The 22nd V.M. Goldschmidt Conference
Earth in Evolution
24-29 June 2012 | Montréal, Canada

Call for Sessions: 12 September 2011
List of Sessions Finalized: 30 November 2011
Abstract Submission Opens: 1 December 2011
Abstract Submission Deadline: 1 February 2012
Online Registration & Housing Opens: 16 January 2012
Early-bird Registration Deadline: 20 April 2012

www.vmgoldschmidt.org

A conference of the Geochemical Society and the European Association of Geochemistry, hosted by GEOTOP and UQAM
Goldschmidt 2013
Florence, Italy
August 25-30

www.goldschmidt2013.org
From the Conveners

We welcome you to the 21st V.M. Goldschmidt Conference, being held this year in the beautiful city of Prague, capital of the Czech Republic. Home to about 1.1M people, Prague has been one of the political, cultural and economic centres of Europe over its 1,100-year existence. The city was the capital of the Holy Roman Empire and, later, the center of the Habsburg Monarchy and of the Austro-Hungarian Empire. After WWI, it became the capital of Czechoslovakia. Since 1992, the extensive historic centre of Prague has been a UNESCO World Heritage Site, making it one of the most popular tourist destinations in Europe.

The theme of this conference is ‘Earth, Life and Fire’. Geochemistry, as its name indicates, is about exploring our planet with physical and chemical tools. Understanding the origin of life, one of the most challenging problems in science, is largely based on geo-biochemical disciplines and on our ability to explore the early Earth with geochemical tools. Life also implies low-temperature geochemistry. Fire and energy are required to activate (geo)chemical reactions, and energy use (and its subsequent remediation) is central to the development of the anthroposphere in the 21st century.

Nature can be viewed as a multiscale network of extremely complicated processes and systems. The recent events in Japan remind us of the danger of forgetting this: models and constructions aimed at anticipating and mitigating the consequences of a major natural disaster proved to be inadequate because the geological record had not been adequately taken into account, and the aftermath of the incident has not been well anticipated. It is our responsibility as geochemists to inform the public audience, including decision makers, of this complexity, especially in the field of nuclear processes where our tools are particularly relevant. With the Geochemical Society of Japan, we decided to organize a special session focusing on the Fukushima accident and its implications. We would like to dedicate this conference to our colleagues and friends in Japan who are working extremely hard to overcome the consequences of this disaster.

We hope you will enjoy this conference in the heart of Europe!

Bernard Marty
Centre de Recherches Pétrographiques et Géochimiques / CNRS, Nancy, France

Bernard Bourdon
Ecole Normale Supérieure, Lyon, France

Martin Novák
Czech Geological Survey, Prague, Czech Republic
From the EAG President

The European Association of Geochemistry and the Geochemical Society together with the organizers of 2011 Goldschmidt meeting would like to welcome all the delegates in the beautiful historical city of Prague. With the breadth of the scientific programme and the promise of exciting presentations at this meeting, we hope that all of you will find this week in Prague enjoyable and fruitful. The plenary presentations will be given by Samuel Mukasa, Marc Hirschmann, Edouard Bard, Franck Selsis and Victoria Orphan, just to illustrate the range of disciplines represented at the meeting.

The largest number of abstracts ever recorded at a Goldschmidt meeting (3800 abstracts) have meant that sessions have also been scheduled on Wednesday afternoon, unlike previous years. While this programme is very studious, there will be several social events that will enable you to enjoy the amazing architectural and artistic treasures of Prague.

As an additional special feature of the programme, Bernard Marty, Mitsuru Ebihara and I have organized a plenary session focusing on the Fukushima accident and its geochemical consequences. Details about this session that will take place on Tuesday all day can be found in the programme on page 99. This conference is dedicated to our Japanese colleagues and friends who are working extremely hard to overcome the consequences of this major disaster.

Finally, I would like to thank all the people who have been involved in the organization of this meeting, either in Prague or elsewhere in Europe, especially Bernard Marty, Martin Novák and Chris Ballentine. The continuing commitment of our community is essential for the success of Goldschmidt conferences.

Have a great time in Prague!

Bernard Bourdon

President, European Association of Geochemistry
Proud to be sponsors of

Goldschmidt 2011

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Komarek, Leona Zemanova, Juraj Farkas, Vojtech Erban, Ferry
Fediuk and Zdenek Taborsky

Cambridge Publications
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David Barrowclough
Mary Chester-Kadwell
Alice Gresham
Barrie Hughes
Jacquie Storey
Andrew Varley

Artwork Acknowledgement
Artwork for Goldschmidt2011 is based on The City of a Hundred Spires by S. Garashok with permission of the artist.
While stocks last

MANGROVE CARBON
Burial underground
TRIGGERED EARTHQUAKES
Low risk at a distance
PLIOCENE SHORELINES
Altered by rebound

IRON IN THE OCEAN
Stable vent source
ANTARCTIC WARMING
Links to the tropics
EASTERN ANDES
High seismic potential

Titan’s atmosphere

MANGROVE CARBON
Burial underground
TRIGGERED EARTHQUAKES
Low risk at a distance
PLIOCENE SHORELINES
Altered by rebound
Multilayered fjord
circulation off Greenland
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<td><strong>Plenary</strong></td>
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<tr>
<td></td>
<td>Bernard Bourdon</td>
<td>Marc Hirschmann</td>
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<td><em>Congress Hall</em></td>
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<td><strong>08:45</strong></td>
<td><strong>Plenary</strong></td>
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<td>Sam Mukasa</td>
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<td><strong>Oral Sessions</strong></td>
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<td><strong>Lunch</strong></td>
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<td><strong>17:00</strong></td>
<td><strong>Registration</strong></td>
<td><strong>Poster Session</strong></td>
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<td><em>Ground Floor</em></td>
<td><em>Floors 1, 2, 3, 4 / Congress Hall Foyer</em></td>
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<td><strong>18:00</strong></td>
<td><strong>Welcome Reception</strong></td>
<td><strong>Poster Session</strong></td>
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<td><em>Floors 2 &amp; 3</em></td>
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<td><strong>19:00</strong></td>
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### Conference Timetable

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<tr>
<td>08:30</td>
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Instructions for Oral Presentations

Oral Presentation Times
Sessions with oral presentations will take place from Monday to Friday from **9:30-12:30** and **14:00-17:00**. There are 18 parallel sessions.

Computer & Software Compatibility
Delegates making oral presentations should make sure that their files are compatible with the software available in the Congress Center. HP computers will be available in each lecture room, each running Windows XP and Office 2007. Delegates should make sure that their presentations are compatible with the software available.

Delegates using Macintosh computers should use their own computers: a second VGA cable will be available but delegates should bring their own adapters.

Uploading your Talk
**Oral presentations should be brought to the room in which the presentation will take place**, on a USB stick, for uploading onto the conference computers.

Delegates with a morning presentation should bring their USB stick between **09:00 and 09:30 on the morning of the presentation**. Delegates with an afternoon presentation should bring their USB sticks between **13:30 and 14:00 on the afternoon of their presentation**. Staff will be available to help with the computers.

Talk Timing
**Speakers should arrive at their allocated session not less than 20 minutes before the start of the first presentation** in order to meet with the chairperson. All presentations must be given in English, which is the official language of the Conference.

Oral presentations are allocated 15 minutes and keynote talks either 15 or 30 minutes. **15-minute talks should be finished after 12 minutes, and 30-minute keynotes after 25 minutes, to leave time for discussion.** The chairperson will give a first signal after 10 minutes, a warning after 12 minutes and prevent further talking after 15 minutes. It is essential for the success of the conference that the speakers strictly stick to this scheme to ensure that all parallel sessions are synchronized.

Mobile Phones & Pagers
Delegates and speakers will be required to mute or turn off their mobile (cell) phones and pagers during oral presentations.
Instructions for Poster Presentations

Poster Presentation Times
There will be **afternoon poster sessions on Monday, Tuesday, Wednesday and Thursday** of the conference from **17:00-19:00**. There will be no poster session on Friday afternoon. **Posters should be put up between 08:30 and 13:00** on the day of presentation. The materials required to attach each poster to the board will be supplied. **Posters should be removed between 19:00-19:30** on the day of presentation. Posters not collected by these times will be removed by the conference organizers and recycled.

Poster Locations
The posters will be displayed in the Congress Hall Foyers on 4 floors of the Congress Centre. **Poster board numbers are given in this Program Volume.** Poster board numbers with first number 1 will be on Floor 1; those starting with 2 will be on Floor 2; those starting with 3 will be on Floor 3 and those starting with 4 will be on Floor 4. See the maps at the back of this Program Volume.

Poster Size
The poster boards are large enough to fit a size A0 poster in portrait orientation (approximately 90 cm wide by 120 cm high). Oversize posters will not be displayed.

Poster Etiquette
The poster sessions are from 17:00 to 19:00 on Monday, Tuesday, Wednesday and Thursday, and **delegates should expect to be available by their poster** for most of this time on the day of their presentation. If there will be any time during this period when no author can be present, a card should be left indicating when the author will next be present.

Cameras & Video Cameras
Photography or videoing is **not permitted in any of the oral sessions, nor at poster sessions**, without the permission of the relevant oral presenter or authors of the poster.
The 3G Laser Ablation System
from New Wave Research

NWR 266
From microns to millimetres with a huge spot size range. Outstanding performance for ultra-trace through to bulk applications, and the perfect partner for ICP and ICP-MS.

NWR 213
The gold standard for solid-state laser ablation just got better. A cost effective solution for analysis of geological materials.

NWR 193
The most accomplished 193nm system available. Combines the exceptional capabilities of the NWR platform with the latest fast excimer technology.

NWR Femto
The analytical excellence of femtosecond laser ablation together with the new NWR platform to create the most user-friendly, integrated femtosecond solution, available as either 266nm or sub-200nm.

ActiveView™
All NWR systems are controlled through ActiveView, the most advanced and complete laser ablation control software available. Now includes the unique 4D sample viewing system.
Conference Information

Congress Center Rooms
Goldschmidt2011 is being held in the Prague Congress Centre in Prague, Czech Republic.

» Registration & Information: 
  Sunday & Monday: Ground Floor / Winter Gardens 
  Tuesday to Friday: Floor 2 / Foyer 2B

» Opening Reception: Floors 2 & 3 / All Foyers

» Plenary and Award Sessions: Floor 2 / Congress Hall

» Poster Sessions: Floors 1, 2, 3, 4 / Congress Hall Foyers

» Exhibition: Floors 2 & 3 / Congress & Forum Hall Foyers

Congress Center Map
See the inside of the back cover of this Program Volume.

Wireless Internet Access
All delegates may access the wireless internet in the foyers of Floors 2 & 3. The network name is Goldschmidt and no password is necessary. If you have trouble accessing the internet please visit the Information Desk in the on the Ground Floor immediately adjacent to the entrance on Sunday and Monday, or on Floor 2 on Tuesday - Friday.

Refreshments, Breaks & Lunches

Refreshments will be available on Floors 2 & 3 during the times allocated for oral presentations. Refreshments will also be available between 17:00 and 18:30 during poster sessions.

Buffet Lunches: For delegates who have pre-purchased the buffet lunch package, these will be served in Restaurant Zoom on Floor 1.

Boxed Lunches: For those who have purchased boxed lunches, these will be available to collect from the Forum Hall Foyer on Floor 3. In good weather try picnicing in the Vysehrad fortress overlooking the Vltava river, about 15 minutes on foot from the Convention Center. Take the main exit and go down the steps on your right. Follow the path to the left to the road 'Na Bucance', continue along until you meet 'V prevnosti'. Turn right and follow this to the Gate House and then on into the Fortress.

Lunches in town: Take the underground from 'Vysehrad' to 'Muzeum' and walk down the Wenceslas Square (Vaclavske namesti). Smaller restaurants 5-10 minutes on foot from 'Muzeum' in side streets may be better value than the places in the square.
My Fifty-eight Years in Science’s Garden of Eden

Coming in January 2012
New EAG Journal

www.geochemicalperspectives.org
Registration Opening Times

Registration & Information Desk Opening Times
Registration will be open as follows:

Ground Floor / Winter Gardens
- Sunday, August 14 15:00-20:00
- Monday, August 15 07:30-17:00

Floor 2 / Foyer 2B
- Tuesday, August 16 08:00-17:00
- Wednesday, August 17 08:00-17:00
- Thursday, August 18 08:00-17:00
- Friday, August 19 08:00-13:00

Name Badges
Please be sure to wear your name badge at all times. Admission to all sessions will require identification by your badge. If you lose your name badge please visit the Registration Desk.

Those with badges stating that they are Accompanying Guests will not be allowed access to the scientific sessions.

Lost & Found
All items found in the Congress Center should be brought to the Registration Desk.

Travel Grants
All enquiries related to travel grants and student support will be dealt with by the Geochemical Society at Booth 40, Floor 3 / Forum Hall Foyer.

Insurance & Responsibility
Liability insurance is the responsibility of each individual delegate. Delegates should have their own medical coverage. The Organizing Committee assumes no responsibility for accident, losses, damage, delays, or any modifications to the program arising from unforeseeable circumstances. It accepts no responsibility for travel or accommodation arrangements. The participant acknowledges that he/she has no right to lodge damage claims against the Organizing Committee should the conference proceeding be hindered or prevented by unexpected political or economic events or generally by Acts of God, or should the non-appearance of speakers or other reasons necessitate program changes.
Field Trips & Sightseeing Tours

Field trip questions should be directed to field trip leaders.

Fieldtrip A: August 12-14
Environment West: From UNESCO World Heritage to Communist Legacy
Leaders: Martin Novák and Michael Komarek
   » Buses depart at 08:30 on Friday, August 12th from the car park to the rear side of the Congress Center.

Fieldtrip B: August 20-22
Environment East: National Parks – Castles – Country Houses
Leaders: Martin Novák and Juraj Farkas
   » Buses depart at 08:30 on Saturday August 20th from the car park to the rear side of the Congress Center.

Fieldtrip C: August 12-14
Medieval Mining: The Famous Silver Triangle
Leaders: Zdenek Taborsky and Ferry Fediuk
   » Buses depart at 08:30 on Friday August 12th from the car park to the rear side of the Congress Center.

Fieldtrip D: August 20-22
Bohemian Enigmas: Granulites, Ultrapotassic Magmatites and Tectites
Leaders: Vojtech Janousek and Roman Skala
   » Buses depart at 08:30 on Saturday August 20th from the car park to the rear side of the Congress Center.

Fieldtrip E: August 20
The Lysina Catchment Critical Zone Observatory (CZO) and Associated Study Sites
Leaders: Pavel Krá, Jacob Hruska and Jan Curik
   » Buses depart at 08:00 on Saturday August 20th from the car park to the rear side of the Congress Center.

Tours of Prague & Castle Tours
   » Saturday, August 13th
   » Sunday, August 14th

For more information about these and other excursions please visit the Information Desk, next to Registration.
Welcome Reception
  » Sunday, August 14  18:00-20:00
  » Congress Centre, Floors 2 & 3 / All Foyers
Delegates are invited to attend the Goldschmidt2011 Welcome Reception. All delegates and accompanying guests are welcome. The 'Golden Prague Quartet' and the 'Prague Jazz Band' will provide music. Light refreshments will be served.

Conference Classical Concerts
  » Monday, August 15  20:00-21:00
  » Historic churches - See page xx for travel directions
A limited number of tickets may be available at the Registration Desk from Monday lunchtime. Tickets cost €10 and must be paid in Euros.

Brevnov Abbey Dinner
  » Tuesday, August 16  19:30-23:00
  » Brevnov Abbey - See page xxi for travel directions
A conference dinner will take place at Brevnov Abbey. Seating is arranged in 6 adjacent chambers, and there is no seating plan. Delegates are asked to be considerate to others when choosing their seats. A limited number of tickets may be available at the Registration Desk from Monday lunchtime. Tickets cost €40 and must be paid in Euros.

Conference Music Event
  » Wednesday, August 17  18:30-20:00
  » Congress Centre, Floor 2 / Forum Hall
The band 'Double Scotch' will be performing. All delegates are welcome; no tickets are required. There will be a cash bar.

Conference Banquet
  » Thursday, August 18  19:30-23:00
  » Municipal House - See page xxi for travel directions
Seating is arranged in 5 halls on three floors, and there is no seating plan. Delegates are asked to be considerate to others when choosing their seats. The Conference Banquet is partly subsidized by conference sponsors to make this event more affordable for all delegates. A limited number of tickets may be available from the Registration Desk from Monday lunchtime. Tickets cost €40 and must be paid in Euros.

*For travel to events outside the Congress Centre, umbrellas are recommended in case of poor weather.*
Public Transportation

The conference recommends that delegates purchase a 3-day pass, valid for underground, trams and buses for 310 CZK. Single tickets cost 32 CZK, valid for 90 minutes. Reduced-rate singles cost 24 CZK, valid for 30 minutes. Children under 15 travel for free. Available to purchase from the Information Desk.

Conference Classical Concerts

St George’s Basilica (sv Jiri), The Prague Castle

40 minutes from Congress Centre to St. George's Basilica.
Take underground line C from 'Vysehrad' to 'Muzeum', change to line A, go to 'Malostranska', tram no. 22 uphill, get off at the 3rd stop ('Prazsky hrad'). This is the rear entrance to the Prague Castle. Walk toward the Cathedral, go past the Cathedral and turn left. St. George's Basilica with two white towers is located behind the presbyterium of the Cathedral.

St. Ignatius (sv. Ignac), Charles Square, Prague 2 - New Town

20 minutes from Congress Centre to St. Ignatius.
Take underground line C to 'I.P. Pavlova', tram no. 10, 16, 22 downhill, two stops. Get off at 'Karlovo namesti'. St. Ignatius is the large Baroque church across the street, 100 m back from the tram stop.

U svateho Klimenta, Klimentska Street, Prague 1 - Old Town

35 minutes from Congress Centre to U svateho Klimenta.
Take underground line C to 'Florenc', change to line B, 1 stop to 'Namesti Republiky'. Alight at 'Namesti Republiky' (NOT to 'Masarykovo nadrazi'). Follow tram tracks to Revolucni street (NOT to Na Porici). Use the right-hand side pavement. Pass Truhlarska and Soukenicka and take the third turn right to Klimentska. Gothic church on the left in about 1 minute.

St. Stephen (sv. Stepan), Stepanska street, Prague 2 - New Town

20 minutes from Congress Centre to St. Stephen
Take underground line C to 'I.P. Pavlova', walk downhill on the right-hand-side pavement, cross motorway, then take the second turn to the right into Stepanska street. The yellowish façade of Gothic St. Stephen is right ahead.

Please make sure you leave in plenty of time to reach your concert venue.
Brevnov Abbey Dinner
Brevnov Abbey, Marketska 1, Prague 6 - Brevnov

60 minutes from Congress Centre to Brevnov Abbey
Take underground line C to 'Muzeum', change to line A, get off at 'Malostranska', tram no. 22 uphill to stop 'Brevnovsky klaster'. Cross street to the right, entrance will be signposted.

Conference Banquet
Municipal House, Namesti Republiky, Prague 1 - Old Town

25 minutes from Congress Centre to Municipal House
Take underground line C to 'Florenc', change to line B, 1 stop to 'Namesti Republiky'. Alight at 'Namesti Republiky' (NOT to Masarykovo nadrazi). The Municipal House is the large Art Nouveau Building with a porch near the Gothic Powder Tower.

Please make sure you leave in plenty of time to reach the venue.

Conference Dormitories
There are 4 different dormitory locations. Please note that the Conference does not provide transportation to and from the dormitories.

Komensky Dormitories
Parlerova street no. 682/6, Prague 1 - Hradcany

17th November Dormitories ("Troja")
Patkova street no. 3, Prague 8

Kajetanka Domitories
Radimova 35/12, Prague 6

Vltava Dormitories
K Verneraku 950/45, Prague 4 - Kunratice

For further details about public transport, directions to places, and maps please go to the Information Desk in the Registration area.
Accompanying Persons' Booth
The Accompanying Persons' Program booth can be found by the Registration and Information desks, and is open at the following times:

- Sunday, August 14 afternoon
- Monday-Friday, August 15-19 08:00-18:00

Payments in Czech crowns, USD or Euro.

Accompanying Persons' Tours
Specialized 3- to 5-hour tours are on offer, which will take place daily from August 16-19. Departures are arranged both in the morning and in the afternoon.

The following 3-hour tours are offered:

- (i) Mozart's Prague
- (ii) Franz Kafka's Prague
- (iii) Art Nouveau in Prague
- (iv) Beer tasting in medieval beer breweries
- (v) Jewish Prague

The tours are offered in 6 languages: English, French, German, Spanish, Italian and Russian. Tours depart from the main entrance of the Congress Center.

Mini-van visits to two medieval castles in the countryside are offered in English:

- (vi) Karlstejn Castle
- (vii) Konopiste Castle

Mini-van tours depart from Hotel Meran/Europa in the Wenceslas Square (underground 'Muzeum', 2-minute walk; map available).
The Exhibition is on **Floors 2 & 3 - see the maps at the back of this Program Volume.** It is open Monday-Friday for browsing and finding out more about the products and services on offer.

The Conference is grateful for the support of the following Exhibitors:

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Plenary Sessions

Welcome Addresses
Monday, August 15
08:30  Floor 2 / Congress Hall

Bernard Bourdon
President of the European Association of Geochemistry

Plenary: Monday, August 15
08:45  Floor 2 / Congress Hall

Sam Mukasa
President of the Geochemical Society
‘Volatiles in the Mantle: Impact on Intraplate Magmatism’

Plenary: Tuesday, August 16
08:30  Floor 2 / Congress Hall

Marc Hirschmann
University of Minnesota
‘Deep Earth Volatile Cycles: From Ancient to Modern’

Plenary: Wednesday, August 17
08:30  Floor 2 / Congress Hall

Edouard Bard
Collège de France
‘Geochemical Profiles to Study the Last Deglaciation and its Impact on Rivers’

Plenary: Thursday, August 18
08:30  Floor 2 / Congress Hall

Franck Selsis
Laboratoire d’Astrophysique de Bordeaux
‘Exoplanet Atmospheres: From Hot to Habitable Worlds’

Plenary: Friday, August 19
08:30  Floor 2 / Congress Hall

Victoria Orphan
California Institute of Technology
Gast Lecture: ‘Microbial Partnerships and Methane-Oxidation in the Deep Sea’
Awards & Special Session

Award Ceremony: Tuesday, August 16

09:10  Floor 2 / Congress Hall

Urey Medal
Don Canfield

Medal Lecture: Wednesday, 14:30, Floor 2 / Terrace 2
Citation by Ariel Anbar

Houtermans Medal
Maud Boyet
in absentia

Ringwood Medal
Kei Hirose

Medal Lecture: Monday, 11:30, Floor 1 / Club D
Citation by David Rubie

EAG/GS Geochemical Fellows
Samuel Bowring  David Rubie
Zhenhao Duan  Susan L. Svane Stipp
Steven Emerson  Dmitri Sverjensky
Katherine Freeman  John W. Valley
J. Michael Moldowan  Dominique Weis
Terry Plank

Following the Awards on Tuesday is an all-day Special Session...

Special Session 23a: Tuesday, August 16

Fukushima Review

09:30-16:00  Floor 2 / Congress Hall
A special session on the geochemical aspects of the Fukushima nuclear power station crisis, chaired by Mitsuru Ebihara, Bernard Bourdon and Bernard Marty.

There are a series of 30-minute talks plus 30 minutes of discussion at the end of the afternoon.

Full details page 99
Awards

Award Ceremony: Wednesday, August 17
09:10  Floor 2 / Congress Hall

Dana Medal
Ross Angel
Medal Lecture: Friday, 09:30, Ground Floor / Small Theatre
Citation by Michael Carpenter

Shen-su Sun Medal
Honglin Yuan
Medal Lecture: Friday, 14:00, Ground Floor / Small Hall
Citation by Chen Zhu

IAG Early Career Award
Leah Morgan
Award Lecture: Thursday, 11:15, Ground Floor / Small Hall

Geochemical Journal Award
Jun-ichi Matsuda, Takuya Matsumoto, Akihisa Suzuki

Award Ceremony: Thursday, August 18
09:10  Floor 2 / Congress Hall

Goldschmidt Medal
Frank Millero
Medal Lecture: Tuesday, 14:00, Floor 2 / Terrace 2
Citation by George Luther

Patterson Medal
Jeff Severinghaus
Medal Lecture: Friday, 09:30, Floor 2 / Terrace 1
Citation by Boaz Luz

Clarke Medal
Rajdeep Dasgupta
Medal Lecture: Tuesday, 16:00, Floor 1 / Club D
Citation by Marc Hirschmann
Meetings

Thermodynamics Meeting
  »  Monday, August 15  12:30-14:00
  »  Floor 4 / Room 4.1
First annual meeting of the working group on thermodynamic databases.

Town Hall Meeting: Geobiology and Geochemistry
  »  Monday, August 15  18:00-19:00
  »  Floor 1 / Club H
A town hall meeting for the Geobiology and Low-Temperature Geochemistry community.

EAG General Assembly
  »  Tuesday, August 16  13:00-13:30
  »  Floor 4 / Room 4.1
All EAG members are welcome. The General Assembly is the annual members' meeting, and it is an opportunity for members to be kept up to date with the EAG's activities, and to discuss related matters.
The European Association of Geochemistry

The EAG is a Proud Co-owner of Goldschmidt2011

The European Association of Geochemistry, EAG, founded in 1985, is dedicated to promoting geochemistry in Europe:

» Organization of the Goldschmidt conference in odd years in Europe
» Publications: *Elements*, *Chemical Geology* and *Geofluids*
» **NEW** EAG Publication coming in January 2012: *Geochemical Perspectives*
» Recognition of scientific excellence through awards
» Sponsorship of workshops and conferences in Europe
» Free publication of job opportunities
» Distinguished Lecture Program
» Communication and networking: monthly newsletters, interviews, Facebook, Twitter

The EAG invites you to become involved!

Please visit the EAG at Booth 35, Floor 3 / Forum Hall Foyer, and attend the EAG General Assembly at Goldschmidt2011 on Tuesday, August 16, 13:00-13:30 (Floor 4 / Room 4.1) for a brief presentation of our activities and an opportunity to meet officers and council members.

EAG Officers

**President:** Bernard Bourdon, ENS Lyon, France  
**Vice-President:** Chris Ballentine, U. of Manchester, UK  
**Past President:** Eric Oelkers, CNRS Toulouse, France  
**Treasurer:** Christa Göpel, IPGP, Paris, France  
**General Secretary:** Steven Banwart, U. of Sheffield, UK  
**Goldschmidt Officers:** Bernard Marty, CNRS Nancy, France  
Bernie Wood, University of Oxford, UK

Contact our Business Office at **office@eag.eu.com**

Come visit us at **Booth 35, Floor 3 / Forum Hall Foyer**

and at the **EAG General Assembly**,  
Tuesday, August 16  
13:00-13:30  
(Floor 4 / Room 4.1)

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President: Mitsuru Ebihara, Tokyo Japan
Vice-President: Naohiro Yoshida, Yokohama Japan

The Geochemical Society of Japan (GSJ) was founded in 1953 for the advancement of research in geochemistry and related sciences. The GSJ is one of the oldest societies devoted to geochemistry in the world. Currently, the GSJ has a membership of about 950 with diverse disciplines related to geochemistry from more than 10 countries. The primary missions of the GSJ are: to publish the latest research results through a rapid and efficient circulation, to provide useful information for the society members and to promote geochemical interests to the general public. To pursue these missions, the GSJ has been cosponsoring the Goldschmidt Conferences since 2003.

The GSJ welcomes your participation. The privilege of the GSJ membership includes free subscription to the Geochemical Journal, discount on GSJ publications, eligibility for an awardee of the GSJ award and eligibility to apply for the Torii Endowment travel/meeting grant. The GSJ would greatly appreciate your input and discussion as well as generous support through an involvement in GSJ. The GSJ cordially welcomes geochemists of wide generations and specialties from all over the world. For more information on the Geochemical Society of Japan and membership benefits, please visit our website at www.geochem.jp/english

Geochemical Journal

Executive Editor: Yuji Sano, Japan
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The Geochemical Society of Japan publishes a bimonthly international journal, the Geochemical Journal (GJ). The most outstanding paper published over the previous year receives the Geochemical Journal Award. For more information on the GJ and the GJ Award, please visit our website at www.geochem.jp/english

The Geochemical Journal has introduced a category of manuscript: the Express Letter. Express Letter presents high-quality short papers published with minimal delay, less than four months. Express Letter provides prompt publication and disseminates timely results to the geochemists and cosmochemists in the world.
Themes & Sessions

Theme 01: Cosmochemistry, Planet Formation
Meenakshi Wadhwa & Marc Chaussidon

01a The Disc Epoch: Sources and Compositions of Early Solar System Materials (Jerome Alelon & Ko Hashizume)
Orals: Mon AM Posters: Mon PM

01b From Gas and Dust to Planetesimals: Processes and Timescales (Fred Ciesla & Ed Young)
Orals: Thu PM, Fri AM Posters: Thu PM

01c From Planetesimals to Planets (Ghylaine Quitte & Frederic Moynier)
Orals: Mon PM Posters: Mon PM

01d Mars and the Moon: New Discoveries from Sample Science to Recent Missions (Anne Peslier, Tomas Magna & Carsten Münker)
Orals: Fri AM, Fri PM Posters: Thu PM

Theme 02: Primitive Earth: From Core to Atmosphere
Stephen Mojzsis, James Kasting & Guillaume Caro

02a Redox Evolution of the Early Mantle, Oceans and Atmosphere (David Catling & Bernie Wood)
Orals: Fri AM, Fri PM Posters: Thu PM

02b Geology, Age and Origin of the Oldest Terrestrial Rocks and Minerals (Nicholas Arndt, Stephen Mojzsis & Janne Blichert-Toft)
Orals: Mon PM, Tue AM Posters: Mon PM

02c The Faint Young Sun Revisited: The Message from Rocks and Climate Models (James Kasting, Nicolas Dauphas & Nathan Sheldon)
Orals: Tue PM Posters: Tue PM

02d Geochemical Evidence For, and Consequences of, Microbial Activity in the Archean Rock Record (Kurt Konhauser, Yuichiro Ueno, Abigail Allwood & Sylvie Derenne)
Orals: Tue PM Posters: Tue PM

02e Timing and Conditions of Core Formation in the Primitive Earth (Caroline Fitoussi & Mathieu Touboul)
Orals: Wed AM Posters: Tue PM

02f Primordial Differentiation and Destruction of Hadean Silicate Reservoirs (Guillaume Caro & Vickie Bennett)
Orals: Thu AM Posters: Wed PM
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<td>What was the Source of Earth’s Volatiles? <em>(Sean Raymond &amp; Bernard Marty)</em></td>
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<td>Taphonomy and Geochemistry: Experiment and Observation in Understanding the Fossil Record of Early Life <em>(Tanja Bosak, Michael Tice &amp; Jochen Brocks)</em></td>
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<td>The Evolving Early Earth Hydrosphere as a Geodynamic Tracer and Facilitator for Life: Constraints from the Supracrustal Rock Record <em>(Vincent van Hinsberg &amp; Emilie Thomassot)</em></td>
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<td>02j</td>
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<td>02k</td>
<td>Astrobiology and Extreme Terrestrial Environments <em>(Jan Jehlicka &amp; Howell G M Edwards)</em></td>
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**Theme 03: Evolution and Dynamics of the Deep Earth**

*James Badro & Mike Walter*

| 03a   | Experimental Constraints on the Origin and Evolution of Earth’s Early Mantle and Core *(James Badro & Mike Walter)* | Tue AM | Mon PM |
| 03b   | Estimating the Deep Mantle Water Budget from Geochemistry, Geophysics, and Geodynamical Modelling *(Bruno Reynard)* | Thu AM | Wed PM |
| 03c   | Mantle Redox and the Deep Carbon Cycle *(Yingwei Fei, Dan Frost & Bob Luth)* | Tue AM, Tue PM | Tue PM |
| 03d   | Cratonic Mantle Processes: Insights from Diamonds and Xenoliths *(Maya Kopylova & Paolo Nimis)* | Wed AM, Wed PM | Tue PM |
| 03f   | Physics and Chemistry of the Deep Earth *(Tetsuya Komabayashi & James Van Orman)* | Mon AM, Mon PM | Mon PM |
Themes & Sessions

03g  Stable Isotope Fractionation at High Pressures and Temperatures (Wim van Westrenen & Helen Williams)
Orals: Mon AM Posters: Mon PM

Theme 04: Mantle to Crust: Ocean Ridge and Intraplate Volcanism
Janne Blichert-Toft & Jasper Konter

04a  Chemical Geodynamics: 25 Years of Mantle Components (Al Hofmann, Francis Albarède, Matthew Jackson & Thorsten Becker)
Orals: Mon AM, Mon PM Posters: Mon PM

04b  New Insights into Mantle and Crustal Processes from High Temperature Stable Isotope Techniques (Bruce Watson, Anat Shahar & Craig Lundstrom)
Orals: Tue AM Posters: Mon PM

04c  Plumes, Mid-Ocean Ridges, and Plates: Examining their Dynamics and Interactions with Observations and Models (Kaj Hoernle, Anthony Koppers, William Sager & Christoph Beier)
Orals: Wed AM, Wed PM Posters: Tue PM

04d  Influence of Volatiles on Mantle and Magma Processes (Rajdeep Dasgupta, Alison Shaw & Dan Frost)
Orals: Thu AM, Thu PM Posters: Wed PM

04e  Mantle Compositional Variability: From Ocean Basins to Melt Inclusions (John Maclennan, Leonid Danyushevsky & David Graham)
Orals: Thu PM, Fri AM Posters: Thu PM

04f  Time Scales of Melt Generation, Extraction, and Transport from the Mantle to the Earth’s Surface (Fidel Costa, Aaron Pietruszka, Mary Reid & Elisabeth Widom)
Orals: Wed AM Posters: Tue PM

04g  Merging Experiments, Models, and Geochemical Observations of Mantle Melting (Paul Asimow, Claude Herzberg & Sebastien Pilet)
Orals: Fri PM Posters: Thu PM

04h  Pb Isotopic Insights into Earth’s Evolution: A Tribute to George R. Tilton (1923 – 2010) (Julie Bryce, Sam Mukasa, Barry Hanan & Kaj Hoernle)
Orals: Thu PM Posters: Wed PM
Themes & Sessions

04i  Origin of Large Igneous Provinces: Linking Geochemistry, Geochronology, Geophysics, Geodynamics and Climate Modeling (Alex Sobolev, Andrea Marzoli, Stephan Sobolev & Fred Jourdan)

Orals: Tue PM Posters: Tue PM

Theme 05: Continental Crust Formation and Evolution

Cin-Ty Lee, James Day & Oliver Jagoutz

05a  The Origin of Planetary Crusts (Audrey Bouvier & James Day)

Orals: Wed AM Posters: Tue PM

05b  Destruction and Recycling of Continental Crust (Yongsheng Liu, Cin-Ty Lee & Shan Gao)

Orals: Tue PM Posters: Tue PM

05c  Continent Formation through Time (Steve Parman, Peter Clift, Steven Shirey & Martin Van Kranendonk)

Orals: Thu AM, Thu PM Posters: Wed PM

05d  The Role of Island and Continental Arcs in Continent Formation (Jaime Barnes, Esteban Gazel & Jade Star Lackey)

Orals: Mon AM Posters: Mon PM

05e  Petrologic, Geochemical and Tectonic Links between the Continental Crust and Lithospheric Mantle (Oliver Jagoutz, Craig O’Neill, Peter Luffi & Josef Dufek)

Orals: Tue AM Posters: Tue PM

05f  Calibrating the Thermo-Mechanical Evolution of Continental Crust: Magmatism, Metamorphism, Deformation, and Erosion (Ethan Baxter, Rebecca Flowers, Stacia Gordon & Gregory Dumond)

Orals: Wed AM, Wed PM Posters: Tue PM

05g  Duration, Tempo and Rates of Magmatic Processes in the Crust (Urs Schaltegger & Othmar Müntener)

Orals: Mon PM Posters: Mon PM

05h  Kimberlite, Carbonatite, and Strongly Alkaline Magmatism: Source-Forming Processes and Relations to Basaltic Magmatism (Sebastian Tappe, Dejan Prelevic & Graham Pearson)

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<td><strong>06e</strong> Deep Subduction of Crustal Rocks into the Mantle: Observations, Experiments, Models (Larissa Dobrzhinetskaya, Shah Wali Faryad, Taras Gerya &amp; Alexei Perchuk)</td>
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<td><strong>07d</strong> Trace Metal Stable Isotopes and Organic Biomarkers: Evidence for Early Life on Earth and Beyond (Vyllinniskii Cameron, Corey Archer &amp; Jennifer Eigenbrode)</td>
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## Themes & Sessions

### 07e
Mesozoic and Early Cenozoic Greenhouse Episodes: Insights into the Anthropocene *(Stuart Robinson, Tom Dunkley Jones & Jim Zachos)*

**Orals: Mon PM**  
**Posters: Mon PM**

### 07f
Modern Analogues for Precambrian Marine Ecosystems *(Sean Crowe & Noah Planavsky)*

**Orals: Wed PM**  
**Posters: Wed PM**

### 07g
Enhancing Mineral Weathering and Ocean Alkalinity to Consume CO₂ and Moderate Ocean Acidification *(Tim Kruger, Dieter Wolf-Gladrow, Greg Rau & Josh West)*

**Orals: Wed AM**  
**Posters: Tue PM**

### 07h
Oceanic Anoxia and Ocean Dead Zones, Past, Present and Future *(Martin Kennedy, Thomas Wagner & Anthony Cohen)*

**Orals: Wed AM**  
**Posters: Tue PM**

### Theme 08: Interfaces and Interfacial Processes from the Nano- to Continental Scale

**Ruben Kretzschmar & Laurent Charlet**

#### 08a
Natural, Synthetic, and Incidental Nanoparticles, their Surface Characteristics, and their Interactions with Earth and Life *(Mike Hochella, Laurent Charlet, Frank von der Kammer & Jamie Lead)*

**Orals: Wed AM, Wed PM**  
**Posters: Tue PM**

#### 08b
Chemical and Microbial Electron Transfer Processes at Mineral Surfaces *(Kevin Rosso & Andreas Kappler)*

**Orals: Wed PM, Thu AM**  
**Posters: Wed PM**

#### 08c
Biogeochemical Processes within Floodplain and Deltaic Sediments *(Scott Fendorf, Shawn Benner & Ruben Kretzschmar)*

**Orals: Thu AM**  
**Posters: Wed PM**

#### 08d
Biotic/abiotic Nucleation and Early Life *(Karim Benzerara, Andreas Kappler & Kurt Konhauser)*

**Orals: Tue AM**  
**Posters: Mon PM**

#### 08e
Current Challenges in Predicting Trace Metals Mobility in the Environment *(Thorsten Schäfer, Christophe Tournassat & Thorsten Stumpf)*

**Orals: Fri PM**  
**Posters: Thu PM**

#### 08f
Oceanic and Terrestrial Natural Organic Matter Transformation *(Alan Stone & Neil Blough)*

**Orals: Tue PM**  
**Posters: Tue PM**
Themes & Sessions

08g  Gas Storage and Transfer in Geological Media (Eric Pili & Jim DeYoreo)
Orals: Tue AM Posters: Mon PM

08h  Geochemical Processes at Mineral-Water Interfaces: Insight from Macroscopic, Spectroscopic, and Computational Methods (Jeffrey Catalano, Udo Becker & Jean-François Boily)
Orals: Mon AM, Mon PM, Tue AM, Tue PM, Wed AM Posters: Tue PM

08i  Mineral Nucleation: From the Atomic to the Planetary Scale (Juan Diego Rodriguez-Blanco, Teresa Roncal-Herrero & Karina Krarup Sand)
Orals: Wed PM Posters: Wed PM

08j  Nanoparticles, Interfacial Processes and Nuclear Waste Management (Andrey Kalinichev, Stepan N Kalmykov & Melissa Denecke)
Orals: Thu PM, Fri AM Posters: Thu PM

08k  Water Structure and Hydrogen Bonding on Mineral and Nanoparticle Surfaces (Glenn Waychunas & Alejandro Fernandez-Martinez)
Orals: Thu PM Posters: Wed PM

Theme 09: Geochemistry of Volcanic Systems and Natural Hazards
David Pyle & Mark Reagan

09a  Magmatic Volatiles, Climate, and Earth Evolution (David Pyle & Bernard Marty)
Orals: Fri AM Posters: Thu PM

09b  New Insights into Geochemical Monitoring of Volcanic Activity (Sandro Aiuppa & Burton Mike)
Orals: Fri PM Posters: Thu PM

09c  Magmatic Volatiles: From Natural and Experimental Systems to Thermodynamics and Numerical Modeling, Their Influence on Magma Properties (Nicole Metrich & Roman Botcharnikov)
Orals: Fri AM Posters: Thu PM

09d  Petrological and Geochemical Indicators of Magmatic Processes and Eruption Trigger Mechanisms (Olivier Bachmann, Fidel Costa & Christian Huber)
Orals: Tue AM Posters: Mon PM
Themes & Sessions

09e  Timescales of Magma Evolution, Degassing, and Ascent through the Crust (Heather Handley & Mark Reagan)
Orals: Fri PM Posters: Thu PM

09f  Linking the Plutonic and Volcanic Records: Textural and Geochemical Fingerprinting of Magma Chamber Processes (Vojtech Janousek, Valentin Troll & Abigail Barker)
Orals: Thu PM Posters: Wed PM

09g  Elements of Ophiolites (Yildirim Dilek & Harald Furnes)
Orals: Wed PM Posters: Wed PM

09h  Volcanic Glass Heterogeneity: Primary and Secondary Causes, and Uses (Kim Berlo, Victoria Smith & Olivier Reubi)
Orals: Wed PM Posters: Wed PM

Theme 10: Earth Resources: Energy
Steve Larter & Chris Ballentine

10a  Geochemistry, Biogeochemistry, Mineralogy and Physics of Shale Gas, Coal Gas and Tight Gas Systems (Robert Burruss)
Orals: Mon PM Posters: Mon PM

10b  Biogenic Gas and Biogeochemical Routes to Cleaner Energy (Bill Mahaffey & Dariusz Strapoc)
Orals: Tue AM Posters: Mon PM

10c  Hydrogen, Electrons, Biofuels and the Biogeochemistry of Sediments (Ian Head & Lars Peter Nielsen)
Orals: Tue PM Posters: Tue PM

10d  Geochemistry in the Post Petroleomics World – Advances in MS (Clifford Walters & Patrick Hatcher)
Orals: Tue PM Posters: Tue PM

10e  Towards the Geochemical Tricorder – Advances in Geochemical Microtechnology, Sampling and Sensing Systems: (Steve Larter)
Orals: Wed PM Posters: Wed PM

10f  Carbon Sequestration Analogues (Chris Ballentine & Dave Cole)
Orals: Mon AM, Mon PM Posters: Mon PM

10g  Organic and Inorganic Fluid-Fluid-Rock Interactions in CO₂ Storage Systems (Axel Liebscher, Andrea Vieth-Hillebrand & Ann-Kathrin Scherf)
Orals: Thu PM, Fri AM Posters: Thu PM
### Themes & Sessions

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<th>Geochemical Frontiers of the Rock/Water/Hydrocarbon System (Bruce Yardley &amp; Christian Ostertag-Henning)</th>
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#### Theme 11: Earth’s Resources: Ores - under the patronage of SGA

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<th>Black Shales and Ocean-Atmosphere Evolution: Implications for Metal Accumulation – Sponsored by SGA (Bernd Lehmann &amp; Jan Pasava)</th>
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<th>Natural and Synthetic Platinum-Group Minerals (PGM): Tracers of Processes at High and Low Temperatures – Sponsored by IMA COM and SGA (Oskar Thalhammer, Federica Zaccarini &amp; Juraj Farkaš)</th>
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### Theme 12: Climate Change

**Edouard Bard & Barbara Stenni**

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<td>Links between CO\textsubscript{2} and Climate: Carbon Cycle Feedbacks over Time (Ralph Keeling &amp; Hagit Affek)</td>
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<td>12b</td>
<td>Patterns of Past Changes in Major Precipitation Systems (Dominik Fleitmann &amp; Julia Cole)</td>
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<td>12c</td>
<td>Chronologies and Rates of Climate Change (Edouard Bard &amp; Dominik Fleitmann)</td>
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<td>Novel Molecular and Isotopic Tracers of Terrigenous Supply to Marine Sediments (Guillemette Menot, Germain Bayon &amp; Johan Weijers)</td>
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<td>Biomineralization of Marine Organisms: Toward a Better Understanding of Proxy Records (Claire Rollion-Bard, Dominique Blamart &amp; Jess Adkins)</td>
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<td>12g</td>
<td>Modeling of Geochemical Proxies (Xavier Giraud, Olivier Marchal &amp; Michael Evans)</td>
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<td>12h</td>
<td>Geochemistry of Ice Sheets and their Basal Environments (Jeff Severinghaus &amp; Barbara Stenni)</td>
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<td>Marginal Basin Sediments: Archives for High-Resolution Paleoclimate Records Including Land-Ocean Interactions (Gert De Lange, F.M. Martinez-Ruiz, Stefano Bernasconi &amp; G Versteegh)</td>
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### Theme 13: Sources, Sinks and Impact of Atmospheric Aerosols

**Gordon McFiggans & Surabi Menon**

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<th>Organics in the Mix: Multicomponent Aerosol Processes <em>(Gordon McFiggans &amp; Douglas Worsnop)</em></th>
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<th>Aerosols, Clouds and Precipitation <em>(Patrick Chuang &amp; Johannes Quaas)</em></th>
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<th>Air Quality and Climate: Bridging the Scales <em>(Mian Chin &amp; Lorraine Remer)</em></th>
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<th>Aerosols, Energy Sources and Climate <em>(Surabi Menon &amp; Jon Egill Kristjansson)</em></th>
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<th>13f</th>
<th>Marine Aerosol Formation and Transformation <em>(Colin O’Dowd &amp; Thorsten Hoffmann)</em></th>
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<th>13g</th>
<th>Atmospheric Dust <em>(Reto Gieré &amp; Bernard Grobéty)</em></th>
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### Theme 14: Weathering, Climate, Tectonics and Surface Processes

**C. France-Lanord & Lou Derry**

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<th>14a</th>
<th>Critical Zone Processes at Multiple Scales <em>(Heather Buss &amp; Jérôme Gaillardet)</em></th>
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<th>The Geochemistry of Landscape Evolution: Linkages between Regolith Formation, Erosion, and Chemical Fluxes <em>(George Hilley &amp; Christian Mavris)</em></th>
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<th>Proxies for Chemical Weathering – Studies of Active Processes and Interpretation of Ancient Records <em>(Friedhelm von Blanckenburg, Ed Tipper, Alexander Piotrowski &amp; Julien Bouchez)</em></th>
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14d  Links between Surface Processes and the Evolution of Earth’s Biogeochemical Cycles (Martin Kennedy & Sasha Turchyn)

Orals: Wed AM  Posters: Tue PM

14e  Silicate Weathering and Organic Carbon Sequestration during Continental Erosion: Processes Controlling Dissolved and Particulate Fluxes Exported by Rivers to the Ocean (Valier Galy & Herdis Schopka)

Orals: Thu AM  Posters: Wed PM

14f  Quantifying Erosion and Weathering Rates and Critical Zone Processes Across Spatial and Temporal Scales (Francois Chabaux, Anthony Dosseto, Arjun Heimsath & Rolf Aalto)

Orals: Mon AM, Mon PM  Posters: Mon PM

14g  Experimental Constraints on Chemical Erosion Rates and Mechanisms Using New and/or non Traditional Isotope Tools (Nathalie Vigier & Eric Oelkers)

Orals: Thu PM  Posters: Wed PM

Theme 15: Oceans Atmosphere: Past and Present

Ed Boyle & Jess Adkins

15a  The GEOTRACES Program (Ed Boyle)

Orals: Mon AM, Mon PM  Posters: Mon PM

15b  Deep Ocean Circulation in the Past (Jeanne Gherardi Scao & Bob Anderson)

Orals: Tue PM  Posters: Tue PM

15d  Geochemical and Microbiological Research in Both Shallow and Deep-Sea Hydrothermal Environments (Roy Price & Paul Craddock)

Orals: Wed AM  Posters: Tue PM

15e  Balancing the Radiocarbon Budget (Jess Adkins)

Orals: Wed AM, Wed PM  Posters: Tue PM

15g  Connectivity of Ocean Circulation and Chemistry at Glacial-Interglacial Transitions (Katharine Hendry & Marcus Gutjahr)

Orals: Mon PM, Tue AM  Posters: Mon PM

15h  Submarine Hydrothermal Processes and Alteration of the Oceanic Lithosphere (Frieder Klein, Marguerite Godard, Gretchen L. Früh-Green & Niels Jöns)

Orals: Wed PM, Thu AM  Posters: Wed PM
Themes & Sessions

15i  Metal Stable Isotope Signals in Earth’s Oceans and Seas  
(Thomas Bullen & Matthew Fantle)  
**Orals: Fri AM, Fri PM**  
**Posters: Thu PM**

**Theme 16: Geochemical Impacts of Human Activity**

**Steve Banwart & Dan Giammar**

16a  Geochemical Processes in Mining Environments – Sponsored by MIBRAG (Kate Campbell, Colleen Hansel & Kai-Uwe Ulrich)  
**Orals: Wed AM, Wed PM, Thu AM, Thu PM**  
**Posters: Wed PM**

16b  Understanding the Fate and Transformations of Metal and Radionuclide Contaminants in Unsaturated and Saturated Subsurface Environments (Scott Brooks, Dawn Wellman, Henning Prommer & Ann Miracle)  
**Orals: Thu PM, Fri AM, Fri PM**  
**Posters: Thu PM**

16c  Soil Carbon Dynamics in Managed Environments (Nikolaos Nikolaidis & Donald Sparks)  
**Orals: Mon PM, Tue AM**  
**Posters: Mon PM**

16d  Assessing Micropollutant Transformation Dynamics in the Earth’s Critical Zone (Thomas Hofstetter, William Arnold & Heileen Hsu-Kim)  
**Orals: Tue AM**  
**Posters: Mon PM**

16e  Engineered Nanomaterials in the Environment: Strategies to Understand their Behaviour and Impact in Environmental and Biological Media (Maria Romero-Gonzalez, Frank von der Kammer, Greg Lowry & Peter Vikesland)  
**Orals: Tue PM, Wed AM**  
**Posters: Tue PM**

16f  Biogeochemical Processes in Management and Forensics of Legacy Radioactive Materials (Katherine Morris, Maxim Boyanov & Albert J Fahey)  
**Orals: Mon AM, Mon PM**  
**Posters: Mon PM**

16h  Environmental Implications of Waste Recycling: Challenges in Preserving Soil and Water Resources (Emmanuel Doelsch & Armand Masion)  
**Orals: Wed AM**  
**Posters: Tue PM**
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Theme 17: Biogeochemistry: From Microbes to Macro and Cycles

Martin Novak, Susan Trumbore & Jon Chorover

17a  Biogeochemical Cycling in Watersheds (Martin Novak & Maria Dittrich)

Orals: Fri AM Posters: Thu PM

17b  Where Minerals Meet Life: Organic Matter Turnover in the Critical Zone (Kirsten Kuesel, Karsten Kalbitz, Katerina Dontsova & Zsuzsanna Balogh-Brunstad)

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17c  Methane Cycling in Marine and Terrestrial Environments (Samantha Joye, Alina Stadnitskaia, Helge Niemann & Tomas Feseker)

Orals: Wed AM Posters: Tue PM

17d  Biogeochemistry of Limiting Nutrients (Stephan Kraemer & Peter Croot)

Orals: Wed PM Posters: Wed PM

17e  Nitrogen Isotopes and Nitrogen Cycling in Terrestrial and Aquatic Systems (Carsten Schubert & Moritz Lehmann)

Orals: Mon AM, Mon PM Posters: Mon PM

17f  Microbial Catalysis of Mineral Dissolution and Precipitation (Liane Benning, Renata van der Weijden, Steeve Bonneville & Carsten Mueller)

Orals: Mon PM, Tue AM Posters: Mon PM

17g  Dynamics, Mobility and Bioavailability of Trace Elements in Contaminated Environments (Michael Komarek, Melanie Davranche, Carla Koretsky & Martin Mihaljevic)

Orals: Thu PM, Fri AM Posters: Thu PM

17h  Biogeochemical Cycling of Iron (Kristina Straub, Thilo Behrends, Ed Burton, Stefan Peiffer & Cara Santelli)

Orals: Mon AM, Mon PM Posters: Mon PM

17i  Linking “Omics” to Biogeochemical Fluxes (Peter Girgius, Jutta Niggemann & Thorsten Dittmar)

Orals: Fri PM Posters: Thu PM

17j  Biogeochemical Processes in Redox-Dominated Environments: From Cold Seeps to Soils (Gert De Lange, Céline Pallud, Christian Hensen & Anniet Laverman)

Orals: Fri AM, Fri PM Posters: Thu PM
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17k Significance of Iodine in Biogeochemistry and the Environmental Sciences: Special Session Commemorating the Bicentennial of the Discovery of Iodine (Yasuyuki Muramatsu & Glen Snyder)

Orals: Thu AM, Thu PM Posters: Wed PM

17l Biomedical Applications of Natural Stable Isotope Variations (Vincent Balter & Anton Eisenhauer)

Orals: Thu PM Posters: Wed PM

17m Microscale (Bio)chemical and Microbiological Characterization of Soils and Geosorbents (Philippe Baveye, Thilo Eickhorst, Astrid Jacobson & Clare Wilson)

Posters: Wed PM

17n Trace Metal Records in Marine Systems: Processes and Proxies (Christian März, Jennifer McKay & Philipp Böning)

Orals: Thu PM Posters: Wed PM

Theme 18: Frontiers in Analytical Techniques
Gerd Gleixner, Tim Elliott & Ed Young

18a Advances in Resolution and Accuracy of in situ Determination of Isotope Ratios (Anders Meibom & Jan Kosler)

Orals: Mon AM, Mon PM Posters: Mon PM

18b New Isotopic Systems at Unprecedented Precision (Magali Bonifacie & Joel Baker)

Orals: Tue PM Posters: Tue PM

18c Accurate and Consistent Time-Keeping in Geological History (Dan Condon, Fin Stuart & Claudine Stirling)

Orals: Thu AM Posters: Wed PM

18d Advanced Microanalytical, Spectroscopic and (Spectro-)microscopic Surface Methods: STXM, NEXAFS, AFM, NANOSIMS,... (Kai Totsche & Karim Benzerara)

Orals: Mon PM, Tue AM Posters: Mon PM

18e Novel Molecular Methods to Understand Past and Present Biogeochemical Processes (Dirk Sachse & Valerie Schwab-Lavric)

Orals: Wed AM, Wed PM Posters: Tue PM

18g Non-Traditional Isotopes in Non-Traditional Matrices (Jean Carignan, Sander van den Boorn & Christophe Cloquet)

Orals: Wed PM Posters: Wed PM
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18h  Recent Advances in the Application of Calorimetry and Thermal Analysis in the Biogeosciences (Alain Plante & Nieves Barros)
      Orals: Thu PM Posters: Wed PM

Theme 19: Frontiers in Computational Geochemistry
       Lars Stixrude & James Rustad

19a  Radioactivity in the Environment: Damage, Solution, and Relativistic Effects (David Dixon & Martin Dove)
      Orals: Mon PM Posters: Mon PM

19b  Large and Complex Atomistic Systems: Physics, Algorithms, and Hardware (Adri van Duin & Paolo Raiteri)
      Orals: Mon PM Posters: Mon PM

19c  Modeling Transition Metal Compounds: Oxides, Sulfides, and Interfaces (Rossitza Pentcheva, Ronald Cohen & Nora de Leeuw)
      Orals: Tue AM Posters: Tue PM

19d  Dynamics of Earth Materials: From Isotope Fractionation to Spectroscopy (Razvan Caracas & David Dixon)
      Orals: Tue AM Posters: Mon PM

19e  Simulation of Geofluids from Melts to Aqueous Solutions (Lars Stixrude & Ariel Chialvo)
      Orals: Fri AM Posters: Thu PM

19f  Bridging the Gap between Atomic, Pore, and Continuum Scales (Virginie Marry & Carl Steefel)
      Orals: Mon AM Posters: Mon PM

19g  Reactions and Catalysis: Mineral-Water Interaction, CO$_2$ Sequestration, Electron Transfer (James Rustad, Nora de Lecuw & Rossitza Pentcheva)
      Orals: Thu PM Posters: Wed PM

19h  High Pressure Behavior from Impacts to Interiors (Nico de Koker & Kanani Lee)
      Orals: Fri PM Posters: Thu PM

19i  New Developments For The Analysis of Core-Level Spectroscopies (Paul Bagus & Eugene Ilton)
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<tr>
<td>Falko Langenhorst &amp; Catherine McCammon</td>
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</tbody>
</table>

| 20a | Unraveling P-T-t Paths: Pseudosections Versus Classical Phase Petrology (Sönke Brandt & Niels Jöns) |
| Orals: Thu PM Posters: Wed PM |

| 20b | Magnetic Properties of Chemical Interfaces and Nano-Crystals in Natural Systems (Suzanne McEnroe & Ann Hirt) |
| Orals: Wed PM Posters: Wed PM |

| 20c | Interplay between Plastic Rock Deformation and Mineral Reactions (Rainer Abart, Bjorn Jamtveit & John Wheeler) |
| Orals: Tue AM Posters: Mon PM |

| 20d | Advances in Experimental and Computational Approaches to Mineral-Fluid Interactions (David Dolejs & Juraj Majzlan) |
| Orals: Wed PM Posters: Wed PM |

| 20e | Diffusion Controlled Processes: Nature, Experiment and Theory (Ralf Dohmen & Jiba Ganguly) |
| Orals: Tue PM Posters: Tue PM |

| 20f | Melts and Glasses: From Deep Earth Interiors over Environmental Applications to Volcanological and Geophysical Challenges (Roberto Moretti & Daniel Neuville) |
| Orals: Fri PM Posters: Thu PM |

| 20g | Applying Synchrotron Science to Geosciences (Max Wilke & Hanns-Peter Liermann) |
| Orals: Wed AM Posters: Tue PM |

| 20h | Abundance and Distribution of Critical High-Tech Metals in Ore Minerals (F. Michael Meyer & Jens Gutzmer) |
| Orals: Wed AM Posters: Tue PM |

| 20i | Advanced Study of the Physical Properties of the Mantle Materials, and Applications to the Earth’s Structure, Composition and Dynamics (Tomoo Katsura & Stanislav Sinogeikin) |
| Orals: Thu AM Posters: Wed PM |

| 20j | Structure, Elasticity and Thermodynamics of Minerals (Michael A. Carpenter, Tiziana Boffa Ballaran & Alan Woodland) |
| Orals: Fri AM, Fri PM Posters: Thu PM |

| 20k | Petrology and Geochemistry of Rutile (Thomas Zack, Daniel F. Stockli & Alicia Cruz-Uribe) |
| Orals: Thu AM, Thu PM Posters: Thu PM |
## Themes & Sessions

### Theme 21: Hydrogeochemistry and Global Water Sustainability

**Chen Zhu & Rolf Kipfer**

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Speakers</th>
<th>Orals</th>
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<tbody>
<tr>
<td>21a</td>
<td>Global Water Sustainability <em>(Chen Zhu)</em></td>
<td></td>
<td>Mon AM, Mon PM</td>
<td>Mon PM</td>
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<tr>
<td>21c</td>
<td>Application of Noble Gases and Naturally Occurring Radioactive Isotopes in Waters and the Environment <em>(Rolf Kipfer &amp; Michael Schubert)</em></td>
<td></td>
<td>Thu AM</td>
<td>Thu PM</td>
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<tr>
<td>21d</td>
<td>Biogeochemistry of Arsenic and Antimony <em>(Karen Johannesson, Annette Johnson &amp; Saugata Datta)</em></td>
<td></td>
<td>Tue PM</td>
<td>Tue PM</td>
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<tr>
<td>21e</td>
<td>Fluid and Solute Fluxes Across the Land, River, Lake and Ocean Interfaces <em>(Henrieta Dulaiova, Thomas Riedel, Natasha Dimova &amp; Hannelore Waska)</em></td>
<td></td>
<td>Mon PM</td>
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<tr>
<td>21f</td>
<td>Fluid Flow in the Earth’s Crust <em>(Alasdair Skelton, Andrew Putnis &amp; Jay Ague)</em></td>
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<td>Wed AM, Wed PM</td>
<td>Tue PM</td>
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### Theme 22: General Sessions

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<thead>
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<tr>
<td>22a</td>
<td>General Low-Temperature Geochemistry <em>(Leona Zemanova)</em></td>
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<tr>
<td>22b</td>
<td>General High-Temperature Geochemistry <em>(Evelyn Füri &amp; Dominique Tobler)</em></td>
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<td>22c</td>
<td>General Biogeochemistry <em>(Juraj Farkas)</em></td>
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<td>Thu PM</td>
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<tr>
<td>22d</td>
<td>Isotope Archaeometry <em>(Ernst Pernicka, Thilo Rehren &amp; Bernd Lehmann)</em></td>
<td></td>
<td>Fri PM</td>
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### Theme 23: Special Sessions

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<tr>
<td>23a</td>
<td>Fukushima Review <em>(Mitsuru Ebihara, Bernard Bourdon &amp; Bernard Marty)</em></td>
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<td>Tue AM, Tue PM</td>
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## Summary & Highlights

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>08:30</td>
<td>Welcome Address</td>
<td>Floor 2 / Congress Hall</td>
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<tr>
<td></td>
<td>Bernard Bourdon</td>
<td>President of the European Association of Geochemistry</td>
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<tr>
<td>08:45</td>
<td>Plenary</td>
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<td></td>
<td>Sam Mukasa</td>
<td>Geochemical Society President</td>
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<tr>
<td></td>
<td>‘Volatiles in the Mantle’</td>
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<td>09:25</td>
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<td>09:30</td>
<td>Oral Sessions</td>
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<tr>
<td>12:30</td>
<td>Lunch</td>
<td>Floor 3 / Forum Hall Foyer</td>
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<td>Floor 1 / Restaurant Zoom</td>
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<td>14:00</td>
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<td>17:00</td>
<td>Poster Session</td>
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<td>20:00</td>
<td>Conference Classical Concerts</td>
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<td>09:30</td>
<td>Maurice</td>
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<td>von der Heyden</td>
<td>Ruiz - Agudo</td>
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<td>Warren</td>
<td>Hu</td>
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<td>Nakamura</td>
<td>Rebiscoul</td>
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<td>Johnson</td>
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<td>Wendt - Potthoff</td>
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<td>Lindgren</td>
<td>Kurganskaya</td>
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<td>Daughney</td>
<td>Colombani</td>
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</table>
### Session chaired by Jérome Aléon & Ko Hashizume

**09:30** Combined NanoSIMS and TEM *in situ* Analysis of Pristine Matrix Material of ALHA 77307 and Acfer 094  
*Soto AN, Brenker FE & Hoppe P*

**09:45** Nickel Isotope Anomalies: Neutron-Rich or Neutron-Poor?  
*Steele R, Elliott T, Coath C & Regelous M*

**10:00** Timing of Early Solar System Homogenization from P-Process $^{180}$W Heterogeneities  
*Schulz T & Münker C*

**10:15** **Keynote:** The Insoluble Organic Matter in Carbonaceous Meteorites  
*Derenne S & Robert F*

**10:45** Invited: The Delivery of Organic Material to the Early Solar System  
*Visser R, van Dishoeck EF, Doty SD & Bergin EA*

**11:00** Origin of N Isotopic Anomalies in Meteoritic and Cometary Organic Matter  
*Aléon J*

**11:15** Meteoritic Organics as a Carrier of the Oxygen Isotope Anomaly in the Solar System  
*Hashizume K, Takahata N, Naraoka H & Sano Y*

**11:30** Photochemistry and the Observed Enrichment of O, C, N, and H Isotopes in Meteorite IOM  
*Lyons J*

**11:45** Experimental Test of the CO Self-Shielding Model for the Early Solar System’s Oxygen Isotope Evolution  
*Shi X, Yin Q-Z, Luo Z, Huang H & Ng C-Y*

**12:00** Aqueous Alteration of Organic Matter and Amorphous Silicate in Pristine Chondrites: A Multiscale Study  
*Le Guillou C, Brearley A, Remusat L & Bernard S*

**12:15** Mercury and Enstatite Chondrite Origins by Equilibrium Condensation from chondritic-IDP Enriched Vapor  
*Ebel DS & Alexander C*

(Session 01a continues on Monday 15th Posters on page 56)
02i: The Evolving Early Earth Hydrosphere as a Geodynamic Tracer and Facilitator for Life: Constraints from the Supracrustal Rock Record

Session chaired by Vincent van Hinsberg & Emilie Thomassot

09:30 **Invited:** Stable Isotope Composition and Volume of Early Archaean Oceans
   Pope E, Rosing M & Bird D

09:45 The First Multiple Sulfur Isotope Evidence for a 2.9 Ga Mesoarchean Sulfate Reservoir
   Barley M, Golding S, Heggie G & Fiorentini M

10:00 Paleoarchean Barites Record Microbial Reduction of a Well-Mixed Marine Sulfate Reservoir
   Roerdink DL, Mason PRD, Farquhar J & Reimer T

10:15 Archean Sulfur May Power Modern Microbial Life in the Deep Subsurface in the Canadian Shield
   Li L, Wing B, Bui T, Slater G, Lacrampe-Couloume G & Sherwood Lollar B

10:30 **Keynote:** Chromium Enrichment in Iron Formations Record Earth’s First Acid Rock Drainage during the Great Oxidation Event

11:00 Molybdenum and Vanadium Abundances in Banded Iron Formation and the Onset of Oxidative Continental Weathering
   Lalonde S, Planavsky N, Rouxel O, Pecoits E & Konhauser K

11:15 Near Neutral Seawater pH 3.45 Billion Years Ago

11:30 **Invited:** Tracking Archean Seawater Trace Metal Inventories through Multi-Proxy Analysis of Euxinic Black Shales
   Scott C, Planavsky N, Kendall B, Wind B, Bekker A, Anbar A & Lyons T

11:45 **Invited:** Mesoarchaean Suprasubduction Zone Ophiolite in the Tartoq Group, SW Greenland
   Szilas K, van Hinsberg V & Kisters A

12:00 Towards a Quantitative Record of Archaean Ocean Water Chemistry: An Element Partitioning Approach
   van Hinsberg V, Szilas K & Wood B

12:15 The Composition of Earth’s Oldest Iron Formations: The Nuvvuagittuq Supracrustal Belt (Québec, Canada)
   Moszewska A, Pecoits E, Cates N, Mojzsis S, O’Neil J & Konhauser K

(Session 02i continues on Monday 15th Posters on page 57)
03f: Physics and Chemistry of the Deep Earth
Session chaired by Tetsuya Komabayashi & James Van Orman

11:30  Medal: The High Conductivity of Iron and Thermal Evolution of the Earth’s Core
       Hirose K, Gomi H, Ohta K, Labrosse S & Hernlund J

       Rainey E, Kavner A & Hernlund J

(Session 03f continues on Monday 15th PM on page 29)
03g: Stable Isotope Fractionation at High Pressures and Temperatures

Session chaired by Wim van Westrenen & Helen Williams

09:30 Isotope Fractionation between Metallic Fe and Fe(III) and Fe(IV) Bearing Compounds
Polyakov V & Soultanov D

09:45 Invited: Isotopic Fractionation of Zinc in Planetary Basalts
Moynier F, Paniello R & Day J

10:00 Keynote: Fractionation of Li and Mg Isotopes in Mantle Derived Materials- Promise, Perils and Progress

10:30 Iron Isotopes and Komatiites: Implications for Mantle Oxygen Fugacity
Hibbert K, Williams H, Kerr A & Puchtel I

10:45 Isotopic Evidence for Internal Oxidation of the Earth’s Mantle during Accretion
Williams H, Wood B, Wade J, Frost D & Tuff J

11:00 Si Isotope Fractionation in High-Temperature Metal-Silicate Systems: Implications for Core Formation
Kempl J, Vroon PZ, Westrenen WV, Small J & Jak HG

11:15 High Pressure and Temperature Silicon Isotope Fractionation between Metal and Silicate
Shahar A, Hillgren V, Young E, Deng L, Fei Y, Macris C & Georg RB

(Session 03g continues on Monday 15th Posters on page 59)

Session 03f follows this session in this room. For details see page 6.
## 04a: Chemical Geodynamics: 25 Years of Mantle Components

Session chaired by Al Hofmann, Francis Albarède, Matthew Jackson & Thorsten Becker

### 09:30 Keynote: The Mantle Zoo: New Species, Endangered Species, Extinct Species  
*Hart S*

### 10:00 Invited: Implications of a Non-Chondritic Primitive Mantle for Chemical Geodynamics  
*Carlson R & Jackson M*

### 10:15 Volatile and Trace Element Abundances in HIMU Melt Inclusions  
*Cabral R, Jackson M, Rose-Koga E, Day J & Shimizu N*

### 10:30 Metasomatism beneath the Kerguelen Plateau Associated with Heterogeneous Mantle Plume  
*Debaille V, Hublet G, Mattielli N & Weis D*

### 10:45 A New Statistical Method for Modeling Mixing of Mantle End-Members for Global MORB and OIB Isotopic Data  
*Sohn R & Sims K*

### 11:00 Evidence for a Hawaii-Emperor Bend in the Rurutu Hotspot Track  
*Konter J, Jackson M & Koppers A*

### 11:15 Pb-Sr-Nd Systematics of the Early Mauna Kea Shield Phase and Insight into the Pacific Deep Mantle  
*Nobre Silva I, Weis D & Scoates J*

### 11:30 Dynamical Geochemistry  
*Davies G*

### 11:45 Partitioning of First-Row Transition Elements between Peridotite and Melt  
*Davis F, Humayun M, Hirschmann M & Cooper R*

### 12:00 Evidence for Metasomatic Enrichment in the Oceanic Lithosphere and Implication for the Generation of Enriched Reservoirs  
*Pilet S, Buchs D, Cosca M, Flores K, Bandini A & Baumgartner P*

### 12:15 ULVZ as Repository for the Enriched Component in the Hawaiian Source  
*Weis D, Garcia MO, Rhodes JM, Jellinek M & Scoates J*

(Session 04a continues on Monday 15th PM on page 30)
# 05d: The Role of Island and Continental Arcs in Continent Formation

**Session chaired by Jaime Barnes, Esteban Gazel & Jade Star Lackey**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
<th>Authors</th>
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<tbody>
<tr>
<td>09:30</td>
<td><strong>Invited:</strong> Seismological Constraints on an Evolution of the Izu-Bonin Intra-Oceanic Arc</td>
<td>Kodaira S, Takahashi N &amp; Sato T</td>
</tr>
<tr>
<td>10:00</td>
<td>The Magnitude and Composition of the Delamination Flux in Arcs during Continental Crust Formation</td>
<td>Jagoutz O &amp; Schmidt MW</td>
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<tr>
<td>10:30</td>
<td>A Type of High Sr/Yb Granite in North Qinling: The Melting Product of a Pre-Exiting Source of Arc Environment</td>
<td>Li P, Chen J-L, Xu X-Y &amp; Li T</td>
</tr>
<tr>
<td>11:00</td>
<td>The Santa Quitéria Batholith, NE Brazil: A Mantle – Crust Interaction</td>
<td>Wernick E, Zincone S &amp; Santos T</td>
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<tr>
<td>11:45</td>
<td>Recycling of Juvenile Supracrustal Rocks in Mesozoic Batholiths: Implications for Crustal Growth</td>
<td>Lackey JS</td>
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<tr>
<td>12:00</td>
<td><strong>Keynote:</strong> Underplating of Felsic Rocks in Arcs</td>
<td>Kelemen P, Hacker B &amp; Behn M</td>
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</table>

(Session 05d continues on Monday 15th Posters on page 61)
07c: Coevolution of Life and the Environment in the Late Neoproterozoic to Early Phanerozoic

Session chaired by David Fike, Matthew Hurtgen & Gordon Love

09:30  Pre-Sturtian Euxinia and Ocean Chemistry: Evidence from the Coppercap Formation in the Northwest Territories, Canada
       Thomas K, Hallmann C, Macdonald F, Summons R & Ono S

09:45  Long Period Oscillations in the Neoproterozoic Carbon Cycle
       Mills B, Watson A, Goldblatt C, Boyle R & Lenton T

10:00  Neoproterozoic Ice Ages, Boron Isotopes, and Ocean Acidification
       Kasemann S, Prave A, Fallick A, Hawkesworth C & Hoffmann KH

10:15  Re-Os Geochronology of the Neoproterozoic Coppercap and Twitya Formations: Implications for the Rapitan-Sturtian Glaciation
       Rooney A, Macdonald F & Selby D

10:30  Re-Os Geochronology of Black Shales from the Neoproterozoic Doushantuo Formation, Yangtze Platform, South China
       Zhu B, Becker H, Jiang S-Y, Pi D & Fischer-Gödde M

10:45  Chromium Isotopes as an Indicator of Redox Conditions in the Cryogenian Shallow Oceans
       Bonnand P, Parkinson I, James R & Fairchild I

11:00  Putative Cryogenian Ciliates from Mongolia
       Bosak T, Macdonald F, Lahr D & Matys E

11:15  An Oxygen Window for Early Ediacaran Animal Life

11:30  Keynote: Coevolution of Early Animals and Environment
       Butterfield N

12:00  Controls on Early Biomineralisation: Oxygen and Competition
       Wood R, Prave A, Hoffman C, Lyne J, Clarkson M & Kasemann S

(Session 07c continues on Monday 15th PM on page 32)
08h: Geochemical Processes at Mineral-Water Interfaces – Insight from Macroscopic, Spectroscopic, and Computational Methods: Surface Alteration and Dissolution

Session chaired by Jeffrey Catalano, Udo Becker & Jean-François Boily

09:30 Interfacial Reactions during Olivine Replacement
King H, Satoh H, Geisler T, Tsukamoto K & Putnis A

09:45 Dissolution/Precipitation Processes during Low-Temperature Mineral Weathering
Ruiz-Agado E, Urosevic M, Putnis CV, Cardell C, Rodriguez-Navarro C & Putnis A

10:00 Study on Mineral Surface Reacted with Water at High Temperatures Above 300°C
Hu S, Zhang R & Zhang X

10:15 Glass Composition Impact on Water Reactivity at the Glass Surface
Rebiscoul D, Bruguier F, Magnin V & Gin S

10:30 Borosilicate Glass Alteration Driven by Magnesium Carbonates
Debure M, Frugier P, De Windt L & Gin S

10:45 The Double Effect of Mg on the Long-Term Alteration Rate of a Nuclear Waste Glass
Thien B, Godon N & Ayral A

11:00 Modeling Glass Alteration Layers
Frugier P, Gin S, Rajmohan N & Debure M

11:15 Reliance of the Rate of Dissolution of the SON68 Glass on SiO_2(aq): New Quantification Using Interferometry
Icenhower J, Steefel C, Luttge A, Ryan J & Pierce E

11:30 Invited: How Crystalline Matter Dissolves: Contours of a Comprehensive Stochastic Model
Luttge A, Arvidson RS, Kurganskaya I & Fischer C

11:45 Modeling the Dissolution and Growth of Whole Mineral Grains
Arvidson RS & Luttge A

12:00 Phyllosilicate Dissolution Kinetics: Experimental Observations and Kinetic Monte Carlo Modeling
Kurganskaya I, Arvidson RS & Luttge A

12:15 Holographic Interferometry Study of the Inhibition of Gypsum Dissolution
Pachon-Rodriguez EA & Colombani J

(Session 08h continues on Monday 15th PM on page 34)
10f: Carbon Sequestration Analogues

Session chaired by Chris Ballentine & Dave Cole

09:30 **Keynote:** Geological Carbon Storage: Geochemical Processes
*Bickle M*

10:00 Monitoring CO₂-H₂O Interactions Using δ¹³C and δ¹⁸O at the CO2CRC Otway Project CO₂ Storage Pilot
*Kirste D, Boreham C, Stalker L & Underschultz J*

10:15 Stepwise C & O Stable Isotope Shows No Detectable CO₂-sequestration by Cerments in Analogue for Engineered Storage
*Heinemann N, Wilkinson M, Fallick A & Haszeldine S*

10:30 Predicting CO₂ EOR and Geological Sequestration Processes with Artificial Noble Gas Tracers

10:45 Natural and Artificial Noble Gases as Tracers of Injected CO₂ Migration within a Deep Reservoir
*Gilfillan S, Haszeldine RS, Poreda R & Hovorka S*

11:00 Laboratory Experiments and Modeling of CO₂ Dissolution in Water for Carbon Sequestration
*Stute M, Fernandez de la Reguera D & Matter J*

11:15 Geophysical and Geochemical Data Used to Infer Origin and Evolution of Natural CO₂ in Italy
*Battani A, Brosse E & Loiselet C*

11:30 Nanometer to Centimeter Scale Analysis and Modeling of Pore Structures in Geologic CO₂ Storage Formations and Caprocks
*Anovitz L, Vlcek L, Rother G & Cole D*

11:45 Changes to Porosity and Pore Structure of Mudstones Resulting from Reaction with CO₂
*Navarre-Sitchler A, Mouzakis K, Heath J, Dewers T, Rother G, Wang X, Kaszuba J & McCray J*

12:00 Geologic Carbon-Sulfur Co-sequestration: Experimental Investigation of a Natural Analogue, Madison Limestone, SW Wyoming USA
*Chopping C & Kaszuba J*

12:15 Trace Element Mobilisation in a Natural Analogue CO₂ Storage Site
*Wigley M, Bickle M, Kampman N, Dubacq B & Champan H*

(Session 10f continues on Monday 15th PM on page 36)
11d: Dating of Mineral Deposits and Fluid Flow in the Lithosphere

Session chaired by Robert Creaser & Keiko Hattori

09:30 Mineral Evolution: What’s New? 

09:45 Causes and Consequences of Zn, Fe and S Isotope Fractionation in a Large Hydrothermal System: The Navan Orebody, Ireland 
_Gagnevin D, Boyce A, Barrie C, Menuge J & Blakeman R_

10:00 Nitrogen Isotopes and Geochronology of the Musselwhite Au Mine, Canada 
_Hollings P, Isaac C, Biczok J, Maas R & Friedman R_

10:15 Venting History and Accumulation Rates of Hydrothermal Sulfide from the Endeavour Segment, Juan de Fuca Ridge 
_Jamieson J, Hannington M, Kelley D, Clague D & Holden J_

10:30 Dating of Submarine Hydrothermal Deposits by ESR and U-Series Methods 
_Toyoda S, Sato F, Nakai S, Takamasa A & Ishibashi J_

10:45 The Zircon Fission Track Constraint on the Mineralizing Ages of the Jiapigou Gold Deposits, Northeastern China 
_Yuan W, Deng J & Huang Z_

11:00 Invited: Zircon Rim Response to Metamorphic and Hydrothermal Regime-Change 
_Schneider D & Schmitt A_

11:15 Geochronological, Geochemical and Growth Constrains of Alpine CLEFTS from U-Th-Pb in Monazite 
_Janots E, Berger A, Gnos E, Whitehouse M & Lewin E_

11:30 Monazite Dating of Base-Metal Mineralization, Eraheedy Basin, Western Australia 
_Muhling J, Fletcher I & Rasmussen B_

11:45 SIMS U-Pb Ages for Heterogenite from Katanga (DRC): Implications for the Genesis of Co-U Deposits in Shinkolobwe 
_Decrée S, Deloule E, De Putter T, Dewaele S, Mees F & Marignac C_

12:00 Palaeomag-Dating of Kupferschiefer Ore at Sangerhausen, Germany – An Epigenetic, Late Jurassic Age for Stratabound Cu-Mineralization 
_Borg G, Walther S, Kawasaki K & Symons D_

12:15 Olympic Dam U-Cu-Au Deposit, Australia: New Age Constraints 
_Maas R, Kamenetsky V, Ehrig K, Meffre S, McPhie J & Diemar G_

(Session 11d continues on Monday 15th PM on page 37)
12a: Links between CO₂ and Climate: Carbon Cycle Feedbacks over Time

Session chaired by Ralph Keeling & Hagit Affek

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<tr>
<th>Time</th>
<th>Session Title</th>
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<tr>
<td>09:30</td>
<td>Climate-Carbon Cycle Feedback during Glacial Cycles</td>
<td>Ganopolski A, Brovkin V, Calov R, Archer D &amp; Manhoven G</td>
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<td>09:45</td>
<td>Enhanced Shelf Sediment Weathering during Glacial Periods Damp pCO₂ Reduction</td>
<td>A Negative Feedback</td>
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<td>Ushie H &amp; Matsumoto K</td>
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<td>10:00</td>
<td>CO₂ Evasion from the Greenland Ice Sheet: A New Carbon-Climate Feedback</td>
<td>Jacobson A &amp; Ryu J-S</td>
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<td>10:15</td>
<td>Oxygen Triple-Isotope Evidence for Enhancement of CO₂ Sequestration Efficiency</td>
<td>In Diatom-Diazotroph Assemblages in a Giant River Plume</td>
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<td>Yeung LY, Berelson WM, Young ED, Prokopenko MG, Carpenter EJ &amp; Yager PL</td>
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<td>10:30</td>
<td>Erosion in the Arctic: Enhanced Carbon Sequestration Associated with High</td>
<td>Latitude Warmth?</td>
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<td>Hilton RG, Galy V, Gaillardet J, Calmels D, Grocke DR &amp; Bryant C</td>
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<td>10:45</td>
<td><strong>Keynote:</strong> Methane and the PETM: All Good Things Must Come to An End?</td>
<td>Pagani M, DeConto R, Galeotti S &amp; Beerling D</td>
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<td>11:15</td>
<td>Mid-Latitude (~50°N) Continental Response to Falling Atmospheric P&lt;sub&gt;CO₂&lt;/sub&gt;</td>
<td>during the Eocene-Oligocene Transition</td>
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<td>Hren MT, Sheldon ND, Grimes ST, Collinson ME, Hooker JJ, Bugler M &amp; Lohmann K</td>
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<td>11:30</td>
<td>The Relationship between Ice Volume, CO₂ and Climate in the Middle Miocene</td>
<td>Foster G, Lear C &amp; Rae J</td>
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<td>11:45</td>
<td>Orbital Scale Alkenone Based CO₂ Records Across the Pliocene Intensification</td>
<td>Schmidt D &amp; Pancost R</td>
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<td>of Northern Hemisphere Glaciation</td>
<td>Badger M, Bowler G, Davis C, Hull A, Potts M,</td>
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<td>12:00</td>
<td>Toward Calibrating the Paleosol Carbonate CO₂ Barometer for paleoVertisols</td>
<td>Schmidt D &amp; Pancost R</td>
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<td>12:15</td>
<td>Are Large Igneous Provinces Net-Sinks for CO₂?</td>
<td>Schaller M, Wright J &amp; Kent D</td>
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(Session 12a continues on Monday 15th Posters on page 76)
14f: Quantifying Erosion and Weathering Rates and Critical Zone Processes Across Spatial and Temporal Scales

Session chaired by Francois Chabaux, Anthony Dosseto, Arjun Heimsath & Rolf Aalto

09:30 **Keynote:** Inferring Process from Provenance Using Apatite (U-Th)/He Ages of Coarse Sediment in Mountain Streams

*Riebe CS, Lukens CE, Sklar L, Beyeler JD & Shuster DL*

09:45 Geochemical Constraints on the Sediment Source-To-Sink Process of the Changjiang (Yangtze) River

*Yang S, Li C, Wang Q & Shao J*

10:00 Deciphering the Offshore Biogeochemical Record of Holocene Erosion in the Waipaoa Watershed, New Zealand

*Leithold E, Blair N & Childress L*

10:15 **Invited:** Quantifying Weathering and Erosion Rates Using Cosmogenic Nuclides

*Bourlès D, Braucher R & Siame L*

10:30 The $^{10}$Be(meteoric)/$^9$Be Ratio as a Tracer of Weathering and Erosion

*von Blanckenburg F, Wittmann H & Dannhaus N*

10:45 A 4 Million Year Record of Paleo-Erosion Rates from the Qilian Shan, China

*Zhao Z & Granger D*

11:00 Inception! Timescale of Chemical Weathering during the Early Stages of Water-Rock Interaction

*Dosseto A & Riebe C*

11:15 Uranium-Series Mobility during Spheroidal Weathering of 300 kyrs Old Basalt (La Réunion Island)

*Claude C, Meunier J-D, Traoré D, Chabaux F, Hamelin B & Colin F*

11:30 U-Series Disequilibria during Soil Weathering

*Andersen MB, Vance D, Keech AR, Rickli J & Hudson G*

11:45 **Invited:** Short-Lived Nuclides of the U and Th-Series Probing Recent Pedogenic Processes in Soils

*Rihs S, Prunier J, Thien B, Lemarchand D, Pierret M-C & Chabaux F*

12:00 Chemical Weathering and Erosion Rates in Lesser Antilles: An Overview in Guadeloupe, Martinique and Dominica

*Rad S, Rivé K, Cerdan O, Vittecoq B & Allègre C*

12:15 **Net Redistribution of $^{137}$Cs over Australia**

*Bui E & Chappell A*

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<tr>
<td>09:30</td>
<td>Fe Kinetics of Marine Particle Uptake and Desorption Determined from Laboratory Experiments</td>
<td>Beck AR &amp; Adkins JF</td>
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<td>09:45</td>
<td>Noble Gas Isotope Fractionation during Air-Sea Exchange: A Tracer for Mechanisms that Determine N₂/Ar Ratios in the Ocean</td>
<td>Emerson S, Tempest K &amp; Hamme R</td>
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<td>10:00</td>
<td>$^{17}$O Anomaly of Dissolved O₂ in the Deep Atlantic Ocean</td>
<td>Luz B, Barkan E, Henderson G &amp; Smethie W</td>
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<td>10:15</td>
<td>Silicon Stable Isotope Constraints on the Global Oceanic Si Cycle</td>
<td>de Souza G, Reynolds B &amp; Bourdon B</td>
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<td>10:30</td>
<td>Vertical Distribution of $^{236}$U in the Western Equatorial Atlantic Ocean</td>
<td>Christl M, Lachner J, Vockenhuber C, Rutgers v. d. Loeff M, Lechtenfeld O &amp; Stimac I</td>
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<td>11:00</td>
<td>GEOTRACES Intercalibration Results for Nd Isotopes and REE on Seawater and Particulate Samples</td>
<td>van de Flierdt T, Pahnke K &amp; Geotracess Intercalibration Participants</td>
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<td>11:30</td>
<td>The Influence of Boundary Scavenging and Particle Composition on Dissolved and Buried $^{230}$Th and $^{231}$Pa in the Subarctic North Pacific</td>
<td>Hayes C, Anderson R &amp; Gesonde R</td>
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<td>11:45</td>
<td>Dissolved $^{230}$Th-$^{232}$Th Dynamics in the Eastern Tropical Pacific Ocean</td>
<td>Singh A, Marcantonio F &amp; Lyle M</td>
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<td>12:00</td>
<td>Cadmium Isotopes in the Western North Atlantic – GEOTRACES Cruise PE319</td>
<td>Powell C, Abouchami W, Galer S, Andreae M, de Jong J, Gerringa L &amp; de Baar H</td>
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</tbody>
</table>
16f: Biogeochemical Processes in Management and Forensics of Legacy Radioactive Materials

Session chaired by Katherine Morris, Maxim Boyanov & Albert J Fahey

09:30 **Keynote:** Plutonium Transport: Identifying the Biogeochemical Mechanisms Controlling its Behavior
Kersting A

10:00 Biogeochemical Behaviour of Pu in a Contaminated Soil from Aldermaston, UK
Kimber R, Purdie P, Boothman C, Livens F & Lloyd J

10:15 Strontium Behaviour during Bioreduction in Nitrate Impacted Sediments
Thorpe CL, Lloyd JR, Morris K, Burke IT, Shaw S & Law GTW

10:30 Incorporation of $^{90}$Sr into Alkaline Altered Sediments
Wallace S, Shaw S, Morris K, Small J & Burke I

10:45 Invited: The Special Case of Actinide(IV) Complexation by the Carboxylic Function of Small and Large Organic Ligands

11:00 Spectroscopic Characterization of U(IV)-Biomass Complexes

11:15 Invited: Uranium Dynamics in Biostimulated Field-Site Sediments: Spatial Distribution and Formation of Non-Uraninite U(IV) Phases

11:30 Nuclear Forensic Analysis of Trinitite at High Spatial Resolution
Wallace C, Simonetti A & Burns P

11:45 Detection of Airborne Radionuclides Released during the Nuclear Accident at Fukushima Daiichi over Europe
Steinmann P, Masson O, Gurriaran R & Wershofen H

12:00 Invited: Biogeochemical Redox Transformations of Pertechnetate ($^{99}$TcO$_4^-$)

12:15 Effect of Climate Change-Driven Sea Water Intrusion on the Mobilisation of Tc(VI) from Reduced Sub-Surface Sediments
Eagling J, Worsfold P, O’Sullivan G & Keith-Roach M

(Session 16f continues on Monday 15th PM on page 45)
17e: Nitrogen Isotopes and Nitrogen Cycling in Terrestrial and Aquatic Systems

Session chaired by Carsten Schubert & Moritz Lehmann

09:30  **Keynote:** Cycling of Nitrogen in the Namibian Coastal Upwelling System – The Stable Isotope View

_Emeis K-C, Nagel B & Lahajnar N_

09:45  **Tracing N₂O Transformation Pathways in a Lake Ecosystem by N₂O Isotopomer Analysis**


10:00  **Novel Denitrifier Method for Measuring ¹⁵N and ¹⁸O of Nitrate**

_Silvennoinen H, Zhu J, Mørkved PT, Bakken L, Mulder J & Dörsch P_

10:15  **Stable Isotopes Ratio in Nitrate: A Tool to Unravel the Biogeochemistry of Nitrate in an Estuarine Environment**

_Wong WW, Cook P, Grace M & Cartwright I_

10:30  **Tracing N₂O Transformation Pathways in a Lake Ecosystem by N₂O Isotopomer Analysis**


10:45  **Tracing Anthropogenic Nitrogen in the Vicinity of Industrial Emitters in the Athabasca Oilsands Region, Alberta, Canada**

_Proemse B, Mayer B & Fenn M_

11:00  **Linking Nitrogen Isotope Systematics and Microbiology in a Subsurface Geothermal Water Stream, Hishikari Gold Mine, Japan**


11:15  **Nitrogen Limitation in Extremophilic Hydrothermal Ecosystems of Yellowstone National Park**

_Romaniello S, Hartnett H, Anbar A, Elser J & Shock E_

11:30  **Extensive Denitrification in the Subsurface of the Oak Ridge Site, Tennessee**


11:45  **Extensive N-Loss from Permeable Wadden Sea Sediments due to Aerobic Denitrification**

_Gao H, Khalili A, Lavik G, de Beer D & Kuypers M_

12:00  **Role of Fluid Flow Conditions on Denitrification Rates in Sediments during Managed Groundwater Recharge**

_Schmidt C, Fisher A, Racz A, Lockwood B & Los Huertos M_

12:15  **Looking for PON in Fluviatile and Marine Sediments: Insights from Nitrogen Isotopic Compositions**


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<tr>
<td>09:30</td>
<td>Acquisition of Fe by Aerobic Microorganisms: Effects of Fe Oxide Nanoparticle Size</td>
<td>Maurice P, Dehner C, Dubois J &amp; Barton L</td>
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<td>09:45</td>
<td>Chemical Speciation of Fe-Rich Colloids and Nanoparticles in the Southern Ocean</td>
<td>von der Heyden B, Roychoudhury A &amp; Myneni S</td>
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<td>10:00</td>
<td>Suspended Floc: Links between Microbial Ecology, FeOOH and Trace Element Dynamics</td>
<td>Warren L, Elliott A &amp; Plach J</td>
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<tr>
<td>10:30</td>
<td><strong>Keynote:</strong> The Fate of Sorbed Contaminants during the Biogeochemical Cycling of Iron in Natural Environments</td>
<td>Fortin D</td>
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<tr>
<td>11:00</td>
<td>Redox Transformations of Iron in Extremely Low pH Environments: Environmental and Industrial Implications</td>
<td>Johnson B, Kanao T &amp; Hedrich S</td>
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<tr>
<td>11:30</td>
<td>As, Fe and S Cycling during Reductive Biomineralisation of Pedogenic Jarosite</td>
<td>Keene A, Johnston S, Burton E &amp; Bush R</td>
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<td>11:45</td>
<td>Fast Iron Sulfide Oxidation in a Region of Land Uplift and Artificial Drainage</td>
<td>Åström M, Boman A &amp; Fröjdö S</td>
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<td>12:00</td>
<td>Phase Transformation in Simulated Acid Mine Drainage Precipitates</td>
<td>Lindegren M &amp; Lövgren L</td>
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<tr>
<td>12:15</td>
<td>Mechanisms of Copper Immobilization by Bacteria during Precipitation of Iron Oxides</td>
<td>Daughney C, Swedlund P &amp; Moreau-Fournier M</td>
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18a: Advances in Resolution and Accuracy of in situ Determination of Isotope Ratios

Session chaired by Anders Meibom & Jan Kosler

09:30  **Keynote:** Advances in Resolution and Accuracy of in situ Determination of Isotope Ratios

*Hirata T, Yokoyama T, Okabayashi S, Maki K, Suzuki T & Kon Y*

10:00  A Simple Method for in situ Zircon U-Th-He Dating

*Vermeesch P & Carter A*

10:15  Advances in Analyses of Radiogenic Isotope by LA-MC-ICPMS: The Importance of Mass Bias and Interference Corrections

*Gerdes A*

10:30  Matrix Effects and Hf Isotope Analysis of Zircon by Laser Ablation MC-ICP-MS

*Pearson N, Payne J & Grant K*

10:45  Maximising Precision and Accuracy in Laser Quadrupole ICPMS U-Pb Geochronology

*Meffre S, Danyushevsky L, Guillong M & Gilbert S*

11:00  Investigation of the Precision and Accuracy of Isotope Ratio Measurements for Atmospheric Sampling for Laser Ablation Multi collector-ICPMS

*Dorta L, Kovacs R, Koch J & Günther D*

11:15  LA-ICP-MS Sr Isotope Ratio Analysis of Individual Fluid Inclusions

*Petke T, Oberli F & Hanley JJ*

11:30  Sr Isotope Ratios Determination by LA-MC-ICPMS in Rb Rich Samples: Online Separation of Rb by Electrothermal Aerosol Heating

*Brogioli R, Dorta L, Hattendorf B & Günther D*

11:45  Laser Ablation with the NEPTUNE Plus MC-ICP-MS

*Lloyd N, Shuttleworth S, Schwieters J & Bouman C*

12:00  Quadruple Sulfur Isotope Determination by SIMS: Limitations, Progress and Prospects

*Whitehouse M*

12:15  Sulfur Isotope Studies in Organic Matter via SIMS Using a Statistical Approach with Heterogeneous Standards

*King H, Zimmer M, Horn W & Lamberti W*

(Session 18a continues on Monday 15th PM on page 50)
**19f: Bridging the Gap between Atomic, Pore, and Continuum Scales**

Session chaired by Virginie Marry & Carl Steefel

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<th>Speaker(s)</th>
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<tr>
<td>09:30</td>
<td><strong>Keynote:</strong> Anions in Clay Materials: A Case Study for Multi-Scale Modeling Approaches</td>
<td>Tournassat C</td>
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<td>10:00</td>
<td>Modelling the Aqueous Al³⁺ System Using Density Functional Theory</td>
<td>Bogatko S, Cauët E &amp; Geerlings P</td>
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<td>10:15</td>
<td>Computer Simulation of Clay Mineral – Biomolecule Interactions</td>
<td>Swadling J, Coveney P &amp; Greenwell C</td>
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<td>10:30</td>
<td><strong>Invited:</strong> Donnan Equilibrium in Na-Montmorillonite from a Molecular Dynamics Perspective – Consequences for Diffusional Transport</td>
<td>Hedström M, Birgersson M &amp; Karnland O</td>
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<td>10:45</td>
<td><strong>Invited:</strong> Multiscale Modeling of Ionic Transport in Charged Clays</td>
<td>Duvail M, Coelho D, Békri S &amp; Rotenberg B</td>
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<td>11:00</td>
<td><strong>Invited:</strong> Two Step Up-Scaling of Molecular Diffusion Coefficients in Clays</td>
<td>Churakov S, Gimmi T &amp; Tyagi M</td>
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<td>11:15</td>
<td><strong>Invited:</strong> Continuum Model for Diffusive Transport in the Electrical Double Layer and Clay Interlamellae</td>
<td>Galindez JM, Steefel C &amp; Maeder U</td>
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<td>11:30</td>
<td><strong>Invited:</strong> Direct Pore-Scale Numerical Simulation of Precipitation and Dissolution</td>
<td>Molins S, Silin D, Trebotich D &amp; Steefel C</td>
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<td>11:45</td>
<td>Compound-Specific Transverse Dispersion in Porous Media: Darcy-Scale Experiments and Pore-Scale Modeling Interpretation</td>
<td>Rolle M, Hochstetler D, Chiogna G, Kitanidis PK &amp; Grathwohl P</td>
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<td>12:00</td>
<td>Upscaling Pore Scale Carbonate Precipitation Rates to the Continuum Scale</td>
<td>Steefel CI, Noiriel C, Yang L &amp; Ajo-Franklin J</td>
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<td>12:15</td>
<td><strong>Invited:</strong> Magnesite Dissolution Rates at the Column Scale: The Control of Mineral Spatial Distribution</td>
<td>Li L, Salehikhoo F &amp; Brantley S</td>
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## 21a: Global Water Sustainability

**Session chaired by Chen Zhu**

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| 09:30 | **Keynote:** Groundwater Depletion: A U.S. National Assessment and Global Perspective  
  Konikow L. |
| 10:00 | Enhancing Heavy Metal Immobilization in SuDS  
  Norris M, Phoenix V, Pulford I, Haynes H & Dorea C |
| 10:15 | What Defines a Saline Aquifer for CO₂ Injection?  
  Blondes M & Corum M |
| 10:30 | Assessment of Water/Rock Interaction to Safeguarding Drinking Water Quality  
  Rezvani Khalilabad M |
| 10:45 | GIS Based Spatial Distribution Mapping for Surface Waters in Solaklı Basin (Trabzon, Turkey)  
  Firat Ersoy A, Gultekin F, Hatipoglu E & Celep S |
| 11:00 | Wadi as Collectors of Drinking Water in the South Mongolia  
  Juřička D, Yondon M, Novotná J & Kynicky J |
| 11:15 | Hydrochemical Characteristics of Bigadiç (Balıkesir) Geothermal Area, Turkey  
  Gocmez G & Ölmez E |
| 11:30 | Geochemical Significance of ¹⁴C, ³⁴S, δ¹⁸O, δ²H and ⁸⁷Sr/⁸⁶Sr Isotopic Data in the Hot Spring Waters of South Korea  
  Lee S-G, Nakamura T, Yoon YY, Kim T-K, Ohta T & Lee T |
| 11:45 | REE in Groundwater as Indicators of Catchment Lithology in Semi-Arid Regions  
  Möller P, Siebert C & Geyer S |
| 12:00 | Oxygen and Hydrogen Stable Isotope Composition of Precipitation in Friuli-Venezia Giulia (Northeastern Italy)  
  Michelini M, Cucchi F, Flora O, Stenni B, Treu F & Zini L |
| 12:15 | Tracing Sedimentary Pyrite Oxidation during Managed Aquifer Recharge  
  Seibert S, Skrzypek G, Descourvies C, Hinz C & Prommer H |

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<td>10f / 10a</td>
<td>Rillard</td>
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<td>McKibbin</td>
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<td>Mukhopadhyay</td>
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<td>Matter</td>
<td>Dawson</td>
<td>Jourdan</td>
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<td>Hanyu</td>
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<td>14:00</td>
<td>Complex Al and P Zoning in Pallasite Olivine: Constraints on High-T History</td>
<td>McKibbin S, O’Neill H, Mallmann G &amp; Halfpenny A</td>
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<td>14:30</td>
<td>Widespread Evidence for Heterogeneous Accretion of the Terrestrial Planets and Planetisimals</td>
<td>Dale CW, Burton KW, Pearson GD &amp; Greenwood R</td>
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<td>14:45</td>
<td>Conditions of Metal-Silicate Segregation in the Parent Bodies of Iron Meteorites</td>
<td>Bourdon B</td>
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<td>15:00</td>
<td><strong>Keynote:</strong> Early Differentiation of Terrestrial Planets: The Relative Importance of Big Impactors and Small Impactors</td>
<td>Stevenson D</td>
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<td>15:30</td>
<td>A Complex Network Analysis of Growth and Mixing Dynamics in Natural Metal-Silicate Systems</td>
<td>Rushmer T, Tordesillas A &amp; Walker D</td>
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<td>15:45</td>
<td><strong>Invited:</strong> Critical Review of Hf-W and U-Pb Clocks for Terrestrial Core Formation</td>
<td>Yin Q-Z, Lee C-T, Blichert-Toft J &amp; Albarède F</td>
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<td>16:00</td>
<td>Indistinguishable Hf/W in the Silicate Earth and the Silicate Moon</td>
<td>Münker C, König S &amp; Schulz T</td>
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<td>16:15</td>
<td><strong>Invited:</strong> Experimental Constraints on Ag Isotope Fractionation during Planetary Core Formation</td>
<td>Schönbächler M, Theis KJ &amp; Wood BJ</td>
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<td>16:45</td>
<td>Halogen Composition of the Early Solar System Inferred from Meteoritic Apatites</td>
<td>Roszjar J, John T, Whitehouse M, Layne G &amp; Bischoff A</td>
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(Session 01c continues on Monday 15th Posters on page 56)
02b: Geology, Age and Origin of the Oldest Terrestrial Rocks and Minerals

Session chaired by Nicholas Arndt, Stephen Mojzsis & Janne Blichert-Toft

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
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<tr>
<td>16:15</td>
<td>Reworked Hadean Crust in the ca. 3780 Ma Nuvvuagittuq Supracrustal Belt</td>
<td>Cates N, Mojzsis S, Ziegler K &amp; Schmitt A</td>
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<tr>
<td>16:30</td>
<td>Age and Origin of the Nuvvuagittuq Greenstone Belt</td>
<td>O’Neil J, Carlson R, Moser D, Heaman L &amp; Francis D</td>
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<tr>
<td>16:45</td>
<td>Inherited $^{142}$Nd Anomalies in the Nuvvuagittuq Supracrustal Belt</td>
<td>Roth A, Bourdon B, Kleine T, Mojzsis S &amp; Touboul M</td>
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(Session 02b continues on Monday 15th Posters on page 56)
<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>14:00</td>
<td>Life at the Dry Limit: Microbial Colonization of Evaporites in the Atacama Desert</td>
<td>Wierzchos J, de los Ríos A, Dávila AF, Valea S, Cámara B, Artieda O &amp; Ascaso C</td>
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<tr>
<td>14:15</td>
<td>Molecular Characterization of Archaeal Lipids Across a Hypersaline Gradient</td>
<td>Dawson KS, Freeman KH &amp; Macalady JL</td>
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<tr>
<td>14:30</td>
<td><strong>Keynote</strong>: Halophilic Microorganisms: Modern and Ancient, on Earth and in Space</td>
<td>Oren A</td>
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<td>15:00</td>
<td>Raman Spectroscopy of Endoevaporitic Microbial Communities from the Atacama Desert</td>
<td>Vítek P, Edwards HGM, Jehlicka J, Carter E, Ascaso C &amp; Wierzchos J</td>
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<td>15:30</td>
<td>Microbial Sulphur Isotope Fractionation in a Mars Analogue Environment at Rio Tinto, SW Spain</td>
<td>Velasco E, Mason P, Vroon P, Roling W, Amils R &amp; Davies G</td>
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<td>15:45</td>
<td>Geochemical Characterization of Biosignatures in Subseafloor Basalts</td>
<td>Knowles E, Staudigel H, McLoughlin N &amp; Templeton A</td>
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<td>16:00</td>
<td>Pre-Biotic Organic Matter from Comets and Asteroids</td>
<td>Flynn G &amp; Wirick S</td>
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(Session 02k continues on Monday 15th Posters on page 57)

Session 02b follows this session in this room. For details see page 27.
03f: Physics and Chemistry of the Deep Earth
Session chaired by Tetsuya Komabayashi & James Van Orman

14:00 Invited: Dynamics and Evolution of the Earth’s Core and Lowermost Mantle
Buffett B

14:15 The Melting Curve of MgO from Shock Temperature Experiments
Asimow PD & Fat’yanov OV

14:30 Keynote: Nature of Mantle Heterogeneities

15:00 Crystal Chemistry of Fe\textsuperscript{II} in (Mg,Fe)SiO\textsubscript{3} Perovskite and Implications for Lower Mantle Properties
Hammer D & Fei Y

15:15 Spin Transition in Fe-Bearing Perovskite: Implications for the Lower Mantle
Caracas R

15:30 Phase Relations of an Fe-Ni Alloy Determined in an Internally-Heated Diamond Anvil Cell
Komabayashi T, Hirose K & Ohishi Y

15:45 Causes and Consequences of Outer Core Compositional Stratification
Helffrich G & Kaneshima S

16:00 Compressibility Change in Fe-Rich Melt and Implications for Core Formation Models

16:15 Invited: Kinetics of the Reaction Perovskite + Ferropericlase = Ringwoodite
Dobson D, Badro J, Meibom A & Mariani E

16:30 TAPP: Retrograde Mg-Perovskite from Subducted Lithosphere?
Armstrong L & Walter M

16:45 Characterising the Earth: Exploiting Seismology and Mineral Physics
Kennett B

(Session 03f continues on Monday 15th Posters on page 58)
04a: Chemical Geodynamics: 25 Years of Mantle Components

Session chaired by Al Hofmann, Francis Albarède, Matthew Jackson & Thorsten Becker

14:00 I-Pu-Xe in OIBs and the Early Separation of the Plume Source from the MORB Source Mantle
Mukhopadhyay S

14:15 A Possible Mantle Plume Source in the Lower Mantle; Evidence from Polynesian HIMU

14:30 He-Pb Lead Evidence for Marble Cake Under the Pacific-Antarctic Ridge
Moreira M, Hamelin C & Dosso L

14:45 Mineralogical Heterogeneities in the Earth’s Mantle: Constraints from Mn, Co, Ni and Zn Partitioning during Partial Melting
Le Roux V, Dasgupta R & Lee C-T

15:00 Invited: Statistical Sampling of Mantle Heterogeneity
Rudge J, Maclennan J & Stracke A

15:15 Displaced Helium in Tilted Mantle Plumes
Hofmann AW, Farnetani C, Spiegelman M & Class C

15:30 En Echelon Volcanic Chains at Hotspots as Probes of the Deep Mantle
Hall P, Huang S & Jackson M

15:45 Intra-Transform Magmatism; Melt Migration and Two-Component Mantle
Saal A, Nagle A, Pickle R & Forsyth D

16:00 Structure and Petrology of the Mantle beneath Hawaii Constrained by Seismic Discontinuity Imaging and Mineral Phase Relations
Shim S-H, Cao Q, van der Hilst R & de Hoop M

16:15 The Evolution Dynamics of Chemical Mantle Reservoirs – 3D Numerical Results
Walzer U & Hendel R

16:30 Invited: Sampling the Earth’s Mantle
Stracke A

(Session 04a continues on Monday 15th Posters on page 59)
05g: Duration, Tempo and Rates of Magmatic Processes in the Crust

Session chaired by Urs Schaltegger & Othmar Müntener

14:00 **Keynote:** Magma Emplacement Durations and Rates and the Dynamics of Magmatism and Volcanism
   *Annen C, Blundy J, Caricchi L, Menand T, de Saint-Blanquat M, Schöpa A & Sparks S*

14:30 Crystal-Poor vs. Crystal-Rich Ignimbrites: A Competition between Stirring and Reactivation
   *Huber C, Bachmann O & Dufek J*

14:45 Missed Connection: Ignimbrite Seeking Plutonic Relationship
   *Coleman D, Mills R & Tappa M*

15:00 Petrography and Chemistry of Zircons from the Chaltén Plutonic Complex and Implication on the Interpretation of U-Pb Zircon Ages
   *Ramírez C, Putlitz B, Müntener O & Ovtcharova M*

15:15 Time Scales of Magma Differentiation and Implications for the Growth Rate of the Torres del Paine Laccolith
   *Leuthold J, Müntener O, Baumgartner L, Putlitz B, Ovtcharova M & Schaltegger U*

15:30 The Rapid Emplacement of the Val Fredda Complex, Adamello Batholith, N. Italy
   *Broderick C, Schaltegger U, Günther D & Brack P*

15:45 Rapid Assembly of an “S-Type” Batholith in New Zealand: The Plutonic Equivalent of a Supereruption?
   *Turnbull R, Tulloch A & Ramezani J*

16:00 U-Pb Geochronology of the Southern Scandinavian Caledonides: The Mesoproterozoic Espedalen Anorthosite-Gabbro-Norite Massif and Associated Rocks
   *Corfu F & Heim M*

16:15 Revisiting the Age of the Merensky Reef, Bushveld Complex
   *Scoates J, Wall C, Friedman R & Chamberlain K*

16:30 Correlated Uranium Concentration, Radiation Damage, and Increased SHRIMP U/Pb Ages of Zircon
   *White L & Ireland T*

16:45 Dating Granites from the Erzgebirge by Different Methods – A Comparison
   *Tichomirowa M & Pfänder J*

(Session 05g continues on Monday 15th Posters on page 62)
07c: Coevolution of Life and the Environment in the Late Neoproterozoic to Early Phanerozoic

Session chaired by David Fike, Matthew Hurtgen & Gordon Love

14:00 Transient Oxic Conditions Amid Ferruginous Deep Waters after the Cryogenian Sturtian Glaciation Evidenced from Fe-C-S Proxies

Li D, Ling H, Shields G, Och L & Poulton S

14:15 A Sulfidic Driver for the Late Ordovician Extinction

Hammarmund E, Dahl T, Harper D, Bond D, Bjerrum C & Canfield D

14:30 Carbonate-Associated Sulfate: A Seawater Proxy with Potential and Weaknesses

Wotte T, Strauss H & Shields G

(Session 07c continues on Monday 15th Posters on page 64)

Session 07e follows this session in this room. For details see page 33.
### 07e: Mesozoic and Early Cenozoic Greenhouse Episodes: Insights into the Anthropocene

**Session chaired by Stuart Robinson, Tom Dunkley Jones & Jim Zachos**

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<tr>
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<tr>
<td>14:45</td>
<td><strong>Keynote:</strong> Impacts and Feedbacks: Are the PETM and Eocene Hyperthermals Relevant to Future Global Change?</td>
<td>Bowen G</td>
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<td>15:45</td>
<td>Ocean Oxygenation during the PETM: Mo Isotope Data from the Arctic and Tethyan Oceans</td>
<td>Dickson A, Cohen A, Coe A, Gavrilov Y &amp; Shcherbinina E</td>
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<td>16:00</td>
<td>Response of Continental Biogeochemical Processes to Short- and Long-Term Global Warming</td>
<td>Pancost R, Taylor K, Hollis C, Handley L, Rees-Owen R, Crouch E &amp; Schouten S</td>
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<td>16:30</td>
<td>Quantifying Biotic Responses to Past Abrupt Climate Change: Thresholds and Sensitivities</td>
<td>Gibbs S, Edgar K, Bown P, O’Dea S, Sluijs A, Murphy B &amp; Zachos J</td>
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<td>16:45</td>
<td>Low Biodiversity Tropics in a High CO₂ Median Mesozoic World</td>
<td>Olsen P, Whiteside J &amp; Schaller M</td>
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<tr>
<td>14:00</td>
<td>Coffinitization of Uraninite – A Review and Discussion of Observations on Different Scales</td>
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<td><em>Evins LZ &amp; Jensen KA</em></td>
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<td>14:15</td>
<td>Evidence for the Formation of a Fluorapatite Surface Layer on Nano-Sized Hydroxyapatite after the Exposure to an Aqueous Solution</td>
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<td><em>Sternitzke V, Kaegi R, Hering JG &amp; Johnson CA</em></td>
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<td>14:30</td>
<td>Molecular Model of Kinetic Isotope Fractionation during Surface-Controlled Growth of CaCO₃ from Aqueous Solution</td>
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<td><em>Nielsen L, DePaolo D &amp; De Yoreo J</em></td>
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<td>14:45</td>
<td>An Experimental Study on the Role of the Tetrahedral SO₄²⁻, CrO₄²⁻ and SeO₄²⁻ Anions in the CaCO₃ Polymorphism</td>
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<td><em>Fernández-González A, Fernández-Diaz L, Sánchez-Pastor N &amp; Prieto-Rubio M</em></td>
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<td>15:00</td>
<td>Novel Insights into the Ion Sorption Properties of Calcite in Aqueous Solutions Using Cavity Ring-Down Spectroscopy</td>
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<td><em>Villegas-Jimenez A, Hazen R &amp; Sverjensky D</em></td>
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<td>15:15</td>
<td>Speciation of Trivalent Metal Ions at the Silica/Water Interface Studied by Second Harmonic Generation</td>
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<td><em>Jordan D, Saslow S &amp; Geiger F</em></td>
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<td>15:30</td>
<td>Evaluation of Surface Complexation Parameters for Eu³⁺ on Muscovite and Orthoclase</td>
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<td><em>Britz S, Nosek U, Brendler V &amp; Stockmann M</em></td>
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<td>15:45</td>
<td>Keynote: Cation Adsorption at the Muscovite-Electrolyte Solution Interface</td>
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<td><em>Fenter P, Lee SS, Schmidt M, Soderholm L, Wilson R, Park C, Nagy K &amp; Sturchio N</em></td>
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<td>16:15</td>
<td>Ion Desolvation as a Mechanism for Kinetic Isotope Fractionation</td>
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<td><em>Hofmann AE, Bourg IC &amp; DePaolo DJ</em></td>
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<td>16:30</td>
<td>Alkali Metal and H₂O Dynamics at Clay-Water Interfaces: Lessons from NMR</td>
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<td><em>Bowers G, Kirkpatrick RJ &amp; Singer J</em></td>
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<td>16:45</td>
<td>Stability of Cu Adsorbed onto Clay Surfaces: An Experimental and Computational Study</td>
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<td><em>Goncalves M, Martins D &amp; Parker S</em></td>
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(Session 08h continues on Tuesday 16th AM on page 112)
### 10a: Geochemistry, Biogeochemistry, Mineralogy and Physics of Shale Gas, Coal Gas and Tight Gas Systems

**Session chaired by Robert Burruss**

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<th>Time</th>
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<tr>
<td>15:00</td>
<td>Quantitative Research on Nanopores of Coal Using Atomic Force Microscope</td>
<td>Yao S, Jiao K &amp; Li M</td>
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<tr>
<td>15:15</td>
<td>Source Rock-Oil Correlation in the Sinop Basin (Northern Turkey)</td>
<td>Kara Gülbay R &amp; Korkmaz S</td>
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<td>15:30</td>
<td>Assessment of Pore Fluid Pressure History in Basin-Centered Gas Accumulations Using Fluid Inclusions</td>
<td>Fall A, Eichhubl P, Bodnar RJ &amp; Laubach SP</td>
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<tr>
<td>16:00</td>
<td>Modeling Hydrogen and Carbon Isotopes of Thermogenic Gases from Different Kerogens in Closed System</td>
<td>Wang Y, Zhao C, Wang H &amp; Liu J</td>
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<tr>
<td>16:15</td>
<td>Noble Gas in Basin Centred Gas: Sampling Techniques and Preliminary Results</td>
<td>Pujol M, Van den Boorn S, Bourdon B, Kipfer R, Wieler R &amp; Brennwald M</td>
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<tr>
<td>16:30</td>
<td>Precise $^{40}$Ar/$^{39}$Ar Geochronology of Gas Migration and Accumulation</td>
<td>Qiu H &amp; Yun J</td>
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## 10f: Carbon Sequestration Analogues

Session chaired by Chris Ballentine & Dave Cole

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<tr>
<td>14:00</td>
<td>Contribution of the Reactive Mineral Surface Area on CO₂ Mineralization Under Natural Conditions</td>
<td>Rillard J &amp; Zuddas P</td>
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<tr>
<td>14:15</td>
<td>Tracking Permanent CO₂ Storage in Basaltic Rocks Using Conservative and Reactive Tracers at the CarbFix Injection Site, Iceland</td>
<td>Matter J, Stute M &amp; Broecker W</td>
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<tr>
<td>14:30</td>
<td>CO₂ Sequestration in Olivine Rich Basaltic Aquifers: A Reactive Percolation Experimental Study</td>
<td>Peuble S, Godard M, Gouze P &amp; Luquot L</td>
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Session 10a follows this session in this room. For details see page 35.
11d: Dating of Mineral Deposits and Fluid Flow in the Lithosphere

Session chaired by Robert Creaser & Keiko Hattori

14:00 Keynote: Fluids on the Loose – Capturing Meaningful Geochronology in Sulfides
Stein HJ

14:30 Re-Os Dating and Trace Element Characteristics of Pyrite from The Lisheen Pb-Zn Deposit, Ireland
Hnatyshin D, Creaser R & Wilkinson J

14:45 Re-Os Ages of Besshi-Type Massive Sulfide Deposits Associated with in situ Basalt as a New Age Constraint for Ridge Subduction
Nozaki T, Kato Y, Suzuki K, Takaya Y & Nakayama K

15:00 Age of the Pueblo Viejo Epithermal Deposit, Dominican Republic: Re-Os Isotope Data for Sulfides from the Moore and Monte Negro Deposits
Kirk J, Kesler S & Ruiz J

15:15 Re-Os Constraints on Gold Mineralisation Events in the Neo-Archaean Storø Supracrustal Belt, Southern West Greenland
Scherstén A, Szilas K, Creaser R, Næraa T, van Gool J & Østergaard C

15:30 A Discussion on Ore-Forming Fluid Sources by Gas Composition of Inclusion and Stable Isotope in Qinglong Antimony Deposit, Guizhou China

15:45 Noble Gas Isotopes of Tungsten-Tin Polymetallic Deposits in South China: Constraints on Origins of Ores and Related Granites
Hu R-Z, Bi X-W & Jiang G-H

16:00 Single-Grain Muscovite Rb-Sr Age of Xushan W Deposit, Central Jiangxi, China, and its Geological Implication
Hua R, Li G, Wei X, Wang X & Huang X

16:15 In situ U-Pb Dating of Scheelite: Constraints on the Age and Genesis of the Felbertal Tungsten Deposit
Raith J, Gerdes A & Cornell D

16:30 TIMS U-Pb Dating of Bastnäsite, Calzirtite and Tantalite as a Powerful Tool for Timing of Rare-Metal Granites and Carbonatites (Eastern Siberia)
Salnikova E, Yakovleva S, Kotov A & Plotkina J

16:45 U-Pb Dating of Columbite-Tantalite from Variscan Rare-Elements Granites and Pegmatites
Melleton J, Gloaguen E, Frei D & Lima A

(Session 11d continues on Monday 15th Posters on page 72)
12b: Patterns of Past Changes in Major Precipitation Systems

Session chaired by Dominik Fleitmann & Julia Cole

14:00  Decoupled Evolution of Temperature and Precipitation in Western Germany during the Last Interglacial Reconstructed from a Precisely Dated Speleothem
Scholz D, Hoffmann D, Spötl C, Hopcroft P, Mangini A & Richter D

14:15  Open System U-Th Ages of Red Sea Corals Indicate the Activity of Freshwater Aquifers at the Last Interglacial
Lazar B & Stein M

14:30  Kinetic Isotopes Effects in Speleothems: Insight from Clumped Isotopes and Fluid Inclusions

14:45  Variation in Contribution of Bay of Bengal Moisture Source Derived from Stable Isotopic Composition of Cave Carbonates in Meghalaya, India
Rangarajan R, Routh J, Ghosh P, Mangini A, Fohlmeister J, Baskar S, Baskar R & Holzkamper S

15:00  A High-Resolution Paleohydrological Record of the Younger Dryas Episode from Western Europe – Using Lipid Biomarker D/H Ratios
Rach O, Brauer A, Wilkes H & Sachse D

15:15  Latitudinal Changes in Sea Surface Temperature and Salinity over the Eastern Arabian Sea during the Last Glacial Maximum through Holocene
Mahesh B & Banakar V

15:30  Using Opal and Organic Carbon as Proxies for Migration of the North African Monsoon
Bradtmiller L, Awalt M, McGee D & DeMenocal P

15:45  Stalagmite Reconstruction of Moroccan Climate from Geographically Spaced Records
Barrott JJ, Day CC, Barton RNE, Bouzouggar A & Henderson GM

16:00  Centennial-Scale Sea Surface Temperature and Salinity Change in the Florida Straits during the Early Holocene
Schmidt M, Weinlein W, Marcantonio F & Lynch-Stieglitz J

16:15  Megadroughts at the Dawn of Islam Recorded in a Stalagmite from Northern Oman
16:30  Indian Ocean Monsoon Dynamics Recorded in a Speleothem from Socotra, Yemen  

16:45  O and Ca Isotopes in Calcite Grown Under Cave-Analogue Conditions 
Day CC, Reynard LM, Pointing MD, Blättler CL & Henderson GM

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### 14b: The Geochemistry of Landscape Evolution: Linkages between Regolith Formation, Erosion, and Chemical Fluxes

**Session chaired by George Hilley & Christian Mavris**

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| 14:45  | **Keynote:** From Seconds to Millennia: Weathering and Erosion of the Highly Dynamic Soils of Alpine Areas  
Egli M & Alewell C |
| 15:15  | Influence of Cyanide on Granite Weathering  
Wongfun N, Plötze M, Brandl H & Furrer G |
| 15:30  | Weathering and Pore Water Evolution in the Foreland of Retreating Glacier, SW Spitsbergen  
Kwaśniak-Kominek M, Manecki M, Rzepa G & Czerny J |
| 15:45  | **Invited:** Supply-Limited and Kinetic-Limited Chemical Erosion  
Riebe CS, Ferrier KL, Hahm WJ & Kirchner JW |
| 16:00  | Vadose Zone Controls on Weathering Intensity and Depth: Observations from Granitic and Basaltic Saprolites  
Goodfellow B, Hilley G, Chadwick O, Schulz M & Shelef E |
| 16:15  | Speed Limits to Soil Weathering and CO₂ Withdrawal  
Dixon J & von Blanckenburg F |
| 16:30  | Permafrost Active Layer Dynamics Inferred from Major Element Geochemical Signatures in Six Arctic Alaskan Rivers  

(Session 14b continues on Monday 15th Posters on page 77)
14f: Quantifying Erosion and Weathering Rates and Critical Zone Processes Across Spatial and Temporal Scales

Session chaired by Francois Chabaux, Anthony Dosseto, Arjun Heimsath & Rolf Aalto

14:00  Scaling of Critical Zone Processes in the Prairie Pothole Region, USA
       Goldhaber M, Mills C, Morrison J & Stricker C

14:15  Geochemical Tracing of Water-Rock Interactions in the Ringelbach Granitic Research Catchment (Vosges, France)
       Chabaux F, Schaffhauser T, Fritz B, Ambroise B & Stille P

14:30  Impact of Interfacial Free Energy on Weathering Rates
       Emmanuel S & Ague J

(Session 14f continues on Monday 15th Posters on page 78)

Session 14b follows this session in this room. For details see page 40.
15a: The GEOTRACES Program
Session chaired by Ed Boyle

14:00 Dissolved Fe in the Western Atlantic Ocean: Distribution, Sources, Sinks and Cycling

14:15 Dissolved Iron Partitioning between Soluble and Colloidal Fractions in the Tropical North Atlantic Ocean
Fitzsimmons J & Boyle E

14:30 Lead and Lead Isotopes in the Atlantic and Indian Ocean: GEOTRACES Data

14:45 Pb in a Deep Sea Coral: Transfer of Anthropogenic Pb to the Deep North Atlantic Ocean over the Last 500 Years
Lee J-M, Eltgroth S, Boyle E & Adkins J

15:00 Quantifying Fluxes of Metals to Surface Waters of the South-East Atlantic

15:15 Sinking Titanic [Ti(IV)] – Insights into the Speciation and Distribution of Titanium in the Atlantic Ocean
Crook P, Dammshäuser A & Heller M

15:30 Particulate Trace Metals and Dust Particles in the Subtropical Atlantic
Balzer W, Barkmann W & Dierssen H

15:45 Trace Element Composition of Size-Fractionated Particulates in the Mauritanian Upwelling Zone of the Eastern North Atlantic U.S. GEOTRACES Section
Ohnemus D & Lam PJ

16:00 Collection and Determination of Suspended Particulate Trace Metals: The US GEOTRACES Intercalibration Cruises
Sherrell R, Planquette H, Field MP, Bishop J, Lam P, Twining B & Morton P

(Session 15a continues on Monday 15th Posters on page 79)
Session 15g follows this session in this room. For details see page 43.
15g: Connectivity of Ocean Circulation and Chemistry at Glacial-Interglacial Transitions

Session chaired by Katharine Hendry & Marcus Gutjahr

16:15 Invited: Southern Ocean Nitrogen and Silicon Dynamics during the Last Deglaciation
Robinson R, Horn M, Beucher C & Brzezinski M

16:30 Surface δ¹³B-pH Reconstructions and Insights into the Dynamics of the Oceanic Carbonate System during the Last Deglaciation
Martínez-Botí MA, Foster GL & Vance D

16:45 Changes in Silicate Utilization and Upwelling Intensity off Peru Since the LGM – Insights from Silicon and Neodymium Isotopes
Ehler C, Grasse P & Frank M

(Session 15g continues on Monday 15th Posters on page 80)
16c: Soil Carbon Dynamics in Managed Environments

Session chaired by Nikolaos Nikolaidis & Donald Sparks

15:30 Keynote: Soil-Carbon Buildup during Soil Formation, Influenced by Different Forms of Land Use  
Lair G & Blum W

16:00 Invited: Long-Term Dynamics of Differently Stable Soil Organic Matter Fractions as Function of Soil Management  
Leinweber P & Thiele-Bruhn S

16:15 Invited: Spatial Vegetation Patterns, Catastrophic Shifts and Desertification in Arid Ecosystems Under Land Use and Climate Regimes  
de Ruiter P & Kefi S

16:30 Assessment of Carbon Needs to Renew Soil Fertility  
Stamati FE, Nikolaidis NP & Schnoor JP

16:45 Spatial Prediction of Soil Organic Carbon Using Digital Soil Mapping Techniques in Slovakia  
Yigini Y, Panagos P & Montanarella L

(Session 16c continues on Monday 15th Posters on page 80)
16f: Biogeochemical Processes in Management and Forensics of Legacy Radioactive Materials

Session chaired by Katherine Morris, Maxim Boyanov & Albert J Fahey

14:00 **Keynote:** Impact of Microbial Metabolism on Radionuclide Solubility in Natural and Engineered Environments


14:30 **Invited:** The Influence of Co-contaminant Complexing Agents on Radionuclide Environmental Behaviour

Keith-Roach M, Reinoso-Maset E, May C, Young L & Worsfold P

14:45 Microbial Populations of Clay Formations and their Interactions with Uranium

López Fernández M, Fernández Sanfrancisco O, Martínez García M, Ranea Robles P, Galera Monge T, Moreno García A & Merroun M

15:00 Exploring the Mobility of Actinyl Ions in the Biogeoosphere: A Spectroscopic and Theoretical Study of U(VI) Complexes with Organic Phosphate Groups

Foerstendorf H, Tsushima S, Brüning S & Li B

15:15 Microbially Induced Corrosion of Depleted Uranium Metal in Oxic Soil

Baxter A, Shaw S, Gardner M & Thompson I

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Session 16c follows this session in this room. For details see page 44.
17e: Nitrogen Isotopes and Nitrogen Cycling in Terrestrial and Aquatic Systems

Session chaired by Carsten Schubert & Moritz Lehmann

14:00 Variability of Nitrogen Stable Isotope in Suspended Organic Matter in Waters of the Western Continental Shelf of India and the Mandovi Estuary
Maya MV, Karapurkar SG, Soares MA, Agnihotri R, Roy R, Naik H & Naqvi SWA

14:15 Amino Sugar and Amino Acid Degradation and Transformation in Two Lakes with Different Redox State
Carstens D, Köllner KE, Bürgmann H & Schubert CJ

14:30 Organic Nitrogen Cycling during Organic Matter Decomposition
Mooshammer M, Wanek W, Frank AH, Hofhansl F, Keiblinger KM, Zechmeister-Boltenstern S & Richter A

(Session 17e continues on Monday 15th Posters on page 82)

Session 17f follows this session in this room. For details see page 47.
17f: Microbial Catalysis of Mineral Dissolution and Precipitation

Session chaired by Liane Benning, Renata van der Weijden, Steve Bonneville & Carsten Mueller

14:45 **Keynote:** Unraveling Microbes-Minerals Interactions in the Deep Biosphere  
*Ménez B, Gérard E, Brunelli D, Pasini V, Le Campion P, Dupraz S, Marinozzi M-C, Amor M & Guyot F*

15:15 Biomineralization of Mn Oxides by Mn(II)-Oxidizing Fungi  
*Santelli CM, Webb S, Dohnalkova A & Hansel C*

15:30 Tracking the Evolution of Phase Changes in Ilmenites in Microbial Fossilization Experiments: Understanding the Role of Microbes in Diagenesis  
*Bower D, Kyono A & Steele A*

15:45 Exploration of Interactions Involving Human Tooth Enamel and Dental Composites Using Vertical Scanning Interferometry  
*Vega-Arroyo M, Taylor SR, Arvidson RS, Kaplan HB, Tribble GD & Luttge A*

16:00 Characterization of Elemental Sulfur Reducing Bacteria Using Transmission Electron Microscopy and their Impact on Sulfur Isotope Fractionation  
*Williams K, Wilkins M, Dohnalkova A, Druhan J & Conrad M*

16:15 Ectomycorrhizal Fungi and Silicate Mineral Weathering: Characterising Nanoscale Interactions Using AFM  
*Kapitulcinova D, Howe RCT, Jackson S, Gazze SA & McMaster T*

16:30 Geochemical and Biological Controls on the Product of Microbial U(VI) Reduction  
*Style M, Alessi D, Uster B, Lezama-Pacheco J, Bargar J & Bernier-Latmani R*

16:45 The Structure and Topology of Cytochromes Involved in Outer Membrane Electron Transport  

(Session 17f continues on Monday 15th Posters on page 83)
17h: Biogeochemical Cycling of Iron
Session chaired by Kristina Straub, Thilo Behrends, Ed Burton, Stefan Peiffer & Cara Santelli

14:00  Microbial Iron Reduction Under Deep Subsurface Pressure Conditions
       Picard A, Testemale D, Hazemann J-L & Daniel I

14:15  Roles of Sulfate and Fe$^{III}$ Reduction on Microbial Community Development
       Kwon MJ, Boyanov MI, Antonopoulos D, Brulc J, Kemner K & O’Loughlin EJ

14:30  Invited: Iron Microbial Mat Formation from Deep Continental Brines
       Toner B, Briscoe L, Michel FM, Alexander S, Alexander C & Gralnick J

14:45  Microbiological Investigation of the Iron-Containing Floculent Mats in Various Deep Sea Environments

15:00  A New Gallionellales Isolate: A Model System for Comparative Studies of Fe-Oxidizer Physiology and Biomineralization
       Chan C, Krepsi S & Saini G


15:30  Enhanced Growth of Acidovorax delafeldii 2AN during Nitrate-Dependent Fe(II) Oxidation in Continuous-Flow Systems
       Chakraborty A, Schieber J, Roden E & Picardal F

15:45  Microbial Iron(II) Oxidation in Littoral Freshwater Lake Sediments; Competition between Phototrophic Versus Nitrate-Reducing Iron(II)-oxidizers
       Melton ED, Schmidt C & Kappler A

16:00  Elucidating the Functions of the Active Microbial Community of Iron Snow in an Acidic Lake
       Lu S, Chourey K, Reiche M, Ciobotă V, Nietzsche S, Hettich R & Küsel K

16:15  On the Multitude of Niches for Bacteria and Archaea in an Acidic Biofilm
       Ziegler S, Dolch K, Majzlan J & Gescher J
16:30  Comparative Genome Analysis of *Metallosphaera yellowstonensis* and a Novel Iron-Oxidizing Sulfolobales from Yellowstone National Park  
*Kozubal M & Inskeep W*

16:45  Distribution and Activity of Iron-Oxidizing Microorganisms in Acidic Geothermal Environments  
*Beam J, Berstein H, Kozubal M, Carlson R & Inskeep W*

(Session 17h continues on Monday 15th Posters on page 84)
18a: Advances in Resolution and Accuracy of *in situ* Determination of Isotope Ratios

Session chaired by Anders Meibom & Jan Kosler

14:00  **Medal:** K-Feldspar Glasses Syntheses for External Calibration of *in situ* Pb Isotope Analysis Using LA-MC-ICPMS

*Yuan H, Song J, Chen K, Dai M, Bao Z & He G*

(Session 18a continues on Monday 15th Posters on page 85)

Session 18d follows this session in this room. For details see page 87.
### 18d: Advanced Microanalytical, Spectroscopic and (Spectro-)microscopic Surface Methods: STXM, NEXAFS, AFM, NANOSIMS...

Session chaired by Kai Totsche & Karim Benzerara

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| 14:45 | **Keynote:** NanoSIMS: New Results of Relevance to Biomineralization and Biology  
Meibom A |
| 15:15 | Combining NanoSIMS with STXM/TEM Imaging to Shed New Light on Organic Matter Contained in Micron-Sized Particles  
Remusat L, Derrien D, Hatton P-J, Nico P & Rouzaud J-N |
Müller CW, Hoeschen C & Kögel-Knabner I |
| 15:45 | Functional Group Chemistry at the Mineral-Organic Interface in Soils  
Lehmann J, Solomon D, Muller D, Chia C, Xin H, Joseph S & Munroe P |
| 16:00 | VESPERS XRF and Laue Diffraction Mapping of Carlin-Type Auriferous Arsenian Pyrite  
Dobosz A, Olivo GR & Pratt AR |
| 16:15 | GEO-Cars: 3-D, Chemically Selective Imaging of Fluid Inclusions with Multimodal Nonlinear Optical Microscopy  
Burruss R, Slepkov A, Pegoraro A & Stolow A |
| 16:30 | Approaching the Final Frontier in Lateral Resolution for Isotopic and Chemical Analysis with CHILI  
Davis A, Stephan T, Savina M, Pellin M, Veryovkin I, Yokochi R, Trappitsch R, Liu N & King A |
| 16:45 | Using TOF-SIMS to Study Biomarkers  
Thiel V, Blumenberg M, Heim C, Lausmaa J, Leefmann T, Siljeström S, Reitner J & Sjovall P |

(Session 18d continues on Monday 15th Posters on page 87)
19a: Radioactivity in the Environment: Damage, Solution, and Relativistic Effects

Session chaired by David Dixon & Martin Dove

14:00  **Keynote:** Which is More Ionic? UO$_2$ or PuO$_2$
       *Martin RL*

14:30  **Invited:** Atomistic Simulations of Uranium in the Environment: Diffusion, Adsorption, and Incorporation
       *Kerisit S, Liu C, Felmy A & Ilton E*

14:45  **Ab Initio** Electronic Structure of Pu(OH)$_4$: Comparison between Density Functional and Multi-Reference Theories
       *Huang P, Zavarin M & Kersting A*

15:00  **Invited:** Computational Studies of Structural, Magnetic, and Spectroscopic Properties of Actinide Species
       *Yang P*

15:15  **Invited:** Computational Studies of Actinide Clusters and Hydrolysis Reactions
       *Dixon D, Jackson V, Vasiliu M, Walker S, Duke J, Flamerich R, Knope K & Soderholm L*

(Session 19a continues on Monday 15th Posters on page 88)

Session 19b follows this session in this room. For details see page 53.
19b: Large and Complex Atomistic Systems: Physics, Algorithms, and Hardware

Session chaired by Adri van Duin & Paolo Raiteri

15:30 Invited: Structure and Stability of Mineral Interfaces
Parker S, Molinari M, Zhu R, Smith W & Noguera C

15:45 Keynote: Recent Advances in First Principles Based Modeling and Simulations of the Physics and Chemistry of Large, Complex Atomistic Systems
Goddard W

16:15 Invited: Large-Scale Simulation of Molecular Structure and Electron Transfer in Microbial Cytochromes

16:30 Invited: Mineral Growth and Dissolution from Rare Event Methods
Stack A

16:45 Structure and Relative Stability of Hydrous and Anhydrous Ca-Mg Carbonates from First-Principle Calculations
Demichelis R, Raiteri P & Gale JD

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21a: Global Water Sustainability

Session chaired by Chen Zhu

14:00   Testing a Geochemical Tracer Tool in New Zealand Water
        Slade A, Warner N, Vengosh A & Whitehead B

14:15   Hydrogeochemistry Groundwater Quality and Pollution
        Potential Studies of Satna City, Madhya Pradesh, India
        Tiwari Rabindra RN

14:30   Influence of Major Hydraulic Projects on Saltwater Intrusion
        in the Yangtze River Estuary
        Zheng M, Liu S & Jiang S

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Session 21e follows this session in this room. For details see page 55.
21e: Fluid and Solute Fluxes Across the Land, River, Lake and Ocean Interfaces

Session chaired by Henrieta Dulaiova, Thomas Riedel, Natasha Dimova & Hannelore Waska

14:45 **Keynote:** Submarine Groundwater Discharge, the Subterranean Estuary and Climate Change: Quo vadis?  
Bokuniewicz H

15:15 Rapid Seawater Circulation through Animal Burrows in Mangrove Forests – A Significant Source of Saline Groundwater to the Tropical Coastal Ocean  
Stieglitz T, Clark J & Hancock G

15:30 The Impact of Sea Level Rise on Salt Water Intrusion into Coastal Aquifers  
Rapaglia J, Bokuniewicz H, Vafeidis A & Pick T

15:45 Seepage of Subsurface Brines into a Major Lake System Using Ra and Stable Isotopes of Oxygen and Hydrogen: A Case Study from Lake Huron  
Baskaran M, Novell T, Ruberg S, Biddanda B, Johengen T, Hawley N & Klump V

16:00 Rare Earth Elements: Indicators of Redox Conditions and Surface Water-Groundwater Mixing in an Estuarine Wetland  
Poh SC & Gasparon M

16:15 Geologic and Hydrologic Control of Porewater Chemistry and Submarine Groundwater Discharge into Indian River Bay, Delaware  

16:30 Ecosystem-Level Impact Signals of Groundwater Borne Continental Nitrate Transfer to the Ria Formosa Lagoon by Submarine Groundwater Discharge (SGD) Traced along the Mixing Gradient by a Multi-Indicator Approach  

16:45 Sea Water Circulation in Coastal Aquifers as Inferred from Radium Isotopes: The Dead Sea Case  
Kiro Y, Weinstein Y, Yechieli Y & Starinsky A

(Session 21e continues on Monday 15th Posters on page 94)
01a: The Disc Epoch: Sources and Compositions of Early Solar System Materials

Floor 1

1001 Search for Nucleosynthetic Tellurium Isotopic Anomalies in Meteorites by N-TIMS
Fukami Y & Yokoyama T

1002 T and fO2 Guided, Gas Phase Mediated Na and K Exchange between Silicate Melt Drops
Gellissen M, Holzheid A, Kegler P & Palme H

1003 Magnesium Isotope Composition of Presolar Silicate Grains
Kodolányi I & Hoppe P

1004 The Formation of Organic Molecules in Solar System Environments: The Miller-Urey Experiment in Space Preflight Overview

01c: From Planetesimals to Planets

Floor 1

1005 EBSD Study of Lattice Preferred Orientation (LPO) of the Harzburgite NWA 5480
Tkalcic B & Brenker FE

1006 Early Thermal Events of the HED Parent Body (4 Vesta) from Euclite Zircon U-Th-Pb-Ti Depth Profiles
Hopkins M, Mojzsis S & Bottke W

1007 Internal Structure of Icy Satellites of Jupiter and Saturn and Subsurface Oceans
Kuskov O, Kronrod V & Zhidikova A

02b: Geology, Age and Origin of the Oldest Terrestrial Rocks and Minerals

Floor 1

1008 Potential Source Variation in Munro Komatiites: Fred’s and Theo’s Flows, Ontario, Canada
Duchemin C, Chauvel C, Arndt N, Debaille V & Mattielli N

1009 146,147Sm-142,143Nd Studies of Komatiites from Western Dharwar Craton, India: Implications for Depleted Mantle Evolution in Early Archean
Maya JM, Bhutani R & Balakrishnan S

1010 Geochemical and Synchrotron Study of Barberton Greenstone Belt Cherts (3.5-3.2 By), South Africa
Ledevin M, Simionovici A, Arndt N & Westall F
02i: The Evolving Early Earth Hydrosphere as a Geodynamic Tracer and Facilitator for Life: Constraints from the Supracrustal Rock Record

Floor 1

1011 Mesaoarchean Gabbroanorthosite Magmatism of the Kola Region (Russia)

Kudryashov N & Mokrushin A

1012 Secondary Origin for “Primary” Mineral Inclusions in Detrital Zircons from Jack Hills, Western Australia

Rasmussen B, Fletcher I, Muhling J, Gregory C & Wilde S

1013 2575 Ma Age of Nuvvuagittuq Metamorphic Garnet

Sullivan N, Baxter E & Mojzsis S

1014 Cathodoluminescence of Quartz as a Reflection of the Evolution of the Teplice Caldera

Švecová K, Breiter K & Leichmann J

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02k: Astrobiology and Extreme Terrestrial Environments

Floor 1

1015 Preliminary High-Resolution Ge/Si Data in Early Archaean BIFs

Luais B, Lach P, Thomassot E, Chaussidon M & Boiron M-C

1016 Mercury Stratigraphy: A Proxy for Volcanogenic CO₂ Buildup in Neoproterozoic Snowball Earth and Volcanism in the K-T Transition


1017 C, Sr Isotopes in Cap Carbonate and and Ce Anomaly in BIFs of Jucurutu Formation, Seridó Belt, NE, Brazil


1018 Carbon-Isotope and Mercury Stratigraphies of the Frecheirinha Formation Cap Carbonate, Northeastern Brazil

Chiglino L, Sial A & Gaucher C

1019 Probable Mars Atmospheric Changes by the Proposed Terraforming Process with Silicon Utilizing Organisms

Das S

1020 Microbial Community Diversity in Oylat Cave and their Roles on Biogeochemical Cycling

Gulecal Y & Temel M
03a: Experimental Constraints on the Origin and Evolution of Earth’s Early Mantle and Core

Floor 1

1021 Differential Changes in Divalent Ni, Co and Fe Coordination in Silicate Melt with Pressure
Jones J, O’Neill H & Berry A

1022 Granularity and Geochemistry of Olivine in Jinchuan Ni-Cu-PGE Magmatic Sulfide Deposit

(Session 03a continues on Tuesday 16th AM on page 103)

03f: Physics and Chemistry of the Deep Earth

Floor 1

1023 Al and Fe Substitution in MgSiO₃ Perovskite: An 27Al and 29Si NMR Study
Palke A, Stebbins J, Frost D & McCammon C

1024 An Empirical Approach to Estimate Melting Temperature and Its Pressure Dependence of Some Rocks of Oman Ophiolite Suite
Arafan S, Singh R & George A

1025 An Experimental Study of Minettes and Associated Mica-Clinopyroxenite Xenoliths from the Milk River Area, Southern Alberta, Canada
Funk SP & Luth RW

1026 First-Principles Simulations of Alkali Aluminosilicate Liquids
Ni H & de Koker N

1027 Volume and Ionic Conductivity Measurements of H₂O Ice at High Pressure and Temperature
Sugimura E, Komabayashi T, Ohta K, Hirose K, Sata N, Ohishi Y & Dubrovinsky LS

1028 Crustal Contribution to the Geo-Neutrino Flux at the Sudbury Neutrino Observatory (SNOLAB)
Phaneuf C, Mareschal J-C, Perry C & Jaupart C

1029 Geoneutrino Observations and the Earth Energy Budget
Mareschal J-C, Phaneuf C, Perry C & Jaupart C

1030 Real Composition of the Earth’s Lower Mantle
Kaminsky F

1031 Pressure Dependence of Electrical Resistivity of Cummingstonite from the World’s Deepest Kola Super Deep-Borehole (KSDB-3), Russia
Parthasarathy G & Gorbatevich F
03g: Stable Isotope Fractionation at High Pressures and Temperatures

1032 On the Mass Independent Fractionations of O, Hg, Si, Mg and Cd during Open-System Evaporation or Thermal Decomposition
Cartigny P, Eiler J, Agrinier P & Assayag N

1033 Computation of Li Equilibrium Isotope Fractionation between Minerals and Aqueous Solution
Kowalski P & Jahn S

1034 Strontium Stable Isotope Variations in Lunar Basalts
Sutcliffe N, Burton K, Parkinson I, Cook D, Charlier B, Mokadem F & Halliday A

04a: Chemical Geodynamics: 25 Years of Mantle Components

1035 Isotope Geochemistry of São Tomé Island (Cameroon Volcanic Line): Implications for Mantle Source Components
Lopes JM, Caldeira R, Cordani U & Munhá JM

1036 Evolution of Variscan Orogenic Popiel Peridotite (SW Poland)
Kukula A, Puziewicz J, Matusiak-Malek M & Ntaflos T

1037 Fe–metasomatism in Upper Mantle beneath SW Poland
Matusiak-Malek M, Puziewicz J, Grégoire M & Ntaflos T

1038 OIB’s from South Eastern Pacific: Notes from Key Geochemical Features
Montecinos P & Pinto K

1039 Mantle Metasomatic Events Related to Alkaline Volcanism during Incipient Rifting: NE Eger Rift (Central Europe) Example
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2071 Origin of Dissolved Metals in Produced Water from the Devonian Marcellus Shale, USA: Sr Isotope Systematics

2072 Platinum-Group Element Mineralization in Black Shales in Xinjiang, China
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2073 Geological Characteristics of Black Shale Series in Southern Anhui Province
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2074 Whether has Platinum Group Elements (PGE) Enriched in Sulfide-Rich Black Shale Series in Southern Anhui Province?
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2075 Mineralization Features and Metallogeny of Polymetallic Deposit in Black Shale Series in Southwest China
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3070 Cr$^{6+}$ Reduction by Sulfate-Reducing Bacteria in Salt Marsh Sediments
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3071 Impact of Biotic and Abiotic Factors on the Mobilization of Heavy Metals in Al-Ghadir River Sediments (Lebanon)
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3073 Characterization of the Microbe-Biotite Interface on Field Samples from a Mine Site, Derome, Sweden
Negrich K, Ballegh-Brunstad Z, Hassenkam T & Stipp SLS

3074 Bioremediation Strategies to Inhibit Salt-Enhanced Stone Weathering
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3076 Calorimetry in Soil Sciences; An Unique Approach

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3077 Particle Size Effects in Bioleaching of Uranium Waste Ore

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3078 Selenite Reduction by *Bacillus L.*

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3079 The Bioleaching Effect of Agitation Speed on Low-Grade Chalcopryite Ore Under the Combined Catalysis

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3081 Vertical Distribution of Fe and S Species in Anoxic Water Column of Pavin Lake (France); Electrochemical Evidence for Nanoparticulate FeS

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3082 Electrical Resistivity Imaging of a Deep Coal Mine Discharge

_Burgos W, Fitzgerald M, Larson L, Herwehe L, Singha K & Gooseff M_

3083 Re-partitioning of Fe and Cu during the Oxidation and Acidification of Acid Sulfate Soil Materials

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3084 Formation of Layered Fe(II)-Al(III) Hydroxides during Reaction of Fe(II) with γ-Al₂O₃ and Montmorillonite

_Elzinga E_

3085 Liesegang Banding and Biochemically Mediated Geochemical Self-Organization

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3087 The Impact of Fe(III) Oxide Structure on Shaping Metal Respiring Microbial Communities and Carbon Oxidation
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3088 Spatial and Seasonal Variations of Iron Species in the Changjiang (Yangtze River) Sediment
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3089 Microbially Mediated Iron Reduction in the Methanic Zone of Sediments from the Western Argentine Basin

3090 Fe(II) and Organic Exudates Interaction in Seawater
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3091 Biotic Dissolution of Tl(I)jarosite by Shewanella putrefaciens CN32
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3093 Quantifying Electron Flow in the Sulfidation of Lepidocrocite
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3094 Aeolian Iron Flux in the South-Western Ross Sea, Antarctica
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3095 Stimulation of the Anaerobic Oxidation of Pyrite by Activators at Neutral pH in the Presence of Nitrate
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3096 Release of Silica from Micas by Alkaliphilic Anaerobes

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4002 Composition of Error in LA-ICP-MS U/Pb Geochronology: Lessons from the Processing of Standard Measurement Series Performed in 10 Laboratories
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4003 LA-ICPMS U-Pb Ages of Paleo- and Mesoproterozoic Granites in Bolivia
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4004 Measurement of Four-Isotope Sulfur Ratios on SHRIMP–SI

4005 NIST SRM 610–614 Matrix Induced Unique Element Fractionation in Laser Ablation ICP-MS at High Spatial Resolution Analysis
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4006 Stacked SIMS Spectra: Unravelling Ion Production in Geological Materials
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4007 In situ Pb and U Isotope Analysis of Single Ostracod Shells from Nam Co, Tibet

4008 In situ Analysis of U-Th Disequilibria in Titanite by fs-LA-MC-ICPMS
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4009 A Synthetic Silica Glass Reference Material for Determination of Ti in Zircon by LA-ICP-MS
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4010 \(^{87}\text{Sr}/^{86}\text{Sr}\) Isotope Ratios in Single Benthic Foraminifera by LA-MC-ICPMS
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4011 Evaluation of Matrix Effects during Laser Ablation MC ICP-MS Analysis of Boron Isotopes in Tourmaline
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4012 Boron Isotopes by Laser Ablation MC-ICPMS
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4013 Iron Isotopic Signature for Weathered Ordinary Chondrites: Application of the LAL sampling-ICP-MS Technique for Cosmochemical Sample
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4015 U-Th-Pb Analyses by Eximer Laser Ablation/ICP-MS on MG Brazilian Xenotime
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4016 Exploring Micro-Scale Stable Isotope Variations Using Femtosecond Laser Ablation MC-ICP-MS
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4017 Study of Candidate Matrix-Matched Calibration Standards for Geological Applications by Nuclear and Laser Ablation Based Methods

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4027 Development of Steady-State Surface Topography and the Determination of Dolomite Dissolution Rates
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4028 Characterization and Identification of Minerals in Rocks by TOF-SIMS and Principal Component Analysis
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3097 A New Methodology for an Improved Description of Radionuclide Retardation in Safety Assessments
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4038 Major Ion Chemistry of Subsurface Water Samples Around Waste Disposal Sites of Hyderabad City, India
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4039 Flour Content in the Groundwater Samples of Chahar-Farsakh Area, South Khorasan, Iran
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4041 Geochemistry of Groundwater from Graciosa Island (Azores): A Contribution to the Hydrothermal System Conceptual Model
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4074  Study of Naryn River (Central Asia) Runoff Formation by Stable Isotope
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4076  Transboundary Problems of Water Resources Quality in the Selenga River Basin
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4091  Sampling Technology of Deep Groundwater with Diffusive Gradient in Thin Film (DGT)
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4092  Fluoride Patterns in a Boreal Stream Influenced by Bedrock and Hydrology
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| 4107 | Modeling of Column Experiments – Influence of Glass Micro Balls  
  
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<td>09:30</td>
<td><strong>Oral Sessions</strong> including <strong>Special Session 23a: Fukushima Review</strong></td>
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<td>12:30</td>
<td><strong>Lunch</strong>&lt;br&gt;Floor 3 / Forum Hall Foyer (Boxed lunches)&lt;br&gt;Floor 1 / Restaurant Zoom (Buffet lunches)</td>
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<td><strong>Oral Sessions</strong> including <strong>Special Session 23a: Fukushima Review</strong></td>
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<td>17:00</td>
<td><strong>Poster Session</strong>&lt;br&gt;Floors 1, 2, 3 &amp; 4 / Congress Hall Foyer</td>
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<td>19:00</td>
<td><strong>Brevnov Abbey Dinner</strong></td>
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<td>19:30</td>
<td><strong>Poster Session</strong>&lt;br&gt;Floors 1, 2, 3 &amp; 4 / Congress Hall Foyer</td>
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<td>23:00</td>
<td><strong>Brevnov Abbey Dinner</strong></td>
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Special Session

23a: Fukushima Review AM

Floor 2 / Congress Hall

09:30  The Role of the Geochemical Society of Japan for Mitigating the Fukushima Accident and its Aftermaths

   Ebihara M

10:00  Seismological Investigations of the March 11, M9, Tohoku-Oki Earthquake

   Ritsema J

10:30  Deconstructing the Nuclear Accident at the Fukushima-Daiichi Plant: What Went Wrong and What are the Prospects for Recovery?

   Blandford E

11:00  A Preliminary Overview of Studies on Dispersals of Radionuclides from Fukushima Nuclear Power Plants

   Yoshida N

11:30  Present Situation of Radioactive Contamination in Soil by the Fukushima Dai-Ichi Accident

   Yamamoto M, Takada T, Nagao N, Hoshi M, Zhumadilov K, Shima T, Fukuoka M & Kimura S

12:00  Measurement of Radioactivity of Aerosol at a few Sites in Japan after the Fukushima Daiichi Accident

   Nagao S, Kanamori M, Tokunari T, Hayakawa K, Toriba A, Kameda T, Hamajima Y, Inoue M & Yamamoto M

23a: Fukushima Review PM

Floor 2 / Congress Hall

14:00  Atmospheric Dispersion of the Fukushima Effluents


14:30  Distribution of Radioactive Materials in Seawater of the North Pacific Ocean: Past and Present

   Uematsu M

15:00  Geochemistry of the Long Term Evolution of the Used Nuclear Fuel/water Interaction

   Grambow B

15:30  Discussion
## Oral Presentations Overview

<table>
<thead>
<tr>
<th>Club B/C</th>
<th>Club A</th>
<th>Club H</th>
<th>Meeting Hall I</th>
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<tbody>
<tr>
<td>03a/03c</td>
<td>06a</td>
<td>09d</td>
<td>05e</td>
<td>17f</td>
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### AM

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<tr>
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<tr>
<td>09:30</td>
<td>10b</td>
<td>Baresi, Maming, Steele-MacInnis, Deloue, Nebel, Wood, Novak, Školik, Jennings, Mazees, Lindasboon, Krüger, Lindeboom, Szymanski, Faiz, Petsch, Urynowicz, Sevinsky,</td>
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<td>09:45</td>
<td>02b</td>
<td>Nebel, Adam, Steele-MacInnis, Deloue, Nebel, Wood, Novak, Školik, Jennings, Mazees, Lindasboon, Krüger, Lindeboom, Szymanski, Faiz, Petsch, Urynowicz, Sevinsky,</td>
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<td>04b</td>
<td>Nebel, Adam, Steele-MacInnis, Deloue, Nebel, Wood, Novak, Školik, Jennings, Mazees, Lindasboon, Krüger, Lindeboom, Szymanski, Faiz, Petsch, Urynowicz, Sevinsky,</td>
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<td>Pacton Reeder Marcolli Thorvalley Shao Jung Loukola Ruskeeniemi Cobert</td>
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<td>12:00</td>
<td>Leveille Blanchard Dal Maso Swann van Hoek Putnis Xu Pearce Wang</td>
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<td>12:15</td>
<td>Gonzalez Lefevre Virtanen Wetzel Marks Jamtveit Lehmann Siebert Cameron</td>
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</table>
02b: Geology, Age and Origin of the Oldest Terrestrial Rocks and Minerals

Session chaired by Nicholas Arndt, Stephen Mojzsis & Janne Blichert-Toft

09:30 Hafnium Isotope Constraints on the Origin of Layered Intrusions and the Stabilisation of the Yilgarn Cratonic Lithosphere
Nebel O, Arculus RJ, Mavrogenes JA, Nebel-Jacobsen YJ & Ivanic TJ

09:45 Hadean Greenstones and the Origin of the Earth’s Early Continental Crust
Adam J, Rushmer T, O’Neil J & Francis D

10:00 Characterization of Magma from Inclusions in Zircon: Apatite and Biotite Work Well, Feldspar Less So
Jennings E, Marschall H, Hawkesworth C & Storey C

10:15 Is the Oxygen Isotope Composition of Zircon Robust Against Aqueous Alteration?
Lenting C, Geisler T, Cliff JB, Kilburn MR & Nemchin AA

10:30 Keynote: Geology, Age and Origin of the Oldest Terrestrial Rocks and Minerals
Van Kranendonk M

11:00 Invited: Limited Early Continents from the Chemistry of Eoarchean Rocks
Bennett V & Nutman A

11:15 Invited: Hf Isotopes Require No Subduction in the Hadean?
Hawkesworth C, Kemp T, Wilde S & Vervoort J

11:30 The ca. 4.2-3.7 Ga History of the Acasta Gneiss Complex (Northwest Territories, Canada)

11:45 A Combined U/Pb and Hf-Isotope Study of up to 4.0 Ga Detrital Zircon from the Wyoming Province
Kamber B, Whitehouse M & Woodhead J

12:00 Detailed Field Relations of Pre-3.85 Ga Zircon Bearing Metasediments from Southern Montana (USA)
Maier A, Cates N & Mojzsis S

12:15 Thermometry of Quartz from the Metaconglomerate of Jack Hills, Western Australia
Menneken M, Nemchin AA & Geisler T
03a: Experimental Constraints on the Origin and Evolution of Earth’s Early Mantle and Core

Session chaired by James Badro & Mike Walter

09:30 **Keynote:** Accretion and Initial Differentiation of the Earth
Wood B

10:00 **Keynote:** Diamond Anvil Cell Applied to the Geochemistry of Earth’s Core Formation
Siebert J, Badro J, Antonangeli D & Ryerson F

10:15 Origin and Composition of LLSVPs in the Lowermost Mantle
Trønnes R

10:30 Partitionning of Pt-Re-Os between Solid and Liquid Metal in the Fe-Ni-Si System
Morard G, Siebert J, Antonangeli D & Badro J

10:45 Metal-Silicate Partitioning of Iodine at High Pressures and Temperatures: Implications for the Earth’s Core
Armytage R, Jephcoat A, Bouhifd MA & Porcelli D

11:00 Oxygen and Silicon Partitioning between Molten Iron and Silicate Melts up to 70 GPa and 4000 K

Nomura R, Ozawa H, Tateno S, Hirose K, Hernlund J, Muto S, Ishii H & Hiraoka N

11:30 Experimental Constraints on the Development of Os Isotopic Heterogeneity in the Earth’s Mantle
Fonseca ROC, Luguet A, Ballhaus C & Pohl F

Session 03c follows this session in this room. For details see page 104.
03c: Mantle Redox and the Deep Carbon Cycle

Session chaired by Yingwei Fei, Dan Frost & Bob Luth

11:45 Formation of Diamond from Oxidized Fluids/Melts: δ¹³C-N SIMS Study of an Eclogitic Diamond from the Jericho Kimberlite, Canada
   Smart KA, Chacko T, Stachel T, Stern R & Muehlenbachs K

12:00 The Abiogenic Generation of Low δ¹³C Reservoirs in the Deep Earth
   Mikhail S, Shahar A, Hunt SA, Verchovsky AB, Franchi IA, Basu S & Jones AP

12:15 Subducted Oceanic Crust Exhumed from the Lower Mantle
   Kohn S, Walter M, Araujo D, Bulanova G & Smith C

(Session 03c continues on Tuesday 16th PM on page 134)
### Session: New Insights into Mantle and Crustal Processes from High Temperature Stable Isotope Techniques

**Session chaired by Bruce Watson, Anat Shahar & Craig Lundstrom**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>09:30</td>
<td>In situ Dating and Investigation of Remarkably Depleted ~27.3‰ SMOW “Slushball” Earth Zircons</td>
<td>Bindeman I, Vazquez J, Schmitt A, Eiler J, Serebryakov N &amp; Evans D</td>
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<td>09:45</td>
<td>Lithium Isotope Fractionation in Pegmatites – Function of Bond Length</td>
<td>Novák M, Magna T, Cempírek J, Janoušek V, Ullmann C &amp; Wiechert U</td>
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<tr>
<td>10:00</td>
<td>Keynote: High-Temperature Kinetic Isotope Fractionation in Silicate Systems: Laboratory and Natural Examples</td>
<td>Richter F</td>
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<tr>
<td>10:30</td>
<td>Influence of Solute-Solvent Interactions on Mass Discrimination during Chemical Diffusion</td>
<td>DePaolo D, Watkins J &amp; Ryerson F</td>
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<tr>
<td>10:45</td>
<td>New Insights into Mantle and Crustal Processes from High-Temperature Magnesium Isotope Fractionation</td>
<td>Teng F-Z, Li W-Y &amp; Liu S-A</td>
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<tr>
<td>11:00</td>
<td>Production of the Cordillera del Paine Igneous Complex by Thermal Migration Zone Refining</td>
<td>Lundstrom C, Gajos N &amp; Michael P</td>
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<td>11:15</td>
<td>New Insights into San Carlos Mantle Xenoliths Using Iron Isotopes</td>
<td>Macris C, Young E, Manning C &amp; Schauble E</td>
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<td>11:30</td>
<td>Fe Isotopes and the Contrasting Petrogenesis of A-, I- and S-Type Granite</td>
<td>Foden J, Sossi P &amp; Halverson G</td>
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<td>11:45</td>
<td>Redox- and Diffusion-Controlled Fractionation of Fe Stable Isotopes in Silicate Minerals of Igneous Rocks</td>
<td>Millet M-A, Baker J, Handler M, Payne C &amp; Dallas J</td>
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<tr>
<td>12:00</td>
<td>Silicon Isotopes in Granitoid Rocks</td>
<td>Savage PS, Georg RB, Williams HM, Burton KW, Halliday AN &amp; Chappell BW</td>
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<tr>
<td>12:15</td>
<td>A Combined Earth-Moon Si Isotopes Model to Track Rocks Petrogenesis</td>
<td>Zambardi T &amp; Poitrasson F</td>
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</table>
05e: Petrologic, Geochemical and Tectonic Links between the Continental Crust and Lithospheric Mantle
Session chaired by Oliver Jagoutz, Craig O’Neill, Peter Luffi & Josef Dufek

09:30 Li Content and Isotopic Distributions in Granulite of Kerguelen Plateau
Deloule E, Ingrin J, Xia Q & Gregoire M

09:45 Os Isotopes of Detrital Os Alloys from the Rhine and Evidence for a 1.2-1.3 Ga Global? Mantle Melting Event
Dijkstra AH, Dale CW, Sergeev DS, Gabelica Z & Devilliers A

10:00 Multiscale Melt Extraction In the Lower Crust and Upper Mantle
Dufek J & Huber C

10:15 Evolution of the Cratonic Lithosphere Inferred from Lithospheric Mantle Heterogeneity: A Geophysical Perspective
Artemieva IM

10:30 Invited: Geodynamic Regimes of Continental Crust Growth and Lithosphere Reworking in Subduction Zones
Gerya T

10:45 Keynote: Crust-Mantle Links in Cratons
Pearson GD, Tappe S, Smart KA, Mather KA, Dale CW & Kjarsgaard BA

11:15 Coupling, Decoupling and Metasomatism: A Saga of Crust-Mantle Relationships beneath NW Spitsbergen (Arctic Norway)
O’Reilly S, Nicolic N, Griffin W & Pearson N

11:30 Deep Crust of the Siberian Craton Evidence from Xenolith Shatsky V, Malkovets V, Griffin W, Belousova E & O’Reilly SY

11:45 U–Pb Zircon, Geochemical and Isotopic Constraints on Age and Origin of Cretaceous Granites from the North Qinling, Central China and Implications for Interaction between Crust and Mantle
Wang XX, Wang T, Qi QJ & Li S

12:00 Primordial Ages of Lithospheric Mantle vs Ancient Relicts in the Astenospheric Mantle: In situ Os Perspective
Wang K-L, O’Reilly SY, Griffin W, Pearson N, Kovach V & Yarmolyuk V

12:15 Melting of Juvenile Lithospheric Mantle: Geochemical Evidence from Neoproterozoic Mafic-Ultramafic Rocks in South China
Zhang S-B, Wu R-X & Zheng Y-F

(Session 05e continues on Tuesday 16th Posters on page 164)
### 06a: Recycling Agents in Subduction Zones: Fluids and Melts

**Session chaired by Joerg Hermann, Susanne Skora & Weidong Sun**

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<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Title</th>
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<tr>
<td>09:30</td>
<td>Invited: Manning C</td>
<td>Aqueous Complexing and Element Recycling by Subduction-Zone Fluids</td>
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<td>09:45</td>
<td>Steele-MacInnis M, Schmidt C &amp; Bodnar R</td>
<td>Silica Speciation in Aqueous Sodium Silicate Solutions</td>
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<td>10:00</td>
<td>Šulák M &amp; Dolejš D</td>
<td>The System SiO$_2$H$_2$O Revisited: Equation of State to Very High Temperatures and Pressures Including Critical Behavior</td>
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<td>10:30</td>
<td>Mysen B</td>
<td>P$^{5+}$ and Ti$^{4+}$ Solution Mechanisms of and Partitioning between Fluids and Melts at Crustal and Upper Mantle Pressure and Temperature</td>
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<td>10:45</td>
<td>Sun W, Li C, Zhang H, Ding X, Ling M &amp; Fan W</td>
<td>Oceanic Anoxic Events and Cenozoic Large Scale Molybdenum Mineralization</td>
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<td>11:00</td>
<td>Evans K &amp; Tomkins A</td>
<td>The Relationship between Subduction Zone Redox Budget and Arc Magma Fertility</td>
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<tr>
<td>11:15</td>
<td>Marschall H &amp; Schumacher J</td>
<td>Recycling Agents in Subduction Zones: Fluids, Melts and Solids!</td>
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<tr>
<td>11:30</td>
<td>Invited: Klimm K, Schroeder F &amp; Blundy J</td>
<td>Experimental Constraints on the Composition of Slab Liquids Below Arc Volcanoes</td>
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<td>11:45</td>
<td>Stepanov A, Hermann J &amp; Rubatto D</td>
<td>Experimental Study of Monazite/Melt Partitioning</td>
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<tr>
<td>12:00</td>
<td>Tsuno K, Dasgupta R, Danielson L &amp; Righter K</td>
<td>Subduction Cycling of C-O-H Volatiles from Sediment Melting</td>
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<td>12:15</td>
<td>Larikova T, Holzheid A &amp; Kegler P</td>
<td>Geochemistry of Tonalites Formed by Partial Melting of Eclogites: Experimental Modelling</td>
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(Session 06a continues on Tuesday 16th PM on page 138)
# 07b: Trace Elements at the Intersection of Biological and Geochemical Evolution

Session chaired by Aubrey Zerkle & Stefan Lalonde

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<tr>
<td>09:45</td>
<td>Sensitivity and Feedback in the Oceanic Molybdenum Cycle</td>
<td>Reinhard C, Scott C &amp; Lyons T</td>
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<tr>
<td>10:00</td>
<td><strong>Keynote:</strong> Rapid Expansions in Biological Metal Utilization</td>
<td>Dupont C</td>
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<td>10:45</td>
<td>Marine Redox Conditions and Sulfur Cycling during the Deposition of the 2.3 Ga Timeball Hill Formation</td>
<td>Diekrup D, Kaufman AJ, Kendall B &amp; Strauss H</td>
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</table>

Session 07d follows this session in this room. For details see page 109.
07d: Trace Metal Stable Isotopes and Organic Biomarkers: Evidence for Early Life on Earth and Beyond

Session chaired by Vyliinniskii Cameron, Corey Archer & Jennifer Eigenbrode

11:00  Zinc and Silicon Isotope Fractionation by Deep-Sea Sponges
Hendry K, Andersen M & Robinson L

11:15  Biosynthesis of Sterols and Wax Esters by Euglena of Acid Mine Drainage Biofilms: Implications for Eukaryotic Evolution and the Early Earth
Fang J, Dasgupta S, Brake S, Hasiotis S & Zhang L

11:30  **Keynote:** Molybdenum as a Paleoredox Proxy: An Update

12:00  13α(n-alkyl)-Tricyclic Terpanes: A Series of Biomarkers for the Unique Microbial Mat Ecosystem in the Middle Mesoproterozoic (1.45~1.30Gyr) North China Sea

12:15  Nickel Isotopes, BIFs and the Archean Oceans
Cameron V, Vance D & Poulton S
08d: Biotic/abiotic Nucleation and Early Life

Session chaired by Karim Benzerara, Andreas Kappler & Kurt Konhauser

11:00  **Keynote:** The Role of Extracellular Organic Matter (EOM) in the Nucleation and Growth of Microbial Carbonates

*Dupraz C*

11:30  Calcium Carbonate Precipitation by the Marine Cyanobacterium *Trichodesmium*

*Kranz SA, Wolf-Gladrow D, Nehrke G, Langer G & Rost B*

11:45  Viruses: A Key Role in Microbial Mat Mineralization

*Pacton M, Wacey D, Kilburn MR, Gorin GE & Vasconcelos C*

12:00  Fossilization of Microaerophilic Iron Oxidizing Bacteria from Marine Hydrothermal Vents

*Leveille R & Laplante K*

12:15  Arsenic Biomineral Formation Leads to Partial Encrustation of Thermoacidophilic Archaea

*Gonzalez P, Weijma J & Buisman CJN*
08g: Gas Storage and Transfer in Geological Media

Session chaired by Eric Pili & Jim DeYoreo

09:30  Geochemical Alteration of Fracture Geometry during Leakage of CO₂
Ellis BR, Peters CA, Fitts JP, Bromhal GS, McIntyre DL & Warzinski RP

09:45  Wettability Alteration Upon Reaction with scCO₂: Pore Scale Visualization and Contact Angle Measurements
Wan J, Kim Y & Jung J

10:00  Sorption Properties of Supercritical Carbon Dioxide in Nano-Porous Synthetic Rocks
Krukowski E, Rother G & Bodnar R

10:15  Hydrogen Sorption by Synthetic Montmorillonites and Clayrock at High Temperature
Didier M, Bardelli F, Giffaut E & Charlet L

10:30  Microbial Activity in Gas Field Fluids and in Laboratory Experiments Simulating Geological CO₂-Storage
Kassahun A, Gniese C, Hache M, Muschalle T & Hoth N

10:45  A Close Look at the Carbon Cycle from the Roselend Natural Laboratory Using Laser-Based Isotope Ratio Spectrometry
Pili E, Guillon S, Agrinier P & Dellinger M

Session 08d follows this session in this room. For details see page 110.
## 08h: Geochemical Processes at Mineral-Water Interfaces – Insight from Macroscopic, Spectroscopic, and Computational Methods: Fundamental Interfacial Processes

**Session chaired by Jeffrey Catalano, Udo Becker & Jean-François Boily**

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<td>Electrolyte Adsorption to Goethite-Water Interfaces</td>
<td>Criscenti L &amp; Hart D</td>
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<tr>
<td>09:45</td>
<td>Hydroxyl Group Reactivity at FeOOH/Gas and FeOOH/Water Interfaces</td>
<td>Boily J-F</td>
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<td>10:00</td>
<td><strong>Keynote:</strong> Probing Mineral-Water Interfaces with Computer Simulation</td>
<td>Kerisit S, Rosso K &amp; Felmy A</td>
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<td>10:30</td>
<td>A Bond-Valence View of Interfacial Structure and Reactivity</td>
<td>Bickmore B</td>
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<td>10:45</td>
<td>Interfacial Thermodynamics: Inherent Limitations of Classical Adsorption Theories</td>
<td>Pan G</td>
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<tr>
<td>11:00</td>
<td>A Comparison of the Reactivity at the Solid-Solution Interface of Nano- and Micro-Crystalline TiO₂ Phases</td>
<td>Ridley M, Machesky M &amp; Kubicki J</td>
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<tr>
<td>11:15</td>
<td>First Principles Investigation of Manganese Oxide Surface Chemistry</td>
<td>Oxford G &amp; Chaka A</td>
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<td>11:30</td>
<td>A Unified Surface Structural Model for Ferrihydrite: Proton, Electrolyte, and Arsenate Adsorption</td>
<td>Villalobos M &amp; Antelo J</td>
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<td>11:45</td>
<td>Tungstate Polymerization and its Role in Sorption on Iron and Aluminum Oxyhydroxides</td>
<td>Lorenz E, Hur H &amp; Reeder R</td>
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<td>12:00</td>
<td>First-Principles Simulation of Arsenate Adsorption on the (1-12) Surface of Hematite</td>
<td>Blanchard M, Morin G, Lazzeri M, Balan E &amp; Mauri F</td>
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</tbody>
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(Session 08h continues on Tuesday 16th PM on page 141)
09d: Petrological and Geochemical Indicators of Magmatic Processes and Eruption Trigger Mechanisms

Session chaired by Olivier Bachmann, Fidel Costa & Christian Huber

09:30  A Predictive Thermodynamic Model for Element Partitioning between Plagioclase and Melt
       Dohnmen R & Blundy J

09:45  Experimental Evidence for Coarsening of Crystals and Bubbles during Thermal Cycling of Mafic and Silicic Magmas
       Mills R & Glazner A

10:00  A Critical Look at the Titanium-in-Quartz (TitaniQ) Thermobarometer
       Huang R & Audet A

10:15  Crystal Growth History of Quartz in the Ordovician Millbrig K-Bentonite
       Huff W & Inanli F

10:30 Keynote: Timescales of Eruption Triggering and Magma Transport from Element Diffusion in Minerals
       Morgan D

11:00  Predicting the Character of Future Eruptions: Insights from Single Crystal Analyses
       Ramos F, Gill J, Wolff J, Dimond C & Tollstrup D

11:15  Fluid-Enhanced Crystallization to Generate High-S Apatite of Silicic Magmas: Evidence from Pinatubo and Other Calc-Alkaline Systems
       Streck MJ, van Hoose A, Broderick C & Parat F

11:30  Magma Mixing and the Assembly of Complex Eruption Sequences
       Ruprecht P & Plank T

11:45  Volcanism on Methana (W Aegean Arc): Magma Mixing, Crustal Contamination & Mantle Sources
       Smet I, De Pelsmaeker E, Elburg M, Vanhaecke F & Andersen T

12:00  Geochemical and Isotopic Insights into the Development of a Large Caldera-Forming Eruption, Atitlan Caldera, Guatemala
       Cunningham HS

12:15  The Geochemical Variation of Volcanic Rocks from Papandayan and Cikuray Volcanoes, West Java: An Existence of Gondwana Continental Fragment as Crustal Contaminant
       Abdurrachman M, Yamamoto M & Suparka E
# 10b: Biogenic Gas and Biogeochemical Routes to Cleaner Energy

**Session chaired by Bill Mahaffey & Dariusz Strapoc**

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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>09:30</td>
<td><strong>Keynote:</strong> Analysis of Methanogen Communities</td>
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<td>Baresi L</td>
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<td>10:00</td>
<td>Importance of Syntrophic Acetate Oxidation during Thermophilic Municipal Solid Wastes Anaerobic Digestion</td>
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<td>Mazes L, Grossin-Debattista J, Qu X, Guenne A, He P, Budzinski H, Le Munier M &amp; Bouchez T</td>
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<td>10:15</td>
<td>‘Biogenic Natural Gas’ Formation in a Pressurized Lab Scale Reactor</td>
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<td>Lindeboom R, Weijma J, vanLier JB &amp; Zagt K</td>
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<td>10:30</td>
<td>Microbial Conversion of Oil, Coal and Shales into Methane – A Future Energy Resource</td>
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<td>Krüger M, Gründger F, Siegert M, Schulz H-M &amp; Richnow H-H</td>
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<td>10:45</td>
<td>Review on Biogeochemistry of Microbial Coal-Bed Methane</td>
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<td>Strápoć D</td>
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<td>11:00</td>
<td>Microbial Diversity and Physiology of Alberta Coal Seams</td>
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<td>Budwill K &amp; Koziel S</td>
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<td>11:15</td>
<td>Chemical Compound Classes Supporting Microbial Methanogenesis in Coal</td>
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<td>Furmann A, Picardal F, Schimmelmann A, Brassell S &amp; Mastalerz M</td>
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<td>11:30</td>
<td>Is Microbial Degradation of Heavy Hydrocarbons a Major Source of Methane in CBM Reservoirs?</td>
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<td>Evidence from Australia</td>
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<td>Faiz M, Amanda M, David M &amp; Phil H</td>
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<td>11:45</td>
<td>Biogeochemistry of Devonian Shale Gas Resources of the Midwest USA: Antrim and New Albany Shales</td>
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<td>Martini A, Petsch S, McIntosh J, Kirk M, Schlegel M, Damashek J &amp; Miller S</td>
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<td>12:00</td>
<td>Enhancing the Bioavailability of Subbituminous Coal</td>
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<td>Urynowicz M &amp; Huang Z</td>
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<td>12:15</td>
<td>Enhanced in situ Methanogenesis and Microbial Community Analysis of Coal Beds</td>
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<td>Sevinsky J &amp; Mahaffey W</td>
</tr>
</tbody>
</table>
11a: Black Shales and Ocean-Atmosphere Evolution: Implications for Metal Accumulation – Sponsored by SGA

Session chaired by Bernd Lehmann & Jan Pasava

11:00 Metalliferous Organic-Rich Black Shales: Where do the Metals Come from?
Emsbo P & Breit G

11:15 Uranium Minerals in Black Shale, South Korea
Kim YJ, Lee HE, Kang S-A, Shin JK, Jung SY & Lee YI

11:30 Trace Elemental Geochemistry of Black Shale from Chengkou District, Chongqing, Southwest China and its Genetic Significances
Li H

11:45 Talvivaara Ni Deposit and Ore Potential of Palaeoproterozoic Black Shale Formations in Finland

12:00 Re-Os Geochronology of Black Shale from the Barents Sea: Refining the Triassic Time Scale
Xu G, Hannah J, Stein HJ, Mørk A, Bingen B & Lundschien BA

12:15 Reconnaissance Trace Element and Os-Mo-Nd Isotope Geochemistry of Late Archean Black Shales in the Carajás Iron Ore District, Brazil
Lehmann B, Creaser R, Nägler T, Voegelin A, Belyatsky B, Cabral AR, Galbiatti H & Seabra A
11e: Biogeochemistry and Geomicrobiology of Ore Deposits – Sponsored by SGA

Session chaired by Gordon Southam

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</table>
| 09:30 | **Keynote**: The Geomicrobiology of Gold: Fundamental Processes to Industrial Applications  
Reith E, Grass G, Zammit C, Southam G & Brugger J |
| 10:00 | Microbially Enhanced Ore Weathering and Surface Anomaly Development  
Leslie K, Ihlenfeld C, Oates C, Barr J & Fowle D |
| 10:15 | Biogeochemistry as a Regional Mineral Exploration Tool: Northeast Yilgarn Craton, Western Australia  
| 10:30 | A Microbially-Mediated Deep Terrestrial Nitrogen Cycle at Henderson Mine, CO  
Swanner E & Templeton A |
| 10:45 | The Microbiology and Biogeochemistry of Sulfidic Mine Dumps  
Schippers A |

Session 11a follows this session in this room. For details see page 115.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker/Authors</th>
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<tbody>
<tr>
<td>09:30</td>
<td>Keynote</td>
<td>Compact Representation of Complex Organic Aerosol Processes</td>
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<td>Donahue N</td>
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<td>10:00</td>
<td>Invited</td>
<td>Aerosol Mass Spectrometer Constraint on the Global Secondary Organic</td>
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<td>Aerosol Budget</td>
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<td>Spracklen D, Jimenez J, Carslaw K, Worsnop D, Evans M, Mann G,</td>
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<td>Zhang Q, Canagaratna M, Allan J, Coe H, McFiggans G, Rap A, Forster</td>
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<td>10:15</td>
<td>Invited</td>
<td>Cloud Droplet Activation of Organic Aerosols: The Role of Molecule</td>
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<td>Size, Polarity, and Functional Group Composition</td>
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<td>A, Matsunaga A, Sullivan R, Minambres L &amp; Prenni A</td>
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<td>10:45</td>
<td>Invited</td>
<td>Insights into Biogenic Secondary Organic Aerosols Produced from Five</td>
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<td>Structurally Different Precursors</td>
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<td>Alfarra MR, Good N, Hamilton J, Wyche K, Monks P, Lewis A &amp;</td>
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<td>McFiggans G</td>
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<td>11:00</td>
<td>Cationic Polymerization of</td>
<td>Isoprene on Cloudwater Droplets</td>
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<td>Enami S, Mishra H, Hoffmann M &amp; Colussi A</td>
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<td>11:15</td>
<td>Increased Stable Carbon</td>
<td>Isotopic Ratios of Oxalic, Malonic, and Glyoxylic Acids in the Arctic</td>
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<td>Aerosols during Polar Sunrise and After</td>
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<td>Kawamura K &amp; Barrie L</td>
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<td>11:30</td>
<td>CAPRAM Mechanism Development:</td>
<td>Evaluation of Prediction Methods for Aqueous Phase Rate Constants</td>
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<td>and Model Results</td>
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<td>11:45</td>
<td>Phases and Phase Transitions</td>
<td>of Tropospheric Aerosols</td>
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<td>Luo B, Soonsin V, Krieger U &amp; Peter T</td>
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<td>12:00</td>
<td>How do Plant VOC Emissions</td>
<td>Affect Atmospheric Nanoparticle Formation?</td>
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<td>Dal Maso M, Mentel TF, Kienldler-Scharr A, Kleist E, Tillmann R,</td>
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Session 13a continues overleaf...
12:15  Invited: Factors Affecting the Physical Phase State of SOA Particles from Biogenic and Anthropogenic Precursors


(Session 13a continues on Tuesday 16th PM on page 146)
14c: Proxies for Chemical Weathering
– Studies of Active Processes

Session chaired by Friedhelm von Blanckenburg & Ed Tipper

09:30 Himalayan Weathering Evolution from LGM to Present
Lupker M, France-Lanord C, Galy V, Lavé J & Kudrass H

09:45 A Paradox between Mg and Li Isotope Ratios during Weathering
Tipper E, Calmels D, Gaillardet J, Louvat P, Capmas F & Dubacq B

10:00 Lithium and Its Isotopes in Central European Rivers
Wiechert U, Ullmann C, Uhlig D, Pfahl T, Ricking M & Becker H

10:15 Tracing Changes in the East Asian Monsoon Using the Mg Isotope Record in a Loess-Paleosol Sequence from Luochuan, China
Wimpenny J, Yin Q-Z, Tollstrup D, Xie L-W & Sun J

10:30 Invited: Contrasting Silicon and Magnesium Isotope Fractionation with Clay Mineralogy in Volcanic Soil Weathering Sequences, Guadeloupe
Delvaux B, Opfergelt S, Georg B, Cabidoche Y-M, Burton K & Halliday A

10:45 The Relase of Hf Isotopes during Weathering
Rickli J, Keech A, Archer C & Vance D

11:00 Invited: The Role of Fluid Residence Times in Controlling the Chemical Fluxes and Isotopic Compositions of Rivers
Maher K, Schneider-Mor A & Oster J

11:15 Isotope Composition of Iron Delivered to the Oceans by Intertropical Rivers: The Amazon River Case

11:30 Calcium Isotope Fractionation in Alpine Plants
Hindshaw R, Reynolds B, Wiederhold J, Kretzschmar R & Bourdon B

11:45 Calcium Isotope Fractionation during Plant Growth Under Limiting and non Limiting Nutrient Supply

12:00 Stable Strontium (δ⁸⁸Sr) Isotopic Fractionation during Hydrological Cycling
Pearce C, Parkinson I, Burton K & Gaillardet J

12:15 Molybdenum Isotope Fractionation during Soil Formation: A New Proxy?
Siebert C, Pett-Ridge J, Opfergelt S, Burton K & Halliday A

(Session 14c continues on Tuesday 16th PM on page 148)
15g: Connectivity of Ocean Circulation and Chemistry at Glacial-Interglacial Transitions
Session chaired by Katharine Hendry & Marcus Gutjahr

09:30 **Keynote:** Deep Ocean Carbonate Chemistry on Millennial to Milankovitch Time Scales  
*Anderson R & Fleisher M*

09:45 Productivity and Circulation Changes during the Last Deglaciation from Biomarkers and Nd Isotopes  
*Calvo E, Pena L, Pelejero C & Cacho I*

10:00 Horizontal and Vertical Water Mass Tracing of the SW Pacific Ocean during the Last Deglaciation  
*Marr J, Baker J, Carter L, Allan A, Christiansen K & Bostock H*

10:15 Controls on Modern and Paleo-Shell Weights of *G. bulloides* in the SW Pacific Ocean  
*Marr J, Bolton A, Christiansen K, Baker I & Carter L*

10:30 Deglacial Southern Ocean Ventilation History from a Benthic Foraminiferal $\delta^{13}C$ Transect  
*Elmore A, Sikes E, Cook M, Schiraldi B & Guilderson T*

10:45 Polar Twins? Deglacial Carbon and Circulation Records from the Deep North Pacific and Southern Oceans  
*Rae J, Foster G, Gutjahr M, Sarnthein M, Skinner L, Schmidt D & Elliott T*

11:00 Glacial to Interglacial Changes in the Carbonate Ion Signature of Deep and Intermediate Water Masses in the Southern Ocean  
*Kersten F & Tiedemann R*

11:15 **Invited:** Transfer of Nutrients and Carbon from the Southern Ocean to the Atlantic during the Last 30,000 Years  
*Robinson LF, Burke A & Hendry KR*

11:30 Past Ocean Temperatures and Coupled U/Th and $^{14}C$ Measurements from Deep-Sea Corals  
*Thiagarajan N, Adkins J & Eiler J*

11:45 **Invited:** Rapid Changes in North Atlantic Deep Ocean Circulation during the MIS 5a/4 Glacial Inception  
*Thornalley D, Barker S, Hall I & Knorr G*

12:00 Regulation of Atmospheric pCO$_2$ by the North Pacific Ocean Since the Last Interglacial  
*Swann G & Snelling A*

12:15 Diatom Si Isotope Variations from the Atlantic Sector of the Southern Ocean (ODP Site 1093) Record Environmental Changes of the Last 170 ka  
*Wetzel F, Shemesh A & Reynolds B*
16c: Soil Carbon Dynamics in Managed Environments

Session chaired by Nikolaos Nikolaidis & Donald Sparks

09:30  Field Scale Organic Management of Vineyard Soils Controls Copper Distribution and Bioavailability at the Micro-Aggregate Scale  
Navel A & Martins JMF

09:45  Effects of Municipal Solid Waste Compost Amendments on Carbon and Nitrogen Cycling in a Clayey Soil  
Paranychianakis N, Giannakis G, Nikolaidis N & Kalogerakis N

10:00  Soil Carbon Sequestration in Olive Grove with Different Soil Management  
Nieto O, Castro J & Fernández-Ondoño E

Session 16d follows this session in this room. For details see page 122.
16d: Assessing Micropollutant Transformation Dynamics in the Earth’s Critical Zone

Session chaired by Thomas Hofstetter, William Arnold & Heileen Hsu-Kim

10:15 **Keynote:** Challenges to Predicting the Fate of Emerging Classes of Organic Micropollutants in Subsurface Environments

*Strathmann T, Machesky M, Finneran K & Paul T*

10:45 **Invited:** Iron Reduction by a *Clostridia* Consortium

*Parikh M, Lin C-C, Barkay T & Yee N*

11:00 Unexpected Changes in Aggregation and Mineralogy of Goethite during the Reduction of Nitroaromatics

*Arnold W, Penn RL, Moore K, Do TA & Stemig A*

11:15 Nitrogen Isotope Fractionation during the Oxidation of Substituted Anilines by Manganese Oxide

*Skarpeli-Liati M, Jiskra M, Arnold WA, Cramer CJ & Hofstetter TB*

11:30 Arsenic Removal with Composite Iron Matrix Filters from Bangladesh

*Neumann A, Kaegi R, Voegelin A, Hussam A, Munir AKM & Hug S*

11:45 The Influence of Contaminant Load on Microbial Ecology in a Sandstone Aquifer

*Baker K, Edyvean R, Thornton S, Banwart S, Scholes J & Rolfe S*

12:00 High Degradation Efficiency of Deicing Chemicals Affects the Natural Redox System in Airfield Soils

*Lissner H, Wehrer M & Totsche KU*

12:15 The Fate of Organic Pollutants in Soil – Emerging Views on the Relevance of Non-Extractable Residues

*Miltner A, Nowak K, Girardi C, Schäffer A & Kästner M*
17f: Microbial Catalysis of Mineral Dissolution and Precipitation

Session chaired by Liane Benning, Renata van der Weijden, Steeve Bonneville & Carsten Mueller

09:30 Keynote: Investigation of Organo-Mineral Interactions in Artificial Soil Incubations by NanoSIMS
Heister K, Höschen C, Pronk GJ, Poll C, Kandeler E, Müller CW & Kögel-Knabner I

09:45 Biomineralization of Fe^{II}-Fe^{III} Green Rust in γ-FeOOH Coated Sand Column Under Saturated Flow Conditions
Sergent A-S, Hanna K, Remy P-P & Jorand F

10:00 Control of Biomineral Formation during Microbial Fe(III) Reduction by Local Fe^{2+} Gradients – A Multiscale Approach
Dippon U, Schmidt C, Obst M, Piepenbrock A & Kappler A

10:15 Selenate Reduction by Iron-Reducing Bacteria Isolated from Bangladesh Soil
Suzuki Y, Oyama R, Saiki H, Tanaka K & Ohnuki T

10:30 Bacterial Oxidation of Pyrrhotite and Troilite Under Acidic Conditions
Hopf J, Pollok K, Hochella MF & Langenhorst F

10:45 Influence of Conditions Past and Present on Bacterial Calcium Mineral Precipitation
Polacek TK, Cockell CS & Gladding T

11:00 Role of Microbe in the Formation of Illite from Nontronite: Mesophilic and Thermophilic Bacterial Reaction
Jaisi D, Eberl D, Dong H & Kim J

11:15 Potential for Widespread Microbial Liberation of Structurally-Coordinated Iron from Common Clay Minerals in Marine Sediments
Gaines R, Trang J, Scott S, Crane E, Prokopenko M & Berelson W

11:30 The Effect of M. thermoflexus on the Fe-Bearing Mineral Assemblage Associated with Low Temperature Basalt-Water Reactions
Mayhew L, Webb S & Templeton A

11:45 Extracellular Electron Transport by the Gram-Positive Species Thermicola potens

12:00 Synergistic Effects of Biocatalysis and Mineral Photocatalysis
Lu A & Li Y

Session 17f continues overleaf...
12:15  Association of Amino Sugars (Chitin) with Fe Oxyhydroxides in Mycorrhizal Mat Soils – A STXM/NanoSIMS Investigation

18d: Advanced Microanalytical, Spectroscopic and (Spectro-)microscopic Surface Methods: STXM, NEXAFS, AFM, NANOSIMS...

Session chaired by Kai Totsche & Karim Benzerara

09:30  Raison D’être of X-Ray Spectromicroscopy for Geochemistry
       Thiem J, Sedlmair J, Mathes M, Prietzle J & Coates J

09:45  The Fe L₃-edge as a Probe for Fe Oxide Speciation
       Roychoudhury A, von der Heyden B, Frith M & Myneni S

10:00  Studying Soft X-Ray Absorption Edges Under Extreme Conditions

10:15  Redox Reaction of Pyrite with Se
       Bardelli F, Kang M, Gehin A & Charlet L

10:30  XPS Heating with Mass Spectrometry: Tackling Chalk, Coccolith and Calcite Surfaces
       Dalby K, Bovet N & Stipp S

10:45  Interaction of Small Organic Molecules with the Calcite Surface
       Bovet N, Yang M, Andersson M & Stipp S

11:00  Linking Solution Composition and Surface Topography to the Rate and Mechanisms of Diopside Dissolution
       Daval D, Saldi GD, Hellmann R & Knauss KG

11:15  Scanning Transmission X-Ray and Atomic Force Microscopy Mapping of Exopolymer Fractionation in Bacillus subtilis Biofilms on Goethite
       Liu X, Eusterhues K, Thieme J, Kuesel K & Totsche K

11:30  Combined Use of Raman, TOF-SIMS and AFM Imaging for Characterizing the Surface Reactivity of Sea Salts
       Sobanska S, Choël M, Moreau M & Barbillat J

11:45  Nanoscale Study of Exopolymeric Substance-Mediated Uranium Biomineralization

12:00  Innovative Low kV X-Ray Microanalysis of Submicron Particles Using PARC Algorithms
       van Hoek C & van der Laan S

12:15  Volatile Elements in Apatite: An Integrated Analytical Approach with Special Focus on Bromine
       Marks MAW, Whitehouse M, Wenzel T, Stosnach H & Markl G
19c: Modeling Transition Metal Compounds: Oxides, Sulfides, and Interfaces
Session chaired by Rossitza Pentcheva, Ronald Cohen & Nora de Leeuw

09:30 Keynote: Atomistic Approaches to Determine Redox Reaction Mechanisms of U, Np, and Pu on Mineral Surfaces
Becker U, Shuller L, Renock D & Ewing R

09:45 Invited: Failure of Density Functional Theory for Ground State Calculations on TiO₂
Steinle-Neumann G, Vlcek V, Holbig E & Wu X

10:00 Keynote: Dynamical Correlations in Transition Metal Compounds
Kunes J

10:15 Pressure Induced Phase Transitions in MnTiO₃: Insights from First Principles
Quiroga C & Pentcheva R

10:30 Importance of Correlation Effects in First-Principles Simulations of Iron at High-Pressure
Pourovskii L, Glazyrin K, Dubrovinsky LS, Tasnadi F, Ekholm M, Katsnelson M, Ruban AV & Abrikosov I

(Session 19c continues on Tuesday 16th Posters on page 192)

Session 19d follows this session in this room. For details see page 127.
19d: Dynamics of Earth Materials: From Isotope Fractionation to Spectroscopy

Session chaired by Razvan Caracas & David Dixon

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<tr>
<td>10:45</td>
<td>Equilibrium Isotope Fractionation Calculation Beyond Harmonic Level</td>
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<td><em>Liu Y, Liu Q &amp; Tossell J</em></td>
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<tr>
<td>11:00</td>
<td><strong>Keynote:</strong> Estimating Stable Isotope Signatures of Core Formation</td>
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Session 20c follows this session in this room. For details see page 128.
20c: Interplay between Plastic Rock Deformation and Mineral Reactions

Session chaired by Rainer Abart, Bjorn Jamtveit & John Wheeler

11:30 Keynote: The Legacy of Plastic Deformation and Pre-Existing Microstructures during Olivine Serpentinization
   Plümper O, Austrheim H, Piazolo S & Jung H

11:45 Seismic Anisotropy Produced by Serpentine in the Mantle Wedge
   Jung H

12:00 The Interplay between Chemical and Textural Evolution Across a Shear Zone
   Putnis A, Austrheim H & Putnis C

12:15 Porosity Evolution, Fracturing and Liesegang-Banding during Spheroidal Weathering
   Jamtveit B, Kobchenko M & Malthe-Sørenssen A
23a: Fukushima Review

Session chaired by Mitsuru Ebihara, Bernard Bourdon and Bernard Marty

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<tr>
<td>09:30</td>
<td>The Role of the Geochemical Society of Japan for Mitigating the Fukushima Accident and its Aftermaths</td>
<td>Ebihara M</td>
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<td>10:00</td>
<td>Seismological Investigations of the March 11, M9, Tohoku-Oki Earthquake</td>
<td>Ritsema J</td>
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<td>10:30</td>
<td>Deconstructing the Nuclear Accident at the Fukushima-Daiichi Plant: What Went Wrong and What are the Prospects for Recovery?</td>
<td>Blandford E</td>
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<td>11:00</td>
<td>A Preliminary Overview of Studies on Dispersals of Radionuclides from Fukushima Nuclear Power Plants</td>
<td>Yoshida N</td>
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<td>12:00</td>
<td>Measurement of Radioactivity of Aerosol at a few Sites in Japan after the Fukushima Daiichi Accident</td>
<td>Nagao S, Kanamori M, Tokunari T, Hayakawa K, Toriba A, Kameda T, Hamajima Y, Inoue M &amp; Yamamoto M</td>
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### Oral Presentations Overview

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<tr>
<th>Time</th>
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<tr>
<td>14:00</td>
<td>Eusterhues, Klebow, Myneni, Myr Abs, Hong, Kim, Sverjensky, Mr. Song, Del Vecchio, Sharpless, Sander</td>
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02c: The Faint Young Sun Revisited: The Message from Rocks and Climate Models

Session chaired by James Kasting, Nicolas Dauphas & Nathan Sheldon

14:00 **Keynote:** What Real Constraints do Cherts Bring on Precambrian Surface Temperatures?  
*Chaussidon M, Lach P, Robert F, Boiron M-C & Luais B*

14:15 **Invited:** Fe and C Isotopes in BIF Carbonates: Evidence for Authigenic Formation and Microbial Fe Respiration  
*Craddock P & Dauphas N*

14:30 **Invited:** Siderite in Archaean Banded Iron Formations – A Sensor for CO₂, Partial Pressures of Ancient Atmospheres?  
*Gäb F, Ballhaus C & Siemens J*

14:45 **Invited:** Paleosol Constraints on Atmospheric CO₂ Levels in the Archaean and Proterozoic  
*Sheldon N*

15:00 **Invited:** Clouds and the Faint Young Sun Paradox  
*Goldblatt C & Zahnle K*

15:15 **Invited:** A Fractal Aggregate Model of Early Earth Organic Hazes: UV Shielding with Minimal Antigreenhouse Cooling  
*Wolf E, Tian F & Toon OB*

(Session 02c continues on Tuesday 16th Posters on page 156)

Session 02d follows this session in this room. For details see page 133.
## 02d: Geochemical Evidence For, and Consequences of, Microbial Activity in the Archean Rock Record

Session chaired by Kurt Konhauser, Yuichiro Ueno, Abigail Allwood & Sylvie Derenne

### 15:30 A Dynamic Archean Sulfur Cycle

_Fischer W, Fike D, Guan Y, Eiler J, Kirschvink J & Raub T_

### 15:45 Pressure-Temperature Diagenesis of Fe Minerals and Biomass Produces Hematite, Siderite and Magnetite as Present in Banded Iron Formations


### 16:00 Nanoscale Structural Variation in Pyrobitumen of the 2.0 Ga Zaonega Formation, Karelia, Russia


### 16:15 Isotopically Heavy Sulfur in Banded Iron Formations from the Eoarchean Nuvvuagittuq Supracrustal Belt

_Papineau D & Hauri E_

### 16:30 Extreme $^{15}$N-Enrichments in 2.72-Gyr-Old Sediments: Evidence for a Turning Point in the Nitrogen Cycle

_Thomazo C, Ader M & Philippot P_

### 16:45 Molecular Fossils and the Late Rise of Eukaryotes and Oxygenic Photosynthesis

_Brooks J_

(Session 02d continues on Tuesday 16th Posters on page 156)
## 03c: Mantle Redox and the Deep Carbon Cycle

Session chaired by Yingwei Fei, Dan Frost & Bob Luth

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tr>
<td>14:00</td>
<td>C- and S-Transfer in Subduction Zones: Insights from Diamonds</td>
<td>Aulbach S, Stachel T, Heaman L, Creaser R, Thomassot E &amp; Shirey S</td>
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<td>14:15</td>
<td>Efficient Carbon Leaching in Silicate through Fluid/Melt Migration and Implications for Diamond Formation</td>
<td>Fei Y, Zhang C &amp; Tao R</td>
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<td>14:30</td>
<td>Keynote: Redox Variable Trace Elements</td>
<td>O’Neill H, Berry A &amp; Mallmann G</td>
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<tr>
<td>15:00</td>
<td>Systematic Underestimation of the Oxidation State of MORB Glasses</td>
<td>Sossi P &amp; O’Neill H</td>
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<td>15:15</td>
<td>High-Pressure Calibration of the Oxygen Fugacity Recorded by Garnet Bearing Peridotites</td>
<td>Stagno V, McCammon C &amp; Frost D</td>
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<td>15:30</td>
<td>Redox-Freezing and -melting of Carbonates in the Deep Mantle and the Role of Transient Carbides</td>
<td>Rohrbach A &amp; Schmidt MW</td>
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<td>15:45</td>
<td>Melting in the Peridotite and Eclogite, Coexisting with Reduced C-O-H Fluid at 3-16 GPa</td>
<td>Litasov K, Shatskiy A &amp; Ohtani E</td>
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<td>16:00</td>
<td>Medal: Silicate Melting in the Earth’s Deep Upper Mantle Caused by C-O-H Volatiles</td>
<td>Dasgupta R, Tsuno K, Withers AC &amp; Mallik A</td>
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<td>16:45</td>
<td>Methane Solubility Under Reduced Conditions in a Haplobasaltic Liquid, Applicable to Degassing of Magma Ocean</td>
<td>Ardia P, Withers AC, Hirschmann MM &amp; Hervig RL</td>
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(Session 03c continues on Tuesday 16th Posters on page 157)
04i: Origin of Large Igneous Provinces: Linking Geochemistry, Geochronology, Geophysics, Geodynamics and Climate Modeling

Session chaired by Alex Sobolev, Andrea Marzoli, Stephan Sobolev & Fred Jourdan

14:00 Invited: Regime of Volatile Components in Magmatism of LIP (Siberian Traps) 
Ryabchikov ID

14:15 Modeling Relationships between a Mantle Plume, a Large Igneous Province and a Mass Extinction 

14:30 Invited: Strongly Reduced Gases Emitted during Flood Magmatism and their Environmental Consequences 

14:45 Two Flood Basalt Events and Contemporary Granites within the Same LIP: Siberian Traps Case Study 
Ivanov A, He H, Yan L, Ryabov V, Shevko A, Palesskii S & Nikolaeva I

15:00 Keynote: Continental Flood Basalts and Biotic Crises: Does the Paraná-Etendeka Exception Prove the Rule? 
Renne P

15:30 Invited: A Novel Proxy Links CAMP Volcanism with End-Triassic Mass Extinction and Early Jurassic Evolution 
Ruhl M, Bjerrum C, Frei R & Korte C

15:45 Sr-Nd-Pb-Os Isotopes of CAMP Tholeiites from Northeast America 
Merle R, Marzoli A, Bertrand H, Reisberg L, Chiaradia M & Bellieni G

16:00 Geochemistry of Eastern North American CAMP Diabase Dykes 
Callegaro S, Marzoli A, Bertrand H, Reisberg L, Chiaradia M & Bellieni G

16:15 A Late Triassic Major Negative δ13C Spike Linked to Wrangellia LIP: The Carnian Pluvial Event Revealed 
Dal Corso J, Mietto P, Newton RJ, Pancost RD, Preto N, Roghi G & Wignall PB

16:30 Intrabasaltic Paleosols from the North Atlantic Igneous Province Record Late Paleocene Global Climate Trends and Hyperthermals 
Riishuus M & Bird D

Session 04i continues overleaf...
16:45 Integration of the Intrusive and Extrusive Cycles of Palaeogene Igneous Activity in N.E. Ireland

McKenna C, Gamble JA, Renne PR, Ellam RM, Fitton JG & Lyle P

(Session 04i continues on Tuesday 16th Posters on page 161)
05b: Destruction and Recycling of Continental Crust

Session chaired by Yongsheng Liu, Cin-Ty Lee & Shan Gao

14:00 An Integrated Approach to Estimate the U and Th Content of the Central Apennines Continental Crust (Italy)
Caltorti M, Boraso R, Mantovani F, Morsilli M, Fiorentini G & Rusciadelli G

14:15 Keynote: Recycling of Lower Continental Crust in an Intracontinental Setting: Mineral Chemistry and Oxygen Isotope Insights from Websterite Xenoliths in the North China Craton

14:45 Hf-Nd Isotope Decoupling during Partial Melting of Thickened Eclogitic Lower Continental Crust
Meng F-X, Gao S, Xu W-L, Guo J-L & Zong C-L

15:00 Evidence from Zircon Ages and Hf Isotopic Composition for Paleoproterozoic Crustal Evolution in Northwestern Vietnam
Pham TH & Chen F

15:15 Tectonic Evolution of the Qinling-Tongbai-Dabie Orogenic Belt
Wu Y & Zheng Y

15:30 Concurrence of Mid-Miocene High Sr/Y Granite and Leucogranite in the Yardoi Gneiss Dome, Tethyan Himalaya, Southern Tibet
Zeng L, Gao L-E, Xie K & Hu G

15:45 Recycling Subcontinental Plagioclase-Rich Lower Crust in the North China Craton

16:00 Crust Recycling-Induced Melt-Peridotite Interactions in the Northern Margin of the North China Craton
Liu Y, Gao S & Hu Z

16:15 New Approaches to Analyze the Preferential Loss of Elements from the Continental Crust
Hartmann J & Moosdorf N

(Session 05b continues on Tuesday 16th Posters on page 163)
06a: Recycling Agents in Subduction Zones: Fluids and Melts

Session chaired by Joerg Hermann, Susanne Skora & Weidong Sun

14:00 The Volatile Content of Subduction Zone Melts and Fluids
Bénard A, Ionov DA, Shimizu N & Plechov P

14:15 Partial Melting and its Role in Elemental Recycling: Insight from Pamir Metasedimentary Xenoliths
Gordon SM, Kelemen P, Hacker BR, Luffi P & Ratschbacher L

14:30 Keynote: Recycling Elements from the Slab to Arc Crust: Insights from Element Mass Balance of the Izu Arc System
Spandler C

15:00 Partial Melting and Element Transfer during Continental Subduction-Zone Metamorphism: Geochemical Insights from Leucosome within UHP Eclogite in the Dabie Orogen
Sheng Y-M & Zheng Y-F

15:15 Thermodynamic and Trace Element Modeling to Quantify Fluid Fluxes and Fluid-Rock Interaction in High Pressure Rocks from the Sesia Zone (Western Alps)
Konrad-Schmolke M, Zack T, O’Brien PJ & Barth M

15:30 Trace Element Redistribution in Oceanic Crust during Subduction-Zone Metamorphism – Evidence from Western Tianshan, China

15:45 Fluid and Trace Element Migration in Subducted Oceanic Rocks from Ecuador
Herms P, John T, Bakker RJ & Schenk V

16:00 Invited: Nb/Ta Fractionation Resulted by Fluid-Rock Interaction in Subducted Oceanic Crust
Ye K, Guo S, Chen Y & Liu J

16:15 Fluid-Rock Interaction during Eclogitisation: Evidence from HP Metamorphic Rocks from Sulawesi, Indonesia
Bæse R & Schenk V

16:30 Element Mobility Across the Boundary between UHP Eclogite and Gneiss: Insights into Supercritical Fluids in Continental Subduction Zones
Huang J, Xiao Y & Wörner G

16:45 Origin of Postcollisional Mafic-Ultramafic Rocks in the Dabie Orogen: Implications for Recycling of the Deeply Subducted Continental Crust
Zhao Z-F & Zheng Y-F

(Session 06a continues on Tuesday 16th Posters on page 167)
07a: Ocean Acidification: Past, Present and Future

Session chaired by Daniela Schmidt & Appy Sluijs

14:00 **Medal:** Effect of Ocean Acidification on Processes in the Ocean
   *Millero FJ*

14:45 Modeling of the Role of Organic Matter in the Carbonate System Seasonal Changes in the Barents Sea
   *Yakushev E & Sørensen K*

15:00 Insights on Ocean Acidification from Instrumental Monitoring and Experiments in Aquaria
   *Pelejero C, Movilla J, Calvo E, Coma R, Serrano E, Ribes M & Fernández-Guallart E*

15:15 The Influence of Physically-Induced Porewater Advection, Benthic Photosynthesis and Respiration on CaCO$_3$ Dynamics in Reef Sands
   *Rao A, Polerecky L, Ionescu D, Meysman F & De Beer D*

15:30 **Keynote:** New Approaches to Assess the Responses of Phytoplankton to Ocean Acidification
   *Rost B*

16:00 Response of Coralline Alga *Lithothamnion glaciale* Kjellman to Ocean Acidification
   *Ragazzola F, Form A, Foster L, Büscher J, Hansteen T & Fietzke J*

16:15 The Future of Marine Calcifiers in a High CO$_2$ World: Boron Isotope Systematics of pH Up-Regulation
   *McCulloch M, Trotter J, Falter J & Montagna P*

16:30 Quantifying Ocean Acidification during the Palaeogene Hyperthermals
   *Foster L, Schmidt D, Ridgwell A, Thomas E, Coath C, Hinton R & Scott T*

16:45 Corals Constrain CaCO$_3$ Chemistry at the Triassic–Jurassic Boundary, a Potential Ocean Acidification Event
   *Martindale R, Berelson W, Corsetti F, Bottjer D & West AJ*

(Session 07a continues on Tuesday 16th Posters on page 170)
08f: Oceanic and Terrestrial Natural Organic Matter Transformation

Session chaired by Alan Stone & Neil Blough

14:00 Polysaccharide Fractionation of Soil Organic Matter due to Reaction with Ferrihydrite
   *Eusterhues K, Neidhardt J, Rennert T, Kögel-Knabner I & Totsche KU*

14:15 X-Ray Analysis of Reactive C-, N-, P-, and S-Functional Groups in NOM
   *Myneni S*

14:30 Influence of Dissolved Organic Matter for the Precipitation of Nanoparticulate Metal Sulfides

14:45 **Keynote**: Application of Advanced Nuclear Magnetic Resonance (NMR) Spectroscopy and Ultrahigh Resolution Mass Spectrometry (MS) to Studies of Organic Matter Transformations
   *Abdulla H, Caricasole P, Chen H, Kamga AW, McKee GA, Mesfioui R, Salmon E, Sleighter RL & Hatcher PG*

15:15 Mechanisms of Light-Induced Flocculation of Terrestrial Dissolved Organic Matter and Iron
   *Helms JR, Schmidt-Rohr K, Mao J & Mopper K*

15:30 Microbial and Photochemical Mineralization of Dissolved Organic Carbon from Big Rivers
   *Vähätalo A & Aarnos H*

15:45 Electron and Proton Transfer Equilibria of Reducible Moieties in Humic Substances
   *Aeschbacher M, Schwarzenbach RP & Sander M*

16:00 Impact of Reductants on the Optical Properties of Humic Substances (HS)
   *Del Vecchio R, Heighton L, Golanoski K & Blough N*

16:15 Production of Superoxide and Hydrogen Peroxide on Photolysis of Natural Organic Matter
   *Garg S, Rose A & Waite D*

16:30 Organic Matter Photochemistry: Singlet Oxygen Precursor Lifetimes
   *Sharpless C*

16:45 **Invited**: Electron Donating Properties of Humic Substances and Implications for Pollutant Phototransformation
   *Sander M, Wenk J, Aeschbacher M, Schwarzenbach RP, von Gunten U, Salhi E & Canonica S*

(Session 08f continues on Tuesday 16th Posters on page 173)
Session chaired by Jeffrey Catalano, Udo Becker & Jean-François Boily

14:00 Monte Carlo Study of Aggregation of Alkyltrimethylammonium Ions at the Montmorillonite-Water Interface
Klebow B & Meleshyn A

14:15 Heating Organoclays: Does it Affect their Potential to Interact with Organic Compounds in Aqueous Environment?
Borisover M, Yariv S, Bukhanovski N & Lapides I

14:30 Invited: Surface Complexation Evidence that Amino Acids Prefer Special Sites on Oxide Surfaces
Sverjensky D, Hazen R, Azzolini D, Lee N & Klochko K

14:45 Surface Structures on Rutile Guide Organic Molecule Attachment

15:00 The Role of Mineral Surface Chemistry in the Prebiotic Selection of Pentose Sugars
Klochko K, Sverjensky D, Hazen RM & Cleaves HJ

15:15 Mechanisms of Cd Sorption to Montmorillonite (Na-SWy-2) Clay Affected by Ionic Strength and Microbial Ligand
Song Z, Bunker B & Maurice P

15:30 Linking Structural Isomerism of Organic Ligands to the Precipitation and Structure of Ferrihydrite
Mikutta C

15:45 Comparing the Surface-Promoted Hydrolysis of Phosphate Mono- and Diesters on Goethite
Kenney J & Persson P

16:00 Enzymatic and Abiotic Hydrolysis of Glucose Phosphate Adsorbed on Goethite
Olsson R, Giesler R, Loring JS & Persson P

16:15 Interactions of Phosphate and Phosphonate with the Calcite Surface
Stelling J, Nothstein AK & Neumann T

16:30 Modeling the Effects of Fertilization and pH on Dissolved Inorganic Phosphorus in Soils
Gerard F, Devau N, Le Cadre E & Hinsinger P

Session 08h continues overleaf...
16:45  Adsorption Behaviour of Copper in Natural Composite Sedimentary Materials
       *Maia F & Gonçalves M*

(Session 08h continues on Tuesday 16th Posters on page 174)
10c: Hydrogen, Electrons, Biofuels and the Biogeochemistry of Sediments

Session chaired by Ian Head & Lars Peter Nielsen

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<th>Topic</th>
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<td>Hydrogenase Enzyme Assay for the Quantification of Microbial Activity in Subsurface Environments</td>
<td>Adhikari RR &amp; Kallmeyer J</td>
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<td>14:15</td>
<td>Seasonal Dynamics of Sulfide Oxidation Processes in Tokyo Bay Dead Zone Sediment</td>
<td>Sayama M</td>
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<td>14:30</td>
<td>Long Distance Electron Transmission Couples Sulphur, Iron, Calcium and Oxygen Cycling in Marine Sediment</td>
<td>Risgaard-Petersen N &amp; Nielsen LP</td>
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<td>15:00</td>
<td><strong>Keynote</strong>: Extracellular Electron Transfer in Microbial Environments</td>
<td>Tender L</td>
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(Session 10c continues on Tuesday 16th Posters on page 177)

Session 10d follows this session in this room. For details see page 144.
10d: Geochemistry in the Post Petroleomics World – Advances in MS

Session chaired by Clifford Walters & Patrick Hatcher

<table>
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<tr>
<td>15:45</td>
<td>Walters C, Qian K, Wu C, Mennito A &amp; Wei Z</td>
<td>Highly Oxidized Species in TSR-Altered Oils</td>
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<td>16:00</td>
<td>Behar F, Salmon E, Kamga A &amp; Hatcher P</td>
<td>Decarboxylation of Fatty Acids during Petrogenesis; Qualitative and Quantitative Analyses of Bitumen NSOs by FTICR-MS</td>
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(Session 10d continues on Tuesday 16th Posters on page 178)
11c: Metal Solubility in Geofluids and Ore-Forming Silicate Melts

Session chaired by Jacob Hanley, Zoltan Zajacz, A.E. Williams-Jones & James Webster

14:00 **Keynote:** A New View on Sulfur Speciation in Geological Fluids at Elevated Temperatures and Pressures
*Pokrovski G, Dubrovinsky L & Dubessy J*

14:30 Heavy Metal Fractionation in High Temperature Fumaroles
*Mavrogenes J & Henley R*

14:45 **Invited:** Preferential Partitioning of Copper into the Vapor Phase: An Artifact?
*Lerchbaumer L & Audetat A*

15:00 *Ab Initio* Molecular Dynamics Simulation of Copper(I) Complexation in Chloride/Sulfide Fluids
*Mei Y, Sherman DM, Brugger J & Liu W*

15:15 Zinc and Cadmium Behavior in Low-Density Fluids
*Bazarkina E, Pokrovski G, Akinfiev N & Zotov A*

15:30 An Experimental Study of the Stability of Hydrosulfide Species of Fe(II) at Hydrothermal Conditions
*Migdisov A, Zezin D & Williams-Jones A*

15:45 Chemistry of Li-Na-K-OH-H₂O Brines up to High Concentrations and Temperatures
*Lassin A, Christov C, André L & Azaroual M*

16:00 Speciation and Thermodynamic Properties of Manganese(II) and Nickel(II) Chloride Complexes in Hydrothermal Fluids: *In situ* XAS Study

16:15 An EXAFS and *ab Initio* Study of Aquated Cd²⁺ and Chlorocadmium(II) Complexes up to 300°C
*Seward T, Lemke K, Henderson M, Charnock J & Sadjadi A*

16:30 **Invited:** Monitoring Beam-Induced Radiolysis Effects on Transition Metal Complexes in Hydrothermal Fluids
*Anderson A, Mayanovic R, Frank M & Pascarelli S*

16:45 XANES Investigation of Selenium Speciation in Silicate Glasses
*Wykes J, O’Neill H & Mavrogenes J*

(Session 11c continues on Tuesday 16th Posters on page 178)
13a: Organics in the Mix: Multicomponent Aerosol Processes

Session chaired by Gordon McFiggans & Douglas Worsnop

14:00  Source Apportionment of Atmospheric Organic Aerosol by Nuclear Magnetic Resonance (NMR) Spectroscopy: Results from EUCAARI Project
Facchini MC, Finessi E, Decesari S, Paglione M, Hillamo R, Raatikainen T, O'Dowd C, Kiendler-Scharr A & Worsnop DR

14:15  Discrimination of Secondary Organic Aerosol from Different Sources

14:30  Invited: Changes in Organic Aerosol Composition with Aging Inferred from Aerosol Mass Spectra
Canagaratna M, Ng NL, Jimenez J-L, Chhabra P, Seinfeld J & Worsnop D

14:45  Novel Approaches to Organic Aerosol Chemical Characterization

15:00  Keynote: Developing a Comprehensive Approach to Chamber Studies of Secondary Organic Aerosol Formation
Ziemann P, Matsunaga A, Aimanant S, Yeh G & Lim Y

(Session 13a continues on Tuesday 16th Posters on page 181)

Session 13d follows this session in this room. For details see page 147.
13d: Aerosols, Energy Sources and Climate

Session chaired by Surabi Menon & Jon Egill Kristjansson

15:30 **Keynote:** Exploring Geoengineering Using Climate and Detailed Modelling Strategies
*Rasch P, Wang H, Yoon J-H, Ganguly D, Ma P-L & Velu V*

16:00 **Invited:** Sensitivity to Deliberate Seeding of Marine Clouds – Observations and Modeling
*Alterskjær K & Kristjansson JE*

16:15 **Invited:** The Global Climate Impact of Civil Aviation
*Unger N*

16:30 **Invited:** The Impact of Aerosols on Radiation and Climate

16:45 **Invited:** Observationally Constrained Estimates of Carbonaceous Aerosol Transport and Radiative Effects
*Stier P, Kipling Z, Schwarz J & Fahey D*
### 14c: Proxies for Chemical Weathering – Interpretation of Ancient Records

**Session chaired by Friedhelm von Blanckenburg & Ed Tipper**

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<tr>
<td>14:00</td>
<td><strong>Keynote:</strong> Reconciling Multiple Constraints on Late Cenozoic Erosion and Weathering Fluxes: Can We do it?</td>
<td><em>Derry</em> L</td>
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<tr>
<td>14:45</td>
<td>Pb Isotopic History of Weathering on Antarctica during the Eocene-Oligocene Transition</td>
<td><em>Martin</em> E &amp; <em>Basak</em> C</td>
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<tr>
<td>15:00</td>
<td>Hf-Nd Isotope Variations of Late Cenozoic Arctic Intermediate Water Reflect Continental Weathering</td>
<td><em>Chen</em> TY, <em>Frank</em> M &amp; <em>Spielhagen</em> RF</td>
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<tr>
<td>15:45</td>
<td>Large ε_{Nd} Change in South Indian Seawater Driven by Australian Weathering at 15 Ma</td>
<td><em>Le Houedec</em> S, <em>Meynadier</em> L &amp; <em>Allègre</em> CJ</td>
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<tr>
<td>16:15</td>
<td>Provenance and Grain Size Effects of Siliciclastic Sediments in the Dead Sea Basin from Pb-Sr-Nd Isotopes and Trace Chemistry</td>
<td><em>Torfstein</em> A, <em>Goldstein</em> S &amp; <em>Stein</em> M</td>
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<tr>
<td>16:45</td>
<td>Testing the ‘Post-Glacial Weathering Peak’ Hypothesis – A Lacustrine Record of ^{87}Sr/^{86}Sr</td>
<td><em>Keech</em> AR, <em>Vance</em> D, <em>Archer</em> C &amp; <em>Lund</em> SP</td>
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15b: Deep Ocean Circulation in the Past

Session chaired by Jeanne Gherardi Scao & Bob Anderson

14:00 Mn-Crusts Record Deep Ocean Ventilation Changes
Mangini A

14:15 Direct Ventilation of the North Pacific did not Reach 2300 m during the Last Glacial Termination
Jaccard S & Galbraith E

14:30 Invasion of Warm, Saline, and Well Ventilated Intermediate Water in Cold Stadials during the Last 30,000 Years? Evidence from the Middle Okinawa Trough Site MD01-2404
Lo L, Chang Y-P, Shen C-C, Chen M-T & Wei K-Y

14:45 Reconstructing Southern and Pacific Ocean Deep Circulation Using Nd Isotopes
Piotrowski A, Noble T & McCave N

15:00 A Spatial Perspective on Nd Isotope Records from the Western Indian Ocean: Evidence for a ‘Boundary Exchange’ Control?
Wilson D, Piotrowski A & Galy A

15:15 A Depth Transect of Four 25 kyr $^{231}$Pa/$^{230}$Th Records from the Argentine Basin: Assessing Southern Component Flow Rates
Hickey B, Henderson G, Thomas A, Rae J, Chiessi C & Mulitza S

15:30 Did the Glacial Atlantic Overturning Circulation run Backwards?
Zahn R, Hall I, Henderson G, Masque P & Thomas A

15:45 Was Atlantic Deepwater Flow Reversed during the Last Glacial Maximum?
Anderson R, Fleisher M, Gersonde R & Kuhn G

16:00 An Atlantic Ocean Pa/Th Survey

16:15 Deglacial NW Atlantic Ventilation from Paired Deep-Water Coral Radiocarbon and Nd Isotopes
Crocket KC, van de Flierdt T, Robinson LF & Adkins JF

16:30 Response of Antarctic Intermediate Water to Weaker Atlantic Meridional Overturning Circulation during the Last Deglaciation
Xie R, Marcantonio F & Schmidt MW

16:45 Reconstruction of Permanent Thermocline Temperatures in the Atlantic during Heinrich Stadial 1
Groeneveld J, Chiessi C, Mackensen A & Tiedemann R

(Session 15b continues on Tuesday 16th Posters on page 184)
16e: Engineered Nanomaterials in the Environment: Strategies to Understand their Behaviour and Impact in Environmental and Biological Media

Session chaired by Maria Romero-Gonzalez, Frank von der Kammer, Greg Lowry & Peter Vikesland

14:00 Invited: Bio-Au Nanoparticles on Archaeal and Bacterial S-Layers
Selenska Pobell S, Reitz T, Geissler A, Merroun M & Herrmannndoerfer T

14:15 Alterations to Nanoparticle Associated Proteins
Vikesland P, Hull M, Chan M, Kent R & Pati P

14:30 Invited: Alteration of Biochemical Assemblage Induced in A. variabilis by TiO₂ Nanomaterials Exposure
Cherchi C & Gu AZ

14:45 Transformations of Silver Nanoparticles in Environmental Systems

15:00 Modes of Interaction between Inorganic Engineered Nanoparticles and Biological and Abiotic Surfaces
Schaumann GE, Abraham PM, Dabrunz A, Schulz R & Duester L

15:15 Invited: Surface Modifications of Engineered Nanoparticles and their Impacts on Cytotoxicity
Gregory K, Li Z & Lowry G

15:30 Keynote: Environmental Impact of Engineered Nanoparticles and Nanomaterials through their Life Cycle

16:00 Stability of Engineered Nanoparticles Under Various Environmental Conditions: Measurements and Modeling
Chen Y, Zhang W & Li K

16:15 Invited: Deposition and Remobilization of Oxidized Multiwalled Carbon Nanotubes on Silica Surfaces: Implications for Environmental Fate and Transport
Chen KL & Yi P

16:30 Imaging Nanoparticle Transport through Porous Media Using Magnetic Resonance Imaging
Lakshmanan S, Holmes W, Sloan B & Phoenix V

(Session 16e continues on Tuesday 16th Posters on page 186)
17b: Where Minerals Meet Life: Organic Matter Turnover in the Critical Zone

Session chaired by Kirsten Kuesel, Karsten Kalbitz, Katerina Dontsova & Zsuzsanna Balogh-Brunstad

14:00 **Keynote:** Bio-Inorganic Interfaces in the Critical Zone
-Chorover J-

14:30 **Invited:** Life as the Catalyst of Mineral Weathering in Acidic Forest Ecosystem
-Turpault M-P, Uroz S, Calvaruso C, Collignon C, Mareschal L, Frey-Klett P & Lepleux C-

14:45 Microbial Community Development and Mineral-Organic Matter Interactions in an Artificial Soil Incubation Experiment
-Prok GJ, Heister K, Ding G-C, Smalla K & Kögel-Knabner I-

15:00 Root Litter Decomposition and Stabilisation in Three Different Soil Depths Related to Microbial Community Dynamics and Enzyme Activity
-Sanaullah M, Chabbi A, Maron P-A, Sarr A, Bladotskaya E & Rumpel C-

15:15 Incomplete Recovery of Mineral-Bound Lignin Phenols
-Kaiser K, Hernes PJ, Dyda RY & Cerli C-

15:30 Could Bacterial Residues be an Important Source of SOM? – A Case Study from a Glacier Forefield
-Schurig C, Smittenberg R, Berger J, Kothe E, Miltner A & Kaestner M-

15:45 Where Life Meets Rocks: Understanding P Cycling during the Early Phases of Soil Formation
-Tamburini F, Bernasconi SM, Pfahler V, Buenemann E & Frossard E-

16:00 The Scale Factor in the Ectomycorrhizal Fungal Weathering Debate
-Smits M, Balogh-Brunstad Z, Saccone L, Wallander H & Colpaert J-

16:15 **Invited:** Insight into Effects of Elevated CO2 and Soil Nutrient Levels on Biological Weathering at the Mesocosm Scale
-Andrews MY, Leake JR, Banwart SA & Beerling DJ-

16:30 No Differences in Sr Isotope Ratios between Ectomycorrhizal and Arbuscular Mycorrhizal Ecosystems Across a Wide Range of Geological Substrates
-Koele N, Dickie I, Blum J, Gleason J, Lovett G & McGlone M-

16:45 Biotite Dissolution: The Effect of Organic Ligands and pH
-Bray A, Bonneville S, Wolff-Boenisch D & Benning LG-

(Session 17b continues on Tuesday 16th Posters on page 188)
18b: New Isotopic Systems at Unprecedented Precision

Session chaired by Magali Bonifacie & Joel Baker

14:00 **Invited:** High-Precision Mg Isotope Measurements of Inner Solar System Materials by HR-MC-ICPMS
   *Bizzarro M, Paton C, Schiller M & Ulfbeck D*

14:15 Measuring the Isotopic Composition of Small (<5 ng) U Samples by MC-ICP-MS
   *Connelly J & Bizzarro M*

14:30 High Precision Ca Isotope Analysis Using MC-ICPMS and TIMS
   *Schiller M, Paton C & Bizzarro M*

14:45 **Keynote:** Ion Microprobe High Precision Measurements of Oxygen and Magnesium Isotopic Compositions in Extraterrestrial Materials
   *Chaussidon M & Rollion Bard C*

15:15 A New Br Isotope Analytical Protocol: Constraints on the Global Br Cycle
   *Schaefer B*

15:30 Fractionation of Cl and Br Isotopes during Precipitation of Salts from their Saturated Solutions
   *Eggenkamp H, Bonifacie M, Ader M & Agrinier P*

15:45 **Invited:** Direct Injection Nebulization with MC-ICP-MS: Performances and Prospects
   *Bouchez J, Louvat P, Paris G, Gaillardet J & Moureau J*

16:00 An Isotopic Perspective on Mass Bias and Matrix Effects in MC-ICP-MS
   *Barling J & Weis D*

16:15 Performance Characteristics of an Enhanced Daly Ion Counting System for TIMS
   *Palacz Z, Jones T, Tootell D, Guest R & Locke S*

16:30 **Invited:** High Mass Resolution Gas-Source Mass Spectrometry
   *Young E, Rumble D, Freedman P, Schauble E & Guo W*

16:45 **Invited:** An Absolute Reference Frame for Clumped Isotope Thermometry
   *Eiler J, Dennis K, Affek H, Passey B & Schrag D*

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### 20e: Diffusion Controlled Processes: Nature, Experiment and Theory

Session chaired by Ralf Dohmen & Jiba Ganguly

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<td>14:00</td>
<td>Diffusion Induced by Pressure Gradients in Natural Garnets</td>
<td>Floess D, Baumgartner L &amp; Podladchikov Y</td>
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<td>14:15</td>
<td>Metamorphic Reaction Rates from Diffusion of Nb in Rutile</td>
<td>Cruz-Uribe A, Feineman M &amp; Zack T</td>
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<td>14:30</td>
<td>Solubility as a Determinant of Rates of Intergranular Diffusion in Metamorphic Rocks</td>
<td>Carlson W</td>
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<td>14:45</td>
<td>Element Transport and Mineral Replacement Reactions during Alkali Contact Metamorphism</td>
<td>Derrey IT, Marks M &amp; Markl G</td>
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<td>15:00</td>
<td>Towards a Resolution of the Timing of Martian Magmatism: Diffusion Study of Hf in Clinopyroxene and Geochronological Implications</td>
<td>Bloch E &amp; Ganguly J</td>
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<td>15:15</td>
<td>On the Application of Jarosite and Hematite Thermochronology to Assess Aqueous Environments on Mars</td>
<td>Kula J &amp; Baldwin S</td>
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<td>15:30</td>
<td><strong>Keynote:</strong> A Predictive Model for Cation Diffusion in Periclase</td>
<td>Van Orman J &amp; Crispin K</td>
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<td>16:00</td>
<td>Silicon Self-Diffusion in Forsterite, Revisited</td>
<td>Fei H, Katsura T, Chakraborty S, Dohmen R, Heggad C, Yamazaki D, Wiedenbeck M, Yurimoto H, Shcheka S, Pollok K &amp; Audétat A</td>
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<td>16:15</td>
<td>AI Diffusion in Olivine: An Experimental Study</td>
<td>Zhukova I, O’Neill H &amp; Campbell I</td>
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<td>16:45</td>
<td>Time Scales of Cooling of Post-Plutonic Picritic to Dacitic Dikes (Adamello-Italy)</td>
<td>Hürlimann N, Müntener O, Ulmer P &amp; Ulianov A</td>
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<td>14:00</td>
<td>Antimony in the Environment: The Facts – or Maybe Not</td>
<td>Filella M</td>
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<td>14:15</td>
<td>Arsenic in Ground Water</td>
<td>McArthur JM</td>
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<td>14:30</td>
<td>New Data on Unexpectedly High Arsenic Concentrations within a Landfill Plume in Central Massachusetts, U.S.A</td>
<td>Hon R, Xie Y, Soeller C, Brandon WC &amp; Simeone RJ</td>
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<td>14:45</td>
<td>Characteristics of Arsenic Distribution in the Holocene Sediment Deposits of South-Western Bangladesh</td>
<td>Tauhid-Ur-Rahman MD, Mano A, Udo K, Ishibashi Y &amp; Han YH</td>
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<td>15:00</td>
<td>A “Cradle to Grave” Analysis of Geothermal Arsenic in Lowland River System</td>
<td>Webster-Brown J, Wilson N, Hegan A, Christenson H &amp; Swedlund P</td>
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<td>15:15</td>
<td>Bacterial Physico-Chemical Controls on As-Pb Iron Hydroxy Sulfates in Reduced Environments</td>
<td>Weisener CG, Smeaton CM, Walshe GE, Smith AML, Chi Frue &amp; Fryer BJ</td>
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<td>15:30</td>
<td>Natural Organic Matter as Major Sorbent for Arsenic in a Peatland</td>
<td>Langner P, Mikutta C &amp; Kretzschmar R</td>
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<td>15:45</td>
<td>Arsenic Concentration Influences Secondary Mineral Formation during Simultaneous As(V) and Fe(III) Reduction by Shewanella sp.</td>
<td>Pombo SA, Huang J-H, Mikutta C, Dippon U, Kappler A &amp; Kretzschmar R</td>
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<td>16:00</td>
<td>Anthropogenically Induced Changes in Groundwater Flow Regimes in Shallow High Arsenic Aquifers: Evidence from $^3$H and $^{14}$C Data</td>
<td>Lawson M, Ballentine C, Polya D, Bryant C &amp; Boyce A</td>
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<td>16:15</td>
<td>Influence of Microbial Cells and Extracellular Polymeric Substances on the Sorption of As(V) and As(III) on Fe (Hydro)oxides</td>
<td>Huang J-H, Elzinga EJ &amp; Kretzschmar R</td>
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23a: Fukushima Review
Session chaired by Mitsuru Ebihara, Bernard Bourdon and Bernard Marty

14:00  Atmospheric Dispersion of the Fukushima Effluents

14:30  Distribution of Radioactive Materials in Seawater of the North Pacific Ocean: Past and Present
  Uematsu M

15:00  Geochemistry of the Long Term Evolution of the Used Nuclear Fuel/water Interaction
  Grambow B

15:30  Discussion
02c: The Faint Young Sun Revisited: The Message from Rocks and Climate Models

1001 δ30Si and Ge/Si Changes in BIFs along the Archaean
Delvigne C, Cardinal D, Hofmann A & André L

1002 The Assumption of a Low pCO₂ during the Archean
Investigated with a 3D Climate Model
Le Hir G, Teitler Y, Fluteau F, Donnadieu Y & Philippot P

1003 Earth’s Early Atmospheric Density Revealed from Archaean Raindrop Imprints
Som S, Catling D & Buick R

1004 Ubiquitous Subaerial Weathering during Emersion of the Fortescue Late Archean Igneous Province, Western Australia
Teitler Y, Philippot P, Gerard M, Fluteau F & Le Hir G

1005 Silicon and Oxygen Isotope Values of Cherts and their Precursors
Ziegler K, Marin-Carbonne J, McKeegan K & Young E

1006 The Diagenesis Effect on Paleo-Temperature Reconstruction from Precambrian Cherts
Marin-Carbonne J, Chaussidon M & Robert F

02d: Geochemical Evidence For, and Consequences of, Microbial Activity in the Archean Rock Record

1007 Cadmium Isotopes in Banded Iron Formations and Early Life in the Precambrian Ocean
Abouchami W, Mezger K, Galer S & Frei R

1008 Raman Spectroscopic Analysis of Heterogeneous Carbonaceous Matter in the 2.0 Ga Zaonega Fm, Karelia, Russia
Qu Y, van Zuilen M & Lepland A

1009 In situ Iron Isotope Analyses of Pyrites from 3.5 to 3.2 Ga Sedimentary Rocks of the Barberton Greenstone Belt, Kaapvaal Craton
Yoshiya K, Sawaki Y, Shibuya T, Yamamoto S, Komiya T, Maruyama S & Hirata T
02e: Timing and Conditions of Core Formation in the Primitive Earth

Floor 1

1010 3 Stages of Earth Evolution – Core Formation, Ocean Emergence and the 2.3 Ga Rise of Atmospheric Oxygen: How are They Linked? Osmaston M

1011 The Partitioning of Volatile Elements between Metal and Silicate at High Pressures and Temperatures Vogel AK, Rubie DC, Frost DJ & Palme H

1012 Mantle-Protocore System Evolution in the Case of Heterogenic Accretion: Paleomagnetic and Isotopic Evidences Pushkarev Y & Starchenko S

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03c: Mantle Redox and the Deep Carbon Cycle

Floor 1

1013 Comparing Carbon Isotopic Signatures between Meteorites and Terrestrial Mantle Samples: Need for Reassessment of Carbon Composition of Earth’s Mantle Basu S, Mikhail S, Jones A & Verchovsky AB


1015 Graphite-Bearing Norites (Cortegana Igneous Complex, SW Spain): Mantle-Derived Carbon or Crustal Contamination? Piña R, Crespo-Feo E, Ortega L, Barrenechea JF & Luque FJ


1017 Polycrystalline Diamonds Witness Redox Processes in the Earth’s Mantle Jacob D, Wirth R & Enzmann F


1019 Native Iron in Association with Forsterite, Experimental Research Nikolenko E & Zhimulev E
03d: Cratonic Mantle Processes: Insights from Diamonds and Xenoliths

Floor 1

1020 The Effect of Diffusion on P-T Conditions Inferred by Cation-Exchange Thermobarometry

1021 Origin of Craton Mantle Layering According to PT Reconstructions
Ashchepkov I, Ionov D, Ntaflos T, Hilary D & Palessky S

1022 Zone of Anomalous Mantle
Davies A & Davies R

1023 Os Isotope and PGE Data on the Age and Evolution of Lithospheric Mantle in the Central Siberian Craton
Doucet L-S, Ionov D, Carlson R, Golovin A & Ashchepkov I

1024 Diamond Record of Metasomatism
Fedorchouk Y & Zhang Z

1025 Redox State of Lithospheric Mantle in Central Siberian Craton: A Mössbauer Study of Peridotite Xenoliths from the Udachnaya Kimberlite
Goncharov A, Ionov D, Doucet L-S & Ashchepkov I

1026 Fluid Microinclusions in Octahedral Diamonds
Kiflawi I, Weiss Y, Griffin WL & Navon O

1027 Origin and Evolution of Carbonatite Magma Parental for Diamond and Syngenetic Inclusions Therein
Litvin Y

1028 Late Metasomatic Addition of Garnet to the SCLM: Os-Isotope Evidence
Malkovets V, Griffin W, Pearson N, Rezvukhin D, O’Reilly S, Pokhilenko N, Garanin V, Spetsius Z & Litasov K

1029 Pyroxene and Olivine Exsolution Textures in Majoritic Garnets from the Mir Kimberlitic Pipe (Yakutia)
Sirotkina E, Bobrov A, Garanin V, Bovkun A, Shkurskii B & Korost D

1030 Effects of Melt Percolation on Platinum Group Elements and Re-Os Systematics of Peridotites from the Tan-Lu Fault Zone, Eastern North China Craton
Xiao Y & Zhang H-F

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04c: Plumes, Mid-Ocean Ridges, and Plates: Examining their Dynamics and Interactions with Observations and Models

Floor 1

1031 Chemical Evolution of MORB: New Insights from Old Crust
Brandl PA, Regelous M & Haase KM

1032 Estimating Mantle Temperature from a Global Comparison of Seismic Models and the Petrology of Mid-Ocean-Ridge Basalts
Dalton C, Gale A & Langmuir C

1033 The Origin of an Oceanic Plateau: Isotope Geochemistry (Sr, Nd, Pb and Hf) of Volcanic Rocks from IODP Site U1347 on the Shatsky Rise (Northwest Pacific)
Heydolph K, Geldmacher J & Hoernle K

1034 Geothermobarometry of Basaltic Glasses from Tamu Massif, Shatsky Rise Oceanic Plateau

1035 Temporal Variations in Galápagos Plume-Ridge Interaction at the Cocos-Nazca Spreading Center
Herbrich A, Hoernle K, Hauff F, Werner R & Garbe-Schönberg D

1036 Felsic Magma Generation in the Oceanic Crust: A Geochemical Study of Pacific Antarctic Rise Lavas
Freund S, Haase K, Beier C & Regelous M

1037 Preliminary Results of a Recent Expedition to the Australian-Antarctic Ridge

1038 Osmium Isotope Signatures in Peridotites from the Ultra-Slow Spreading SWIR and RTJ
Senda R, Sato H, Nakamura K, Kumagai H & Suzuki K

1039 Sr, Nd, and Pb Isotopes of Basalts along Hotspot-Influenced Central Indian Ridge
Machida S, Orihashi Y, Neo N, Tanimizu M, Unsworth S & Tamaki K

1040 Isotope-Geochemical Features of Enriched Mantle Source of Rift Tholeiites from Bouvet Triple Junction (South Atlantic)
Migdisova N, Sushchevskaya N & Belyatsky B

1041 Plume-Ridge Interaction: Constraints on Melting Dynamics from the Azores and Iceland
Genske FS, Beier C, Turner SP, Haase KM & Schaefer BF
1042 He and Ne Isotopic Ratios from the Terceira Rift (Azores): Constraints on the Boundary between Eurasia and Nubia Mantle Sources

Madureira P, Moreira M, Nunes J, Lourenço N, Gautheron C, Carvalho R, Mata J & Pinto de Abreu M

1043 Melting Condition and Evolution of Fissural Volcanism in the Island of Faial (Azores Archipelago)

Zanon V, Peccherillo A & Pacheco JM

1044 Age and Origin of Alkaline Lavas from Tore-Madeira Rise: Interactions between Complex Lithosphere Motion and Multi-Components Source

Girardeau J, Merle R, Marzoli A & Chiaradia M

1045 Petit Spot-Like Volcanoes Exposed in Costa Rica

Buchs D, Pilet S, Baumgartner P, Cosca M, Flores K & Bandini A

1046 Lithium Isotope Perspective on the Iceland Mantle Plume

Hansen HE, Magna T, Kosler J & Pedersen R-B

1047 Chemical and Isotopic Composition of Cenozoic Hornblende-Bearing Basalts from the Rhön Area (Germany)

Mayer B, Jung S & Stracke A

1048 Cenozoic Intraplate Volcanism in Central Europe Determined by LAB Topography

Abratis M & Viereck-Goette L

1049 The Mesozoic Evolution of the West Iberian Margin as Witnessed by Magma Geochemistry


1050 How Small-Volume Basaltic Magmatic Systems Develop: A Case Study from Jeju, Korea

Brenna M, Cronin SJ, Smith IEM, Maas R & Sohn YK

1051 Volume Control on Magmatic Evolution and Eruption Style Transition, Jeju, Korea

Brenna M, Cronin SJ, Smith IEM & Sohn YK

1052 Geochemical Evidence for Lithosphere Delamination beneath the Central Rio Grande Rift

Byerly B & Lassiter J

1053 The Evidences of the Initial Broken for the Shangdan Ocean: Geochronology and Geochemistry of the Muqitan Formation, in North Qinling


1054 Platinum-Group Elements in Basaltic Rocks from the Etendeka Province in N.W. Namibia

Trumbull RB, Keiding JK & Hahne K

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04f: Time Scales of Melt Generation, Extraction, and Transport from the Mantle to the Earth’s Surface

Floor 1

1055 Two Competing Processes in Petrogenesis of Basaltic Magma Conduits
Chistyakova S & Latypov R

1056 Towards a Numerical Model to Constrain the Time Scales for Vertically Moving Axial Magma Chambers beneath Fast-Spreading Ocean Ridges
Kirchner C, Koepke J & Behrens H

1057 Cenozoic Volcanic Activity in North Sudetic Basin (Lower Silesia, SW Poland) – Possible Evolution Model Based on Combined Petrological, Geochemical and Isotopic Investigation of Lithospheric Xenoliths and Volcanic Host-Rocks
Nowak M, Muszyński A & Michalak P

1058 Magmatic Plumbing Dynamics along the Northern Rift Zone, NE Iceland
Pernet-Fisher J & Thrilwall M

1059 Dissolution-Precipitation as a Possible Mechanism of C-O-H Fluid/Melt Segregation in the Deep Mantle
Shatskiy A, Litasov K & Ohtani E

1060 Monogenetic Basaltic Volcanoes Represent Extraction Rather Than Melting Events
Smith IEM, McGee L, Cronin S, Bebbington M & Lindsay J

(Session 04f continues on Wednesday 17th AM on page 203)

04i: Origin of Large Igneous Provinces: Linking Geochemistry, Geochronology, Geophysics, Geodynamics and Climate Modeling

Floor 1

1061 Geochemistry of Granites from Magmatic-Metamorphic Complex of Boein-Miandasht, Sanandaj-Sirjan Zone, Iran
Davoudian Dehkordi AR, Shabanian Boroujeni N & Panahdar F

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**07g: Enhancing Mineral Weathering and Ocean Alkalinity to Consume CO₂ and Moderate Ocean Acidification**

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08a: Natural, Synthetic, and Incidental Nanoparticles, their Surface Characteristics, and their Interactions with Earth and Life

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4002 Sorption of Engineered Silver Nanoparticles to Environmental and Model Surfaces
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4003 Interaction of NOM and NZVI: Implication for NZVI’s Toxicity and Reactivity in the Environment
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4004 Analysis of Nanoscale Zero Valent Iron Particles Upon Arrival at a Monitoring Well
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4005 Imaging the Removal of Radionuclides from Solution by NZVI Using HRTEM
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4006 Mobilization of Multi-Walled Carbon Nanotubes in Consecutive Imbibition and Drainage Events
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4007 Ptychography: A Powerful X-Ray Imaging Tool

4008 Solubility and Toxicity of Hydroxylapatite (HAP) Nanoparticles (NPs): Implications for Nanobiomaterial Safety
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4009 Development of Methodologies Based on Field-Flow Fractionation for the Characterization of Engineered Nanoparticles in Complex Samples
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17c: Methane Cycling in Marine and Terrestrial Environments

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- **4033** Comparison of Different Evaluation Schemes and Optimization of Instrumental Parameters for Chlorine Isotope Analysis of Organic Compounds Using GC-QMS  
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- **4034** Improved $^{27}$Al/$^{24}$Mg Ratio Measurement Using a Modified Isotope-Dilution Approach  
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20: Diffusion Controlled Processes: Nature, Experiment and Theory

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4063 Lithium Self-Diffusion in LiAlSi₂O₆ Glass and Single Crystals
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4080 Deciphering Arsenic Sources in Surface Waters and the Role of Bacterial Oxidation
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4081 Contrasting Sediment and Water Geochemistry between Low and Very High Arsenic Affected Areas in Murshidabad, West Bengal, India  
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4082 Effect of Phosphate Fertilizer on the Mobility of Arsenic in Fairdpur Soil, Central Bangladesh  
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4083 Hydrogen Sulfide Reaction with Natural Organic Matter: Implications for Arsenic Binding  
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4084 Arsenic and Tungsten in Groundwaters of West Bengal, India  

4085 Relations of Arsenic Concentrations Among Groundwater, Soil, and Bedrock in Geumsan, Korea: Implication for As Mobilization According to Changes in As-Hosting Minerals and Land Use  

4086 Experimental Study on As and Cd Releases from Anoxic Sedimentary Rock Under Anoxic and Aerobic Conditions  
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4087 Geochemical Behavior of As Originated from Acidic Thermal Water during River Transport and Sedimentation Mechanism  
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4088 Arsenic Speciation and Sequential Extraction Studies  
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4089 Mineral Sources of Arsenic from Glacial Aquifer Sediments to Well Water in Minnesota, USA  
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4093  U and Sr Isotopic Variations at a Deep Underground Laboratory, Homestake Mine, SD  
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4094  Paleohydrological Communication between Baksa Gneiss and Overlying Carboniferous Sediments  
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4096  Geochemistry of Fluids from the Bruce Nuclear Site: Evidence for a Geologically Ancient Ordovician Porewater System  
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4097  Helium in Michigan Basin Sediments: A Tracer for Pore Fluid Migration and Age  
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4098  Geochemical and Isotopic Analyses of Non-Volcanogenic Hot Springs in Central Japan  

4099  Isotope Distribution of Dissolved Carbonate Species in Serbian Thermal Waters  
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4100  Flux Rates for Water and Carbon during Greenschist Facies Metamorphism  
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4101  Excess Argon Systematics Under HP – LT Conditions: A Tracer for Metamorphic Fluid Connectivity?  
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Oral Presentations Overview

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Chamber Hall

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Stefansson

09:45
Yu

10:00
Rosenqvist

10:15
Zhang

10:30
Rosenbauer

10:45
Richard

11:00
Bertler

11:15
Levan

11:30
He

11:45
Bourdet

12:00
Frank

12:15
    

Papers in the AM session include:

- Stefansson
- Yu
- Rosenqvist
- Zhang
- Rosenbauer
- Richard
- Bertler
- Levan
- He
- Bourdet
- Frank

The session covers topics such as biochemistry, physiology, and pharmacology.

For further details, please refer to the conference program.
<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
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<tr>
<td>09:30</td>
<td>Stolpe</td>
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<td>Fritzsche</td>
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Note: This schedule is for Oral Presentations Overview. Each session is followed by a 15-minute break.
### 02e: Timing and Conditions of Core Formation in the Primitive Earth

**Session chaired by Caroline Fitoussi & Mathieu Touboul**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>09:30</td>
<td><strong>Keynote</strong>: Core Formation in the Earth and the Terrestrial Planets</td>
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<tr>
<td></td>
<td>Rubie D, Frost D, O’Brien D, Nimmo F, Morbidelli A &amp; Palme H</td>
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<tr>
<td>10:00</td>
<td><strong>Invited</strong>: Core Formation and Volatile Element Addition to the Earth</td>
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<td></td>
<td>Wood B &amp; Rehkämper M</td>
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<td>10:15</td>
<td><strong>Invited</strong>: A Multidisciplinary Study of Core Composition</td>
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<td>Badro J</td>
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<td>10:30</td>
<td>Metal-Silicate Partitioning of Mo and W at High Pressures and</td>
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<td></td>
<td>Temperatures: Applications to Core Formation on Earth and Mars</td>
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<td></td>
<td>Wade J &amp; Wood BJ</td>
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<tr>
<td>10:45</td>
<td>Experimental Constraints on Molybdenum Isotope Fractionation</td>
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<td></td>
<td>between Metal and Silicate Liquids</td>
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<td></td>
<td>Hin RC, Burkhardt C, Schmidt MW, Bourdon B &amp; Kleine T</td>
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<tr>
<td>11:00</td>
<td>Large Vanadium Isotope Difference between Silicate Earth and Meteorites</td>
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<td>Nielsen S, Prytulak J, Wood B &amp; Halliday A</td>
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<td>11:15</td>
<td>Silicon Isotope Evidence Against an Enstatite Chondrite Earth</td>
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<td></td>
<td>Fitoussi C &amp; Bourdon B</td>
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<td>11:30</td>
<td><strong>Invited</strong>: The Breakup and Chemical Equilibration of Metal Diapirs</td>
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<td>in Terrestrial Magma Oceans</td>
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<td>Samuel H</td>
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<td>11:45</td>
<td><strong>Invited</strong>: Metal-Silicate Mixing during Impact-Driven Planet</td>
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<td></td>
<td>Accretion – Implications for the Age of the Moon</td>
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<td>Dahl T &amp; Stevenson D</td>
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<tr>
<td>12:00</td>
<td><strong>Invited</strong>: Understanding Late Accretion on the Earth, Moon, and</td>
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<td></td>
<td>Mars</td>
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<td>Bottke W, Walker R, Day J, Nesvorny D &amp; Elkins-Tanton L</td>
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<tr>
<td>12:15</td>
<td>Secular Depletions in Highly Siderophile Elements Recorded in &gt;3.6 Ga</td>
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<td>Komatiites</td>
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<td>Frank E, Maier W &amp; Mojzsis S</td>
</tr>
</tbody>
</table>
03d: Cratonic Mantle Processes: Insights from Diamonds and Xenoliths

Session chaired by Maya Kopylova & Paolo Nimis

09:30 Comparative Sr-Nd-Pb-Hf-Os Isotopic Systematics of Xenolithic Peridotites from Yangyuan, North China Craton

09:45 Redox Profile through the Siberian Craton: Fe K-Edge XANES Determination of Fe³⁺/Fe²⁺ in Garnet from Peridotite Xenoliths of the Udachnaya Kimberlite
Yaxley G, Berry A, Kamenetsky V, Woodland A, Paterson D, de Jonge M & Howard D

10:00 Keynote: Peridotite Xenolith Inferences on the Formation and Evolution of the Central Siberian Cratonic Mantle

10:30 Diamondiferous Conglomerate Preserves Evidence for Kimberlite and the Deep Cratonic Root of the Mesoarchean Southern Superior Craton
Kopylova M, Afanasiev V, Bruce L & Ryder J

10:45 The Age and Origin of the Limpopo Sub-Continental Lithospheric Mantle
van der Meer Q, Klaver M, Reisberg L, Davidheiser B & Davies G

11:00 Re-Os and Lu-Hf Dating in Lethakane Peridotite Xenoliths (Botswana)
Luguet A, Behrens M, Herwartz D & Pearson G

11:15 Chronological and Thermal History of the Lithospheric Mantle Underneath the Gibeon Kimberlite Field, Namibia
Luchs T, Brey G & Gerdes A

11:30 Geochemistry of Xenoliths from the Gibeon Kimberlite Province, Namibia

11:45 Ultra-Depleted Eclogites: Residues of TTG Melting
Shu Q & Brey G

12:00 Geochemistry of Mantle Microxenoliths from Zagadochnaya Kimberlite (Yakutia, Russia)
Ziberna L, Nimis P, Zanetti A, Sobolev NV & Marzoli A

12:15 Experimental Investigation of Garnet-Cpx Geobarometers in Eclogites
Pickles J, Blundy J, Sweeney R & Smith C

(Session 03d continues on Wednesday 17th PM on page 233)
04c: Plumes, Mid-Ocean Ridges, and Plates: Examining their Dynamics and Interactions with Observations and Models

Session chaired by Kaj Hoernle, Anthony Koppers, William Sager & Christoph Beier

11:30 A “hotspot Highway” in the S. Pacific

11:45 Effect of Thickness of Oceanic Lithosphere on Chemical Composition of OIBs: Implication for Origin of the South Pacific Magmatism
Shimoda G

12:00 Central Indian Ridge Versus Réunion Hotspot: Do Interaction Processes Account for on and off Axis Geochemical Observations?
Hemond C, Janin M, Murton B, Füri E, Hilton D & Dyment J

12:15 Diverse Mantle Sources for Ninetyeast Ridge Volcanoes

(Session 04c continues on Wednesday 17th PM on page 234)
04f: Time Scales of Melt Generation, Extraction, and Transport from the Mantle to the Earth’s Surface

Session chaired by Fidel Costa, Aaron Pietruszka, Mary Reid & Elisabeth Widom

09:30 Pervasive Reactive Melt Migration Though the Lower Oceanic Crust: Implications for the Evolution of Mid-Ocean Ridge Basalt
- *Lissenberg CJ, MacLeod CJ, Howard KA & Godard M*


10:00 Mantle-To-Surface Magma Dynamics at Mauna Loa and Kilauea, Hawai’i
- *Gonnermann HM, Poland M, Foster JH, Brooks B, Wolfe CJ & Miklius A*

10:15 Slow Mantle Upwelling on the Margin of the Hawaiian Plume Based on $^{230}$Th-$^{238}$U Disequilibria at Loihi Seamount
- *Pietruszka A, Hauri E, Carlson R & Garcia M*

10:30 Insights into the Galápagos Plume from Uranium-Series Isotopes of Recently Erupted Basalts
- *Handley H, Berlo K, Beier C, Turner S & Saal A*

10:45 Monogenetic, but not Monotonous: Basaltic Eruptions in the Auckland Volcanic Field, New Zealand
- *McGee L, Smith IEM, Millet M-A, Beier C, Lindsay J & Handley H*

11:00 Keynote: Do Erupted Mafic Lavas Accurately Reflect Mantle Magmatic Timescales?
- *Rubin K*

Session 04c follows this session in this room. For details see page 202.
05a: The Origin of Planetary Crusts

Session chaired by Audrey Bouvier & James Day

09:30 **Keynote:** Comparative Planetology – What are the Factors Controlling the Nature of Terrestrial Planetary Crusts?
   *Downes H*

10:00 Relationships between the Composition of Planetary Crusts and their Sedimentary Records
   *McLennan S*

10:15 **Invited:** Experimental and Numerical Investigations of the Formation of Felsic Asteroidal Crust
   *Usui T, Jones J & Senshu H*

10:30 **Invited:** Kirschsteinite Exsolution Lamellae in Olivine from Young Angrites: Implications for their Thermal History
   *Mikouchi T, Miyamoto M & McKay G*

10:45 The Formation of the Angritic Crust
   *Bouvier A, Brennecka G, Sanborn M & Wadhwa M*

11:00 Howardite Noble Gases as Indicators of Asteroid Surface Processing
   *Cartwright JA, Mittlefehldt DW, Herrin JS & Ott U*

11:15 **Invited:** Lithium – Light Metallic Traveller through Crusts of the Earth and Beyond
   *Magna T*

11:30 Differentiation of Impact-Melt Sheets: Evidence from Manicouagan with Implications for the Moon
   *Spray J, O’Connell-Cooper C & Thompson L*

Session 05f follows this session in this room. For details see page 205.
05f: Calibrating the Thermo-Mechanical Evolution of Continental Crust: Magmatism, Metamorphism, Deformation, and Erosion

Session chaired by Ethan Baxter, Rebecca Flowers, Stacia Gordon & Gregory Dumond

11:45 Deciphering the Evolution of Subducted Continental Crust: Insights through Laser Ablation Split-Stream (LASS) Petrochronology
   Kylander-Clark A & Hacker B

12:00 Invited: Subduction and Exhumation of the UHP Western Gneiss Region: Petrology, Structural Geology, and LASS Petrochronology
   Hacker B & Kylander-Clark A

12:15 Accelerating Garnet Growth and Related Dehydration at Blueschist-Facies Conditions, Sifnos, Greece
   Dragovic B, Baxter E & Caddick M

(Session 05f continues on Wednesday 17th PM on page 235)
06a: Recycling Agents in Subduction Zones: Fluids and Melts

Session chaired by Joerg Hermann, Susanne Skora & Weidong Sun

09:30  Fluorine Partitioning between Hydrous Minerals and Aqueous Fluid at 1 GPa and 770-850°C
  Wu J & Koga K

09:45  Partitioning of Chlorine and Fluorine between Apatite and Felsic Silicate Melts at Subduction Zone Conditions
  Li H & Hermann J

10:00  A Chlorine Isotope View of Mantle Metasomatism via Slab Fluids/Melts
  Selverstone J & Sharp Z

10:15  Solubility of Fluorine and Chlorine in Nominally Anhydrous Mantle Minerals: Implications for Mantle Metasomatism and Arc Magmas
  Bernini D, Dolejs D, de Koker N, Audetat A, Keppler H & Wiedenbeck M

10:30  Subducted Serpentinites are the Boron Reservoirs for Arc Magmatism
  Scambelluri M & Tonarini S

10:45  Boron, Lithium and Nitrogen Isotope Geochemistry of K- and NH₄-Rich illite/Smectite Clays in Fossil Hydrothermal Systems
  Bobos I

Session 06b follows this session in this room. For details see page 207.
06b: Arc Magmas from Slab to Eruption
Session chaired by Olivier Bachmann, Lorella Francalanci, Philipp Ruprecht & Paul Wallace

11:00 Effect of Differentiation on Fe Oxidation in Arc Basalts
Brounce M, Kelley K & Cottrell E

11:15 Occurrence of Reduction Induced Sulfide Saturation in Oxidised Arc Magmas
Whan T, Mavrogenes J & Arculus R

11:30 Crustal CO₂ Liberation at Merapi Volcano, Indonesia: An Earthquake Trigger?
Troll V, Hilton D, Jolis EM, Chadwick J, Schwarz-Kopf L, Zimmer M, Blythe L & Deegan F

11:45 Why do Mafic Arc Magmas Contain 4 wt% Water on Average?
Plank T, Kelley K, Zimmer M, Hauri E & Wallace P

12:00 Experimental Determination of the Hydrous Basalt Liquidus
Stamper C, Blundy J, Melekhova E & Arculus R

12:15 Crystal-Rich Basaltic Andesites of the Current Arenal Eruption in Light of Experiments with Crystal-Poor Basalt
Parat F, Streck M, Holtz F & Almeev R

(Session 06b continues on Wednesday 17th PM on page 236)
07g: Enhancing Mineral Weathering and Ocean Alkalinity to Consume CO₂ and Moderate Ocean Acidification

Session chaired by Tim Kruger, Dieter Wolf-Gladrow, Greg Rau & Josh West

09:30 Electrochemical Enhancement of Carbonate and Silicate Weathering for CO₂ Mitigation
   Rau G & Carroll S

09:45 Enhanced Weathering – Not Only CO₂-Consumption
   Hartmann J, Köhler P & Wolf-Gladrow D

10:00 Keynote: Carbon Storage Technology Potentials and Difficulties
   Lackner K

10:30 Alkaline Particle Size and Delivery for Settling and Dissolution: Optimising Ocean-Based Enhanced Weathering Geoengineering
   Lubansky A, Tannennberger M, Kruger T & Darton R

10:45 Carbonation of Artificial Silicate Minerals: Passive Removal of Atmospheric CO₂
   Washbourne C-L, Renforth P & Manning D

Session 07h follows this session in this room. For details see page 209.
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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>11:00</td>
<td>Enhanced Phosphorus Regeneration in Low Oxygen Marine Settings: Insights from Modern and Ancient Sediments and Implications for the Future Ocean</td>
<td>Jilbert T, Slomp CP, Kraal P, Steenbergh AK &amp; Palastanga V</td>
</tr>
<tr>
<td>11:15</td>
<td>Sediment Response to Persistently Low Oxygen Levels in Bottom Waters: The Lower St. Lawrence Estuary</td>
<td>Mucci A, Lefort S &amp; Sundby B</td>
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<td>11:30</td>
<td>Insights into Short-Term Changes in Local and Global Seawater Redox Conditions during Cretaceous OAE 2</td>
<td>Goldberg T, Poulton SW, Wagner T &amp; Rehkamper M</td>
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<td>11:45</td>
<td>Mo-Isotopes as Tracers of Cretaceous Ocean Anoxia</td>
<td>Izon G, Cohen A, Coe A, Poulton S &amp; Wagner T</td>
</tr>
</tbody>
</table>
08a: Natural, Synthetic, and Incidental Nanoparticles, their Surface Characteristics, and their Interactions with Earth and Life

Session chaired by Mike Hochella, Laurent Charlet, Frank von der Kammer & Jamie Lead

09:30 Multimethod Characterisation of Nanoparticles in the Environment
Stolpe B, Lead J, Lapworth D, Handley-Sidhu S, Fabrega J, Galloway T, Poole J, Whitby C & Colbeck I

09:45 Nanoparticles in Aqueous Environments: Electrochemical, Nanogravimetric, STM and AFM Studies
Ciglenečki I, Bura-Nakić E, Margus M, Milanović I, Batina N, Avalos-Perez A & Krznarić D

10:00 Radiolabelling of Engineered Nanomaterials as a Tool for Sensitive Particle Tracking
Hildebrand H & Franke K

10:15 The Ash that Closed Europe’s Airspace: Part I, Grains Size Distribution of the Eyjafjallajökull Ash and Soluble Salt Coatings

10:30 The Ash that Closed Europe’s Airspace: Part II, the Physical Aspects of the Eyjafjallajökull Ash (Geochemistry Fellow Presentation)

10:45 Local Structure of Poorly Ordered Nanosized Iron Oxides. Implications for Contaminants Scavenging

11:00 Composition, Structure and Shape of in situ Precipitated Fe-Oxide Nanoparticles from a Soil Effluent
Fritzsche A, Wieczorek AK, Rennert T, Händel M & Totsche KU

11:15 Adsorption of Organophosphorous Compounds on Well-Characterized Iron Mineral Nanoparticles
Mäkie P, Persson P & Österlund L

11:30 Nanoparticulate Fe(III)-precipitates Forming by Fe(II) Oxidation in Water
Voegelin A, Schwarz S, Hug S & Kaegi R
11:45 Discovering Environmentally-Critical Nanomineralogy: Highly Reactive Mn-Oxyhydroxide Nanofiber Nucleation and Growth Catalyzed by Nanohematite

12:00 Structural Aspects and Surface Reactivity of Aluminous Ferrihydrite Precipitates
Cismasu AC, Michel FM, Stebbins J, Levard C & Brown G

12:15 Surface Properties and Complexation on Titanium Dioxide Nanoparticles
Jonsson C, Perez Holmberg J, Gallego-Urrea J, Abbas Z, Ahlberg E, Bergenholz J & Hassellöv M

(Session 08a continues on Wednesday 17th PM on page 239)
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<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td>09:30</td>
<td>Electrochemically-Driven Lithium Isotopic Fractionation</td>
<td>Black J, Perre E, Umeda G, Dunn B, McDonough W &amp; Kavner A</td>
</tr>
<tr>
<td>09:45</td>
<td>Iron Isotope Fractionation in Soil Solutions of a Gleysol</td>
<td>Schuth S &amp; Mansfeldt T</td>
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<tr>
<td>10:00</td>
<td>Combined WAXS/XAFS Measurements for Studying the Reaction of S(-II) with Lepidocrocite</td>
<td>Behrends T, Hellige K, Silveira M &amp; Peiffer S</td>
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<tr>
<td>10:15</td>
<td>Pyrrhotite Oxidative Dissolution: A Microstructural Perspective by FIB-TEM and Surface Topometry</td>
<td>Harries D, Pollok K &amp; Langenhorst F</td>
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<td>10:30</td>
<td>Alteration of Arsenopyrite in Sulphuric Acid</td>
<td>Cai Y &amp; Hu X</td>
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<td>11:00</td>
<td>Invited: Photochemical Transformations of Carboxylates on TiO₂ and Iron(III)(hydr)oxide Surfaces</td>
<td>Hug S &amp; Borer P</td>
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<tr>
<td>11:15</td>
<td>Adsorption and Oxidative Transformation of Aromatic Acids by Fe(III)-Montmorillonite</td>
<td>Polubesova T, Eldad S &amp; Chefetz B</td>
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<tr>
<td>11:30</td>
<td>Kinetics of Coupled Fe(II)-Catalysed Ferrihydrite Transformation and U(VI) Reduction</td>
<td>Boland D, Collins R, Glover C, Payne T &amp; Waite D</td>
</tr>
<tr>
<td>11:45</td>
<td>Invited: Time-Resolved Metal(loid) Reactivity at Biogeochemical Interfaces</td>
<td>Sparks D, Ginder-Vogel M &amp; Landrot G</td>
</tr>
<tr>
<td>12:00</td>
<td>Reduction of Biogenic Uranil Phosphate Nanoparticles by Three Metal-Reducing Bacteria</td>
<td>Rui X, Boyanov M, Kwon MJ, O’Loughlin E, Dunham-Cheatham S, Fein J, Bunker B &amp; Kemner K</td>
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<tr>
<td>12:15</td>
<td>Using Bacteria to Produce Tailored Magnetic Nanoparticles</td>
<td>Byrne J, Coker V, Telling N, van der Laan G, Vaughan D, Pat trick R &amp; Lloyd J</td>
</tr>
</tbody>
</table>
10h: Geochemical Frontiers of the Rock/Water/Hydrocarbon System

Session chaired by Bruce Yardley & Christian Ostertag-Henning

09:30 The Stability and Structure of Mg\(^{2+}\) Bicarbonate and Carbonate Ion Pairs – An Experimental and Theoretical Study
Stefansson A, Lemke K, Benezeth P & Schott J

09:45 Metastable Phase Equilibria for the Aqueous System Containing Lithium, Rubidium and Chloride at 298.15 K
Yu XD, Zeng Y, Zhang JQ & Yang JY

10:00 Solubility of Carbon Dioxide in Aqueous Fluids at Subcritical Pressure: Testing the Models
Rosenqvist J, Kilpatrick A & Yardley B

10:15 Recent Advances in Kinetics of Water-Rock Interaction and Applications to Geological Carbon Sequestration
Zhu C, Lu P & Liu F

10:30 Kinetic Experiments of Some Silicate Mineral Dissolutions in Water from a Subcritical to a Supercritical State
Zhang R, Hu S & Zhang X

10:45 Invited: Reactivity of Mafic and Ultramafic Rocks with CO\(_2\)-charged Fluids and the Autocatalytic Reduction of CO\(_2\) to Form CH\(_4\)
Rosenbauer R, Oze C, Jones C, Thomas B, Goldsmith J & Bischoff J

11:00 Thermodynamic Consequences of the Injection of CO\(_2\)-H\(_2\)S Gas Mixtures in Sulfur-Rich Hydrocarbon Reservoirs
Uteyev R, Richard L, Randi A & Pironon J

11:15 On the Use of Nucleation Barriers in Numerical Simulation of Water-Rock Interactions
Bertier P, Weber C & Stanjek H

11:30 Keynote: Analogues between Water in Granite Melts and Petroleum Formation
Lewan M

12:00 Effects of Water on the Thermal Stability of Hydrocarbons and the Composition and Isotope Characteristics of the Gas Products
He K, Zhang S & Mi J

12:15 Alteration of Oil by Gas: Experiments in Fused Silica Capillary Capsules
Bourdet J, Eadington P, Burruss R & Chou I-M

(Session 10h continues on Wednesday 17th PM on page 245)
11c: Metal Solubility in Geofluids and Ore-Forming Silicate Melts

Session chaired by Jacob Hanley, Zoltan Zajacz, A.E. Williams-Jones & James Webster

09:30 Gold Scavenging by Liquid Bismuth Melts
Cockerton AB & Tomkins AG

09:45 The Transport of Gold in Petroleum: An Experimental Study
Fuchs S, Migdisov A & Williams-Jones A

10:00 The Effect of Cl on the Solubility of Au and Pd in Andesitic Melts
Botcharnikov R, Linnen R, Guillou M, Holtz F & Kamenetsky V

10:15 The Solubility of Au and Cu in Andesite Melts
Zajacz Z, Candela PA, Piccoli PM, Wälle M & Sanchez-Valle C

10:30 New Insights into Gold Transport in HCl-Bearing Vapour at Elevated Temperatures
Hurtig NC, Migdisov A & Williams-Jones A

Zezin D, Migdisov A & Williams-Jones A

11:00 The Effect of Sulfur on PGE Solubility in Silicate Melts
Laurenz V, Fonseca ROC, Ballhaus C, Jochum KP & Sylvester P

11:15 Hydrothermal Processes beneath the Merensky Reef and UG2 Chromitite, Bushveld Complex, RSA
Adlakha E, Hanley J & Heinrich C

11:30 Experimental Constraints on Magmatic Wolframite
Che X, Linnen R & Wang RC

11:45 Chemical Limits of Trace Elements in Pyrite
Deditius A, Kesler S, Reich M, Utsunomiya S & Ewing R

12:00 Tin Substitution in Chalcopyrite and Sphalerite from Hydrothermal Sulfides
Evrard C, Moussa N, Fouquet Y & Rinnert E

12:15 Mineral Textures and Fluid Inclusion Characteristics of Ore Samples from the Guanajuato District, Mexico
Moncada D & Bodnar R

(Session 11c continues on Wednesday 17th PM on page 246)
13d: Aerosols, Energy Sources and Climate

Session chaired by Surabi Menon & Jon Egill Kristjansson

09:30 Invited: Multi-Decadal Change of Atmospheric Aerosols and their Effect on Surface Radiation
Chin M, Diehl T, Streets D, Wild M, Qian Y, Yu H, Tan Q, Bian H & Wang W

09:45 Effects of Absorbing Aerosols on Accelerated Melting of Snowpack in the Tibetan-Himalayas Region
Lau W

10:00 Invited: Direct Aerosol Effect from Multimodel Simulations in AeroCom
Myhre G

10:15 Invited: Observational and Modeling Study of the Relationship between Aerosols and Super-Cooled Cloud Fraction
Storelømo T, Lohmann U & Choi Y-S

10:30 Smoke Aerosol Emission Source Analysis from Satellite and Airborne Measurements
Ichoku C, Gatebe C & Kahn R

Session 13f follows this session in this room. For details see page 216.
13f: Marine Aerosol Formation and Transformation

Session chaired by Colin O’Dowd & Thorsten Hoffmann

10:45 Keynote: Production Flux of Sea-Spray Aerosol
   de Leeuw G, Andreas EL, Anguelova MD, Fairall CW, Lewis ER, O’Dowd C, Schulz M & Schwartz SE

11:15 Invited: Laboratory Studies into Sea-Spray Chemical Speciation in Plankton-Enriched Sea-Water

11:30 Evaluating the Impact of Marine Organic Aerosols on Climate
   Meskhidze N, Xu J & Gantt B

   Ovadnevaite J, Ceburnis D, Berresheim H, Dall’Osto M, Bialek J, Monahan C, Worsnop D & O’Dowd C

12:00 Invited: Comparing Ambient and Generated Marine Particle Composition, Size, and Production
   Russell L, Frossard A, Modini R, Deane G, Stokes D, Keene W, Quinn T & Bates T

12:15 Marine Aerosol Oxalic Acid from In-Cloud Oxidation of Glyoxal

(Session 13f continues on Wednesday 17th PM on page 249)
14c: Proxies for Chemical Weathering – Interpretation of Ocean Records

Session chaired by Friedhelm von Blanckenburg & Ed Tipper

09:30 Nd Isotopes vs Magnetic Susceptibility as a Double Proxy for Paleoclimate and Paleoweathering: The Kerguelen Case
 *Allègre* CJ, *Meynadier* L & *Kent* DV

09:45 Iron Isotope Composition of the Middle Eocene Ooidal-Oncoidal Ironstones and the Associated Lateritic Paleosols from the Bahariya Depression, Western Desert, Egypt

10:00 Oxidative Weathering Fractionates Chromium Isotopes

10:15 High-Resolution, Ultra-Trace and Major Element Chemical Stratigraphy of a New Paleoproterozoic Weathering Profile
 *Babechuk* MG & *Kamber* BS

10:30 Weathering of Black Shales and Re-Os Isotope Systematics

10:45 *In situ* O & Si Isotopic Microanalysis of Diagenetic Cements: Basin Brines vs. Weathering, Low vs. High T

Session 14d follows this session in this room. For details see page 218.
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
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<tbody>
<tr>
<td>11:00</td>
<td>Enhanced Chemical Weathering during Early Triassic in Response to the Collapse of Terrestrial Ecosystem after the End-Permian Mass Extinction</td>
<td>Ikeda M, Sakuma H, Tada R &amp; Takahasi S</td>
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<td>11:15</td>
<td>Mycorrhizal Weathering through Space and Time: Implications for the Long-Term Carbon Cycle</td>
<td>Taylor L, Banwart S, Leake J &amp; Beerling D</td>
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<td>11:30</td>
<td><strong>Invited:</strong> Geochemical and Ecological Models of Plant-Driven Chemical Weathering: Insights into the Sinks for Atmospheric CO₂</td>
<td>Keller CK, O’Brien R, Balogh-Brunstad Z &amp; Bormann B</td>
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<tr>
<td>11:45</td>
<td>Rates and Mechanisms of Oxygen Consumption by Fresh Volcanic Material in the Marine Environment</td>
<td>Hembury D, Palmer M &amp; Fones G</td>
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<tr>
<td>12:00</td>
<td><strong>Keynote:</strong> Land Colonisation and Earth System Change: A Recurring Pattern</td>
<td>Lenton T</td>
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</table>
## 15d: Geochemical and Microbiological Research in Both Shallow and Deep-Sea Hydrothermal Environments

**Session chaired by Roy Price & Paul Craddock**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>09:30</td>
<td><strong>Invited:</strong> The Emergence of Metabolism: Prebiotic Simulations of Shallow Sea Hydrothermal Vents</td>
<td>Guzman M</td>
</tr>
<tr>
<td>09:45</td>
<td>Geo-Bio Interactions in Hydrothermal Fluids and their Potential Role for Hydrothermal Metal Fluxes</td>
<td>Koschinsky A, Sander S, Klevenz V &amp; Perner M</td>
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<tr>
<td>10:00</td>
<td><strong>Keynote:</strong> Microbial Community Structures in Shallow-Sea, Deep-Sea, and Terrestrial Hydrothermal Systems</td>
<td>Amend J, Meyer-Dombard D &amp; Schrenk M</td>
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<tr>
<td>10:45</td>
<td>Thermophilic Anaerobic Oxidation of Methane Performed by Novel Microbial Consortia</td>
<td>Wegener G, Knittel K, Holler T, Krukenberg V, Widdel F &amp; Boetius A</td>
</tr>
<tr>
<td>11:15</td>
<td>Structure and Function of Microbial Communities Associated with Low-Temperature Hydrothermal Venting and Formation of Barite Chimneys at Loki’s Castle Vent Field</td>
<td>Steen IH, Thorseth IH, Roalkvam I, Dahle H, Stokke R &amp; Pedersen R-B</td>
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<tr>
<td>11:30</td>
<td><strong>Invited:</strong> Abiogenic Formation of Carbon Species at Hydrothermal Conditions Using a Novel Flow Apparatus</td>
<td>Pester N &amp; Seyfried W</td>
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</table>

Session 15e follows this session in this room. For details see page 220.
15e: Balancing the Radiocarbon Budget

Session chaired by Jess Adkins

11:45  The Effect of Deep Ocean Stratification on pCO₂ and Δ¹⁴C
       Adkins J

12:00  Invited: A Deglacial ¹⁴C Budget
       Hain MP, Sigman DM & Haug GH

(Session 15e continues on Wednesday 17th PM on page 251)
16a: Geochemical Processes in Mining Environments: Introduction

Session chaired by Kate Campbell, Colleen Hansel & Kai-Uwe Ulrich

12:00  **Keynote:** Acid Mine Drainage and Responsible Mining  
*Nordstrom DK*

(Session 16a continues on Wednesday 17th PM on page 253)
16e: Engineered Nanomaterials in the Environment: Strategies to Understand their Behaviour and Impact in Environmental and Biological Media

Session chaired by Maria Romero-Gonzalez, Frank von der Kammer, Greg Lowry & Peter Vikesland

09:30 Invited: Optimization and Application of Engineered Nanocrystalline Iron Oxides (nMAG) for Uranium Analysis in Environmental Samples
Fortner J, Mayo J, Lewicka Z, Benoit D & Colvin V

09:45 Imogolites as a Tool for Evaluating the Hazard of HARN

10:00 Single Particle ICP-MS for Detection of Engineered Nanoparticles in Environmental Samples
Tuoriniemi J, Cornelis G, Gustafsson S & Hassellöv M

Session 16h follows this session in this room. For details see page 223.
16h: Environmental Implications of Waste Recycling: Challenges in Preserving Soil and Water Resources

Session chaired by Emmanuel Doelsch & Armand Masion

10:15 Invited: Investigation of Copper and Zinc Speciation in Pig Slurry by a Multitechnique Approach

10:30 Copper Speciation in Organic Wastes by X-Ray Absorption Spectroscopy
Tella M, Chataing S, Collin B, Diot MA, Bravin MN & Doelsch E

10:45 Keynote: Zeolitization of Aluminosilicate Waste Materials in Soil as a Tool for Soil Remediation
Terzano R

11:15 Redox Conditions in Infiltration Basins of a Large Scale Soil Aquifer Treatment (SAT) of Effluent

11:30 Mobility of Nitrogen and Heavy Metals in Biosolid Amended Soil

11:45 Invited: The Impact Associated to Wastewaters Treatment Plant Discharges into a Fluvial System (Central Portugal)
Silva A, Carvalho N, Almeida P, Oliveira N, Antunes M, Ferreira A & Albuquerque T

Session 16a follows this session in this room. For details see page 221.
17c: Methane Cycling in Marine and Terrestrial Environments

Session chaired by Samantha Joye, Alina Stadnitskaia, Helge Niemann & Tomas Feseker

09:30 **Keynote:** Methane Geochemistry’s “Stealth” Process: Microbial Oxidation

*Reeburgh W*

10:00 Differences in Coupling between AOM and SRR in Marine Sediments

*Knab N & Jørgensen B*

10:15 Characterization of Anaerobic Methane Oxidation in Lake Kinnet (Israel)

*Bar-Or I, Sivan O, Adler M, Kushmaro A, Pearson A & Eckert W*

10:30 Endolithc Anaerobic Methane Oxidation at Cold Seeps

*Marlow J, Steele J & Orphan V*

10:45 Coenzyme F430, Understanding Methanotrophy in Methane Rich Environments

*Fulton J, Bird L & Freeman K*

11:00 Dynamic Subsurface Biosphere Fuelled by Organic Matter from the Past


11:15 Hydrate Destabilization and Methane Release Events during Last Glacial Episode in Bay of Bengal

*Joshi RK & Mazumdar A*

11:30 Seasonal Variations in Microbial Carbon Cycling in Freshwater Wetland Sediments Identified through Rate Assays, Lipid Biomarkers, and Porewater Geochemistry

*Segarra K, Yoshinaga M, Schubotz F, Heuer V, Hinrichs K-U, Samarkin V & Joye SB*

11:45 Aerobic Methanotrophs Drive the Formation of a Seasonal Anoxic Benthic Nepheloid Layer in a Monomictic Lake


12:00 Synoptic Approaches to Scale CH₄ Flux in Boreal Landscapes

*Dörsch P, Lange H, Thomas B, Siljanen H, Jensen S & Bakken L*

12:15 Abiotic Synthesis of Methane from Biomolecules Under Ambient Conditions

*Althoff F & Keppler F*
18e: Novel Molecular Methods to Understand Past and Present Biogeochemical Processes

Session chaired by Dirk Sachse & Valerie Schwab-Lavric

09:30 **Keynote:** Tracing Molecular Proxy Signals from Biological Source to Sedimentary Sink


10:00 Reconstructing Ancient Landscapes: Molecular Insights to Spatial Patterns in Ecosystems and Water

*Magill CR, Ashley GM & Freeman KH*

10:15 The Rusty Sink: Impact of Iron on the Sedimentary Organic Biomarker Record

*Gelinas Y, Lalonde K, Tremblay L, Moritz A & Barber A*

10:30 Molecular Tools for Understanding Biomarker Compounds

*Bradley A, Pearson A & Marx C*

10:45 Deciphering the Significance of Hopanoids in the Marine Geologic Record

*Saenz J, Wakeham S, Eglinton T & Summons R*

11:00 D/H Composition of Leaf Waxes from C3 Plants along a Transect from the UK to Central Siberia, Russia

*Pedentchouk N & Fisher K*

11:15 Soil Leaf-Wax n-Alkane δD along Altitudinal and Latitudinal Transects: Implications for Paleoelevation and Paleohydrology Reconstructions

*Luo P, Peng P & Gleixner G*

11:30 Compound-Specific Isotopic Evidence of Paleoenvironmental Change Lake El’gygytgyn, NE Russia

*Wilkie K, Petsch S, Burns S & Brigham-Grette J*

11:45 **Invited:** δD of Alkenones as Proxy for Paleo Sea Surface Salinity

*vander Meer M, Kasper S, Benthien A, Bijma J, Zahn R, Sinninghe Damsté JS & Schouten S*

12:00 Hydrogen Isotopic Signatures of Algal Biomarkers as a Proxy of Hydroclimatic Variability in Lake Isabel, Mexico

*Romero Viana L, Haug GH, Kienel U & Sachse D*

12:15 Quantitative Deuterium NMR as a Site-Specific D/H Probe to Study Organic Matter

*Wang Y, Cody G, Alexander C & Fogel M*

(Session 18e continues on Wednesday 17th PM on page 255)
20g: Applying Synchrotron Science to Geosciences

Session chaired by Max Wilke & Hanns-Peter Liermann

09:30   Keynote: High Pressure Geochemistry in Laser-Heated Diamond Anvil Cells with Synchrotron Light
        Dubrovinsky L

10:00   In situ Insights to Partitioning of Highly Siderophile Elements between Silicate and Iron Rich Liquids at Extreme Conditions
        Petitgirard S, Borchert M, Andrault D, Appel K & Liermann H-P

10:15   In situ SXRF Determination of Trace Element Abundances in Aqueous Fluid at 1 – 3 GPa and 300 – 500°C: Applications to Subduction Zone Element Cycling

10:30   Direct Measurement of Ce³⁺/Ce⁴⁺ and Eu²⁺/Eu³⁺ in Hadean Zircons by XANES
        Tailby N, Trail D, Cates N, Mojzsis S, Bell E, Harrison TM & Watson EB

10:45   Initial Results from a New Time Resolved Microfocus XEOL Facility at the Diamond Light Source
        Mosselmans F, Taylor R, Finch A & Quinn P

11:00   Two- and Three-Dimensional Imaging of Platinum-Group Minerals at Submicrometer Scale with Synchrotron X-Ray
        Kogiso T, Suzuki K, Suzuki T & Uesugi K

11:15   Synchrotron Rapid Scanning X-Ray Fluorescence of Soft-Tissue Fossils

11:30   Invited: High-Pressure Microbiology in the Synchrotron Light
        Daniel I, Picard A, Testemale D & Hazemann J-L

Session 20h follows this session in this room. For details see page 227.
20h: Abundance and Distribution of Critical High-Tech Metals in Ore Minerals

Session chaired by F. Michael Meyer & Jens Gutzmer

11:45 Keynote: Base Metal Ore Deposits and Marine Mineral Resources: Rare Metal Sources for Sustainable Energies? 
Schwarz-Schampera U

12:00 Trace Element Geochemistry of Micas by Laser Ablation ICP-MS in the Moose II Lithium-Tantalum Pegmatite Deposit, NWT 
Anderson M, Lentz D, McFarlane C & Falck H

12:15 Concentration of Chalcophile and Siderophile Elements in MORB Sulphide Droplets: New Sulphide Melt-Silicate Melt Partition Coefficients 
Patten C, Barnes S-J & Mathez EA
21f: Fluid Flow in the Earth’s Crust

Session chaired by Alasdair Skelton, Andrew Putnis & Jay Ague

09:30 δ¹⁸O Zoning in Eclogite Garnet

09:45 Halogen Concentrations and δ³⁷Cl in Apatite as a Fluid Probe to Decipher Fluid-Rock Interaction
Layne G, John T, Whitehouse M, Austrheim H & Kusebauch C

10:00 Invited: Deformation of Garnet in Eclogite: Dominant Mechanisms and the Active Role of Fluids
Smit M, Scherer E, John T & Janssen A

10:15 Keynote: What can Equilibrium Thermodynamics Tell us About Metasomatic Alteration?
Evans K

10:45 B-Bearing Fluids: Caught in the Act
Dutrow B, Henry D, Gable C, Travis B & Foster T

11:00 Fluid-Flow Controls of Low δ⁵⁷Fe Hydrothermal Iron Mineralization
Matthews A, Erel Y, Stern D, Ryb U & Avni Y

11:15 REE and Stable Isotope Constraints on Formation of Metamorphic Quartz Veins: A Case Study from the Rhenish Massif (Germany)
Wagner T, Boyce A & Erzinger J

11:30 Evidence of K-Fe Metasomatism in the SW Scottish Highlands
Kleine B, Skelton A & Pitcairn I

Bowman J, Moser D, Valley J, Wooden J, Kita N & Mazdab F

12:00 The Nature of Fluid Flow through Vertical Formations in the Aureole of the EJB Pluton, White Mountains, California
Nabelek P & Morgan S

12:15 Depth- and Pressure Dependent Permeability in the Upper Continental Crust – Data from the Urach 3 Geothermal Well
Stober I

(Session 21f continues on Wednesday 17th PM on page 259)
<table>
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**Oral Presentations Overview**

- **Class Willett**
- **Zhao**
- **Luther**
- **Parsons**
- **Lin**
- **Raman**
- **Keller**
- **Ingrin**
- **Sager**
- **Larson**
- **Becker**
- **Jacques**
- **Lambin**
- **Yarkovich**
- **Labanieh**
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- **Goodenough**
- **Keber**
- **Waworuntu**
- **Zhao**
- **Portragn**
- **Zeldenzov**
- **Eisner**
- **Krasnenikov**
- **Gaillou**
- **Nestola**
- **Bracciali**
- **Markl**
- **Wittig**
- **Stumpf**
- **Zhao**
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- **Eisner**
- **Krasnenikov**
- **Gaillou**
- **Nestola**
- **Bracciali**
- **Markl**
- **Wittig**
- **Stumpf**

**Note:** The table provides an overview of sessions and speakers for different halls and timeslots during the conference.
<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
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## 02g: What was the Source of Earth’s Volatiles?

**Session chaired by Sean Raymond & Bernard Marty**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>14:00</td>
<td>The Great Volatile Delivery to Earth</td>
<td>Albarède F, Ballhaus C, Lee C-T, Yin Q-Z &amp; Blichert-Toft J</td>
</tr>
<tr>
<td>14:15</td>
<td><strong>Invited:</strong> Observational Constraints on the Water and Volatile Content of Planet-Forming Regions of Circumstellar Disks</td>
<td>Eisner J</td>
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<tr>
<td>14:30</td>
<td><strong>Invited:</strong> The Role of Comets as Possible Contributors of Water and Prebiotic Organics to Terrestrial Planets</td>
<td>Mumma M &amp; Charnley S</td>
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<tr>
<td>14:45</td>
<td>How Jupiter’s Two-Phase Gas-Driven Migration Shaped the Inner Solar System</td>
<td>Raymond S, Walsh K, Morbidelli A, O’Brien D &amp; Mandell A</td>
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<tr>
<td>15:00</td>
<td>Late Volatile Addition to Earth</td>
<td>Ballhaus C, Laurenz V, Fonseca ROC, Muenker C, Albarède F, Rohrbach A, Schmidt MW, Jochum KP, Stoll B, Weis U &amp; Helmy H</td>
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<tr>
<td>15:15</td>
<td><strong>Invited:</strong> Early Degassing of the Earth</td>
<td>Yokochi R</td>
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<tr>
<td>15:30</td>
<td><strong>Keynote:</strong> Xenon the Magnificent</td>
<td>Zahnle K</td>
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<td>15:45</td>
<td>Chondritic-Like Xenon in the Archean Atmosphere</td>
<td>Pujol M &amp; Marty B</td>
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<tr>
<td>16:00</td>
<td>Origin of Earth’s Volatile Elements: Constraints from Rb Isotopes</td>
<td>Mezger K, Nebel O &amp; vanWestrenen W</td>
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<tr>
<td>16:15</td>
<td>Mantle Degassing Rates and Gas Loss from Atmosphere: A View from Xenology</td>
<td>Tolstikhin I, Marty B &amp; Hofmann A</td>
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<tr>
<td>16:30</td>
<td>Degassing History of Earth</td>
<td>Zhang Y</td>
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<td>16:45</td>
<td>Reconciling Abundances of Highly Siderophile Elements and Major Volatiles in the Silicate and Near-Surface Earth</td>
<td>Becker H &amp; Fischer-Gödde M</td>
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<tr>
<td>14:00</td>
<td>Evidence for Evolution of Growth Media in Superdeep Diamonds from Sao-Luis (Brasil)</td>
<td>Zedgenizov D, Ragozin A, Shatsky V, Kagi H, Odake S, Griffin W, Araujo D &amp; Yuryeva O</td>
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<tr>
<td>14:30</td>
<td>Crystalllographic Relationships between Diamond and its Olivine Inclusions</td>
<td>Nestola F, Nimis P &amp; Harris JW</td>
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<tr>
<td>14:45</td>
<td>“Table” vs “Bench”: Trace Elements in Fibrous Diamonds</td>
<td>Navon O, Griffin WL &amp; Weiss Y</td>
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<tr>
<td>15:30</td>
<td>“WEERTMAN” Cracks: A Possible Mechanism for Near Sonic Speed Diamond Extraction from the Earth’s Mantle</td>
<td>Sommer H, Regenauer-Lieb K, Gaede O, Jung H &amp; Gasarova B</td>
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<tr>
<td>15:45</td>
<td>Water Content of Lithospheres Deduced from Xenoliths: The Example of Kerguelen Islands and South African Craton</td>
<td>Ingrin J, Liu J, Xia QK, Deloule E &amp; Grégoire M</td>
</tr>
</tbody>
</table>
04c: Plumes, Mid-Ocean Ridges, and Plates: Examining their Dynamics and Interactions with Observations and Models

Session chaired by Kaj Hoernle, Anthony Koppers, William Sager & Christoph Beier

14:00 **Keynote:** Plate- Versus Plume-Driven Processes – South Atlantic DUPAL Revisited  
*Class C & le Roex A*

14:30 New Isotopic Constraints on Amsterdam-St. Paul Hotspot Activity: Evidence for a Deep-Seated Mantle Plume and Implications for the DUPAL Anomaly Origin  
*Janin M, Hemond C, Maia M, Agranier A, Johnson K & Ponzevera E*

14:45 Evidence of Mantle Heterogeneity Underneath Slow-Spreading Ridges? Case Study at 45°N Mid-Atlantic Ridge  
*Schroth N & Murton BJ*

15:00 The Generation of Geochemical Asymmetry in MORB Around Iceland by Radially Symmetric Plume Flow Under an Asymmetric Ridge System  
*Shorttle O & Maclennan J*

15:15 Geochemical Investigation of Gabbroic Xenoliths from Hualalai Volcano, Hawaii  
*Lassiter J & Gao R*

15:30 Highly Depleted Melt Inclusions in Olivine from Shatsky Rise  
*Almeev R, Portnyagin M, Wengorsch T, Sano T, Natland J & Garbe-Schönberg D*

15:45 The Shatsky Rise Supervolcano  
*Sager W, Sano T & Korenaga J*

16:00 Sr, Nd, Hf and Pb Isotope Characterisation of Basalts from IODP Site U1346, Shirshov Massif the Youngest Edifice of the Shatsky Rise, Northwest Pacific  
*Murphy D, Geldmacher J & Romanova I*

16:15 Lithospheric Control on Geochemical Composition of the Louisville Seamount Chain  
*Beier C, Regelous M, Mahoney J, Vanderkluysen L & Haase K*

16:30 Preliminary Results from Integrated Ocean Drilling Program Expedition 330 to the Louisville Seamount Trail  
*Koppers A, Yamazaki T & Geldmacher J*

16:45 Origin of the Seamounts Near Futuna Island, SW Pacific  
*Labanieh S, Chazot G, Etoubleau J, Fouquet Y, Dosso L & Hemond C*
05f: Calibrating the Thermo-Mechanical Evolution of Continental Crust: Magmatism, Metamorphism, Deformation, and Erosion

Session chaired by Ethan Baxter, Rebecca Flowers, Stacia Gordon & Gregory Dumond

14:00 **Keynote:** From Thermochronometric Ages to Exhumation Rates  
*Willett S, Brandon M, Fox M & Herman F*

*Bracciali L, Parrish RR, Najman Y & Horstwood MSA*

14:45 Tectonothermal Evolution of the Triassic Flysch in the Songpan-Garzę Orogen, Eastern Tibetan Plateau  
*Wang H, Rahn M, Zhou J & Tao X*

15:00 Fate of an Eocene HT Metamorphic Complex in a Forearc Location  
*Bruand E, Gasser D & Stuewe K*

15:15 A Long-Term Record of Continental Lithosphere Exhumation via U-Pb Thermochronology of the Lower Crust  
*Blackburn T, Bowring S, Perron T, Mahan K & Dudas F*

15:30 Combined SIMS U-Pb Ages and Ti-in-Zircon Geothermometry Fingerprints Long Deep Crustal Residence in the Archaean  
*MacDonald J, Wheeler J, Harley S, Goodenough K, Crowley Q & Mariani E*

15:45 Xenoliths Reveal Lower Crustal Deformation and Metamorphism with No Obvious Surface Expression  
*Daly JS, Van den Berg R, Whitehouse M & O’Rourke H*

16:00 Power Law Behavior in Continental Crustal Heat Production and Its Implications to the Thermal Regime of the Continents  
*Vedanti N, Srivastava RP, Pandey OP & Dimri V*

16:15 Melting in the Deep Crust: Message from Melt Inclusions in Peritectic Garnet from Migmatites  
*Bartoli O, Cesare B, Poli S, Bodnar RJ, Frezzotti ML, Acosta-Vigil A & Meli S*

16:30 Zircon Behavior in the Upper Amphibolite Facies Polymetamorphic Terrane, Ryoke Belt, Japan  
*Kawakami T, Yamaguchi I, Yokoyama TD, Maki K, Hirata T & Shibata T*

16:45 Rates and Mechanisms of Hydration in Crystalline Crust  
*Yardley B, Nabein H-P & Heinrich W*
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<th>Time</th>
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<tbody>
<tr>
<td>14:00</td>
<td><strong>Keynote:</strong> Arc Magmas from Slab to Eruption: The Case of Kluchevskoy Volcano</td>
<td>Portnyagin M, Mironov N, Ponomareva V, Bindeman I, Hauff F, Sobolev A, Kayzar T, Garbe-Schönberg D &amp; Hoernle K</td>
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<tr>
<td>14:15</td>
<td>Parental Melts of Avachinsky Volcano (Kamchatka) Recorded in Melt Inclusions</td>
<td>Krasheninnikov S &amp; Portnyagin M</td>
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<tr>
<td>14:30</td>
<td>Geochemical Evolution of Lavas of the Rabaul Caldera – Fractionation of Fe Isotopes and HFSE Ratios during Fractional Crystallisation</td>
<td>Hohl S, König S, Münker C, Schuth S &amp; Kuduon J</td>
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<tr>
<td>14:45</td>
<td>Tracking the Magmatic Evolution of an Island Arc Volcano: Insights from a High-Precision Pb Isotope Record of Montserrat, Lesser Antilles</td>
<td>Cassidy M, Taylor R, Palmer M &amp; Trofimovs J</td>
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<tr>
<td>15:00</td>
<td>Upper Crustal Overprinting of Lower Crustal Processes at Maipo Volcano (34°10’S), Southern Volcanic Zone</td>
<td>Feineman M, Drew D, Murray T &amp; Sruoga P</td>
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<tr>
<td>15:30</td>
<td>Subduction Factory Unroofed: Modern Submarine Magmatism in the North Fiji Basin, Southwest Pacific</td>
<td>Danyushevsky L &amp; Falloon T</td>
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<tr>
<td>15:45</td>
<td>U-Series Disequilibria of Arc Lavas Revisited: Time-Scales of Magmatism in Convergent Margins</td>
<td>Huang F</td>
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<tr>
<td>16:00</td>
<td>Deep Versus Shallow Slab Melt Signatures Recorded by Nb/Ta in Modern Island Arc Lavas</td>
<td>König S &amp; Schuth S</td>
</tr>
<tr>
<td>16:30</td>
<td>Origin of Nepheline-Normative Primitive Magmas in Island Arcs</td>
<td>Sorbadere F, Schiano P &amp; Métrich N</td>
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</table>
16:45 Along-Arc Geochemical Variations in the Southern Volcanic Zone, Chile

07f: Modern Analogues for Precambrian Marine Ecosystems

Session chaired by Sean Crowe & Noah Planavsky

14:00 Multiple Sulfur Isotope Fractionation during Sulfur Cycling in a Warm, Monomictic Lake with Sub-Millimolar Sulfate Concentration

14:15 Microbial Sulfur Isotope Fractionation in Littoral Sediments: Interpreting $\delta^{34}S$ Variability in Archean Rocks
*Mason P, Stam M, Laverman A, Pallud C & Van Cappellen P*

14:30 Medal: The Many Flavors of Oxygen-Minimum Zones Past and Present
*Canfield D*

15:15 Fe Isotope Cycling in Ferruginous and Anoxic Lake Pavin (France) from Water Column to Sediment
*Busigny V, Planavsky N, Jézéquel D, Louvat P, Michard G, Viollier E & Lyons T*

15:30 Invited: Metatranscriptomics of the Green Sulfur Bacteria in a Meromictic Swiss Lake (Lago di Cadagno)
*Cox R, Habicht K, Miller M, Storelli N, Tonolla M & Frigaard N-U*

15:45 Keynote: Iron Mineralization in Anoxic, Non-Sulphidic Systems
*Poulton S*

16:00 Invited: Proterozoic Analog Ecosystem and Organic Biomarkers in a Florida Sinkhole

16:15 Invited: A Precambrian Manganous Sea?
*Jones C, Crowe SA & Canfield DE*

16:30 High Methane Oxidation Rates in Ferruginous Lake Matano
*Sturm A, Crowe S, Jones C, Leslie K, Canfield D, Nomosatryo S, Mucci A & Fowle D*

16:45 $S$ Isotope Investigation of a Redox-Stratified System Dominated by Chemotrophic Sulfide Oxidation
*Zerkle A, Macalady J, Jones D & Farquhar J*

(Session 07f continues on Wednesday 17th Posters on page 265)
08a: Natural, Synthetic, and Incidental Nanoparticles, their Surface Characteristics, and their Interactions with Earth and Life

Session chaired by Mike Hochella, Laurent Charlet, Frank von der Kammer & Jamie Lead

14:00 Zinc Sulfide in Suspended Matter from an Oxic River (Seine, France)

14:15 Size Dependent Element Interaction and Speciation in Environmental Nanoparticles
*Neubauer E, von der Kammer F, Kraemer SM & Hofmann T*

14:30 Keynote: Diffusion of Nanoparticles in Waters and Biofilms-Implications for Bioavailability
*Peulen T-O, Domingos RF, Simon DF & Wilkinson KJ*

15:00 Toxicity of Silver Nanoparticles to Environmental Microbial Consortia
*Dobias J, Costanza A, Suvorova E, Trotta M & Bernier-Latmani R*

15:15 Influence of Thiol-Containing Ligands for the Aggregation and Dissolution of Metallic Silver Nanomaterials
*Gondikas A, Reinsch B, Lowry G & Hsu-Kim H*

Session 08b follows this session in this room. For details see page 240.
08b: Chemical and Microbial Electron Transfer Processes at Mineral Surfaces

Session chaired by Kevin Rosso & Andreas Kappler

15:30 **Keynote:** Redox Reactions on Mineral Surfaces: Spectroscopic and Imaging Studies at the Molecular Level

16:00 Bioengineering Nano-Magnetite for Contaminant Clean-Up

16:15 An Electrochemical Approach to Determine the Redox Properties of Iron-Bearing Clay Minerals
*Gorski C, Sander M, Aeschbacher M, Klüpfel L & Hofstetter T*

16:30 The Role of Aluminum in Ferrihydrite Preservation
*Hansel C*

16:45 Natural Ferrihydrite: Impact of Structure and Composition on Redox Cycling
*Michel FM, Cismasu AC, Lezama-Pacheco JS, Massey M, Fendorf S, Brown GE & Bargar JR*

(Session 08b continues on Wednesday 17th Posters on page 266)
08i: Mineral Nucleation: From the Atomic to the Planetary Scale

Session chaired by Juan Diego Rodriguez-Blanco, Teresa Roncal-Herrero & Karina Krarup Sand

14:00 Interfacial Tension, Metastability, and Solubility of Solid Solutions
Prieto M, Katsikopoulos D & Fernandez-Gonzalez A

14:15 Keynote: Nucleation and Growth Mechanisms and Kinetics of Environmentally Important Oxides and Carbonates

14:45 Is Mineral Precipitation the Reverse of Dissolution?
Oelkers E, Saldi G & Schott J

15:00 CaCO₃ Polymorph Growth and Stabilization in Water-Ethanol Mixtures
Sand K, Rodriguez-Blanco JD, Makovicky E, Benning L & Stipp S

15:15 Nanoparticle Bioremediation: Application of Solid Phase Capture
Skuce R, Tobler D, Lee M & Phoenix V

15:30 Invited: Mapping the Amorphous-To-Crystalline Transitions in CaCO₃ Biominerals with 20-nm Resolution
Gilbert P

15:45 The Role of Mg in the Formation of Monohydrocalcite
Rodriguez-Blanco JD, Bots P, Roncal-Herrero T, Shaw S & Benning LG

16:00 Atomic Force Microscopy Observations of Nanostructures and Crystal Growth in Bivalves
Pina CM, Checa AG, Sainz-Díaz CI & Cartwright JHE

16:15 How do Mineral Substrates Affect Calcite Nucleation and Growth?
Stockmann GJ, Oelkers EH, Wolff-Boenisch D & Bovet N

16:30 Invited: Growth Rate of Giant Gypsum Crystals
Van Driessche AES, García Ruiz JM, Tsukamoto K, Patiño LD & Satoh H

16:45 Ferric Iron Geometry and Coordination during Hydrolysis and Ferrihydrite Precipitation
Collins R, Rose A, Glover C, Boland D, Payne T & Waite D

(Session 08i continues on Wednesday 17th Posters on page 267)
09g: Elements of Ophiolites

Session chaired by Yildirim Dilek & Harald Furnes

14:45 **Keynote:** Geochemical and Tectonic Fingerprinting of Ophiolites  
*Dilek Y & Furnes H*

15:00 Different Types of Precambrian Ophiolites  
*Furnes H, Dilek Y & DeWit M*

15:15 Multiphase Magmatic History of the Oman-UAE Ophiolite  
*Goodenough K, Styles M, Thomas B, Schofield D, Crowley Q & Millar I*

15:30 **Invited:** Processes and Timescale of Subduction Initiation and Subsequent Evolution of Izu-Bonin Mariana Island Arc  

15:45 Demir Kapija Ophiolite: A Snapshot of Subduction Initiation within a Back-Arc  
*Bozovic M, Prelevic D, Romer RL & Barth M*

16:00 *In situ* Diamonds and Moissanite in Podiform Chromitites of the Luobusa and Ray-Iz Ophiolites, Tibet and Russia  
*Yang J-S & Robinson PT*

(Session 09g continues on Wednesday 17th Posters on page 269)

Session 09h follows this session in this room. For details see page 243.
**09h: Volcanic Glass Heterogeneity: Primary and Secondary Causes, and Uses**

Session chaired by Kim Berlo, Victoria Smith & Olivier Reubi

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<tr>
<td>16:15</td>
<td><strong>Invited:</strong> Primary and Secondary Water Content Heterogeneity in Volcanic Glasses</td>
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<td><em>Tuffen H, Castro J, Owen J &amp; Denton J</em></td>
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<td>16:30</td>
<td><strong>Keynote:</strong> Magma Mixing as a Petrological Clock to Measure the Timescale of Volcanic Eruptions: Experiments and Numerical Models</td>
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<td><em>Perugini D</em></td>
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<td>16:45</td>
<td><strong>Boron Isotope Systematics during Magma-Carbonate Interaction</strong></td>
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<td><em>Deegan FM, Jolis EM, Troll VR, Freda C &amp; Whitehouse MJ</em></td>
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10e: Towards the Geochemical Tricorder – Advances in Geochemical Microtechnology, Sampling and Sensing Systems:

Session chaired by Steve Larter

15:30 Keynote: Collection and Measurements of Reservoir Fluids Properties – ‘Today and Tomorrow’
Stankiewicz A, O’Keefe M, Mostowfi F, Ratulowski J, Atkinson M & Sharma S

16:00 Keynote: Predicting Reservoir Fluid Properties Using Absolute Concentrations of Canned Cutting Gas Components
Sun Y

Larter S & Snowdon L
### 10h: Geochemical Frontiers of the Rock/Water/Hydrocarbon System

**Session chaired by Bruce Yardley & Christian Ostertag-Henning**

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| 14:00 | A Simulation Study of Hydrocarbon Gas Generation from Fischer–Tropsch Synthesis with Varying Carbon Source and Hydrogen in a Gold Tube System  
*Zhang S & Mi J* |
| 14:15 | **Keynote:** The Significance of Rotliegend Brines in Mineralizing Processes and Hydrocarbon Systems in the Southern Permian Basin  
*Lüders V, Plessen B, Vonhof H & Schneider J* |
| 14:45 | Geochemical Signatures of Thermochemical Sulfate Reduction – Ketones and Sulphur Species  
*Germerott S, Ostertag-Henning C & Behrens H* |
| 15:00 | A Study on the Effect of Pore Geometry on Mineral Changes  
*Pedersen J, Jettestuen E, Vinningland JL, Madland M, Cathles L & Hiorth A* |
| 15:15 | Fluid Pressure Versus Rock Pressure: Their Influence on Metamorphic Reactions  
*Wheeler J, Llana-Funez S & Faulkner D* |

(Session 10h continues on Wednesday 17th Posters on page 270)

Session 10e follows this session in this room. For details see page 244.
**11c: Metal Solubility in Geofluids and Ore-Forming Silicate Melts**

Session chaired by Jacob Hanley, Zoltan Zajacz, A.E. Williams-Jones & James Webster

14:00 Distribution of Rare Elements in Mineral-Forming Environments of Rare-Metal Granites

*Badanina E, Borisova A, Thomas R & Syritso L*

14:15 Fluoride Complexation of Yttrium Under Hydrothermal Conditions

*Loges A, Migdisov A, Wagner T, Williams-Jones A & Markl G*

14:30 Acid-Base Fractionation in the Model Cl-Bearing Granite

*Aranovich L & Novikova M*

14:45 Invited: Molybdenite Deposition in Bingham Canyon Deposit: Role of Sulfur, Redox and pH Chemistry in Magmatic-Hydrothermal Fluids

*Seo JH, Guillong M & Heinrich CA*

15:00 Ion Association in Hydrothermal Systems: Strontium Chloride, Hydroxide and Acetate to 350 °C and 20 MPa

*Arcis H, Zimmerman G & Tremaine P*

15:15 Origin of Early Hydrothermal Fluids Associated with the Sudbury Structure Deduced from Individual Fluid Inclusion Sr Isotope Analysis

*Hanley J, Oberli F & Pettke T*

15:30 Composition of the Earliest Hydrothermal Fluids Circulating along the South Range of the Sudbury Igneous Complex, Canada

*Lefort D, Hanley J & Seo JH*

15:45 Albitite Related to Iron Oxide Mineralization: Melt Inclusion Evidence for a Magmatic Origin

*Tomé CM, Tornos F & Wälle M*

16:00 U-Series Disequilibrium in Groundwater as a Vector for U Mineralisation

*Murphy M, Dosseto A, Turner S & Schaefer B*

16:15 Conditions for Uranium Transport in Unconformity-Related U Deposits

*Richard A, Rozsypal C, Banks DA, Mercadier J, Cuney M, Boiron M-C & Cathelineau M*

16:30 Advancing Studies of the Origin and Role of Hydrocarbons in Ore-Forming Systems

*Kerr M & Hanley J*

16:45 Boron Isotope Geochemistry of Subseafloor Hydrothermal Ore Deposits, Agrokipia B, in Troodos Ophiolite, Cyprus

*Kawahata H, Yamaoka K, Matsukura S & Ishikawa T*
12g: Modeling of Geochemical Proxies

Session chaired by Xavier Giraud, Olivier Marchal & Michael Evans

14:00 Keynote: How Geochemical Proxies Provide Quantifiable Evidence of Climate Shifts over the Last 25,000 Years

Gebbie G

14:30 The Stable Isotope Composition of Chlorine in Hyperarid Soils

Amundson R, Barnes J, Ewing S, Heimsath A & Chong G

(Session 12g continues on Wednesday 17th Posters on page 275)

Session 12i follows this session in this room. For details see page 248.
12i: Marginal Basin Sediments: Archives for High-Resolution Paleoclimatic Records Including Land-Ocean Interactions

Session chaired by Gert De Lange, F.M. Martinez-Ruiz, Stefano Bernasconi & G Versteegh

15:30 Binge/Purge Oscillations of the Thawing Fennoscandian Ice Sheet Revealed by $\varepsilon_{\text{Nd}}$ and Biomarkers

15:45 A $\delta^{30}\text{Si}$ Reconstruction of Holocene Productivity of the Southern Ocean, East Antarctica
Panizzo V, Cardinal D, Crosta X & Mattielli N

16:00 Variation in Carbon Stable Isotope Ratios of Organic Matter in Bay of Bengal during the Last Glacial Episode
Mazumdar A, Joshi RK, Peketi A & Naik BG

16:15 Interactions between Precipitation and Sea Surface Temperature in Northern Chilean Patagonia during the Late Holocene
Bertrand S, Hughen K, Sepúlveda J & Pantoja S

16:30 Relationship between Palaeoclimatic and Diagenesis Intensity in Sediments from Transitional Environments: The Galician Rías (NW Spain)
Andrade A, Rubio B, Rey D, Álvarez-Iglesias P, Bernabeu A & Vilas F

16:45 Mediterranean Sapropel Formation: Preservation and Palaeoceanography

(Session 12i continues on Wednesday 17th Posters on page 276)
## 13f: Marine Aerosol Formation and Transformation

Session chaired by Colin O’Dowd & Thorsten Hoffmann

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<tr>
<td>14:00</td>
<td><strong>Keynote:</strong> Marine Productivity: Impacts on Aerosols and Clouds</td>
<td>Nenes A</td>
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<tr>
<td>14:15</td>
<td>On the Hygroscopic Behaviour of Marine Particles Enriched with Biogenic Nanogels</td>
<td>Fuentes-Lopez E, Coe H, Green D &amp; McFiggans G</td>
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</table>

Session 13g follows this session in this room. For details see page 250.
13g: Atmospheric Dust

Session chaired by Reto Gieré & Bernard Grobéty

14:45 Invited: Ice Formation on Atmospheric Mineral Dust Particles
   Stetzer O, Welti A, Ladino L & Liönd F

15:00 Invited: Advances in the Understanding of Atmospheric Impacts of Volcanic Ash Emissions Since Eyjafjallajökull 2010
   Durant AJ & Prata AJ

15:15 Global Distributions of Mineral Dust Properties from SeaWiFS and MODIS: From Sources to Sinks
   Hsu NC, Bettenhausen C & Sayer A

15:30 Biogeochemical Impact of Long-Range Transported Dust over Northern South China Sea
   Tsay S-C, Wang S-H & Hsu NC

15:45 Keynote: Chemical Modification of Airborne Mineral Dust
   Grassian V

16:15 Direct Observation of Chemical Modification of Asian Dust Particles during Long-Range Transport
   Song Y-C, Jung H-J, Kim H & Ro C-U

16:30 Minor Effect of Physical Size Sorting on Iron Solubility of Transported Mineral Dust
   Woodhouse M, Shi Z, Carslaw K, Krom M, Mann G & Benning L

16:45 Atmospheric Acidification of Mineral Aerosols: A Source of Bioavailable Phosphorus for the Oceans

(Session 13g continues on Wednesday 17th Posters on page 277)
### 15e: Balancing the Radiocarbon Budget

**Session chaired by Jess Adkins**

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<tr>
<td>14:00</td>
<td>The Relationship between $\Delta^{14}C$ and $\delta^{13}C$ of DIC in the LGM Ocean</td>
<td>Bryan S, Lehman S &amp; Marchitto T</td>
</tr>
<tr>
<td>14:15</td>
<td>Low Latitude Surface Ocean Contribution to the Deglacial Atmospheric Radiocarbon Decline</td>
<td>Marchitto T, Lehman S, Lindsay C, Bryan S, Ortiz J &amp; van Geen A</td>
</tr>
<tr>
<td>14:30</td>
<td>Intermediate Water $\Delta^{14}C$ off Brazil between 3-40 ka BP</td>
<td>Ruckelshausen M, Kowsmann R, Godoy JM, Santos GM &amp; Mangini A</td>
</tr>
<tr>
<td>14:45</td>
<td>The Mid-Depth $\Delta^{14}C$ Anomaly during Termination 1, Do Hydrothermal Vents Play a Role?</td>
<td>Stott L &amp; Timmermann A</td>
</tr>
<tr>
<td>15:00</td>
<td>Mixing of Radiocarbon from High Latitude Oceans through the Atmosphere and Ocean during the Last Deglaciation: Results from Iceland and the Drake Passage</td>
<td>Burke A, Robinson L &amp; White N</td>
</tr>
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Session 15h follows this session in this room. For details see page 252.
**15h: Submarine Hydrothermal Processes and Alteration of the Oceanic Lithosphere**

Session chaired by Frieder Klein, Marguerite Godard, Gretchen L. Früh-Green & Niels Jöns

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<tbody>
<tr>
<td>15:30</td>
<td><strong>Keynote:</strong> Serpentinization and Hydrogen Generation&lt;br&gt;McCollom T, Klein F, Bach W, Jons N &amp; Templeton A</td>
</tr>
<tr>
<td>15:45</td>
<td>Iron Speciation in Serpentine during Oceanic-Type Serpentinization&lt;br&gt;Andreani M, Munoz M, Marcaillou C &amp; Delacour A</td>
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<tr>
<td>16:00</td>
<td>On Organic Synthesis Reactions Driven by Serpentinization&lt;br&gt;Hentscher M, Bach W &amp; Klein F</td>
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<td>16:30</td>
<td>Microbial Utilization of the Products of Serpentinization at the Lost City Hydrothermal Field&lt;br&gt;Lang S, Fruh-Green G, Bernasconi S, Butterfield D, Lilley M, Proskurowski G &amp; Mehay S</td>
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<td>16:45</td>
<td>Cryptoendolithic Colonization in the Hydrating Mantle along Mid Ocean Ridges&lt;br&gt;Pasini V, Ménez B &amp; Brunelli D</td>
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<td>14:00</td>
<td>Invited: Establishing Baseline Geochemical Conditions at Historic Gold Mines for Risk Assessment and Remediation</td>
<td>Parsons M, Goodwin T &amp; Little M</td>
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<td>14:15</td>
<td>Mercury Distribution and Speciation in a Seasonal Wetland Impacted by Mine Waste</td>
<td>O'Day P, Serrano S, Stilson T &amp; Vlassopoulos D</td>
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<td>15:15</td>
<td>Geochemical Reactivity of Submarine Tailings from the Batu Hijau Mine</td>
<td>Sahami A, Waworuntu J &amp; Fawcett S</td>
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<td>16:00</td>
<td>$^{230}$Th-$^{234}$U-$^{238}$U Disequilibria along the River Catchments from the Iberian Belt (Spain) Affected by Acid Mine Drainage (AMD)</td>
<td>Ketterer M, Hierro A, Barbero L, Olias M, Bolivar JP, Casas-Ruiz M &amp; Baskaran M</td>
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<td>16:15</td>
<td>Development of an Active Mine Water Treatment Technology by Use of Schwertmannite</td>
<td>Janneck E, Burghardt D, Simon E, Damian C, Martin M, Schöne G &amp; Meyer J</td>
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<td>16:30</td>
<td>Pilot-Scale Barrier System for Removal of Nitrate in Mine Drainage</td>
<td>Herbert R &amp; Winbjörk H</td>
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<td>16:45</td>
<td>Metals and As in Mine Tailings Drainage Systems: Mobility and Removal</td>
<td>Yurkevich N &amp; Saeva O</td>
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17d: Biogeochemistry of Limiting Nutrients

Session chaired by Stephan Kraemer & Peter Croot

14:00 **Keynote:** Soluble Mn(III), Mn(II) and Total Mn in Sediment Porewaters: Soluble Mn(III) is Ubiquitous  
*Madison A, Mucci A, Sundby B, Tebo B & Luther G*

14:30 Uncovering the Key Processes Involved in Manganese Biogeochemical Cycling in the Ocean  
*Wuttig K, Heller M & Croot P*

14:45 Sequestering of Phosphorus during Freshening of a Silled Marine Basin; Role of Manganese  
*Ingri J, Sutterasak T, Widerlund A & Elming S-Å*

15:00 Processes Affecting Iron Solubility in the Tropical North Atlantic  
*Heller MI & Croot PL*

15:15 Photochemical Production of Dissolved Organic and Inorganic Nutrients from Resuspended Sediments  
*Kieber R, Southwell M, Laquire C, Thompson L, Skrabal S, Avery B & Mead R*

15:30 Keep and Touch – Dust and Mineral Iron Utilization by the Marine Diazotroph *Trichodesmium*  
*Shaked Y, Rubin M & Berman-Frank I*

15:45 Evaluating Sources and Transport of Zinc and Cadmium and their Complexing Ligands in the Atlantic and Pacific Oceans  
*Carrasco G, Duffaut-Espinosa L, Morton P & Donat J*

16:00 Competitive Ligand Exchange between Cu-Humate Complexes and Methanobactin  
*Pesch M-L, Christl I, Kraemer SM & Kretzschmar R*

16:15 Silicon Isotopes as a Tracer for Silicate Utilization in the Peruvian Upwelling  
*Grasse P, Ehlert C, Stramma L, Ryabenko E, Franz J & Frank M*

16:30 In Silico, Physiological, and Proteomic Cost-Benefit Analysis of Resource-Limited Microbial Growth  
*Carlson R, Folsom J & Taffs R*

16:45 Available-Phosphate Oxygen Isotopes Point to Extracellular Equilibration  
*Angert A, Mazeh S & Weiner T*

(Session 17d continues on Wednesday 17th Posters on page 286)
18e: Novel Molecular Methods to Understand Past and Present Biogeochemical Processes

Session chaired by Dirk Sachse & Valerie Schwab-Lavric

14:00 **Invited**: Compound-Specific Stable Isotope Analysis of Amino Acids as a Novel Tool for Ecological Food Web Study
Chikaraishi Y, Ogawa N, Takano Y, Tsuchiya M & Ohkouchi N

14:15 Is TEX$_{86}$ Paleothermometry Applicable in the Polar Regions?

14:30 Distribution of Branched Tetraether Lipids in a Black Sea Sediment Core: Insights into Continental Temperature Evolution in Central Europe over the Past 40000 Years
Sanchi L, Menot G & Bard E

Session 18g follows this session in this room. For details see page 256.
# 18g: Non-Traditional Isotopes in Non-Traditional Matrices

Session chaired by Jean Carignan, Sander van den Boorn & Christophe Cloquet

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| 14:45 | Isotope Reference Materials for Present and Future Isotope Research<br>
        | *Vogl J & Pritzkow W*                                                                             |
| 15:00 | **Keynote:** Unconventional Matrices Prevent Novel Isotopes Turning Traditional<br>
| 15:30 | Sequential Extractions as a Tool to Investigate Stable Metal Isotope Fractionation between Soil Pools<br>
        | *Wiederhold J, Bourdon B & Kretzschmar R*                                                           |
| 15:45 | Isotope Fractionation during Fe Translocation in Plants Grown with an Artificial Chelate<br>
        | *Guelke-Stelling M & von Blanckenburg F*                                                            |
| 16:00 | An Animal Model (Sheep) for Fe, Cu and Zn Isotopes Cycling in the Body<br>
        | *Balter V & Zazzo A*                                                                               |
| 16:15 | Copper and Zinc Isotope Fractionation during their Interaction with Phototrophic Biofilm<br>
        | *Coutaud A, Pokrovsky OS, Rols J-L & Viers J*                                                       |
| 16:30 | Determination of U-Th and Pb Isotope Ratios in Crude Oil, Kerogen and Asphaltenes; Potential Application for Dating Age of Expulsion of Crude Oil from the Rock Source<br>
        | *Sanabria G, Pécheyran C, Bérail S, Prinzhofer A & Donard OFX*                                    |
| 16:45 | Identifying the When and Where of Oil Generation Using Platinum, Palladium, Osmium and Rhenium Geochemistry<br>
        | *Selby D, Finlay A & Osborne M*                                                                     |

(Session 18g continues on Wednesday 17th Posters on page 290)
20b: Magnetic Properties of Chemical Interfaces and Nano-Crystals in Natural Systems

Session chaired by Suzanne McEnroe & Ann Hirt

16:00 Invited: The Influence of Local Cation-distribution on the Magnetic Properties in Ilmenite-rich α-Fe₂O₃-FeTiO₃ Systems
Frandsen C & Mørup S

16:15 Transition of a Pyrrhotites to Antiferromagnetic State Induced by Cation Vacancies
Tereshova A, Onufrienok V & Sazonov A

16:30 Magnetic Properties of Ilmenite-Hematite Containing Magnetite Nano-Crystals
Brownlee S, Feinberg J, Kasama T, Harrison R, Scott G & Renne P

16:45 Interfaces and Exchange Coupling
McEnroe S, Robinson P, Fabian K, Harrison R, Miyajima N & Langenhorst F

(Session 20b continues on Wednesday 17th Posters on page 293)
20d: Advances in Experimental and Computational Approaches to Mineral-Fluid Interactions

Session chaired by David Dolejs & Juraj Majzlan

14:00 Invited: On the Duration and Rates of Fluid Release from a Dehydrating Slab

14:15 Reaction Paths and Volume Changes of Solid Solutions in Coupled Dissolution-Precipitation Reactions: The Role of Endmember Solubility
Pollok K, Putnis CV & Putnis A

14:30 Keynote: Computational Approaches to Hydrothermal Fluid-Rock Interaction on Nanometer to Kilometer Scales
Driesner T

15:00 Experimentally Determined Standard Properties for MgSO_4·4H_2O (Starkeyite) and MgSO_4·3H_2O; A Revised Internally Consistent Thermodynamic Dataset for Magnesium Sulfate Hydrates
Grevel K-D, Majzlan J, Benisek A, Dachs E, Steiger M, Fortes AD & Marler B

Gross J, Burchard M & Maresch WV

15:30 Experimental High-Grade Alteration of Zircon Using Alkali- and Ca-Bearing Solutions
Harlov D & Dunkley D

15:45 CO_2 Sequestration and Hydrothermal Basalt Alteration at 40-250°C
Gysi A & Stefánsson A

(Session 20d continues on Wednesday 17th Posters on page 293)

Session 20b follows this session in this room. For details see page 257.
21f: Fluid Flow in the Earth’s Crust

Session chaired by Alasdair Skelton, Andrew Putnis & Jay Ague

14:00 The Effect of Post-Depositional Fluids on Ediacaran Sedimentary Carbonate in South China
Zhao Y & Zheng Y

14:15 U/Pb Dating of Geodic Calcites: A Tool for Paleohydrological Reconstructions
Pisapia C, Deschamps P, Hamelin B, Battani A, Buschaert S & David J

14:30 Mineralizations Monitor Depth and Composition Variations of Paleohydrothermal Fluid Systems
Markl G & Staude S

Session 09g follows this session in this room. For details see page 242.
02g: What was the Source of Earth’s Volatiles?

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1001 A Hydrogen Rich Early Earth? 
*Toulhoat H, Beaumont V, Zgonnick V, Larin N & Larin VN*

1002 Nitrogen Speciation in Mantle Fluids 
*Li Y, Keppler H & Audetat A*

1003 Time Variation of He and Ar Isotopic Compositions in the Earth’s Atmosphere  
*Arakawa Y & Matsuda J-I*

1004 Constraints on Earth Outgassing History from Ar Isotope Composition of Devonian Atmosphere  
*Stuart F & Mark D*

1005 Implications of Fault Spilling Gases in Searching Active Ruptures  

1006 Role of Hydrogen and Oxygen Fugacity in Incorporation of Nitrogen in Reduced Magmas of the Early Earth’s Mantle  
*Kadik A & Litvin Y*

02h: Taphonomy and Geochemistry: Experiment and Observation in Understanding the Fossil Record of Early Life

**Floor 1**

1008 Early Fossilization Process of Cyanobacteria in Modern Microbialites  
*Couradeau E, Benzerara K, Gerard E, Esteve I, Moreira D & Lopez-Garcia P*

(Session 02h continues on Thursday 18th PM on page 329)

03b: Estimating the Deep Mantle Water Budget from Geochemistry, Geophysics, and Geodynamical Modelling

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1009 Distribution and Time Variation of Helium Isotope Ratios Around the Source Region of The Iwate-Miyagi Nairiku Earthquake in 2008  
*Horiguchi K, Nakayama T & Matsuda J-I*

1010 Structural Phase Transition of Ammonia Hydrate Under High Pressure  
*Ma C, Zhou Q, Li F, Hao J, Wang J, Huang F & Cui Q*

1011 FTIR Study of OH-OD Exchange in Fe-Free Ringwoodite-Wadsleyite Samples  
*Vigouroux E, Ingrin J, Bolfan-Casanova N & Frost DJ*

(Session 03b continues on Thursday 18th AM on page 303)
04d: Influence of Volatiles on Mantle and Magma Processes

1012  Extreme Pressure Dependence of Sulphur Solubility in Silicate Melts (Experimental Data)
      Kostyuk A & Gorbachev N

1013  A Study on Volcanic Minerals and Hosted Melt Inclusions in Newly-Erupted Tengchong Volcanic Rocks, Yunnan Province
      Li N, Fan Q & Zhang L

1014  Chlorine and CO2 Rich Fluids in 2.5 Ga Amphibolite-Granulite Facies Basement Below the Killari Earthquake Region, India and Seismogenesis
      Pandey O, Parthasarathy G, Tripathi P, Rajagopalan V & Sreedhar B

1015  Basaltic Magmatism and Mantle Metasomatism in the Rio Grande Rift
      Rowe M, Lassiter J & Schmandt B

(Session 04d continues on Thursday 18th AM on page 304)


1016  U-Pb Dating of Very Low-Grade Metamorphic Titanite
      Oliveros V, Simonetti A & Morata D

1017  Pb-Hf-Nd Isotopic Decoupling in Peridotite Xenoliths from Mega (Ethiopia): Insights into the Multistage Evolution of the East African Lithosphere
      Bianchini G, Bryce JG, Blichert-Toft J, Beccaluva L & Natali C

      Bryce J, Graham D, Blichert-Toft J, Hanan B, Miller S, Barkman J, Spera F & Tilton G

1019  Chemical Heterogeneities along the South Atlantic Mid-Ocean-Ridge (5-11°S): Shallow or Deep Recycling of Ocean Crust?
      Hauff F, Hoernle K, Kokfelt TF, Haase K, Garbe-Schönberg D & Werner R

1020  Pb Isotopes and the Origin of the ‘ghost Plagioclase’ Signature in Melt Inclusions from the Galapagos Archipelago
      Peterson M, Saal A, Nakamura E, Burgess K & Kitagawa H

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<td>1022</td>
<td>Mineralogy and Petrogenesis of the Precambrian Basement Rock, Around Ede, Southwestern Nigeria</td>
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<td>1023</td>
<td>Preliminary Results of Magnetic Fabric of the Gole – Zard Pluton, Aligoodars, Iran</td>
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<td>1024</td>
<td>Paleoproterozoic Crustal Growth in West Africa: Archean or Modern Tectonics?</td>
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<td>1025</td>
<td>Early Archean Crust of the Ukrainian Shield – Evidence from Detrital Zircons</td>
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<td>Age and Geochemical Characteristics of the Malayer Plutonic Complex, West of Iran</td>
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<td>1027</td>
<td>Evolution of Crust in the Dharwar Craton: The Nd Isotopic Evidence</td>
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<td>1028</td>
<td>LA-ICP-MS Chronological Study of Tongka Gneissic Granite in Northern Gangdise, Qinghai-Tibet Plateau</td>
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<td>1029</td>
<td>Secular Trends in Granite Zircon εHf–δ18O, Australian Tasmanides</td>
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<td>Detrital Zircon Provenance of Late Ordovician-Silurian Sandstones in the Lower Yangtze Foreland Basin of South China</td>
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<td>Geochronology and Geochemistry of Hongqilapu Granite in Eastern Pamirs, China</td>
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<td>1032</td>
<td>Implications of U-Pb-Hf Detrital Zircon Data on the Precambrian Crustal Evolution of NW India</td>
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<td>1033</td>
<td>Geodynamic Implications of New U-Pb Zircon Ages for the Kamanjab Inlier (NW-Namibia)</td>
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1034  Zircon Hf Isotopic Study of the Mesozoic Granitoids from Korea and Japan and Tectonic Implications  
Lee SR, Cho D-L & Wu F-Y

1035  Precambrian P-T-Time History of the Yenisey Ridge as a Consequence of Contrasting Tectonic Settings in the Western Margin of the Siberian Craton  
Likhanov I & Reverdatto V

1036  Recognition of the Archean High-Grade Terrain in the South Qinglin Orogen and its Conection with the South China Block Tectonics  
Ling W-L, Lu S-S, Chen Z-W, Liu X & Duan R-C

1037  Complex Tectonic-Thermal History of the Red River Shear Zone: Evidence on Zircon SHRIMP and LA-ICP-MS Dating of the Yaoshan Group, SE Yunnan, China  
Liu Y-P, Li Z-X, Liao Z, Ye L, Pi D & Li C-Y

1038  Isotope Study of Neoproterozoic to Lower Palaeozoic Successions of the Southern Kalahari Craton  
Naidoo T, Zimmermann U, Miyazaki T & Vervoort J

1039  Isotopic Composition of the Early Precambrian Crust of the South-Western Siberian Craton: Implications for Crustal Growth and Mantle-Crustal Interaction through Time  
Turkina O

1040  Geochronological Fingerprint Revealed the Evolution of the Crust Underlying Cerro Pampa Adakite, Argentine Patagonia  
Orihashi Y, Anma R, Motoki A, Haller M, Ramos V & Hirata D

1041  Petrogenesis of Syn-Orogenic Leucogranites (Damara Orogen, Namibia)  
Ostendorf J & Jung S

1042  Mesoarchaean Tectono-Metamorphic Event from Bundelkhand Craton, Central India  
Pati JK & Saha L

1043  The Lower Pre-Cambrian, the Urals  
Pystin A & Pystina Y

1044  Distinguishing Periods of Crustal Growth and Recycling by U-Pb Dating, Sr, Pb and Hf Isotopes Among the Eastern Cordilleran Granitoids of South Peru  
Reitsma M, Schaltegger U, Spikings R, Chiaradia M, Ulianov A & Gerdes A

1045  The 1.86-1.84 Ga Magmatism in the Western East European Craton: Implications for a Convergent Continental Margin  
Skridlaite G, Whitehouse M, Bogdanova S & Taran L
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**06c: Geochemical Tracing of Recycled Subducted Materials**

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<td>Facies and Petrochemical Characteristics of the Tertiary Aged Tekkeköy (Samsun) Area Volcanics, NE Turkey</td>
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<td>The Chemistry of Some Minerals from the Shir-Kuh Granitoidic Batholith, South-West of Yazd, Central Iran</td>
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<td>Fluid-Mobile Element Enrichment in Mantle Wedge of Subduction Zones</td>
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<td>Xiao Y, Xu L, Gao Y, Li S, Sun H &amp; Gu H</td>
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07f: Modern Analogues for Precambrian Marine Ecosystems

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<td>Jimenez A, Hernandez A, Fernandez-Gonzalez A &amp; Prieto M</td>
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<td>Morales J, Astilleros JM, Jimenez A &amp; Fernández-Díaz L</td>
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<td>Formation and Inhibition of Calcite, Aragonite and Vaterite</td>
<td>Niedermayr A, Dietzel M &amp; Köhler S</td>
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<td>Ossorio Peralta M, Van Driessche A &amp; García Ruiz JM</td>
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<td>Putnis CV, Ruiz-Agudo E, Wang L, Klasa J &amp; Putnis A</td>
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<td>The Transformation of ACC to Vaterite; An in situ SAXS/WAXS Study</td>
<td>Bots P, Rodriguez-Blanco JD, Roncal-Herrero T, Shaw S &amp; Benning L</td>
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<td>The Role of Inorganic Additives in Evaporitic Carbonate Precipitation</td>
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<td>Trittschack R &amp; Grobéty B</td>
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### 08k: Water Structure and Hydrogen Bonding on Mineral and Nanoparticle Surfaces

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### 09f: Linking the Plutonic and Volcanic Records: Textural and Geochemical Fingerprinting of Magma Chamber Processes

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<tr>
<td>2001</td>
<td>A Magma Plumbing System Probed by the Grænavatn Porphyritic Group, East Iceland</td>
<td>Andersen C, Riishuus M &amp; Tegner C</td>
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<td>2002</td>
<td>Petrogenesis of Monotonous Dacitic Taapaca Volcanic Complex, N. Chile</td>
<td>Banaszak M &amp; Wörner G</td>
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<td>U-Th-Ba Elemental Fractionation during Partial Melting of Crustal Xenoliths and its Implications for U-Series Disequilibria in Continental Arc Rocks</td>
<td>Brens R &amp; Hickey-Vargas R</td>
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<td>Ellis B, Wolff J, Mark D &amp; Bindeman I</td>
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<td>Yildiz M &amp; Altunkaynak S</td>
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2019 | Primary Phases in Peridotites of the Ślęża Ophiolite (SW Poland) | Wojtulek P, Puziewicz J & Ntaflos T                                    |
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<td>Petrogenesis of Mantle Peridotites from the Kızıldağ Ophiolite (SE Turkey): Implications from Mineral Composition</td>
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<td>Sen AD, Uysal I, Godard M, Bağcı U &amp; Kaliwoda M</td>
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<td>The Petrological, Geochemical and Tectonic Settings of Metabasites from Mashhad, NE of Iran</td>
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<td>Shirdashtzadeh N, Samadi R &amp; Torabi G</td>
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**09h: Volcanic Glass Heterogeneity: Primary and Secondary Causes, and Uses**

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2030 Application of the Correspondence Analysis to Determine Anomalous Elements and Samples
Darabi Gholestan F, Ghavami-Riabi R & Asadi-Haroni H

2031 Two Easy Methods in Evaluation of an Exploration Data Set
Ghavami-Riabi R, Khalo-Kakai R & Asadi-Haroni H

2032 Albite Precipitation in Mudstones – Comparison of Natural and Synthetic Systems
Hellevang H, Thyberg B & Jahren J

2033 New Insights on the Origin of Unresolved Complex Mixtures
Hu SZ, Li SF, Wang JH, Zhang DM & Ma J

2034 Oil-Source Correlation for Severely Biodegraded Oils in Biyang Depression, China
Li SF, Hu SZ, He S & Zhang DM

2035 Impact of Parent Rocks and Diagenetic Evolution on Sandstone Reservoir Quality with Low to Very Low Permeability
Luo JL

2036 Using Discrimination Analysis for Anomaly Separation and Distinguish the Mineralized Factors
Majlesi MJ, Memarzadeh M, Ghavami-Riabi R & Asadi-Haroni H

2037 Transformation of Nitrogen during Sediment Burial History
Ostertag-Henning C & Illing C

2038 Desorption of Quinoline from Clay: An Investigation of the LoSal™ Mechanism
Pedersen C, Hem C & Stipp S

2039 The Solubilities and Phase Diagram of the Aqueous System Containing with Vanadate at 298 K
Peng Y & Zeng Y

2040 Quantitative Identification of Reservoir Fluid Properties and Boundary Shifts by Laser-Induced Fluorescence
Su J, Zhang S & Zhu G

2041 Sulphate Reduction Induced by Hydrogen Under Hydrothermal Conditions
Truche L, Berger G & Cartigny P

2042 Potential-Ph Diagram for the V-Cl-H2O System at High Chlorine Concentration
Wang RL, Zeng Y & Zhang SH

2043 Phase Equilibrium for the Aqueous System Containing Ammonium, Magnesium and Chloride at 323.15 K
Zeng Y, Yu XD, Yang JY & Hong J
2044  Large Area Multi-Stage Quasi-Layer Petroleum Accumulation in Carbonate Reservoirs in Tazhong Area, Tarim Basin  

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2045  Geothermal Energy Development In Turkey  
Akpinar A, Akaryali E & Kömürçü Mİ

2046  Model Calculations of Scale Forming Minerals of High Enthalpy Geothermal Waters in Turkey  
Çetiner Z & Xiong Y

2047  Density and Apparent Molar Volume of Binary Electrolyte Aqueous Solutions at Elevated Temperatures  
Zezin D, Driesner T & Sanchez-Valle C

2048  Hydrochemical Properties of Thermal Waters in the Eastern Black Sea Section  
Gultekin E, Firat Ersoy A & Hatipoglu E

2049  Geothermal Gradient and Heat Flow Distributions of Northeastern Taiwan and Its Implication  
Liu C-M, Song S-R, Jeng F-S, Yeh E-C, Wang T-T & Lu Y-C

2050  The Crystal Morphology of Aragonite and its Implications in Pumping Pipe of Hot Spring, Taiwan  
Lu Y-C, Song S-R, Liu C-M & Huang L

2051  Simulating Experiments on Gas Generation of Coal Under Different Fluid Pressure  
Mi J, Zhang S & He K

2052  Monitoring Fluid Properties in a Geothermal Plant  
Regenspurg S, Harald M, Giese R & Mathias P

2053  Hotspot: The Snake River Geothermal Drilling Project  
Schervais J

2054  Silicic Acid Removal as Calcium or Magnesium Silicate from Geothermal Water  
Yonezu K, Kawabata Y, Watanabe K & Yokoyama T

2055  Application of Lithogeochemistry for Regional Scale Mapping of Geothermal Prospectivity in Sabalan Volcano, North West of Iran  
Ziaei M, Ziaii M, Kamkar A & Asghari AA

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<td>Investigation the Use of Ozonation Column for Phenol Removal</td>
<td>Jalayeri H, Marandi R &amp; Doulati F</td>
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<td>Contaminated Soil Diagnosis by Electrical Resistivity Tomography in Underground Storage Tanks of Different Petrol Stations in SE Spain</td>
<td>Rosales RM, Martinez P &amp; Faz A</td>
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<td>2059</td>
<td>A Global Distribution Map for Nd Isotopes in European Watersheds</td>
<td>Bayon G, Toucanne S, Freslon N &amp; Ponzevera E</td>
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<td>Terrigenous Input and Microcharcoal Changes in the Gulf of Papua during the Last 60 Kyrs</td>
<td>Bonnet N, de Garidel-Thoron T, Ménog T, Beaufort L, Buchet N &amp; Bard E</td>
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<td>Dynamics of the Pliocene East Antarctic Ice Sheet Revealed by Radiogenic Isotopes in Marine Sediments</td>
<td>Cook C, van de Flierdt T, Williams T, Hemming S &amp; Pierce E</td>
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<td>2062</td>
<td>Removal of Seawater $^{234}$U Incorporated in Holocene Basaltic Sediments from the Reykjanes Ridge</td>
<td>Mohamed KJ, Robinson LF &amp; McManus JF</td>
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<td>2063</td>
<td>The Os Isotopic Record of Organic Rich Sediments from the Benguela Upwelling System, Namibia</td>
<td>Reisberg L, Blamart D &amp; Zimmermann C</td>
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<td>Wetland Extension on the Russian Plain over the Past 40 Kyr: A Biomarker Approach from the Black Sea</td>
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**2066** Rapid Age Determination of Oysters Using Shell Mg/Ca Ratios

*Spence B, Gillikin DP, Goodwin DH, Byrne D, Roopnarine P & Anderson L*

**2067** Carbon Isotope Fractionation Associated with CaCO$_3$ Precipitation Induced by Ureolysis

*Millo C, Dupraz S, Ader M, Guyot F, Thaler C & Ménez B*

**2068** Determination of $\delta^{11}$B Ratios in Marine Biogenic Carbonates via LA-MC-ICP-MS

*Fietzke J, Ragazzola F, Heinemann A, Taubner I, Böhm F, Erez J, Hansteen TH & Eisenhauer A*

**2069** Strontium Isotope Fractionation in Scleractinian Corals


**2070** Effects of Thermal and Salinity Stresses on Growth of Aposymbiotic and Symbiotic Primary Polyps (*Acropora* digitifera)

*Inoue M, Shinmen K, Nakamura T, Iguchi A, Suzuki A, Kawahata H & Sakai K*

**2071** Coral Records of Ocean Acidification and Physiological Processes in the Southern Great Barrier Reef

*Kang JO, McCulloch M, Eggins S, Gagan M & Mortimer G*

**2072** Calcium and Magnesium Isotopes in Biogenic Calcite

*Kisakürek B, Eisenhauer A, Müller M, Taubner I, Fietzke J, Böhm F, Buhl D & Erez J*

**2073** In situ $\delta^{18}$O and Mg/Ca Analyses of Diagenetic and Foraminiferal Calcite: Implications for Paleoceanographic Proxy Records

*Kozdon R, Kelly C, Kitajima K, Strickland A & Valley J*

**2074** Boron Isotopes as pH Proxy: Combination of Boron Speciation and Isotope Composition Data

*Rollion-Bard C, Blamart D, Trebosc J, Tricot G, Mussi A & Cuif J-P*

**2075** Diurnal Cycle of Strontium/Calcium Ratio in a Giant Clam Shell: A Super-Fine Pyrheliometer

*Sano Y, Kobayashi S, Shirai K, Takahata N, Watanabe T, Sowa K & Iwai K*

**2076** Elemental and Isotopic Composition of Cultured Scleractinian Corals

*Taubner I, Böhm F, Fietzke J, Eisenhauer A, Garbe-Schönberg D & Erez J*
The Role and Effect of Boron during the Crystallization of CaCO₃
Valinia B, Rodriguez-Blanco JD, Blanco JA & Benning LG

Temperature Dependence of Mg Isotope Fractionation in Deep-Sea Coral: Paleoceanographic Implication as a New Proxy for Water Temperature
Yoshimura T, Tanimizu M, Inoue M, Suzuki A, Iwasaki N & Kawahata H

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Cosmogenic ²¹Ne Production Systematics in Quartz Inferred from a 25 m Sandstone Core
Balco G, Shuster D, Blard P-H, Zimmermann L & Stone J

Irregular Retreat of Tropical Glaciers during the Holocene

Molecular Fossils and Organic Proxies Evidencing the Facial Evolution of the Lower Miocene Sokolov Basin, Eger Graben
Francu J, Máčová D, Sýkorová I, Havelcová M, Kribek B, Martinek K & Rojík P

Paleoenvironmental Evolution of the Lower Miocene Organic Clays (the Sokolov Basin, Eger Graben, Czech Republic): Anorganic Proxies
Knesl I, Kribek B, Martinek K, Rojík P & Francu J
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Almogi-Labin A, Sandler A & Herut B

2086 Sediment-Water Nutrient and Oxygen Fluxes in Two Antarctic Continental Shelf Areas Differently Affected by Climate Change
Sañé E, Isla E & Grémare A

2087 Geochemical Composition of Recent Sediments and Subrecent Variability of the Last 500 Years for the SW Adriatic Sea and the Gulf of Taranto (Southern Italy)
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2088 High-Frequency Climate Cycles in the Westernmost Mediterranean during the Last 20,000 yrs
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2089 Comparison of XRF Core Scan Data to Conventional Geochemical Analyses: Usage in High Resolution Paleoenvironmental Research
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13b: Aerosols, Clouds and Precipitation

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2090 Anions Dramatically Enhance Proton Transfer Across the Air-Water Interface
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2091 Does Aerosol Alter Entrainment Mixing in Warm Cumulus?
Small J, Jonsson H & Chuang P

2092 Combustion Aerosol over Marine Stratus: Long Range Transport, Subsidence and Aerosol-Cloud Interactions over the South East Pacific
Clarke A, Freitag S, Brekhofskikh V, Snider J, Campos T, Kazil J & Feingold G

2093 A Possible Evidence of Urbanization Effect on the Light Precipitation in the Mid-Korean Peninsula

2094 Dependence of Adiabaticity of Stratiform Clouds Upon Stability, and its Relationship to Aerosol-Cloud Interactions
Kim Y-J, Kim B-G, Miller M & Song C-K
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<td>Ship Emissions and their Influence on Large Scale Cloud Fields</td>
<td>Peters K, Quaas J, Stier P &amp; Grassl H</td>
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<td>Palchan D, Stein M, Erel Y, Almogi-Labin A &amp; Goldstein SL</td>
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<td>Lequy É, Conil S, Leclerc E &amp; Turpault M-P</td>
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<td>Chemical and Isotopic Properties of Airborne Particles in Industrial, Urban and Rural Areas of the Rhine Valley</td>
<td>Guéguen F, Stille P, Dietze V &amp; Millet M</td>
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<td>Distribution Characteristics of Pt, Pd, and Related Traffic Elements in Dusts from Seoul, Korea</td>
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<td>Dry Deposition: A Major Pathway of Atmospheric Dust Particle Deposition</td>
<td>Kumar R &amp; Kumari KM</td>
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<td>2112</td>
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<td>Chemical and Mineralogical Profile of the Local Wind-Blown Surface Soil Contribution to Respirable Airborne PM in Rome (Italy)</td>
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<td>Seasonal and Tidal Variations of Dissolved Thallium in Coastal Waters</td>
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<td><strong>Böning P, Beck M, Schnetger B &amp; Brumsack H-J</strong></td>
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<td>Geochemistry of Nickel Isotopes in Ferromanganese Crusts</td>
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<td><strong>Gall L, Williams H, Siebert C &amp; Halliday A</strong></td>
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<td>Cu Speciation in Coastal Waters Using a Vibrating Gold Microwire Electrode</td>
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<td><strong>Gibbon-Walsh K, Salaun P &amp; van den Berg S</strong></td>
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3113  Diagenetic Mobility of Mn and Fe Crusts in Organic-Poor Sediments of Lake Superior
       Li J, Crowe S, Brown E, Dittrich M, Miklesh D & Katsev S

3114  Metal-Rich Brown Layers in Arctic Ocean Sediments: Climate Versus Diagenesis
       März C, Stratmann A, Eckert S, Schnetger B, Poulton SW & Brumsack H-J

3115  How and Where Redox-Sensitive Trace Metals can Answer the Question Productivity or Ventilation
       McKay J, Ivanochko T & Pedersen T

3116  High Resolution Sulfur Isotope Analyses Across Sulphate-Methane Transition Zone
       Peketi A & Mazumdar A

3117  Osmium Isotopes in Manganese Nodules from the Labrador Sea
       Poirier A, Hillaire-Marcel C, Meredyk S & Edinger E

3118  Origin and Evolution of Ferromanganese Crusts from South Atlantic
       Rimskaya-Korsakova M, Dubinin A & Vvedenskaya I

3119  Behavior of Biological and Terrigenous Elements during the Late Cenozoic in the Bering Sea: Paleocceanographic Constraints of the IODP Exp. 323 Sediments by High Resolution Non-Destructive TATSCAN Scanning

3120  Geochemical Studies in Piraeus Port Sediments, Greece
       Sakellariadou F

3121  Dissolved Reactive Mangenate at Pelagic Redoxclines
       Schnetger B & Dellwig O

3122  Mineral Composition of Sediments of the Southern Baltic Sea and their Heavy Metals Content
       Sobczak K, Beldowski J & Michalik M

3123  Ni Speciation and Isotope Fractionation in Marine Ferromanganese Deposits
       Sorensen J, Toner B, Gueguen B & Rouxel O

3124  The Comparison of Mo Isotope and Paleo-Oxygenation Parameters in Black Shales from Upper Yangtze Marine Sediments
       Zhou L, Su J, Hu Z, Huang J & Zhao L

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18c: Accurate and Consistent Time-Keeping in Geological History

**Floor 4**

- **4001** High-Precision Age for the Haifanggou Formation and its Implications for the Coevolution of Plants and Atmospheric CO₂
  *Chang S-C, Zhang H, Hemming S, Mesko G & Fang Y*

- **4002** Synthetic ‘Age Solutions’, Reference Materials for U-Th Geochronology
  *Condon D, Henderson G, Richards D & Woodhead J*

- **4003** Re-Os Geochronology of Lacustrine Organic-Rich Sedimentary Rocks: Systematics and Implications
  *Cumming V, Selby D & Lillis P*

- **4004** Intercalibration of Ar-Ar Standards and Samples at LDEO

- **4005** A New Highly Effective Silicagel Emitter for Lead Isotopic Measurements
  *Huyskens M, Iizuka T & Amelin Y*

- **4006** SHRIMP Studies of the Uranium Oxide-Based U/Pb SIMS Calibration
  *Magee C*

- **4007** VisualAge: A Novel Approach to U-Pb LA-ICP-MS Geochronology
  *Petrus JA & Kamber BS*

- **4008** Combined U-Pb Zircon Dating and Apatite Trace Element Compositions Applied to Paleozoic Tephrochronology
  *Sell B & Samson S*

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18g: Non-Traditional Isotopes in Non-Traditional Matrices

**Floor 4**

- **4009** Trace Metal and Mo Isotope Systematics in Petroleum Fluids
  *Archer C, Elliott T, Van den Boorn S, Avanzinalli R & Van Bergen P*

- **4010** Precise Determination of the Ca Isotopic Compositions by Thermo Ionization Mass Spectrometry
  *Chen H-W, Chen J-C, Shen J-J-S, Lee D-C & Lee T*

- **4011** Mercury Isotope Fractionation in Layered Roasted Ore Waste
  *Smith R, Wiederhold J, Jew A, Brown G, Bourdon B & Kretzschmar R*
Mercury Isotope Fractionation during Bio-Accumulation in Lichens
*Estrade N, Carignan J & Cloquet C*

Zn Mobility during Oceanic Crust Alteration Inferred by its Isotopic Composition
*Cloquet C, Carignan J & France-Lanord C*

Is Your Clean Lab Full of Zinc?
*Wasylenkii L, Wilkes E & Anbar A*

On the way to Medical Diagnosis Based on the Isotopic Analysis of Metabolically Relevant Transition Metals
*Van Heghe L, Engström E, Rodushkin I, Verstraete A, Van Vlierberghe H, Cloquet C & Vanhaecke F*

A Novel Ion Exchange Separation for Cu Prior to Stable Isotope Analysis by MC-ICPMS

Cu Isotope Geochemistry in the Unusual Las Cruces Supergene Copper Deposit
*Miguélez NG, Mathur R, Tornos F, Velasco F & Videira JC*

New Offset δ^{11}B Isotope Reference Materials for Geochemical and Environmental Boron Isotope Studies
*Rosner M & Vogl J*

**18h: Recent Advances in the Application of Calorimetry and Thermal Analysis in the Biogeosciences**

Application of DSC and NMR to Study the Soil Organic Matter in the Atacama Desert
*Barros N, Feijoo S, Rodríguez JA, Proupin J, Villanueva M & Salgado J*

The Effect of Sodium Fluoride on Soil Microbial Activity during Organic Matter Decomposition – A Calorimetric Approach
*Dziejowski JE*

Application of Thermal Analysis and NMR to Study Soil Organic Matter Biodiversity and Biodegradability in Afforested Lands
*Merino A, Pérez-Cruzado C, Salgado J & Barros N*

Determining the Influence of the Mineral Matrix on Thermal Analysis of Soil Organic Matter in Bulk Samples
*Fernández JM, Rasmussen C & Plante AF*
Posters

Floor 4

4023 Use of TGA/DSC-IR to Assess the Effect of Cr on Struvite Stability
Rouff A

4024 Energy Content of Soil Organic Matter as Studied by Bomb Calorimetry
Rovira P & Henriques R

4025 Analysis of Thermal Phases in Canaanite Ceramic ‘Metallic Ware’ Using FT-IR Spectroscopy
Shoval S & Paz Y

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19g: Reactions and Catalysis: Mineral-Water Interaction, CO₂ Sequestration, Electron Transfer

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4026 The Reaction Products during the Preparation of Granites for the Trace Elements Analysis by ICP-MS
Anoshkina J & Buharova O

4027 Molecular Modelling of Carbon Dioxide Adsorption in Zeolites
Crabtree J, Parker S & Purton J

4028 Mineral Variation Induced by CO₂ Injection in Saline Aquifer
Du S, Su X-S & Gu X

4029 Modelling of Nanoparticles: Aggregation of Oxides and Hydroxides
Molinari M, Sayle D & Parker S

4030 Modelling the Free Energy of Adsorption of Persistent Organic Pollutants at Clay Mineral-Water Interfaces
Shapley T & Parker S

4031 Experimental Study of Solution-Mineral Interaction in the Qisanba Uranium Deposit, NW-China
Sun Z, Zhou Y & Liu J

4032 Computational Modelling of Water and Amino Acid Adsorption at Corundum Structured Oxide Surfaces
Woronycz L, Shapley T, Arrouvel C, Costa D & Parker S

4033 Reactive Transport Modeling of Carbon Sequestration in Volcanogenic Sandstone Formations
Zhang S, Depaolo D & Xu T

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20a: Unraveling P-T-t Paths: Pseudosections Versus Classical Phase Petrology

Floor 4

4034 Interaction between Metamorphism and Deformation in Eclogite Facies Shear Zones, Lofoten, Norway
Nasipuri P, Stunitz H, Ravna EJK, Menegon L & Kullerud K

4035 Mineral Metastability and Effective Bulk Composition: The Effect of Grain Sizes and Modal Mineral Amounts
Verdecchia SO, Reche J, Baldo EG, Segovia-Diaz E & Martinez FJ

4036 Mineral Assemblages and Metamorphic History of Granulites in the Rychleby Mts., Bohemian Massif
Schlöglová K, Faryad SW, Dolejš D & Klápová H

4037 Calculated Stability of Osumilite, Sapphirine and Biotite in K₂O-FeO-MgO-Al₂O₃-SiO₂-H₂O-TiO₂-O (KFMASHTO)
Taylor-Jones K, Powell R & Holland T

4038 ⁴⁰Ar-³⁹Ar Geochronology and PT Estimations on Garnet-Hornblende-Muscovite-Plagioclase Schists from the Kheis Belt, South Africa
van Schijndel V & Cornell D

4039 Multistage Growth of Garnet in UHP Metagranite in the Dabies Orogen
Xia Q-X, Zheng Y-F & Lu X-N

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20b: Magnetic Properties of Chemical Interfaces and Nano-Crystals in Natural Systems

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4040 Anisotropy of Magnetic Susceptibility of Triassic Red Beds, Central Portugal
Ferreira C, Gomes C & Sant’Ovaia H

4041 Magnetic Anisotropy of Artificial Deposits
Mashukov A, Mashukova A & Siminchuk S

20d: Advances in Experimental and Computational Approaches to Mineral-Fluid Interactions

Floor 4

4042 Mechanism of Water–Rock Interaction of Alkaline Leaching Uranium in Shihongtan Deposit
Gao B & Sun Z
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<tr>
<td>4043</td>
<td>Hydrogen Production from Low Temperature Olivine Alteration</td>
<td>Huang S, Hellevang H &amp; Thorseth IH</td>
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<td>4045</td>
<td>Experimental Study of Mineral Equilibria in the System Li₂O-K₂O-Al₂O₃-SiO₂-HF-H₂O (With Topaz) at 400°C and 100 MPa</td>
<td>Štěkova T, Shapovalov Y &amp; Balitsky V</td>
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<td>4046</td>
<td>Study on Diagenetic Environments of Calcite Veins Hosted in Marine Carbonate Rock in Middle Yangtze Region of Southern China</td>
<td>Wang F, He S &amp; Yang X</td>
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<td>4047</td>
<td>The Dissolving and Driving Process in Qarhan Salt Lake, China</td>
<td>Wang W, Li W &amp; Hao A</td>
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<td>4048</td>
<td>Zircon Solubility in Na-Si-Al-O-H Fluids by in situ SR-XRF Analysis</td>
<td>Wilke M, Schmidt C, Dubrail J, Appel K &amp; Borchert M</td>
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### 20i: Advanced Study of the Physical Properties of the Mantle Materials, and Applications to the Earth’s Structure, Composition and Dynamics

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<tr>
<td>4049</td>
<td>The Elasticity Change of Na-Contained Silica According to the Post-Stishovite Phase Transition in the Earth’s Lower Mantle</td>
<td>Asahara Y, Hirose K, Ohishi Y, Hirao N, Ozawa H &amp; Murakami M</td>
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<td>High-Pressure Single-Crystal Elasticity of MgSiO₃ and (Mg,Fe)SiO₃ Perovskites at Pressures of the Earth’s Lower Mantle</td>
<td>Kurnosov A, Trots D, Boffa Ballaran T, Harries D &amp; Frost D</td>
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<td>4051</td>
<td>Focused Ion Beam Cutting of Large Samples for Brillouin Spectroscopy</td>
<td>Marquardt K &amp; Marquardt H</td>
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<td><em>Ab Initio</em> Study on Lattice Thermal Conductivity of Minerals</td>
<td>Dekura H, Tsuchiya T &amp; Tsuchiya J</td>
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<td>4053</td>
<td>High Pressure Diffraction Tomography Technique for Mineral Physics Research</td>
<td>Liu H &amp; Wang L</td>
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22b: General High-Temperature Geochemistry

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4054 Pressure-Induced Phase Transitions and H-D Isotope Effects in Portlandite
Iizuka R, Kagi H, Komatsu K, Yagi T & Nakano S

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4055 Geological, Mineralogical and Geochemical Characteristics of Saheb Skarn (West of Iran)
Abedi N, Yazdi M, Dana K & Shirkhani K

4056 Studying on Tectono-Geochemistry and Rock Ore Specimens Appraisal of Bangwei Copper Mine
Pan P, Han R-S & Chang H

4057 Geochemical Constrains on Lower Ordovician Magmatism at the Central Iberian Zone (Central Portugal)
Antunes M, Neiva A & Silva MMV

4058 Metamorphic and Geodynamic Evolution of the High-Grade Units of Mundão – Sátão (Northern Portugal)
Castro P, Bento dos Santos T, Meireles C, Sequeira A & Ferreira N

4059 Calibration and Applications of the Dolomite Clumped Isotope Thermometer to High Temperatures
Bonifacie M, Ferry J, Horita J, Vasconcelos C, Passey B & Eiler J

4060 Geochemistry of S-Type Granitic Rocks from the Valongo Area (Northern Portugal)
Carvalho P, Neiva A, Vinha M & Corfu F

4061 Highly Felsic Peraluminous Granitoids in the Borborema Province, Northeastern Brazil
Ferreira V, Sial A, Parada M & Toselli A

4062 Analysis of Geochemical “Twins” Al/Ga and Si/Ge in Rock-Forming Silicate Minerals in Granitoides Using LA-ICP-MS
Gardenová N, Kanický V, Breiter K & Vaculovič T

4063 Ophiolites of the Kuznetzky Alatau Ridge (SW Siberia) as a Possible Ancient Crust Fragment of the Paleoasian Ocean
Gertner I & Krasnova T

4064 Mantle Heterogeneities beneath Laguna Timone Volcano, Pali Aike Volcanic Field, Southern Chile
Gervasoni F, Conceição RV, Jalowitzki TLR & Orihashi Y

4065 Mineralogical and Geochemical Studies of the Metasomatic Rocks within Gachin, Kalat, Pohl and Hormuz Island Salt Plugs, Iran
Kanianian A, Taghipour S, Nemati R & Mackizadeh MA
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4066 Geological Evolution of Paleotethys: Constraints from Ar-Ar, U-Pb Ages of Gabbro in Jinshajiang Suture Zone  
Li J, Chen W, Yong Y, Sun J & Ji H

4067 Rare Earth Element (REE) Quantification in Geochemical Samples: Can We Trust Commercially Available ICP-MS Calibration Solutions?  
Marillo Sialer E & Meisel T

4068 The Role of Hydroxyl Group (OH) in Forming Minerals  
Onufrienok V, Sazonov A, Terehova A & Nikiforov A

4069 Ti-in-Quartz Thermometry of Siliciclastic Metasedimentary Rocks of the Otago Schist, New Zealand  
Palin JM, King CL, Wilson A & Martin CE

4070 Spectroscopic Investigations on Natural Stichtite and Synthetic Hydrotalcites  
Parthasarathy G & Reddy C

4071 Zoned Calc-Silicated Boudins in Quartz-Pelitic Metatexitic Rocks, NW Portugal  
Ribeiro MDA, Areias MDC, Dória A & Ferreira P

4072 Late-Cretaceous Alkaline Continental Magmatism Associated with Deccan Continental Flood Basalt Sequences of Saurashtra in Western India  
Subba Rao DV, Babu EVSSK, Vidyasagar G & Madhukumar B

4073 Basaltic Volcanism in NE-Russia; Evidence for Metasomatized Depleted Mantle Underneath Bering Sea Basalt Province  
Naflos T, Tschegg C, Bizimis M & Akinin V

4074 Proterozoic Magmatism  
Volcan O

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**22c: General Biogeochemistry**

Floor 4

4075 Tracing the Geographical Origin of Beefs Based on Carbon and Oxygen Isotopes  
Bong Y-S, Lee K-S & Shin W-J

4076 Research on Pretreatment of Highly Concentrated Dye-Printing Wastewater Using Surplus Sludge Together with Powder Ash  
Chen I

4077 Coupled Geochemical and Foraminiferal Response to Environmental Changes during the Deposition of Upper Cretaceous Oil Shale in the Negev, Israel  
4078 Determining the Geographical Origin of Ginseng Using Strontium Isotopes, Multielements, and Metabolite Analysis

4079 MUMIA VERA – Vera Mumia?
Scholz-Böttcher B, Rullkötter J & Nissenbaum A

4080 Provenance Discrimination of Plants from Three Bedrock Types Using Strontium Isotopes and Chemical Analysis
Song B-R, Gautam M, Shin W-J, Choi M & Lee K-S

4081 Biomineralization and Growth Mechanism of Morphologically Controlled Strontium Carbonate
Sreedhar B, Satya Vani C, Keerthi Devi D & Parthasarathy G

4082 UV-Vis Absorbance, Fluorescence and Concentration of Dissolved Organic Carbon (DOC) of Sea-Surface Microlayer Samples Collected at Okinawa, Japan
Toyama Y, Miyagi Y & Arakaki T

4083 Readily Available Acidity in Schwertmannite
Vithana C, Sullivan L, Bush R & Burton E

4084 Determination on Nitrate Use Capacity in Plants via Isotope Tracer
Wu Y

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<td>Laboratoire d’Astrophysique de Bordeaux</td>
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<td>‘Exoplanet Atmospheres’</td>
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<td><strong>Goldschmidt Medal (GS):</strong> Frank J. Millero</td>
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<td><strong>Patterson Medal (GS):</strong> Jeff Severinghaus</td>
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<td><strong>Clarke Medal (GS):</strong> Rajdeep Dasgupta</td>
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<td><strong>Oral Sessions</strong></td>
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<td>14:00</td>
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02f: Primordial Differentiation and Destruction of Hadean Silicate Reservoirs

Session chaired by Guillaume Caro & Vickie Bennett

09:30  **Invited:** Evolution of Magma Oceans
       *Solomatov V*

09:45  **Invited:** Hf Isotope Evidence for Depleted and Enriched Reservoirs in the Hadean
       *Blichert-Toft J & Albarède F*

10:00  Evolution of Deep Mantle Sources as Inferred from Os-Nd Isotope Systematics of Archean Komatiites
       *Puchtel I & Walker R*

10:15  Tungsten Isotopic Anomalies in Archean Komatiites
       *Touboul M, Puchtel IS & Walker RJ*

10:30  The W Isotopic Composition of the Hadean Mantle: Evidence for the Late Heavy Bombardment
       *Willbold M, Elliott T & Moorbath S*

10:45  **Keynote:** Dynamical Constraints on Mantle Reservoirs through Time
       *Davies G*

11:00  Implications of a Non-Chondritic Earth for Terrestrial Heat Production and Geodynamics
       *White W & Phipps-Morgan J*

11:15  **Invited:** Jack Hills Zircon Lu-Hf Revisited
       *Harrison TM & Bell E*

11:30  Searching for Ancient Crusts: Integrating Pb Isotopes in Plagioclase with Hf Isotopes in Zircon
       *Souders K, Sylvester P & Myers J*

Session 22b follows this session in this room. For details see page 324.
03b: Estimating the Deep Mantle Water Budget from Geochemistry, Geophysics, and Geodynamical Modelling

Session chaired by Bruno Reynard

09:30 Water Contents in the Cenozoic Subcontinental Lithospheric Mantle beneath the Cathaysia Block, SE China
Yu Y, Xu X, Griffin W & O'Reilly S

09:45 A New Model of the Asthenosphere
Karato S-I

10:00 Keynote: Fluid Processes in Subduction Zones and Global Water Circulation
Iwamori H

10:30 Slab-Derived Halogens and Noble Gases with a Marine Pore-Fluid Signature

10:45 Electrical Conductivity of the Serpentinised Mantle and Fluid Flow in Subduction Zones
Reynard B, Mibe K & Van de Moortèle B

11:00 Invited: Equation of State of Water and Melting Curve of Ice VII Based on Simultaneous Measurements of Sound Velocity and X-Ray Diffraction of Ice VII to 19 GPa and 873 K

11:15 Kinetics and Mechanism of Antigorite Dehydration: Implications for Subduction Zone Seismicity
Chollet M, Daniel I, Koga KT, Morard G & van de Moortèle B

11:30 Stability of Phase D at High Pressure and Temperature: Implications for the Role of Fluids in the Deep Mantle
Ghosh S & Schmidt M

11:45 Hydrous Phases in the Lower Mantle
Smyth JR & Brown DA

12:00 Invited: Elastic Properties of Hydrous and Anhydrous Mantle Minerals at High Pressure
Wang J & Bass J
**04d: Influence of Volatiles on Mantle and Magma Processes**

Session chaired by Rajdeep Dasgupta, Alison Shaw & Dan Frost

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<td>09:30</td>
<td>Evidence of Water Degassing in Archean Komatiites</td>
<td>Fiorentini ML, Beresford S, Stone W &amp; Deloule E</td>
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<td>10:00</td>
<td>Invited: Multiple Sulfur Isotopes in Basalts: Chemical Geodynamics in the South Atlantic Mantle</td>
<td>Labidi J, Cartigny P, Bourrand J-J &amp; Assayag N</td>
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<td>10:15</td>
<td>Chromium Mobility in Hydrous Fluids at Upper Mantle Conditions</td>
<td>Klein-BenDavid O, Pettke T &amp; Kessel R</td>
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<td>10:30</td>
<td>Noble Gases and Halogens in Icelandic Basalts</td>
<td>Weston B, Burgess R &amp; Ballentine CJ</td>
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<tr>
<td>10:45</td>
<td>Crustal Accretion on Mid-Ocean Ridges Revealed through Volatile Concentrations in Olivine-Hosted Melt Inclusions</td>
<td>Wanless VD, Shaw A &amp; Behn M</td>
</tr>
<tr>
<td>11:00</td>
<td>Keynote: Water in the Mantle, Melting, and the Evolution of Earth’s Atmosphere</td>
<td>Kepler H</td>
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<tr>
<td>11:30</td>
<td>Ferric Iron and Water Incorporation in Wadsleyite Under Hydrous and Oxidizing Conditions</td>
<td>Bolfan N, Munoz M, McCammon C, Deloule E, Ferot A, Demouchy S, France L, Andrault D &amp; Pascarelli S</td>
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<tr>
<td>11:45</td>
<td>A New Methodology to Experimentally Determine Water Incorporation into Upper Mantle Olivine and Pyroxene</td>
<td>Kovacs I, Green D, Rosenthal A, Hermann J, O’Neill H, Hibberson W &amp; Udvardi B</td>
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<tr>
<td>12:00</td>
<td>Quantification of H in Olivine: Direct Calibration of FTIR and SIMS by ERDA</td>
<td>Withers A, Hirschmann M, Bureau H &amp; Raepsaet C</td>
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<tr>
<td>12:15</td>
<td>Water Content and OH Speciation in Natural Fe-Bearing Pyroxenes</td>
<td>Begaudeau K, Morizet Y &amp; Mercier JC</td>
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</table>

(Session 04d continues on Thursday 18th PM on page 331)
05c: Continent Formation through Time

Session chaired by Steve Parman, Peter Clift, Steven Shirey & Martin Van Kranendonk

09:30 U-Pb Ages and Hf Isotopes of Detrital Zircons from Miogeoclinal Strata of Western North America
Gehrels G & Pecha M

09:45 Long-Distance Transport of North Gondwana Cambro-Ordovician Sandstones: Evidence from Detrital Zircon Hf Isotopic Composition
Morag N, Avigad D, Gerdes A, Belousova E & Harlavan Y

10:00 Zircon U-Pb, Hf and O Isotope Constraints on Growth Versus Recycling of Continental Crust in the Grenville Orogen, Ohio, USA

10:15 Evolution of the Lower Crust from S Mexico: Constraints from Lu-Hf Isotopes and U-Pb Ages in Zircon
Weber B, Scherer E, Mezger K & Ruiz J

10:30 From Archean to Cambrian: Isotopic Crustal Evolution of the Borborema Province, NE Brazil
Zincone S, Wernick E & Santos T

10:45 The Evolution of the Tarim Craton in Archean and Proterozoic: Zircon U-Pb and Hf Isotopic Evidence from the Kuruktag Area, NW China
Zheng B, Zhu W, Shu L, Wu H & He J

11:00 Crustal Growth in the North China Craton at ~2.5 Ga: Evidence from in situ Zircon U-Pb Dating, Hf Isotopes and Whole-Rock Geochemistry of the Dengfeng Complex

11:15 Provenance of Early Sedimentary Sequences in the Tethyan Yunnan, SW China: Age and Hf Isotope of Early Archean Zircons
Chen F, Liu B-X, Li S-Q & Siebel W

11:30 Growth and Reworking of Gondwana through Time
Dhuime B, Hawkesworth C, Cawood P, Storey C & Sircombe K

11:45 Beach Placer, a Proxy for the Average Nd-Hf Isotopic Composition of a Continental Area
Garcon M, Chauvel C & Bureau S

12:00 Eoarchean TTG Formation by Melting of Thickened Mafic Arc Crust
Hoffmann JE, Nagel TJ & Münker C

Session 05c continues overleaf...
12:15 The Archean Anorthosite-Monzogranite Magmatic Association of the Narryer Gneiss Terrane, Western Australia

Sylvester P, Souders K, Crowley J & Myers J

(Session 05c continues on Thursday 18th PM on page 334)
06c: Geochemical Tracing of Recycled Subducted Materials

Session chaired by Julian Pearce & David Peate

09:30 **Keynote:** Crustal Recycling: New Findings and Challenges

*Sobolev A*

10:00 Distinguishing Arc, Backarc, and Hotspot Affinities Using Helium Isotope and C/²He Ratios

*Lupton L, Resing J, Lilley M, Butterfield D, Keller N, Arculus R, Baker E & Embley R*

10:15 Stable Isotope (C-N) and Noble Gas (Ne-Ar) Evidence for Recycled Plume Components at the CIR

*Barry P, Hilton D, Fueri E, Murton B, Hemond C & Dyment J*

10:30 The Noble Gas and Halogen Composition of the Hydrated Oceanic Crust

*Chavrit D, Burgess R, Ballentine C, Weston B & Teagle D*

10:45 Halogens (Cl, Br, I) in Basalt Glasses

*Kendrick M, Kamenetsky V, Woodhead J, Phillips D & Honda M*

10:45 Recycled Halogen Signature Preserved in the Tristan Hotspot

*Abbott L, Burgess R, Murphy D & Ballentine C*

11:15 Molybdenum Isotopes in the Altered Oceanic Crust, a Novel Proxy for Recycling?

*Vils F, Elliott T, Willbold M, Harris M, Smith-Duque C, Coggon R & Teagle D*

11:30 Molybdenum Isotopes as a Novel Tracer for Subduction Components in the Mariana Arc

*Freyre H, Elliott T & Willbold M*

11:45 Tracing Crustal Recycling in the Mantle Sources of the Cape Verde and Azores Plumes Using Stable Mo Isotope Measurements

*Lai Y-J, Elliott T & Willbold M*

12:00 Tracing Deep Slab Recycling via Study of Boron Isotopes of Volcanic Rocks from Hotspot (OIB) Settings

*Savoy IP, Shirey S, Tonarini S, Ryan J & Hauri E*

12:15 Ca Isotopes of Central American Arc Basalts Lack Carbonate Component

*Simon J, Brown S & DePaolo D*

(Session 06c continues on Thursday 18th PM on page 335)
08b: Chemical and Microbial Electron Transfer Processes at Mineral Surfaces

Session chaired by Kevin Rosso & Andreas Kappler

09:30 Surface Transformations and Element Cycling Resulting from Interfacial Fe(II)-Fe(III) Self Exchange
*Catalano J, Friedich A, Luo Y, Fenter P, Park C & Rosso K*

09:45 Fe(II) Exchange at Titanomagnetite-Water Interfaces
*Pearce C, Liu J, Qafoku O, Arenholz E, Heald S & Rosso K*

10:00 Origin of the Differences in Redox Reactivity of Iron (Oxyhydr)oxides Revealed by Time-Resolved Spectroscopy

10:15 Control of Charge and Orbital Order at the Fe₃O₄(001)-Surface via Adsorbates: Insights from Density Functional Theory Calculations
*Pentcheva R, Mulakaluri N & Scheffler M*

10:30 Defining a Landscape for Microbial Electron Transfer to Extracellular Minerals

10:45 Cytochromes and Iron Reduction
*Richter K & Gescher J*

11:00 Spectral and Electrochemical Evidence for Kinetically Separate Cytochrome Compartments in Geobacter Biofilms
*Liu Y, Franklin R & Bond D*

11:15 Electron Shuttle Production by Shewanella oneidensis
*Gralnick J & Kotloski N*

11:30 Does the Electron Transfer Process Determine the Product of U(VI) Reduction?

11:45 Uranium Valence Cycling with Iron-Rich Phyllosilicates
*Burgos W, Luan F, Boyanov M, Kemner K & Dong H*

12:00 Olivine and Pyroxene Surface Reactivity during H₂-generation
*Templeton A, Mayhew L, Trainor T, Eng P & McCollom T*

12:15 Challenges in the Identification of Redox Reactive Fe(II) Mineral Phases in Suboxic Aquifer Sediments
*Zachara J, Peretyazhko T, McKinley J, Liu C & Felmy A*
### 08c: Biogeochemical Processes within Floodplain and Deltaic Sediments

**Session chaired by Scott Fendorf, Shawn Benner & Ruben Kretzschmar**

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<tr>
<td>09:30</td>
<td><strong>Keynote:</strong> Transport of Solutes through Hydraulically and Chemically Heterogeneous Sediments of the Bengal Basin</td>
<td>Michael H</td>
</tr>
<tr>
<td>10:00</td>
<td>Deltaic Landforms and Stratigraphic Controls on Groundwater Arsenic</td>
<td>Weinman B, Goodbred S, van Geen A &amp; Singhvi A</td>
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<tr>
<td>10:30</td>
<td><strong>Invited:</strong> The Hydrogeochemistry of Pond and Rice Field Recharge: Implications for the Arsenic Contaminated Aquifers in Bangladesh</td>
<td>Neumann RB, Ashfaque KN, Polizzotto ML, Badruzzaman ABM, Ali MA &amp; Harvey CF</td>
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<tr>
<td>10:45</td>
<td><strong>Invited:</strong> Arsenic Contamination of Groundwater in Vietnam: Delta-Wide Survey and 3D Geospatial Modeling</td>
<td>Berg M, Winkel LHE, Trang PTK, Lan VM, Stengel C, Amini M, Ha NT &amp; Viet PH</td>
</tr>
<tr>
<td>11:00</td>
<td><strong>Invited:</strong> Predicting Spatial and Temporal Concentrations of Arsenic within the Mekong Delta</td>
<td>Kocar B, Benner S &amp; Fendorf S</td>
</tr>
<tr>
<td>11:15</td>
<td>Redox Transformations of Cu in Periodically Flooded Soils</td>
<td>Fulda B, Voegelin A &amp; Kretzschmar R</td>
</tr>
<tr>
<td>11:45</td>
<td><strong>Invited:</strong> The Role of Microbial Sulfidogenesis in Shaping Iron-Sulfur-Arsenic Interactions within Floodplain Soils</td>
<td>Burton E, Johnston S &amp; Bush R</td>
</tr>
<tr>
<td>12:00</td>
<td>The Effect of Flood-Induced Redox Oscillations on Arsenic Mobility in a Calcareous Fluvisol</td>
<td>Parsons C, Couture R-M, Omorogie E, Roman-Ross G &amp; Charlet L</td>
</tr>
<tr>
<td>12:15</td>
<td>Mercury Colloid Formation in a Floodplain Soil</td>
<td>Hofacker A, Voegelin A &amp; Kretzschmar R</td>
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# 10i: Geochemistry in Geothermal Energy: Field Observations, Experiments and Modeling

Session chaired by Simona Regenspurg & Ferdinand Hingerl

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<thead>
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| 09:30 | **Keynote:** Review of Geochemical Problems and Mitigation during the Production of Geothermal Reservoirs<br>
 Vuataz F-D & Giroud N |                                                                              |
| 10:00 | Potential Products of Fluid-Rock Interactions in the Soultz-Sous-Forêts Enhanced Geothermal System<br>
 Fritz B, Baldeyrou-Bailly A & Vidal O |                                                                              |
| 10:15 | Origin and Isotope Composition of the Radium Content in Highly Saline Fluids<br>
 Degering D & Köhler M |                                                                              |
| 10:30 | Biogeochemical Characterization of Geothermal Fluids<br>
| 10:45 | Water-Rock Interaction at the Theistareykir Geothermal Field in NE-Iceland<br>
 Gautason B & Muehlenbachs K |                                                                              |
| 11:00 | Hydrothermally Induced Changes of Electrical Rock Conductivity and Permeability in Porous Feldspar-Rich Materials<br>
 Schepers A & Milsch H |                                                                              |
| 11:15 | Experimental Fluid-Rock Interaction Simulating Brine Reinjection in Greywacke-Hosted Reservoirs of the Taupo Volcanic Zone, New Zealand<br>
 Sonney R & Mountain BW |                                                                              |
| 11:30 | Sulfate Mineral Solubilities in Na-Ca-Cl Brines<br>
 Banks J & Regenspurg S |                                                                              |
| 11:45 | Chemical Sensors Based on Zr/ZrO₂ Electrode for Measurement of pH in a Subcritical to Supercritical Aqueous Water<br>
 Zhang X, Zhang R & Hu S |                                                                              |
| 12:00 | **Invited:** Thermodynamic Models of Aqueous Systems To High Temperature and Concentration<br>
 Moller N & Weare JH |                                                                              |
| 12:15 | Development of an Aqueous Activity Model for Geothermal Conditions<br>
 Hingerl F, Wagner T, Kulik D, Kosakowski G & Driesner T |                                                                              |
11b: Ore Deposits and the Role of the Lithospheric Mantle – Sponsored by SGA

Session chaired by Wolfgang Dereck Maier, Sisir K. Mondal, Thomas Oberthür & Marco Fiorentini

09:30 Keynote: Ore Deposits and the SCLM
Griffin W, Begg G, O’Reilly S & Pearson N

10:00 Invited: Ore Metals from the Subcontinental Lithospheric Mantle?
Arndt N

Kerrich R

10:30 Intra-Cratonic Lithospheric Deformations – Heterogeneities, Faulting and Rayleigh-Taylor Instabilities

10:45 Gold Mobility in the Mantle: Constraints from Sulfides in Pyroxenites and Lherzolites
Saunders J, Pearson N & O’Reilly S

11:00 Gold Contents of the Cratonic Sub-Continental Lithospheric Mantle: Implications for Orogenic Gold Deposits
Maier W, Kontinen A & McDonald I

11:15 Low Oxygen Fugacity Mantle Derived Auriferous Fluids for Archaean Orogenic Gold Deposit of Ajjanaahalli, Chitradurga Schist Belt, Dharwar Craton, India
Sarangi S, Sarkar A, Balaram V & Srinivasan R

11:30 Sulfide Mineralogy of West Greenland Kimberlitic Mantle Xenoliths
Mondal SK, Bernstein S & Rosing MT

11:45 Melting and Melt/Rock Reaction of Sulphides in Middle Atlas Spinel Peridotite Xenoliths
Westner K, Wittig N, Klemd R, Brätz H & Osbahr I

12:00 Possible High-PGE-Au Silicate Melt/Aqueous Fluid in Mantle Wedge: Inferred from Ni Metasomatism in Avacha Peridotite Xenolith
Ishimaru S, Arai S, Borisova AY & Tamura A

(Session 11b continues on Thursday 18th PM on page 341)
12e: Biomineralization of Marine Organisms: Toward a Better Understanding of Proxy Records

Session chaired by Claire Rollion-Bard, Dominique Blamart & Jess Adkins

09:30 Keynote: Understanding Biological Control and Environmental Influence – Unlocking the Secrets of Biomineralisation

_Cusack M_

09:45 Quantification of Environmental Proxy Precision

_Meibom A & Kopp C_

10:00 Biomineralization and Seawater Dynamics in Foraminifera Studied with the Fluorescent Dye Calcein

_Erez J, Levenson Y & Almogi-Labin A_

10:15 Calibrating the Boron Isotope pH-Proxy in _Globigerinoides ruber_ by MC-ICPMS

_Henehan M, Foster G, Rae J, Erez J, Wilson P & Kucera M_

10:30 Boron Isotopes (δ¹¹B) in Coral: Energy Budgets and pH Control at the Site of Calcification

_Hendy E, Mass T, Brickner I & Genin A_

10:45 Boron Isotope Systematics of pH Regulation in Cold-Water Corals and Resilience to Ocean Acidification

_Trotter J, McCulloch M, Montagna P, Lopez Correa M, Taviani M & Forsterra G_

11:00 Calcium Isotopes during Coral Biomineralization

_Gagnon A, DePaolo D, Adkins J & De Yoreo J_

11:15 High Temporal Resolution δ¹⁸O and δ¹³C Heterogeneity in a _Porites lobata_ Coral Skeleton

_Allison N & Finch A_

11:30 Growth Rate Effect on Oxygen Isotope Fractionation between Calcite and Fluid: _In situ_ Data


Session 12f follows this session in this room. For details see page 313.

Session chaired by Pierre-Henri Blard, Didier Bourles & Finkel Bob

11:45 **Keynote**: High-Precision $^{10}$Be Dating of Moraines and the Exploration of Pro-Glacial Bedrock as Climate Archive Using the New in situ $^{14}$C/$^{10}$Be Tool

*Schaefer JM, Schimmelpfennig I, Goehring B, Finkel RC & Rood D*

12:15 Most Recent Developments in AMS Technologies

*Synal H-A, Schulze-König T, Seiler M, Suter M, Vockenhuber C & Wacker L*

(Session 12f continues on Thursday 18th PM on page 343)
13g: Atmospheric Dust

Session chaired by Reto Gieré & Bernard Grobéty

09:30  Role of Acid Mobilization in Association of Smaller Particle Size with Higher Iron Solubility
       Itô A

09:45  Updated Dust-Iron Dissolution Mechanism: Effects of Organic Acids, Photolysis, and Dust Mineralogy
       Johnson M & Meskhidze N

10:00  Physical and Chemical State of Fe-Phases in Chinese Aeolian Dust
       Kaneko M, Nakamatsu Y, Xie Z & Utsunomiya S

10:15  Chemical Analysis of Saharan Dust in Marine Aerosols
       Fomba KW, Müller K, Gnauk T & Herrmann H

10:30  Atmospheric Dust Input to the Northern Gulf of Aqaba
       Teutsch N, Tirosh O, Tzipori A, Dayan U & Erel Y

10:45  Characterization of Saharan Dust from Red Rain Precipitated over Athens, Greece
       Godelitsas A, Nastos P, Mertzimekis T, Toli K, Douvalis A & Simon R

11:00  Invited: Characterizing Sources of Airborne Mineral Dust, in Iraq
       Engelbrecht J & Jayanty RKM

11:15  Invited: Chemical Speciation of Airborne Mineral Dust in the Middle East
       Jayanty R, Flanagan JB & Engelbrecht JP

11:30  Seasonal and Temporal Variations of Uranium Isotope Ratio in Atmospheric Deposits in Japan
       Kikawada Y, Yamauchi R, Nomura M, Oi T & Hirose K

11:45  Transfer of Uranium Isotopes, Thorium and their Decay Products to Edible Plants
       Jeambrun M, POURCELOT L, MercaT C, Gauthier-Lafaye F & Boulet B

12:00  Mineral Composition of Particulate Matter in Human Lung Samples from Upper Silesia (Poland) – Preliminary Results
       Jablonska M

12:15  Dust Particles in Brochoalveolar Lavage Fluids from Coal Miners in Quang Ninh Province, Viet Nam
       Gieré R, Hoàng-Hòa TB & Sedlazeck P
14e: Silicate Weathering and Organic Carbon Sequestration during Continental Erosion: Processes Controlling Dissolved and Particulate Fluxes Exported by Rivers to the Ocean

Session chaired by Valier Galy & Herdis Schopka

09:30 The Subduction Weathering Factory
Gaillardet J, Louvat P, Dessert C & Lajeunesse E

09:45 Uncertainty Assessment in Quantification of Silicate Weathering Rates in Global Rivers
Moon S, Chamberlain CP & Hilley G

10:00 Constraining Subannual Variability in River Chemistry and Hydrology with $^{87}$Sr/$^{86}$Sr: A Case Study in the Fraser River Basin, Canada

10:15 Weathering Fluxes from Time Series Sampling of the Irrawaddy and Salween Rivers
Chapman H, Bickle M, Thaw SH & Thiam HN

10:30 Ca Fluxes Linked to Particles Exchange with Seawater during Himalayan Erosion
France-Lanord C, Lupker M, Lartiges B & Gaillardet J

10:45 Incongruent Dissolution of Volcanic Riverine Particulate Material in Seawater: Consequences for Global Element Cycling
Jones M, Pearce C, Jeandel C & Oelkers E

11:00 Carbon Export by Erosion of Biomass from a Mountain Belt: Controls on Rates of Transfer
Hilton RG, Hovius N, Gay A, Horng MJ & Chen H

11:15 Particulate Organic Carbon Deposition Offshore Taiwan Following Typhoon Morakot
Sparkes R, Hovius N, Gay A, Kumar RV & Liu JT

11:30 Comparing the Fate of Lignin in Dissolved and Particulate Organic Matter of Ganges–Brahmaputra River System
Feng X, Gayle V, Montlucon D & Eglinton T

11:45 **Keynote:** Efficient Cycling of Particulate Organic Carbon through Orogenic Systems

12:15 Contribution of Groundwater to Chemical Weathering Fluxes in the Pingtung Plain, Taiwan
### 15h: Submarine Hydrothermal Processes and Alteration of the Oceanic Lithosphere

Session chaired by Frieder Klein, Marguerite Godard, Gretchen L. Früh-Green & Niels Jöns

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<tr>
<td>09:30</td>
<td>H₂-rich Fluids Issued from the Kulo Lasi Volcano: A New Active Hydrothermal Field Recently Discovered in the South-West Pacific</td>
<td>Charlou JL, Donval JP, Konn C, Guyader V &amp; Fouquet Y</td>
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<tr>
<td>10:00</td>
<td>Phase Separation, Degassing and Anomalous Methane at the Menez Gwen Hydrothermal Field</td>
<td>Reeves E, Prieto X, Hentscher M, Rosner M, Seewald J, Hinrichs K-U &amp; Bach W</td>
</tr>
<tr>
<td>10:30</td>
<td>Cu, Zn and Fe Isotope Systematics of Low-T Hydrothermal Fe-Si Deposits</td>
<td>Moeller K, Schoenberg R, Thorseth IH &amp; Pedersen R-B</td>
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<tr>
<td>10:45</td>
<td>Calcium Carbonate Veins in Ocean Crust Record a Threefold Increase of Seawater Mg/Ca and Sr/Ca in the Past 30 Million Years</td>
<td>Rausch S, Böhm F, Eisenhauer A, Klügel A &amp; Bach W</td>
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<tr>
<td>11:00</td>
<td>Oceanic Plagiogranites as Products of Hydrothermal Activity at Slow-Spreading Ridges</td>
<td>Koepke J, Wolff E &amp; Feig S</td>
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<td>11:15</td>
<td>Chlorine Chemistry of Altered Oceanic Crust</td>
<td>Barnes J</td>
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<tr>
<td>11:45</td>
<td>The Ligurian Ophiolite: An Analogue to Marine Serpentinite-Hosted Hydrothermal Systems</td>
<td>Schwarzenbach E, Früh-Green G &amp; Bernasconi S</td>
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<tr>
<td>12:00</td>
<td>Characterization of Hyperalkaline Fluids Produced by Serpentinization of Mantle Peridotites in Oman and in Liguria (Northern Italy)</td>
<td>Monnin C, Chavagnac V, Ceuleneer G, Boulart C &amp; Hoareau G</td>
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<tr>
<td>12:15</td>
<td>The Evolution of a Serpentinizing Environment Inferred from Andradite Vein Networks</td>
<td>Plümper O, Beinlich A, Janots E &amp; Austrheim H</td>
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</tbody>
</table>
16a: Geochemical Processes in Mining Environments: Biological Interactions, Coupled Processes, and Bioremediation
Session chaired by Kate Campbell, Colleen Hansel & Kai-Uwe Ulrich

09:30 Invited: High-Resolution Metabolomics Reveals Unusual N-Methyl Lyso Phosphatidylethanolamines as Abundant and Strain-Specific Lipids in Acid Mine Drainage Biofilms

09:45 Biogeochemistry and Stable Isotope Investigation of Acid Mine Drainage Associated with Abandoned Pb-Zn Mine in Balya, Turkey
Balci N, Gul Karaguler N, Sonmez MS & Sari E

10:00 Ecological Niches of Fe-Oxidizing Acidophiles in a Coal Mine Discharge
Jones D, Brown J, Larson L, Mills D, Burgos W & Macalady J

10:15 New Thiomonas and Bordetella Strains Involved in Iron Oxidation at a Slightly Acidic, Heavy Metal Contaminated Creek
Fabisch M, Beulig F, Akob DM & Küsel K

10:30 Biogenic Mn Oxide Formation at pH 5.5 and 7 by New Mn-Oxidizing Bacteria from a Former U Mining Site
Akob D, Beyer A, Schäffner F, Händel M, Merten D, Büchel G, Totsche KU & Küsel K

10:45 Invited: Hydrological Constraints for Biogeochemical Processes in Acidic Mining Lakes
Peiffer S

11:00 Schwertmannite and Fe Oxides Formed by Biological Low-Ph Fe(II) Oxidation Versus Abiotic Neutralization
Larson L, Luan F, Troyer L, Borch T & Burgos W

11:15 Understanding O₂-Deficient and CO₂-enriched Gas Production and Migration in the Subsurface Above a Coal Post-Mining Area through in situ Gas Monitoring and Modelling
Lafortune S, Charmoille A & Pokryszka Z

11:30 Bench Scale Experiments Modeling the Effects of a Phytostabilization Strategy for Arsenic and Lead Containing Mine Tailings in the Semi-Arid Southwestern United States
Hammond C, Root R, White S, Maier R & Chorover J

11:45 Speciation and Micro-Scale Spatial Distribution of As in a Mining-Affected River Floodplain
Kretzschmar R, Mandaliev P, Mikutta C, Barmettler K & Kotsev T

Session 16a continues overleaf...
12:00  Mechanism of Uranium Accumulation in a Mining-Impacted Acidic Peat Bog  

12:15  Linking Geochemistry and Texture of Mine Tailings and Soils to the Evolution of Plant Community in a Contaminated Copper-Sulphide Mining Area  
Anawar HM & Freitas MC

(Session 16a continues on Thursday 18th PM on page 346)
17k: Significance of Iodine in Biogeochemistry and the Environmental Sciences: Special Session Commemorating the Bicentennial of the Discovery of Iodine

Session chaired by Yasuyuki Muramatsu & Glen Snyder

09:30  **Keynote:** Iodide in Kelp: An Inorganic Antioxidant in Life Impacting Atmospheric Chemistry  
Kuepper FC

10:00  Cell Permeability/Senescence Controls the Reduction Rate of Iodate to Iodide in Marine Phytoplankton  
Bluhm K, Croot P, Wuttig K & Lochte K

10:15  **Invited:** The Correlation between Iodide Sorption Capacity and Microbial Enzyme Activity in Soils  
Amachi S & Muramatsu Y

10:30  Understanding Bioavailability of Iodine in Soils of Northern Ireland  
Smith H, Ander L, Bailey E, Croot N, Watts M & Young S

10:45  Iodine Fingerprints Biogenic Fixation of Platinum and Palladium  

11:00  **Invited:** The 129I Isotopic Composition of Supergene Iodine Minerals in Chile and Australia  

11:15  Fluids at Continental Margins: What We Can Learn from 129I Results  
Fehn U

11:30  Anthropogenic Contributions of 129I and 85Kr to Global Reservoirs: Current Distribution Patterns and Projected Increases  
Snyder GT, Moran JE & Aldahan AA

11:45  Tracer Application of Chemical Speciation of 129I in Arctic Seawater  

12:00  129I as Atmospheric Tracer  
Jabbar T, Steier P, Wallner G, Kandler N & Katzberger C

12:15  Depth Profile of 129I/127I Ratio in Andisol Collected in Preserved Field of NIAES, Tsukuba, Japan  
Matsuzaki H, Maejima Y, Ohkura T, Tsuchiya Y, Abe K, Miyairi Y & Muramatsu Y

(Session 17k continues on Thursday 18th PM on page 349)
# 18c: Accurate and Consistent Time-Keeping in Geological History

Session chaired by Dan Condon, Fin Stuart & Claudine Stirling

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<td>09:30</td>
<td>The Evolving Landscape of U-Series Sea Level Chronologies</td>
<td>Dutton</td>
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<tr>
<td>09:45</td>
<td>Best Practices for Ensuring Consistent Coral Geochronology</td>
<td>Thompson W.</td>
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<td>10:00</td>
<td>Time Constraint on Brunhes-Matuyama Inversion Inferred by U-Series Disequilibrium</td>
<td>Ghaleb B, Falguères C, Pozzi J-P, Rousseau L, Carlt J, Boudad L.</td>
</tr>
<tr>
<td>10:45</td>
<td>Further Progress Towards Synchronizing Geochronometers</td>
<td>Renne P</td>
</tr>
<tr>
<td>11:00</td>
<td>The Manicouagan Impact Crater: A site for testing the accuracy of revisions to the K-Ar System</td>
<td>Mark D, Morgan L</td>
</tr>
<tr>
<td>11:15</td>
<td>Improving the Accuracy of the $^{40}$Ar/$^{39}$Ar Geochronometer</td>
<td>Morgan L, Mark D, Kuiper K, Postma O, Villa I &amp; Wijbrans J</td>
</tr>
<tr>
<td>11:30</td>
<td>Toward Establishing Precise Chronologies for the Integration of Late Pleistocene Palaeoclimate Archives: An Example from Suigetsu SG06, Japan</td>
<td>Smith V, Mark D, Staff R, Blockley S, Bronk Ramsey C, Bryant C, Nakagawa T, Kim KH, Weh A, Takemura K, Danhara T</td>
</tr>
<tr>
<td>11:45</td>
<td>Development of a Micro-Interdigitated Electrode Array for Use in High Precision TIMS-Based Isotope Ratio Determinations</td>
<td>Farmer G, Verplanck E</td>
</tr>
<tr>
<td>12:00</td>
<td>Pairing Re-Os Geochronology and Biostratigraphy – Dating Fossils</td>
<td>Hannah J, Stein HJ, Yang G &amp; Maletz J</td>
</tr>
<tr>
<td>12:15</td>
<td>Possible Rhenium Fractionation during Standard Re-Os Dissolution and Chemical Separation Procedures</td>
<td>Zimmerman A, Georgiev S, Yang G, Stein H &amp; Hannah J</td>
</tr>
</tbody>
</table>
20i: Advanced Study of the Physical Properties of the Mantle Materials, and Applications to the Earth’s Structure, Composition and Dynamics

Session chaired by Tomoo Katsura & Stanislav Sinogeikin

09:30 Indoor Seismology

09:45 Toward a Self-Consistent Pressure Scale: Elastic Moduli and Equation of State of MgO and Ringwoodite by Simultaneous X-Ray Density and Brillouin Sound Velocity Measurements at High-P and High-T

10:00 Elastic Properties of Nano-Crystalline MgO to High Pressures by Brillouin Scattering

10:15 Laboratory-Based Conductivity Structure in the Mantle Transition Zone
   Yoshino T, Shimojuku A & Katsura T

   Wang Y

11:00 Experimental Compressibility of Molten Hedenbergite at High Pressure
   Agee C, Barnett G, Waller C, Asimow P, Guo X & Lange R

11:15 Pressure-Induced Phase Transitions and Electron Spin State Changes of Iron Bearing Spinels
   Yamanaka T, Kyono A, Kharlamova S, Struzhkin V, Mao H-K & Hemley R

Session 20k follows this session in this room. For details see page 322.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td>11:30</td>
<td><strong>Invited</strong>: Trace Element Systematics in HT Metamorphic Rutile: The Robustness of the Zr Geothermometer</td>
<td>Kooijman E, Smit M, Mezger K &amp; Berndt J</td>
</tr>
<tr>
<td>11:45</td>
<td><strong>Invited</strong>: Insights into Lower Crustal Evolution from Hf Isotope and Zr Thermometry Data for Rutile</td>
<td>Ewing T, Rubatto D &amp; Hermann J</td>
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<tr>
<td>12:00</td>
<td><strong>U/Pb Age Spectra of Detrital Rutile as a Powerful Tool for Provenance Analysis</strong></td>
<td>Rösel D, Zack T, Barth M, Möller A &amp; Oalmann J</td>
</tr>
</tbody>
</table>

(Session 20k continues on Thursday 18th PM on page 355)
21c: Application of Noble Gases and Naturally Occurring Radioactive Isotopes in Waters and the Environment

Session chaired by Rolf Kipfer & Michael Schubert

09:30 Invited: Noble Gas Paleotemperature Records: Recent Developments in Dating, Archives, and Interpretation
Aeschbach-Hertig W, Wieser M & Marx T

09:45 Investigation of 36Cl Distribution in the North-Western Sahara Aquifer System

10:00 Neon Identifies Two Billion Year Old Fluid Component in Kaapvaal Craton
Lippmann-Pipke J, Sherwood Lollar B, Niedermann S, Stroncik NA, Naumann R, van Heerden E & Onstott TC

10:15 Noble Gases from the Precambrian Shield of Canada
Holland G, Sherwood Lollar B, Li L, Lacrampe-Couloume G, Slater G & Ballentine C

10:30 Mantle Volatiles in Groundwaters Near the San Andreas Fault
Kulongoski J, Hilton D & Belitz K

10:45 Dispersal of Tritium and 3He along the Outer Rim of the Weddell Gyre
Moriarty R, Zhou Z & Ballentine C

11:00 Growth Conditions of Stalagmites Derived from Noble Gas Concentrations in Fluid Inclusions
Scheidegger Y, Vogel N, Figura S, Brennwald M, Wieler R, Fleitmann D & Kipfer R

11:15 Measuring Annual Variation of Soil Air Composition Focusing on the Effect of Oxygen Depletion on Noble Gas Partial Pressures
Freundt E, Schneider T & Aeschbach-Hertig W

11:30 On the Fate of 220Rn in Partially Saturated Media
Huxol S, Brennwald MS, Hoehn E & Kipfer R

11:45 The Dependence of 222Radon Air-Water Partitioning on Water Temperature and Water Salinity
Schubert M & Paschke A

(Session 21c continues on Thursday 18th Posters on page 388)
22b: General High-Temperature Geochemistry

Session chaired by Evelyn Füri & Dominique Tobler

11:45 Geochronological and Thermochronological Evolution of the Southern Gaoligongshan Metamorphic Belt, Yunnan (China)
Eroglu S, Siebel W, Danisik M, Pfänder J & Chen F

12:00 Origin of Miocene Volcanic Rocks from Eskisehir, NW Anatolia, Turkey
Telsiz S, Temel A & Gourgaud A

12:15 The Characteristics of Generation and Distribution of CO$_2$ Gas Pools in Songliao Basin, China
Wang J, Luo X, Hou L & Wang Y
|-------|-------------|-------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 14:00 | Atlas       | de Leuw| Hazen    | Conrad | Lewan  | Huettel| Gallego| Huybrechts| Polhemus| Telford| Aagaard| Kennedy| Reuben| Alt-Epping| Ayling| Baillie| Barfield| Barlow| Blackman| Bloom| Bransome| Bremner| Brother| Brown| Burns| Butcher| Clack
| 15:00 | Atlas       | de Leuw| Hazen    | Conrad | Lewan  | Huettel| Gallego| Huybrechts| Polhemus| Telford| Aagaard| Kennedy| Reuben| Alt-Epping| Ayling| Baillie| Barfield| Barlow| Blackman| Bloom| Bransome| Bremner| Brother| Brown| Burns| Butcher| Clack
| 16:00 | Atlas       | de Leuw| Hazen    | Conrad | Lewan  | Huettel| Gallego| Huybrechts| Polhemus| Telford| Aagaard| Kennedy| Reuben| Alt-Epping| Ayling| Baillie| Barfield| Barlow| Blackman| Bloom| Bransome| Bremner| Brother| Brown| Burns| Butcher| Clack

Oral Presentations Overview
<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Meeting Hall IV</th>
<th>Meeting Hall V</th>
<th>North Hall</th>
<th>Panorama Hall</th>
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<td>14:00</td>
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### 01b: From Gas and Dust to Planetesimals: Processes and Timescales

**Session chaired by Fred Ciesla & Ed Young**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</thead>
</table>
| 14:00  | **Keynote:** The First 10 Million Years of the Solar System  
Bouvier A                                    |
| 14:30  | Chronology of Early Solar System Inferred from Precise Al-Mg Isotope Systematics of Vigarano CAIs  
Mishra RK & Chaussidon M                      |
| 14:45  | Mn/Cr Systematics in Carbonaceous Chondrites: Mineral Isochrons Versus Stepwise Dissolution  
Gopel C, Birck JL & Zanda B                    |
| 15:00  | Uniform Os Isotopic Composition in Early-Formed Planetesimals  
Walker R                                      |
| 15:15  | Palladium-Silver Systematics in the Oldest Differentiated Planetesimal  
Horan M, Carlson R & Blichert-Toft J           |
| 15:30  | W-Os Isotope Systematics in IVB Iron Meteorites  
Wittig N & Humayun M                           |
| 15:45  | $^{238}\text{U}/^{235}\text{U}$ Ratios of Angrites: Adjusting Absolute Ages of Anchors  
Brennecka GA & Wadhwa M                        |
| 16:00  | Revised Ages of Angrites  
Kaltenbach A, Stirling C & Amelin Y             |
| 16:15  | Hf-W Evidence for Rapid Accretion and Core Formation in Protoplanets  
Kruijer T, Sprung P, Kleine T, Leya I & Wieler R |
| 16:30  | Hf-W Chronometry of Angrites: Implications for $^{26}\text{Al}$ Heterogeneity and Core Formation in Protoplanets  
Kleine T, Hans U, Irving T & Bourdon B          |
| 16:45  | **Invited:** Mars as a Planetary Oligarch  
Dauphas N & Pourmand A                          |

(Session 01b continues on Thursday 18th Posters on page 357)
02h: Taphonomy and Geochemistry: Experiment and Observation in Understanding the Fossil Record of Early Life

Session chaired by Tanja Bosak, Michael Tice & Jochen Brocks

14:00 **Keynote:** On the Morphology and Chemistry of (Micro) fossils: Matches, Mismatches and Kerogen Formation

_J. de Leeuw_ I

14:15 **Invited:** Deciphering the Early Fossil Record of Cyanobacterial Mats Based on their Mode of Mineralization

_K. Kremer, J. Kazmierczak & S. Kempe_ S

14:30 **Invited:** Revealing the Hidden Signature of Biomacromolecules in Ancient Organic Fossils

_G. Cody, R. Hazen, S. Gupta & D. Kilcoyne_ D

14:45 Analysis of Organic Biomarkers in Single Precambrian Oil-Bearing Fluid Inclusions Using TOF-SIMS

_S. Siljeström, J. Lausmaa, H. Volk, S. George, P. Sjövall, A. Dutkiewicz & T. Hode_ T

15:00 Identification of the Oldest Carotenoid Breakdown Products in the Geological Record

_C. Lee & J. Brocks_ I

15:15 Peering through the Diagenetic Window for Archean Phototrophs

_M. Tice, J. Cai, C.-T. Lee & D. Lowe_ D

Session 02j follows this session in this room. For details see page 330.
02j: Aqueous Environments Captured by Clay Mineral Deposits on the Early Earth and on Mars

Session chaired by Joseph Michalski & Javier Cuadros

15:30 Chemical Models for Formation of Clay-Rich Layered Rocks in the Mawrth Vallis Region, Mars
   Zolotov M & Mironenko M

15:45 Evidence for Habitable Environments Deep in the Martian Crust
   Michalski J, Niles P & Cuadros J

16:00 Keynote: Terrestrialization of the Earth and its Influence on the Advent of Complex Life
   Kennedy M
04d: Influence of Volatiles on Mantle and Magma Processes

Session chaired by Rajdeep Dasgupta, Alison Shaw & Dan Frost

14:00 Invited: Water Weakening in Dunite: Highlights from Torsion Experiments
Demouchy S, Hansen L, Zimmermann M, Tommasi A, Barou F & Kohlstedt D

14:15 Water Contents of Incipient Partial Melts in Equilibrium with Peridotite at Upper Mantle Conditions
Novella D & Frost DJ

14:30 Invited: H₂O and CO₂ Devolatilization in Subduction Zones: Implications for the Global Water and Carbon Cycles
van Keken P, Hacker B, Syracuse E & Abers G

Session 04e follows this session in this room. For details see page 332.
# 04e: Mantle Compositional Variability: From Ocean Basins to Melt Inclusions

Session chaired by John Maclennan, Leonid Danyushevsky & David Graham

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>14:45</td>
<td>Invited</td>
<td>Mantle Compositional Variability Constrained from Arc and Oceanic Basalts</td>
<td>Iwamori H</td>
</tr>
<tr>
<td>15:00</td>
<td>Keynote</td>
<td>A New Starting Point for the Mantle’s Geochemical Reservoirs</td>
<td>Jackson M &amp; Carlson R</td>
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<tr>
<td>15:30</td>
<td></td>
<td>186Os-187Os and Highly Siderophile Element Abundance Systematics of Earth’s Upper Mantle</td>
<td>Day J, Warren J &amp; Walker R</td>
</tr>
<tr>
<td>15:45</td>
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<td>Noble Gas Isotopic Compositions of Mantle Xenoliths in a Kimberlite</td>
<td>Yamamoto J, Kurz M, Ishibashi H &amp; Curtice J</td>
</tr>
<tr>
<td>16:00</td>
<td></td>
<td>Heavy Noble Gases from the Northern Lau Basin: The Xenon Perspective on Mantle Heterogeneity</td>
<td>Pető M, Mukhopadhyay S &amp; Kelley K</td>
</tr>
<tr>
<td>16:30</td>
<td></td>
<td>Large Regional Variations in F/Cl Ratio for the MORB Source Mantle</td>
<td>Shimizu N</td>
</tr>
<tr>
<td>16:45</td>
<td></td>
<td>H Isotopes in Lavas from Loihi and Pitcairn: Primitive or Recycled Water ?</td>
<td>Clog M, Cartigny P &amp; Aubaud C</td>
</tr>
</tbody>
</table>

(Session 04e continues on Thursday 18th Posters on page 358)

**Session chaired by Julie Bryce, Sam Mukasa, Barry Hanan & Kaj Hoernle**

<table>
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<tr>
<th>Time</th>
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<tr>
<td>14:00</td>
<td><strong>Keynote:</strong> George Tilton: Pioneer of Lead Isotope Geochemistry</td>
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<td><em>Hofmann AW</em></td>
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<td>14:30</td>
<td><strong>Invited:</strong> George R. Tilton and the Development of U-Pb Geochronology</td>
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<td><em>Mattinson J</em></td>
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<td>14:45</td>
<td><strong>Invited:</strong> Carbonatites and Pb Isotopes – Insights into Terrestrial Evolution</td>
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<td><em>Bell K</em></td>
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<td>15:00</td>
<td><strong>Invited:</strong> Melting Conditions Associated with the Colorado Plateau, USA</td>
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<td><em>Reid M, Bouchet R &amp; Blichert-Toft J</em></td>
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<td>15:15</td>
<td><strong>Invited:</strong> Isotopic Variations in Mafic Volcanic Rocks from the Western Branch of the East African Rift</td>
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<td><em>Graham D, Furman T, Blichert-Toft J, Lupton J, Ebinger C &amp; Rogers N</em></td>
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<tr>
<td>15:30</td>
<td>A High-Resolution, Multi-Isotopic Study of Mantle Heterogeneity beneath the Southeast Indian Ridge: Preliminary Pb and Hf Results</td>
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<td>15:45</td>
<td>The Christmas Island Seamount Province, Indian Ocean: Origin of Intraplate Volcanism by Shallow Recycling of Continental Lithosphere?</td>
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<td><em>Hoernle K, Hauff F, Werner R, van den Bogaard P, Conrad S, Gibbons A &amp; Müller D</em></td>
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<tr>
<td>16:00</td>
<td>Ancient Lead Trapped in the Earth’s Upper Mantle</td>
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<td><em>Burton K, Cenki-Tok B, Mokadem F, Harvey J &amp; Parkinson I</em></td>
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<td>16:15</td>
<td>Tracing Mantle Enrichments into Oceanic Crust and Hydrothermal Systems, Juan de Fuca Ridge</td>
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<td><em>Gill J</em></td>
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<td>16:30</td>
<td>Phosphate Dissolution/Precipitation Controls on Isotopic Compositions of Continental Assimilants</td>
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<td><em>Barkman J, Bryce J, Watson B, Blichert-Toft J, Baxter E &amp; Bowring S</em></td>
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<td>16:45</td>
<td>The Pb Age of the Earth from Neoarchean Galenas</td>
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<td><em>Vervoort J, Blichert-Toft J &amp; Albarède F</em></td>
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## 05c: Continent Formation through Time

Session chaired by Steve Parman, Peter Clift, Steven Shirey & Martin Van Kranendonk

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<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>14:00</td>
<td>Continental Growth Spurts during Supercontinent Break-Up</td>
<td>Roberts N</td>
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<tr>
<td>14:30</td>
<td>Invited: Contrasting Roles of Continental and Oceanic Arcs in the Growth of Continents</td>
<td>Condie K &amp; Kroener A</td>
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<tr>
<td>15:30</td>
<td>Crust-Mantle Links and a Major Mesoproterozoic Melting Event</td>
<td>Nowell GM, Dale CW, Pearson GD, Oberthur T, Dijkstra AH &amp; Parman SW</td>
</tr>
<tr>
<td>15:45</td>
<td>Average Nd-Hf Isotopic Compositions and Model Age of the Upper Continental Crust</td>
<td>Chauvel C, Garcon M, Arndt NT, Gallet S &amp; Jahn B-M</td>
</tr>
<tr>
<td>16:00</td>
<td>The Magmatic, Metamorphic, Mineralisation and Plate Tectonic Evolution of Continents</td>
<td>Storey C &amp; Smith M</td>
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<tr>
<td>16:15</td>
<td>Continental Growth Periods Deduced from River Sand U-Pb-Dated Zircons with O and Lu-Hf Isotope Analyses</td>
<td>Allen CM, Campbell IH &amp; Iizuka T</td>
</tr>
<tr>
<td>16:30</td>
<td>Eoarchaean Crustal Evolution of the North Atlantic Craton</td>
<td>Lancaster P, Storey C &amp; Hawkesworth C</td>
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<tr>
<td>16:45</td>
<td>Evolution of the African Continental Crust from Pb-Hf-O Isotope Systematics of Detrital Zircons</td>
<td>Iizuka T, Campbell I &amp; Allen C</td>
</tr>
</tbody>
</table>
06c: Geochemical Tracing of Recycled Subducted Materials

Session chaired by Julian Pearce & David Peate

14:00 What Stays in the Slab and What Returns to the Surface? A Geochemical Mass Balance Model Perspective

14:15 A Varially Enriched Mantle Wedge and Contrasting Melt Types during Arc Stages Following Subduction Initiation in the Southwest Pacific
Todd E, Gill J & Pearce J

14:30 Sediment Melt Flux into the Melting Zone of the Northernmost Tonga Island Arc
Haase K, Regelous M & Beier C

14:45 Effects of Louisville Seamount Subduction: Geochemical Evidence from Central Tonga-Kermadec Arc Volcanoes
Timm C, Graham I, Leybourne M, de Ronde C & Woodhead J

15:00 Recycling of Subducted Sediments Traced by HFSE and W Systematics of K-Rich Mafic Aegean Lavas
Kirchenbaur M & Münker C

15:15 Distinguishing Mantle Derived Contributions at a Continental Arc Volcano: Tatara-San Pedro
Jweda J, Goldstein S, Dungan M, Langmuir C & Davidson J

15:30 Geochemical Fingerprint of an Oligocene to Miocene Arc Segment in Eastern Mindanao (Philippines)
Sonntag I, Kerrich R & Hagemann S

15:45 Neogene Central Andean Adakites, Frontal Arc Migration and Forearc Subduction Erosion at 27º-28.5ºS
Kay S, Goss A & Mpodozis C

16:00 Recycling Plus: A New Recipe for Making Orogenic Mantle Prelevic D

16:15 Nd and Hf Model Ages in the Western Gneiss Region, Norway: A New way to Better Understand Mantle-Crust Evolution
Martin C, Duchène S, Luais B & Deloule E

16:30 U-Pb Age, Geochemical and Hf-O Isotopic Constraints on Magma Source of the I-Type Calc-Alkaline Baimaxueshan Batholith (SW China): Implications for Crustal Recycling at Convergent Margin
Zi J, Cawood PA, Fan W, Tohver E, Wang Y & McCuaig TC

16:45 The Oxygen Isotopic Composition of Xenoliths from Tallante (Southern Spain): Evidence for Crust Recycling into the Mantle
Dallai L & Bianchini G
08j: Nanoparticles, Interfacial Processes and Nuclear Waste Management

Session chaired by Andrey Kalinichev, Stepan N Kalmykov & Melissa Denecke

16:15 **Keynote:** Multi-Scale Modelling of Ions and Water Diffusion in Clays

*Churakov S*

16:45 Water Dynamics in Clay as a Function of Temperature: Coupling Neutron Spin Echo and Molecular Dynamics

*Marry V, Dubois E, Malikova N, Salanne M, Longeville S, Haussler W & Breu J*

(Session 08j continues on Thursday 18th Posters on page 363)
08k: Water Structure and Hydrogen Bonding on Mineral and Nanoparticle Surfaces

Session chaired by Glenn Waychunas & Alejandro Fernandez-Martinez

14:00 Influence of Interfacial Water Structure on Surface Protonation and Ion Adsorption at Metal Oxide Surfaces

14:15 Electrokinetic Properties of the Rutile/Water Interface: Zeta-Potential Prediction from Computer Simulations
Predota M, Machesky M, Wesolowski D & Cummings P

14:30 **Keynote:** Hydrogen Bonding and Molecular Ordering of Water at Mineral-Solution Interfaces
Kalinichev A, Wang J & Kirkpatrick RJ

15:00 Sum Frequency Vibrational Spectroscopy (SFVS) of Water and Hydroxyls on the Corundum (1-102) Surface: Acid-Base Properties from Direct Observation of Protonation States
Waychunas G, Sung J & Shen R

15:15 Aqueous CO₂ Solutions at Silica Surfaces and Confined Environments
Chialvo A, Vlcek L & Cole D

15:30 Water Structure at the Structurally Heterogeneous Calcite Surface
Wolthers M, Di Tommaso D, Du Z & De Leeuw N

15:45 Thermodynamic Properties of Hydration Layers on Surfaces of Metal Oxide Nanoparticles
Ross NL, Spencer EC, Woodfield BF, Navrotsky A, Parker SF & Kolesnikov AI

16:00 Water Structure and Hydration Properties of Imogolite Nanotubes

Session 08j follows this session in this room. For details see page 336.
09f: Linking the Plutonic and Volcanic Records: Textural and Geochemical Fingerprinting of Magma Chamber Processes

Session chaired by Vojtech Janousek, Valentin Troll & Abigail Barker

14:00 Keynote: The Volcanic-Plutonic Connection

Bachmann O, Deering C, Dufek J & Huber C

14:30 Age Relations, Mineral-Chemical and Isotopic Investigations on Basaltic Gem Stone Zircons from Eastern Germany

Büchner J, Tietz O, Seifert W, Gerdes A & Linnemann U

14:45 Basanite-Phonolite Mixing Indicated by Trace Elements in Green-Core Clinopyroxenes from La Palma

Klügel A

15:00 Amphibole Antecrysts in Deposits of Merapi Volcano, Indonesia: A Plutonic Phase in Extrusive Magmas

Peters S, Chadwick J & Troll V

15:15 Magma Physical Properties Affect Isotope Variations in Volcanic Rocks: The Example of High-T Rhyolites

Wolff J, Ellis B & Ramos F

15:30 Mineral Compositions Indicate Magma Recharge Processes in the Ilímaussaq Complex, Greenland

Ratschbacher B, Marks M, Pfaff K & Markl G

15:45 Nature, Origin and Causes of Jurassic Felsic Igneous Activity in the Victory Glacier Area (Eastern Graham Land)


16:00 Invited: O-Isotope Evidence for a Hydrothermally Altered Volcanic Roof to the Bushveld Complex

Harris C & Fourie D

16:15 Catching a Collapsing Solidification Front through Thermal Gradient Experiments

Masotta M, Freda C & Gaeta M

16:30 Constraining Magma-Carbonate Interaction at Vesuvius, Italy: Insights from Stable Isotopes and Experimental Petrology


16:45 A 3D Snapshot from Granitic System: Tourmaline Nodules and their Bearing on the Granite Evolution

Balen D & Petrinec Z
10g: Organic and Inorganic Fluid-Fluid-Rock Interactions in CO₂ Storage Systems

Session chaired by Axel Liebscher, Andrea Vieth-Hillebrand & Ann-Kathrin Scherf

16:00 Potential for Mineral Trapping during CO₂ Storage in Sedimentary Basins
   Aagaard P, Hellevang H, Alemu BL, Pham VTH & Sundal A

16:15 Numerical Simulation of Alteration Patterns Induced by Sequestration of CO₂ in a Carbonate-Hosted Saline Aquifer
   Alt-Epping P & Diamond LW

16:30 Thermodynamic Study for CO₂ Storage in Deep Saline Aquifers
   Ji X & Zhu C

16:45 Reactive Transport Modeling of Natural Carbon Sequestration in Ultramafic Tailings
   Bea SA, Mayer KU, Wilson SA & Dipple G

(Session 10g continues on Thursday 18th Posters on page 366)
10j: Giant Oil Spills and Environmental Impact: Past Lessons and Future Predictions

Session chaired by Bill Mahaffey & Terry Hazen

14:00 The Exxon Valdez, BP MC 252, and Other Oil Spills: What We Learned About Petroleum Biodegradation and Bioremediation

14:15 The Deepwater Horizon Oil Spill: Ecogenomics of the Deep-Sea Plume

14:30 Isotopic Evidence for Microbial Oxidation of Dissolved Methane in the Gulf of Mexico Oil Spill Deep Plume

14:45 Asphaltene Content as a Measure of Oil Losses Related to the Deepwater Horizon Oil Spill

15:00 Invited: Penetration, Accumulation and Degradation of Deepwater Horizon Oil in Florida Sandy Beaches

15:15 The Prestige Oil Spill after a Decade: Evaluation of Remediation Strategies and the Role of Bioremediation

Session 10g follows this session in this room. For details see page 339.
11b: Ore Deposits and the Role of the Lithospheric Mantle – Sponsored by SGA

Session chaired by Wolfgang Dereck Maier, Sisir K. Mondal, Thomas Oberthür & Marco Fiorentini

14:00 **Keynote:** Chalcophile Elements in Magmas and Magmatic Sulfide Deposits: Can We see the Mantle Signals?
*Barnes S, Maier W & Fiorentini M*

14:30 **Invited:** Mechanisms for the Attainment of Sulfide Saturation in Magmas Derived from Subcontinental Lithospheric Mantle
*Ripley E*

14:45 **Invited:** Is the Platinum in the Bushveld Complex Derived from the Lithospheric Mantle?
*Barnes S-J, Maier W & Curl E*

15:00 Can Multiple Sulfur Isotopes be Used as a Tracer of Sub-Continental Lithospheric Mantle in the Bushveld?
*Penniston-Dorland S, Farquhar J, Polley G, Mathez E & Kinnaird J*

15:15 Sudbury Asteroid Impact Triggered the Emplacement of Endogenous Magma that Produced a Giant Ni-Cu-PGE Deposit
*Latypov R*

15:30 Petrogenesis Implications from PGE in the Layered Mafic Dufek Intrusion and Related Sills of the Ferrar Large Igneous Province, Antarctica
*Hanemann R, Viereck-Goette L & Mukasa S*

15:45 PGE Distribution in Base-Metal Sulfides from the Merensky Reef of the Bushveld Complex, South Africa
*Osbahr I, Oberthür T & Klemd R*

16:00 Multiple Magma Inputs and Sulfur Sources in the Development of the BIC Intrusion, Northern Michigan, Midcontinent Rift System
*Donoghue K & Ripley E*

16:15 Hydrothermal Alteration and Ni Sulphide Formation in the Bon Accord Ni-Oxide Body, Barberton, South Africa
*Wildau A, Williams-Jones AE & Tredoux M*

16:30 Sr-Nd-Hf-Pb Isotope Systematics of the Oyu Tolgoi Cu-Au Deposit (Mongolia)
*Dolgopolova A, Seltmann R, Armstrong R, Belousova E & Pankhurst R*

(Session 11b continues on Thursday 18th Posters on page 367)
### 12d: Novel Molecular and Isotopic Tracers of Terrigenous Supply to Marine Sediments

**Session chaired by Guillemette Menot, Germain Bayon & Johan Weijers**

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>15:30</td>
<td>Changes in Neogene Himalayan Erosion Regime: Input of Pb and Nd Isotopes into the Indian Ocean</td>
<td>Gattacceca JC, Galy A, Piotrowski AM &amp; Frank M</td>
</tr>
<tr>
<td>15:45</td>
<td><strong>Keynote:</strong> Evolving Isotopic Fluxes to Asian Marginal Seas Controlled by Monsoon Strength Since the Last Glacial Maximum</td>
<td>Clift P, Hu D &amp; Limmer D</td>
</tr>
<tr>
<td>16:00</td>
<td>Heinrich Events on the Irish Atlantic Margin: Insights from the Pb Isotopic Composition of Ice-Rafted Feldspar</td>
<td>Tyrrell S, Toms L &amp; Haughton P</td>
</tr>
<tr>
<td>16:15</td>
<td>Tracing the Source of IRD in the Heinrich Layers of the North Atlantic</td>
<td>Naafts D, Hefter J, Zhang S &amp; Stein R</td>
</tr>
<tr>
<td>16:45</td>
<td>A Major Decline of C4 Plant in the Source Region of the North Pacific Eolian Dust (Asian Interior) from 12 to 9 Ma</td>
<td>Jia G, Li Z &amp; Peng P</td>
</tr>
</tbody>
</table>

Session chaired by Pierre-Henri Blard, Didier Bourles & Finkel Bob

14:00 Long-Term Production Rates of Cosmogenic Nuclides: Millions of Years of Rock Exposure in Antarctica and the Atacama Desert

14:15 Approaching a Consistent Set of Cosmogenic $^3$He, $^{21}$Ne and $^{10}$Be Production Rates
Niedermann S & Fenton C

14:30 A New Calibration Site for Cosmogenic $^3$He Production Rate in the Central Altiplano
Blard P-H & Lavé J

14:45 Invited: Deglaciation Pattern during the Late-Glacial / Holocene Transition in the Southern French Alps. Chronological Data from the Clarée Valley (Durance Catchment, S. France)
Cossart E, Bourles D, Braucher R, Fort M, Perrier R & Siame L

15:00 Cosmogenic Nuclide Measurements of Pleistocene Glacial Erosion
Stone J, Ploskey Z, Hallet B & Jaffrey M

15:15 Soil Closure Ages from Meteoric $^{10}$Be, McMurdo Dry Valleys, Antarctica
Dickinson W, Schiller M, Ditchburn R, Graham I & Zondervan A

Session 12d follows this session in this room. For details see page 342.
13b: Aerosols, Clouds and Precipitation

Session chaired by Patrick Chuang & Johannes Quaas

14:00 **Keynote:** Aerosol, Clouds, Precipitation, Radiation, and Climate; A Global Perspective
*Stephens G*

14:30 **Invited:** Robust Aerosol Indirect Effects Inferred from Remotely-Sensed Cloud Properties Acquired during VOCALS
*Zuidema P, Leon D & Painemal D*

14:45 **Invited:** Interaction of Particulate Pollution and Precipitation
*Flossmann A & Wobrock W*

15:00 Modeled Response in Radiative Properties of Shallow Convective Clouds due to Perturbations in Meteorological State Variables and Atmospheric Aerosol Loading
*Engström A & Ekman A*

15:15 **Invited:** Cloud Condensation Nuclei Concentrations and Actual Supersaturations in Real Clouds
*Baltensperger U, Jurányi Z, Emanuel H, Gysel M, Bukowiecki N & Weingartner E*

15:30 Cloud Processing Measured with Sulfur Isotopes during HCCT 2010
*Harris E, Sinha B, Hoppe P, Crowley J, Borrmann S, Foley S, Gnauk T, Van Pinxteren D & Herrmann H*

15:45 **Invited:** The Barbados Cloud Observatory: Controls on Precipitating Shallow Cumulus Convection
*Nuijens L, Serikov I, Hirsch L & Lonitz K*

16:00 **Invited:** Projection of Future Climate Change by Aerosols along the Representative Concentration Pathways (RCPs) with a Global Climate Model
*Takemura T*

16:15 **Invited:** Cloud-Aerosol Interactions in Operational NWP: Presently Simple, but the Future is Complicated
*Field PR, Wilkinson J, Shipway B & Hill A*

16:30 Anthropogenic Aerosols and the Weakening of the South Asian Summer Monsoon
*Ming Y, Bollasina M & Ramaswamy V*

16:45 **Invited:** Evaluating New Particle Formation, Growth, and CCN Formation in Global Models
*Adams P, Westervelt D, Riipinen I, Pierce J & Trivitayanurak W*
14g: Experimental Constraints on Chemical Erosion Rates and Mechanisms Using New and/or non Traditional Isotope Tools

Session chaired by Nathalie Vigier & Eric Oelkers

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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>14:00</td>
<td>Li Isotopes a Powerful Tool to Trace Hydrothermal Impact during Chemical Weathering Processes</td>
<td>Rivé K, Rad S, Garcin M &amp; Millot R</td>
</tr>
<tr>
<td>14:15</td>
<td>Modelling Li Isotope Signatures of Waters Altering a Basaltic Glass in Under-Saturated Condition</td>
<td>Verney-Carron A, Vigier N &amp; Millot R</td>
</tr>
<tr>
<td>14:30</td>
<td>Silica Coatings on Young Hawaiian Basalts: Constraints on Formation Mechanism from Silicon Isotopes</td>
<td>Chemtob S, Hurowitz J, Guan Y, Ziegler K, Eiler J &amp; Rossman G</td>
</tr>
<tr>
<td>14:45</td>
<td>Effect of Aqueous Organic Ligands on Mg-Isotope Fractionation during Magnesite Precipitation</td>
<td>Mavromatis V, Gautier Q, Schott J &amp; Oelkers E</td>
</tr>
<tr>
<td>15:00</td>
<td>Experimental Weathering of Micas in Acid Soils Conditions: Contribution of Boron Isotopes</td>
<td>Voinot A, Lemarchand D, Turpault M-P &amp; Chabaux F</td>
</tr>
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Session 22c follows this session in this room. For details see page 356.
16a: Geochemical Processes in Mining Environments: Field/Lab Studies, Modeling, and New Strategies

Session chaired by Kate Campbell & Colleen Hansel

14:00 Invited: Amendment of Mill Tailings for in situ Treatment of Mine Drainage
   Blowes D, Lindsay M, Halshof A, Ptacek C & Gould D

14:15 Geochemical Behavior of (Thio)arsenates with Fe-Minerals
   Couture R-M, Wallschläger D, Mitchell K & Van Cappellen P

14:30 Dissolved Metals and As from Metal Mine Waste – Laboratory vs. Field Determination
   Turner A, Braungardt C & Rieuwerts J

14:45 Mine Water Geochemistry and Biogeochemical Modeling
   Parmentier M, Croiset N, Battaglia-Brunet F & Azaroual M

15:00 Formation of Secondary Minerals – A Lysimeter Approach
   Schäffner F, Merten D, De Giudici G, Ricci PC & Büchel G

15:15 Geochemical Modeling of Reactive Minerals Associated with in situ Recovery of Uranium
   Longmire P, Lagneau V & Bouzid M

15:30 Long-Term Forecast of Acidity Load from Overburden Substrate into a Mining Pit Lake: An Integrated Approach

15:45 Balancing of Geological Acidity and Buffering Potentials of Mid German Lignite Open Casts by Long-Term Experiments
   Simon A, Hoth N, Rascher J & Jolas P

16:00 Enhancing the Accuracy of the Environmental Monitoring Systems in Mining Areas
   Baciu C, Costin D, Pop C & Lazar L

Session 16b follows this session in this room. For details see page 347.
16b: Understanding the Fate and Transformations of Metal and Radionuclide Contaminants in Unsaturated and Saturated Subsurface Environments

Session chaired by Scott Brooks, Dawn Wellman, Henning Prommer & Ann Miracle

16:15 **Invited:** Effects of Microbial Activity and Electron Shuttles on the Reduction of U(VI) Under Sulfidogenic Conditions

*O’Loughlin EJ, Boyanov MI, Kwon MJ, Long P, Williams K & Kemner KM*

16:30 Modeling of Co-metabolic Cr(VI) Reduction Under Denitrifying Conditions

*Yang L, Molins S, Steefel C & Beller H*

16:45 Geomicrobiology of Hyperalkaline Cr(VI) Contaminated Land

*Whittleston R, Burke I, Stewart D & Mortimer R*

(Session 16b continues on Thursday 18th Posters on page 378)
17g: Dynamics, Mobility and Bioavailability of Trace Elements in Contaminated Environments

Session chaired by Michael Komarek, Melanie Davranche, Carla Koretsky & Martin Mihaljevic

14:45 Invited: How Biogenic Nano-Iron Oxides can Control the Fate of Pollutants

15:00 Fate of As Upon Microbial Fe(III) Reduction of As-Bearing Biogenic Fe Minerals
Muehe EM, Scheer L & Kappler A

15:15 Synchrotron XAS and XRF Study of Microbially Reduced Arsenic and Iron in Iron-Based Remediation Media
Root R, Alday F, Fathordoobadi S, Ela W & Chorover J

15:30 Rapid Weathering of Arsenopyrite in Agricultural Soils
Robson T, Braungardt C & Keith-Roach M

15:45 Arsenic Uptake and Speciation in the Green Marine Alga Ulva lactuca: Development of a Coastal Aquatic Bioindicator
Pham C, Charlet L & Sposito G

16:00 Arsenic and its Compounds in Plants Growing in Soils Contaminated by Mining Activities
Pacáková I, Száková J, Goessler W & Tlustoš P

16:15 Biogeochemical Characterization of Contaminant Mn Sequestration
Herndon E, Martinez CE, Eissenstat D & Brantley S

16:30 Plant Uptake of Metals of Economic Importance: Laboratory Studies
Lintern M, Hough R, Anand R & Ryan C

16:45 Zn Isotope Fractionation in the Soil-Plant System (A pot Experiment)
Couder E, Drouet T, Delvaux B, Maerschalk C, Meeus C & Nadine M

(Session 17g continues on Thursday 18th Posters on page 381)
17k: Significance of Iodine in Biogeochemistry and the Environmental Sciences: Special Session Commemorating the Bicentennial of the Discovery of Iodine

Session chaired by Yasuyuki Muramatsu & Glen Snyder

14:00  **Keynote:** Thermodynamics of One and Two Electron Transfer Steps: Implications for Iodide Oxidation and Iodine Environmental Cycling

*Luther G*

14:15  Biogeochemical and Microbial Controls of $^{129}$I Mobility in Groundwater

*Santschi PH, Brinkmeyer R, Schwehr KA, Zhang S, Xu C, Li H-P, Kaplan DJ, Yeager C & Roberts KA*

14:30  Molecular Iodine Emission Rates from *Laminaria digitata* as a Function of Algal Part, Irradiance and Temperature

*Dixneuf S, Ruth AA, Nitschke U & Stengel DB*

Session 17g follows this session in this room. For details see page 348.
### 17I: Biomedical Applications of Natural Stable Isotope Variations

Session chaired by Vincent Balter & Anton Eisenhauer

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<tr>
<th>Time</th>
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<th>Presenters</th>
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<tbody>
<tr>
<td>16:00</td>
<td><strong>Keynote:</strong> The Expansion of Metal Stable Isotope Biogeochemistry into Biomedicine</td>
<td>Bullen T &amp; Croteau M-N</td>
</tr>
<tr>
<td>16:15</td>
<td>Calcium Isotopes in Human Urine Under Simulated Microgravity Conditions</td>
<td>Heuser A, Frings-Meuthen P, Rittweger J &amp; Galer S</td>
</tr>
<tr>
<td>16:30</td>
<td>Assessing Calcium Isotopes as a Dietary Proxy for Terrestrial Vertebrates</td>
<td>Broska J, Tüken T, Galer SJG, Held P &amp; Alt KW</td>
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</tbody>
</table>
# 17n: Trace Metal Records in Marine Systems: Processes and Proxies

**Session chaired by Christian März, Jennifer McKay & Philipp Böning**

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<tbody>
<tr>
<td>14:00</td>
<td><strong>Keynote:</strong> Geochemical Roles of Thioanions of the Heavier Metals and Metalloids</td>
<td><em>Helz G</em></td>
</tr>
<tr>
<td>14:45</td>
<td>Benthic Fluxes of Iron and Manganese Under Various Redox Conditions</td>
<td><em>Pakhomova S</em></td>
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<tr>
<td>15:00</td>
<td>Understanding Early Jurassic Ocean Connectivity Using Os Isotopes</td>
<td><em>Porter S, Selby D, Suzuki K &amp; Grocke D</em></td>
</tr>
<tr>
<td>15:30</td>
<td>Diatom-Bound Trace Metals: A Tracer for Past Changes in Micronutrients Availability?</td>
<td><em>Pichevin L, Geibert W &amp; Ganeshram R</em></td>
</tr>
<tr>
<td>15:45</td>
<td><strong>Invited:</strong> Proxy Validation from the Culturing Perspective: A Top Down Approach</td>
<td><em>Shaw T, Myrick M, Richardson T &amp; Hill L</em></td>
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Session 17l follows this session in this room. For details see page 350.
# 18h: Recent Advances in the Application of Calorimetry and Thermal Analysis in the Biogeosciences

**Session chaired by Alain Plante & Nieves Barros**

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<th>Time</th>
<th>Session</th>
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</table>
| 14:00 | **Keynote:** Potentiality and Limits of Applying DSC and TG to Complex Systems: Direct and Indirect Information  
*Dell’Abate MT* |
| 14:30 | Developing Models to Assess Fine Scale Energy Change in Soil Organic Matter Under Different Forest Managements  
*Liles G & Horwath W* |
| 14:45 | Thermal Stability of Soils and the Detection of Use Induced Changes  
*Siewert C* |
| 15:00 | **Invited:** Thermodynamic Principles of Soil Organic Matter Decomposition in a Changing World  
*Herrmann AM, Grice SM, Ritz K & Harris JA* |
| 15:15 | Use of CO₂/H₂O IRGA-Based Evolved Gas Analysis during Thermal Analysis of Soil Organic Matter  
*Fernández JM, Craine JM & Plante AF* |

Session 19g follows this session in this room. For details see page 353.
19g: Reactions and Catalysis: Mineral-Water Interaction, CO$_2$ Sequestration, Electron Transfer

Session chaired by James Rustad, Nora de Leeuw & Rossitza Pentcheva

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<tr>
<td>16:00</td>
<td>Density Functional Theory Study of the Interaction of Arsenic Complexes with FeOOH Surfaces</td>
<td>Otte K, Schmahl WW &amp; Pentcheva R</td>
</tr>
<tr>
<td>16:30</td>
<td>Nucleation of Amorphous Calcium Carbonate: A Combined Theoretical and Experimental Perspective</td>
<td>Demichelis R, Raiteri P, Gale J, Gebauer D &amp; Quigley D</td>
</tr>
<tr>
<td>16:45</td>
<td>How Acidic is Water on Calcite?</td>
<td>Andersson M &amp; Stipp S</td>
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# 20a: Unraveling P-T-t Paths: Pseudosections Versus Classical Phase Petrology

**Session chaired by Sönke Brandt & Niels Jöns**

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<tr>
<td>14:45</td>
<td><strong>Keynote</strong>: Unravelling P-T-t Paths: Pseudo-Sections Versus Classical Phase Petrology</td>
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<td><em>O’Brien P</em></td>
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<td>15:15</td>
<td>Classical Geothermobarometry Versus Pseudosections: Practical Experiences and Strange Encounters</td>
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<td><em>Proyer A &amp; Bruand E</em></td>
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<tr>
<td>15:30</td>
<td>Combining Phase Petrology, Reaction Balancing and Partial Pseudosections – Theory and Examples</td>
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<td><em>Kriegsman L &amp; Álvarez-Valero A</em></td>
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<td>15:45</td>
<td>Decompression Melting in Tectonics: Where’s the Melt?</td>
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<td><em>Yakymchuk C, Korhonen F &amp; Brown M</em></td>
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<td>16:00</td>
<td>Constraining the P-T Conditions of Melting in Stromatic Migmatites from Ronda (S. Spain)</td>
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<td><em>Tajcmanova L, Bartoli O, Cesare B &amp; Acosta-Vigil A</em></td>
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<td>16:15</td>
<td>Prograde P-T Path of a ~3.2 Ga Tectonometamorphic Event from Assegai Greenstone Belt, SE Kaapvaal Craton</td>
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<td><em>Saha L, Hofmann A &amp; Xie H</em></td>
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<td>16:30</td>
<td>Allanite Petrochronology in High-Pressure Rocks</td>
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<td><em>Engi M, Regis D, Darling J, Cenki-Tok B &amp; Rubatto D</em></td>
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<td>16:45</td>
<td>From Compositional to P-T-Deformation-t(Relative Age)-Redox Maps at the Thin Section Scale</td>
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<td><em>Vidal O, Lanari P, Dubacq B, Munoz M &amp; Lewin E</em></td>
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</table>
20k: Petrology and Geochemistry of Rutile

Session chaired by Thomas Zack, Daniel F. Stockli & Alicia Cruz-Uribe

14:00 **Keynote:** New Roles for Rutile in Tracing Petrogenetic Processes

*Manning C*

14:15 **Invited:** Thermodynamics of Rutile- and α-PbO₂-type Solid Solutions from Quantum-mechanical Calculations

*Vinograd VL & Winkler B*

14:30 Element Redistribution during Rutile Dissolution and Titanite Precipitation

*Lucassen F, Franz G & Rhede D*

(Session 20k continues on Thursday 18th Posters on page 387)

Session 20a follows this session in this room. For details see page 354.
## 22c: General Biogeochemistry

**Session chaired by Juraj Farkas**

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<tbody>
<tr>
<td>15:45</td>
<td>Organic Geochemical Analysis of the Impact of Cadaver Burial on Soil</td>
<td>Ismail SS, Bull I &amp; Evershed R</td>
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<tr>
<td>16:00</td>
<td>Molecular-Level Studies of Fe(III) in Aquatic Systems</td>
<td>Karlsson T, Persson P &amp; Skyllberg U</td>
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<tr>
<td>16:15</td>
<td>Biogas Generating Simulation from Source Rock and Oil in Jiyang Depression, Bohai bay Basin, China</td>
<td>Luo X, Hou LH, Yang C &amp; Wang JH</td>
</tr>
<tr>
<td>16:45</td>
<td>Biogeochemical Characteristics and Environmental Effects of Low Molecular-Weight Organic Acids in Lacustrine Ecosystem</td>
<td>Xiao M &amp; Wu F</td>
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01b: From Gas and Dust to Planetesimals: Processes and Timescales

Floor 1

1001 Spectroscopic Characterization of Olivine due to Fe/Mg in Dergaon H5 Chondrite
Saikia BJ, Parthasarathy G & Borah RR

1002 REE Abundances in CAIs from Rumuruti Chondrites
Horstmann M, Bischoff A & Berndt J

1003 Oxygen Isotope Variations in the Allende CV3 Meteorite

1004 Solar Noble Gases in Tagish Lake
Jakubowski T, Ott U & McCausland PJA

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1007 U-Pb and Pb-Pb Dating of Phosphates in Martian Meteorites
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1008 Radioactive Element Abundances, Paleo-Heat Flows, and the Internal Evolution of Mars

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2018  Geochemical Anomaly Pattern in the Haojiahe Sandstone-Type Copper Deposit, Yunnan, China 
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2019  Investigation of Geochemical Properties of Khonj Bentonite Mine (East of Iran) 
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2023  Geological Characteristics and Genesis Discovery of Native Copper in East Tian Mountain, Xinjiang, P.R. China 
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Geochemistry and Mineralogy of Volcanic Ash Red Paleosol from Fogo Island (Cape Verde)
*Marques R, Prudêncio MI, Waerenborgh JC, Rocha F, Dias MI & Ferreira da Silva E*
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<td>4063</td>
<td>Geochemical Signatures in Detrital Tourmalines as Indicators for Sediment Provenance: The Baixo Alentejo Flysch Group, South Portuguese Zone</td>
<td>Rodrigues B, Dias P, Jorge RCGS &amp; Fernandes P</td>
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<td>4064</td>
<td>Geochemical Partitioning and Mineral Speciation of Zn in Naturally Metal-Enriched Soils of SW Spain</td>
<td>Fernandez-Caliani JC, Giraldez I, Rivera MB &amp; Barba-Brioso C</td>
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<td>4065</td>
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<td>Mahdavi A &amp; Taghipour B</td>
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<td>Phase Equilibrium of the Cd-Bearing Systems at 298 K: Cd²⁺/Cl⁻, SO₄²⁻, NO₃⁻·H₂O Quaternary System</td>
<td>Zhang S, Huang Y &amp; Ni S</td>
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<td>4067</td>
<td>Phase Equilibrium of the Cd-Bearing Quaternary Reciprocal System at 298 K</td>
<td>Wang C, Huang Y, Zou F &amp; Ni S</td>
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<td>4068</td>
<td>Uranium Mobility in the Beiras Granite (Central Portugal): Implications for Radon Exhalation</td>
<td>Pereira A &amp; Neves L</td>
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<td>4069</td>
<td>δ¹³C_carbonate Chemostratigraphy of the Carrapateira Outlier (Lower Kimmeridgian), Southern Portugal</td>
<td>Borges M, Goodhue R, Fernandes P, Pereira Z, Matos V &amp; Rodrigues B</td>
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<td>4070</td>
<td>Magnetic Susceptibility of Sands from a River Beach for Forensic Applications</td>
<td>Carvalho Á, Ribeiro H, Guedes A, Sant’Ovaia H, Abreu I &amp; Noronha F</td>
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<td>4071</td>
<td>Oxidation of FeS by Fe³⁺(aq)</td>
<td>Chirita P &amp; Schlegel M</td>
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<td>4072</td>
<td>Use of Stable (HOCN) and Radiogenic (Sr) Isotopes to Determine the Geographical Provenance and Traceability of Artisanal Cheeses of Quebec, Canada</td>
<td>Desrochers S, Stevenson R, Hélie J-F &amp; Poirier A</td>
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<td>4073</td>
<td>Host Rocks of Santa Eulalia Plutonic Complex (Southern Portugal): A Preliminary Study</td>
<td>Doria A, Ribeiro MDA, Sant’Ovaia H &amp; Fernandes F</td>
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<td>4074</td>
<td>Geochemical Correlations of Low-Temperature Calcite and Groundwater in Subsurface Granite Fractures</td>
<td>Drake H, Tullborg E-L &amp; Åström M</td>
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<td>4075</td>
<td>Geochemical and Mineralogical Studies on the Fe-Mn Deposits of Dehbid Area, Fars Province, South Iran</td>
<td>Ebrahimi S &amp; Moosavi Z</td>
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<td>4076</td>
<td>Metastable Phase Equilibria of the Quaternary System KCl + K₂CO₃ + K₂SO₄ + H₂O at 273 K</td>
<td>Feng S, Zeng Y, Cui ZL &amp; Yu XD</td>
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A Geochemical Approach to the Sado Saltmarshes (Portugal)  
Moreira S, Freitas MDC, Andrade C & Araújo MDF

Stable Isotopes of Organics and Inorganics of Aptian  
Lacustrine Sediments in North-Eastern Brazil  
Gratzer R, Neumann V, Vortisch W, Rocha D & Bechtel A

The Use of Magnetic Susceptibility in Forensic Soils Analyses  
Guedes A, Ribeiro H, Sant’Ovaia H, Rodrigues A, Valentim B,  
Leal S & Noronha F

Raman Spectroscopic Study of the System NaCl-Na₂CO₃-Na₂SO₄-H₂O: Implications for the Determination of Cl Concentration in Fluid Inclusions  
Hu W, Wang X, Chou I-M & Sun Q

Petrography and Mineralogy of Western Samen Metapelites  
Khodaian Chegeni Z, Baharifar AA, Emami MH, Mohajjel M  
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Oxygen Isotope Fractionation between Calcium Carbonate  
and Water: Influence of Ionic Strength  
Kim S-T

The Elemental and Stable Isotope Geochemistry of Korean Bottled Waters: Characterization and Identifying their Origins  

Low-Temperature Thermochronology of the Mesozoic Uplift History in the Hardangerfjord Area, SW Norway  
Kohlmann F, Ksienzyk A, Jacobs J & Fossen H

Chemical and Mass Changes of the Vein Type  
Mineralizations in Çetilli Area, (Ordu, Turkey)  
Kudun Yozgat K & Tüysüz N

Preliminary Account of the Silurian Carbon Isotope Record (δ¹³Corg) from the Barrancos Region, Ossa Morena Zone, Portugal  
Lopes G, Fernandes P, Goodhue R, Pereira Z & Piçarra JM

Modifying the Diffusive Gradients in Thin Films Technique for the Geochemical Exploration of Gold  
Lucas A, Rate A, Salmon U & Zhang H

Skarn Bearing Clintonite from Kuhe-Dor, Shirkuh, Yazd Province, Iran  
Mackizadeh MA & Taghipour B

Radon Risk and their Geological Control in the Region of  
Amarante (Northern Portugal)  
Martins L, Gomes M, Neves L & Pereira A

Clay Mineralogy and Chemical Environment of an Aptian  
Lacustrine Succession in North-Eastern Brazil  
Vortisch W, Neumann V, Gratzer R & Rocha D
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<td>4091</td>
<td>Discovery and Description with Scintillometric and Geochemistry of Gossans Above Amethyst Deposits in Altered Volcanic Rocks of the Paraná Province, South America</td>
<td>Pertille da Silva I &amp; Hartmann LA</td>
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<td>4092</td>
<td>((\text{Ba, Cu})(\text{UO}_2)_2(\text{PO}_4)_2.n\text{H}_2\text{O}) Solid Solution Occurences from an Uranyl-Phosphate Deposit in Portugal</td>
<td>Pinto A, Gonçalves M, Prazeres C &amp; Batista MJ</td>
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<td>4093</td>
<td>The Variation of Magnetic Susceptibility with Grain Size: Its Implication on Forensic Studies</td>
<td>Ribeiro C, Guedes A, Valentim B, Sant’Ovaia H, Ribeiro H &amp; Noronha F</td>
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<td>4095</td>
<td>Concerning Organization of Geochemical Environment as a Study Object for Geochemistry</td>
<td>Romanov S &amp; Korobova E</td>
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<tr>
<td>4096</td>
<td>Removal Pb\textsuperscript{2+} from Water Sample, by Using Natural Zeolites of Aftar Mine (Semnan, Iran)</td>
<td>Peyravi S, Zahir R &amp; Moradi K</td>
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**22d: Isotope Archaeometry**

**Floor 4**

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<th>Session</th>
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<td>4097</td>
<td>Lime Lumps in Gothic Joint Mortars from Kruszwica (Central Poland): An Insight into the Lime Production</td>
<td>Bartz W &amp; Rudy M</td>
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<td>4098</td>
<td>Atmospheric Lead Deposition in Ombrotrophic Peat Bogs of Southern Poland</td>
<td>Fiałkiewicz-Koziel B, Mattielli N &amp; Fagel N</td>
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<tr>
<td>4099</td>
<td>Osmium, Carbon and Trace Element Investigations into Archaeological Material</td>
<td>Finlay A, McComish J, Bates R &amp; Selby D</td>
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<tr>
<td>4100</td>
<td>Magnetic Susceptibility of Zafarghand Granitoidic Pluton</td>
<td>Gavanji N, Sadeghian M &amp; Shekari S</td>
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<tr>
<td>4101</td>
<td>Tin Isotope Analysis for an Archaeological Application</td>
<td>Yamazaki E, Nakai S &amp; Saito T</td>
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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</table>
| 08:30 | **Plenary**<br>
        | Floor 2 / Congress Hall<br>
        | Victoria Orphan<br>
        | California Institute of Technology, Gast Lecturer<br>
        | ‘Microbial Partnerships and Methane-Oxidation in the Deep Sea’ |
| 09:10 | Closing Remarks                           |
| 09:25 |                                            |
| 09:30 | **Oral Sessions**                         |
| 12:30 | **Lunch**<br>
        | Floor 3 / Forum Hall Foyer (Boxed lunches)<br>
<pre><code>    | Floor 1 / Restaurant Zoom (Buffet lunches) |
</code></pre>
<p>| 14:00 | <strong>Oral Sessions</strong>                         |
| 17:00 |                                            |</p>
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<tr>
<th>Time</th>
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<tr>
<td>09:30</td>
<td>Wolff-Boenisch, Trail, Perdok, Nagbara, Chalapathi Rao.</td>
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<tr>
<td>09:45</td>
<td>Perdok, Nagbara, Chalapathi Rao.</td>
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<tr>
<td>10:00</td>
<td>Heeschen, Liu, Mano, Mano, Mandeavel, Liu</td>
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<tr>
<td>10:15</td>
<td>Rempel, Foley, Krot, Krot</td>
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<td>10:30</td>
<td>Berryman, Gaillard, Schauble</td>
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<tr>
<td>10:45</td>
<td>Blume, Faqih, Dohrhenaeky, Dohrhenaeky</td>
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<tr>
<td>11:00</td>
<td>Mayer, Philippot, Kukhry, Kukhry</td>
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<tr>
<td>11:15</td>
<td>Mytiten, Strauss, Jacobsen</td>
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<tr>
<td>11:30</td>
<td>Johnson, Oto, Barov</td>
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<tr>
<td>11:45</td>
<td>Mytiten, Johnson, Oto</td>
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<tr>
<td>12:00</td>
<td>Gao, Gu, Lopand</td>
</tr>
<tr>
<td>12:15</td>
<td>Gao, Gu, Lopand</td>
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</tbody>
</table>

*Note: The above schedule is an example and may not reflect the actual program.*
### Oral Presentations Overview

**Meeting Hall IV**
- 08:15 - Nitsche, van der Grift, Harlavan, de Koker, Angel, Rasmussen, de Koker, Severinghaus, Arai, Gonzalez, Jimenez, Angel, Arai

**Meeting Hall V**
- 09:30 - Kirsch, Palmer, Bonn, Eisenhauser, Gökçen, Mihailova, Kalinichev, Gonzalez-Jimenez, Dere, Barbante

**South Hall**
- 10:00 - Romanchuk, Perdrial, Shaw, Eisenhauser, Gökçen, Mihailova, Kalinichev, Gonzalez-Jimenez, Dere, Barbante

**Small Hall**
- 10:30 - Eisenhauser, Gökçen, Mihailova, Kalinichev, Gonzalez-Jimenez, Dere, Barbante

**North Hall**
- 11:00 - Eisenhauser, Gökçen, Mihailova, Kalinichev, Gonzalez-Jimenez, Dere, Barbante

**Panorama Hall**
- 11:30 - Eisenhauser, Gökçen, Mihailova, Kalinichev, Gonzalez-Jimenez, Dere, Barbante

**Small Theatre**
- 12:00 - Eisenhauser, Gökçen, Mihailova, Kalinichev, Gonzalez-Jimenez, Dere, Barbante
# 01b: From Gas and Dust to Planetesimals: Processes and Timescales

Session chaired by Fred Ciesla & Ed Young

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<tr>
<th>Time</th>
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<tr>
<td>09:30</td>
<td>Kinetics of Condensation and Cosmochemical Fractionation of the Planet Forming Materials in the Early Solar Nebula</td>
<td>Nagahara H &amp; Ozawa K</td>
</tr>
<tr>
<td>09:45</td>
<td>Nucleosynthetic Mo and W Isotope Anomalies in Murchison Leachates</td>
<td>Burkhardt C, Kleine T, Dauphas N, Oberli F &amp; Wieler R</td>
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<tr>
<td>10:00</td>
<td>O-Isotope Compositions of Ferroan Olivine in Ngawi (LL3-6) Breccia</td>
<td>Krot A, Nagashima K &amp; Petaev M</td>
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<tr>
<td>10:15</td>
<td>Modeling Isotopic Signatures of Nebular Chlorine Condensation</td>
<td>Schauble E &amp; Sharp Z</td>
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<tr>
<td>10:45</td>
<td>Hydrothermal Synthesis of Cubanite Under Conditions Relevant to the CI-Chondrite Parent Body</td>
<td>Berger E, Lauretta D &amp; Keller L</td>
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Session 01d follows this session in this room. For details see page 399.
01d: Mars and the Moon: New Discoveries from Sample Science to Recent Missions

Session chaired by Anne Peslier, Tomas Magna & Carsten Münker

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<tr>
<td>11:00</td>
<td>Martian Surface Geochemistry from MGS TES: Evidence of Global-Scale Dissolution of Olivine from Basalts</td>
<td>Hamilton VE &amp; Rogers AD</td>
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<tr>
<td>11:15</td>
<td>Newly Discovered MIL 090030, MIL 090032, and MIL 090136 Nakhliite: Paired with MIL 03346?</td>
<td>Udry A &amp; McSween HY</td>
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<tr>
<td>11:45</td>
<td>Calcium Isotopes in Martian Meteorites</td>
<td>Gussone N, Magna T &amp; Mezger K</td>
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<tr>
<td>12:00</td>
<td><strong>Keynote:</strong> The C1 Isotope Composition of the Moon and Mars</td>
<td>Sharp Z, Shearer C, McCubbin F &amp; Agee C</td>
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(Session 01d continues on Friday 19th PM on page 424)
02a: Redox Evolution of the Early Mantle, Oceans and Atmosphere

Session chaired by David Catling & Bernie Wood

09:30  The Oxidation State of Hadean Melts and Implications for the Composition of Earth’s Early Atmosphere
Trail D, Watson EB & Tailby N

09:45  Invited: Copper Systematics in Arc Magmas and Implications for the Origin of Continents, the Pb-Paradox, and Copper Porphyry Deposits

10:00 Invited: Linking Early Atmospheric Composition to Volcanic Degassing from a Reduced Mantle
Foley S & Eremets M

10:15  Volcanic Gases and Redox Biogeochemistry at the Archean-Proterozoic Transition
Gaillard F, Scaillet B & Arndt N

10:30 Invited: Redox and Early Earth’s Sulfur Cycle
Harquhar J, Claire M, Domagal-Goldman S, Harms B, Poulton S & Zerkle A

10:45  Reconciling the Sulfur Atmospheric Cycle of Early Earth with the Geological Record
Philippot P & Van Zuilen M

11:00 Multiple Sulfur Isotopic Evidence for Multiple Origins of Late Archean and Early Paleoproterozoic Sediment-Hosted Pyrite, Quadrilátero Ferrífero of Minas Gerais
Strauss H, Cabral AR, Cording A & Koglin N

11:15 Experimental Tests for the Origin of Archean Sulfur Mass-Independent Fractionation during SO2 Photolysis
Ono S & Whitehill A

11:30 Ultraviolet Spectra of 32/33/34/36 SO2: Implications for the Archaean Atmosphere
Ueno Y, Danielache S, Hattori S, Johnson M & Yoshida N

11:45 Seawater-Derived REY and HFSE Systematics in Archean BIFs
Viehmann S, Hoffmann JE, Münker C, Alexander BW & Bau M

12:00 Origin of Isotopically Heavy Fe in Pyrite from 2.75 Ga Wilgie Mia BIF, Western Australia
Lepland A, Van Kranendonk MJ & Whitehouse MJ

12:15 High Magnitude MIF-S due to Increased Atmospheric p(O2)
Kurzweil F, Hannington M & Strauss H

(Session 02a continues on Friday 19th PM on page 425)
04e: Mantle Compositional Variability: From Ocean Basins to Melt Inclusions
Session chaired by John Maclennan, Leonid Danyushevsky & David Graham

09:30 Magma Sources at Eyjafjöll and Adjacent South Iceland Central Volcanoes
   Thirlwall M, Manning C & Lowry D

09:45 The Role of North Atlantic Asthenosphere in the Genesis of Icelandic Lavas: Evidence from Heimaey
   Manning C & Thirlwall M

10:00 Contrasting Mantle Signatures along the Mid-Atlantic Ridge (10-50°N)
   Dosso L, Hamelin C, Hanan B, Thirlwall M & Silantyev S

10:15 Mantle Lithologies from Minor Elements in Olivine: Cape Verde
   Barker A, Holm PM & Troll V

10:30 Mantle Controls on the Geochemistry of Kilauea Lavas Erupted over the Last Millennium
   Burns D, Pietruszka A, Norman M, Marske J, Garcia M & Rhodes JM

10:45 Invited: Heterogeneity in the Mantle Plume: Spatial Scales and Ages
   Sobolev A, Hofmann A, Joehum K, Kuzmin D & Stoll B

11:00 Invited: Small-Scale Processes and Mantle Source Heterogeneity Recorded in Melt Inclusions from the Mid-Atlantic and Gakkel Ridges
   Laubier M & Langmuir C

11:15 Invited: Mantle Heterogeneity Constraints from Abyssal Peridotite Sulfide Pb and Os Isotopic Compositions
   Warren J & Shirey S

11:30 Pyroxenites in Peridotites from External Liguride Ophiolites (Italy): Insights on Small Scale Heterogeneities in MORB Mantle
   Borghini G, Rampone E, Zanetti A, Class C, Cipriani A, Hofmann A & Goldstein S

11:45 Petrogenesis of the Oceanic Crust from Trace Elements in Basalt Glasses
   O’Neill H & Jenner F

12:00 Oceanic Basalts Provide a Biased View of Mantle Composition
   Regelous M, Haase K & Brandl P

12:15 Invited: Local and Regional Magmatic Modulators to Mantle Signatures in Erupted Mid-Ocean Ridge Lavas
   Rubin K, Maclennan J, Sinton J & Hellebrand E
### Session chaired by Sebastian Tappe, Dejan Prelevic & Graham Pearson

**09:30 Invited:** Kimberlites, Flood Basalts and Mantle Plumes: New Insights from the Deccan Large Igneous Province  
*Chalapathi Rao NV & Lehmann B*

**09:45** Pb-Sr-Nd-Hf Isotope Variations of Megacrysts from Mesozoic Southern African Kimberlites Reflect Mixing of HIMU Melts with Deep Lithosphere  
*Janney P & Bell D*

**10:00** Rogue Hafnium Isotopes in Lac de Gras Kimberlites, Canada: Ultradeep vs. Shallow Mantle Processes  
*Tappe S, Pearson G, Kjarsgaard BA, Nowell G & Dowell D*

**10:15** Uniqueness of Kimberlite Magma: Its Source Characteristics and Transportation Systems Revealed by Isotope Signatures  
*Kaneoka I*

**10:30** Oxygen Isotopes in Perovskites from Kimberlites  
*Sarkar C, Storey C, Hawkesworth C & Sparks S*

**10:45** U-Pb Perovskite Ages of Kimberlites from the Rosário do Sul Cluster: Southern Brazil  
*Conceiçção R, Lenz C, Provenzano C, Sander A & Silveira F*

**11:00 Invited:** Volatiles in the Kimberlite Melt – What Drives Ascent and Causes Explosive Eruption?  
*Kamenetsky V*

**11:15** High-Mg Carbonatitic HDFs, kimberlites and the SCLM  
*Weiss Y, Griffin W, Bell D & Navon O*

**11:30 Invited:** The Lithium Isotopic Signature of Carbonatites  
*Halama R, McDonough WF, Rudnick RL & Bell K*

**11:45** The Origin of Carbonate Globules in Silicate Melts: Solids or Liquids?  
*McMahon S, Bailey K, Walter M & Caricchi L*

**12:00** U-Pb Geochronology and Lu-Hf Isotope Data from Meta-Carbonatites in the Southern Canadian Cordillera  
*Millonig LJ, Gerdes A & Groat LA*

**12:15** The First Stepwise Crushing Data on C, N and Ar Isotopic and Elemental Ratios in Guli Carbonatites  
*Buikin A, Verchovsky A, Grinenko V & Kogarko K*

(Session 05h continues on Friday 19th PM on page 427)
06e: Deep Subduction of Crustal Rocks into the Mantle: Observations, Experiments, Models

Session chaired by Larissa Dobrzhinetskaya, Shah Wali Faryad, Taras Gerya & Alexei Perchuk

09:30 Decarbonation of Subducting Slab at Subarc Depth: Experimental Modeling
Perchuk A, Korepanova O & Yapaskurt V

09:45 Continental Materials Around the Bottom of the Mantle Transition Zone
Kawai K, Yamamoto S, Ichikawa H, Tsuchiya T & Maruyama S

10:00 **Keynote**: Super-Si Garnet Breakdown Kinetics and Implications for Craton Evolution
Spengler D, Nishihara Y & Fujino K

10:30 Fluids Nature at Peak of Ultrahigh-Pressure Metamorphism in Deep Subduction Zones – Evidence from Diamonds
Dobrzhinetskaya L, Wirth R, Green H & Sumino H

10:45 Discovery of Diamond and Coesite in Bohemian Granulites
Kotkova J, O’Brien PJ & Ziemann MA

11:00 Diamond-Graphite Transformation: A NanoSIMS Isotope Study of Diamond-Graphite Inclusion in Zircon from the Kochetav Massif
Jacobsen B, Matzel J, Hutcheon I, Green H & Dobrzhinetskaya L

Burov E

11:30 Evidence for Subduction History Recorded by Mineral Inclusions in High-Grade Metamorphics of the Modanubian Zone, Central Europe
Faryad SW, Lexa O, Racek M, Dolejš D & Jedlička R

11:45 Geochemical and U-Pb Age Constraints on the Occurrence of Polygenetic Titanites in UHP Metagranite in the Dabie Orogen

12:00 Continental Subduction, Slab Breakoff and Eduction: End-Member Processes for UHP Rock Histories
Sizova E, Duretz T & Gerya T

12:15 Coexistent Aqueous Fluid Phase and Melt in Lherzolites from Bultfontein, South Africa
Purchase M, Sommer H, Regenauer-Lieb K, Jung H & Gasharova B
**08j: Nanoparticles, Interfacial Processes and Nuclear Waste Management**

Session chaired by Andrey Kalinichev, Stepan N Kalmykov & Melissa Denecke

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<th>Authors</th>
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<tr>
<td>10:00</td>
<td>PuO(_x\bullet n)H(_2)O Nanoparticles Formation Upon Pu(V,VI) Sorption onto Hematite</td>
<td>Romanchuk A, Egorov A, Zubavichus Y, Shiryaev A &amp; Kalmykov S</td>
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<td>10:15</td>
<td>Laser-Induced Breakdown Detection (LIBD) of Uranium and Silica Colloids</td>
<td>Jung EC, Cho H-R &amp; Park MR</td>
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<td>10:45</td>
<td>Competition between Lanthanides and Al for Humic Acid Binding</td>
<td>Marsac R, Davranche M, Gruau G &amp; Dia A</td>
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<td>11:00</td>
<td>The Uptake of Radionuclides into Nanoparticulate Hydroxyapatite</td>
<td>Handley-Sidhu S, Renshaw J, Stolpe B, Lead J &amp; Macaskie L</td>
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<td>11:30</td>
<td>Uranium Speciation in Opals from the Nopal I Deposit (Mexico)</td>
<td>Othmane G, Allard T, Menguy N, Vercouter T, Morin G, Calas G &amp; Fayek M</td>
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<td>11:45</td>
<td>STXM and XAS Study of Kaolinite Conversion into Berthierine-Like Mineral</td>
<td>Rivard C, Montanges-Pelletier E, Pelletier M, Michot LJ, Vantelon D, Karunakaran C, Villieras F &amp; Michau N</td>
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<td>12:00</td>
<td>Density Functional Study of Uranyl Adsorption on Solvated Surfaces of Clay Minerals</td>
<td>Kremleva A, Krueger S &amp; Roesch N</td>
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<td>12:15</td>
<td>Consistent Treatment of Entropy, Enthalpy and Volume Effects of Multi-Dentate Adsorption Reactions</td>
<td>Kulik D &amp; Lützenkirchen J</td>
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<tr>
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<td>11:45</td>
<td>S Isotopes Distinguish Two S Pulses at Terrestrial Cretaceous-Paleogene Boundary Sections</td>
<td>Cousineau M, Therrien F, Maruoka T, Wing B &amp; Fortin D</td>
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<tr>
<td>12:00</td>
<td>Did the AD 1452 Kuwae Eruption Have Global Climatic Impact?</td>
<td>Nemeth K, Cronin S &amp; Smith I</td>
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<tr>
<td>12:15</td>
<td>Release Rate of Pollutants, Nutrients and Protons from Pristine Eyjafjallajökull Ash</td>
<td>Alfredsson HA, Gislason SR, Stipp SLS &amp; Burton KW</td>
</tr>
</tbody>
</table>
09c: Magmatic Volatiles: From Natural and Experimental Systems to Thermodynamics and Numerical Modeling. Their Influence on Magma Properties

Session chaired by Nicole Metrich & Roman Botcharnikov

09:30  **Keynote:** Progress in Understanding of Sulfur in Subduction Zone Magmas  
*Mandeville C, Shimizu N, Kelley K, Metrich N & Fiege A*

10:00  Post-Entrapment Changes to H₂O and CO₂ in Olivine-Hosted Melt Inclusions  
*Gaetani G, O’Leary J & Shimizu N*

10:15  Evolution of the δD Value in Water-Rich Basaltic Melt Inclusions during Volcanic Processes  
*Metrich N, Deloule E & Di Muro A*

10:30  **Invited:** Carbon Isotope Evolution in Magmatic Systems by CO₂ Fluxing  
*Yoshimura S & Nakamura M*

10:45  The Plumbing System of the Ischia Island: A Physico-Chemical Window on the Fluid-Saturated and CO₂-Sustained Neapolitan Volcanism (Southern Italy)  
*Moretti R, Arienzo I, Orsi G, Civetta L & D’Antonio M*

11:00  **Invited:** Inverse Modelling of Gas Chemistry Measurements  
*Burgisser A, Alletti M & Oppenheimer C*

11:15  Lithium-Boron Isotope Fractionation during Degassing of Rhyolitic Magma  
*Koga KT, Rose-Koga EF, Laporte D, Cluzel N, Shimizu N & Deloule E*

11:30  **Invited:** Volatiles and Viscosity  
*Dingwell DB*

Session 09a follows this session in this room. For details see page 405.
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<thead>
<tr>
<th>Time</th>
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<tr>
<td>09:45</td>
<td>Mineral Alterations due to Accessory Gases in the Geological Storage of CO₂</td>
<td>Heeschen K, Risse A, Stadler S &amp; Ostertag-Henning C</td>
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<tr>
<td>10:00</td>
<td>An Experimental Study of Brine-CO₂ Metal Fractionation: Applications to the Geological Storage of CO₂</td>
<td>Rempel K, Liebscher A, Heinrich W &amp; Schettler G</td>
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<tr>
<td>10:15</td>
<td>Carbonation of Steel Slag I</td>
<td>Berryman E, Williams-Jones A, Migdisov A &amp; van der Laan S</td>
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<tr>
<td>10:45</td>
<td><strong>Keynote:</strong> Oxygen Isotope Exchange between H₂O and Supercritical CO₂: Lab Experiments and Field Evidence</td>
<td>Johnson G, Mayer B, Nightingale M &amp; Shevalier M</td>
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<tr>
<td>11:45</td>
<td>Effects of Organic Ligands on Supercritical CO₂-Induced Phlogopite Dissolution and Secondary Mineral Formation</td>
<td>Jun Y-S, Shao H &amp; Ray J</td>
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<tr>
<td>12:00</td>
<td>Magnesite Growth Inhibition by Organic Ligands: Complexation and Adsorption</td>
<td>Gautier Q, Bénézeth P, Jordan G, Berninger U-N &amp; Schott J</td>
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</table>
11b: Ore Deposits and the Role of the Lithospheric Mantle – Sponsored by SGA

Session chaired by Wolfgang Dereck Maier, Sisir K. Mondal, Thomas Oberthür & Marco Fiorentini

09:30  **Keynote:** Ultrahigh-Pressure Podiform Chromitites as a Possible Deep Recycled Material  
*Arai S, Ahmed A & Miura M*

10:00  Geodynamic Implications of >1 Ga Re-Os Model Ages in PGM from the Dobromirtsi Ultramafic Massif, Central Rhodope, Bulgaria  
*Gonzalez-Jimenez JM, Griffin WL, Gervilla F, Kerestedjian T, O'Reilly SY & Pearson NJ*

10:15  PGE Contents and Spinel Compositions of Different Podiform Chromitites in the Eastern Anatolia Complex, Turkey  
*Colakoglu AR, Gunay K & Prichard H*

10:30  Gold and Palladium Mineralization at Est of Bou Azzer Ophiolite, Morocco  
*Elghorfi M, Ennaciri A, Maacha L & Oberthur T*

10:45  Hydrothermal Co-Ni Mineralization, Associated with Serpentinitized Peridotites: Bou Azzer, Morocco  
*Ennaciri A, Maacha L, Barbanson L & Maier WD*

Session 11g follows this session in this room. For details see page 409.
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<tr>
<th>Time</th>
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<th>Authors</th>
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<tr>
<td>11:00</td>
<td><strong>Keynote:</strong> Biotransformation Rare Earth Elements</td>
<td>Ohnuki T</td>
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<tr>
<td>11:30</td>
<td>Key Impact of Soil (Fe/Organic C) Ratio on REE Shallow Groundwater Patterns</td>
<td>Pédrot M, Dia A, Davranche M &amp; Gruau G</td>
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<tr>
<td>11:45</td>
<td>Rare Earth Elements in Pore Waters of the Bering Sea Sediments</td>
<td>Huh Y &amp; Soyol-Erdene T-O</td>
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<td>12:00</td>
<td>Rhine River: First Case of Anthropogenic Lanthanum as a Dissolved Microcontaminant in the Hydrosphere</td>
<td>Kulaksiz S &amp; Bau M</td>
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(Session 11g continues on Friday 19th PM on page 433)
12h: Geochemistry of Ice Sheets and their Basal Environments

Session chaired by Jeff Severinghaus & Barbara Stenni

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<th>Time</th>
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<tr>
<td>09:30</td>
<td>Medal: Krypton and Xenon in Air Bubbles from Ice Cores as Tracers of Past Ocean Temperature</td>
<td><em>Severinghaus J &amp; Kawamura K</em></td>
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<td>10:15</td>
<td>Keynote: Past Fire Reconstructions in Ice Core through the Determination of Specific Molecular Markers</td>
<td><em>Barbante C</em></td>
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<td>10:45</td>
<td>Glacial Interglacial Aerosol Input over Antarctica and the Global Hydrological Cycle</td>
<td><em>Petit JR &amp; Delmonte B</em></td>
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<tr>
<td>11:00</td>
<td>Invited: How are Oceanic δ¹⁸O Changes Imprinted in Ice Core Records?</td>
<td><em>Jouzel J, Hoffmann G, Landais A, Stenni B, Masson-Delmotte V &amp; Waelbroeck C</em></td>
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<td>11:15</td>
<td>A 700 Year Record of Accumulation Rates at Dome A, Antarctica</td>
<td><em>Jiang S, Li Y, Cole-Dai J &amp; Ferris D</em></td>
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<td>11:30</td>
<td>Volcanic, Solar Activity, and Atmospheric Circulation Influences on Cosmogenic ^10Be Fallout at Vostok and Concordia (Antarctica) over the Last 60 Years</td>
<td><em>Baroni M, Bard E, Petit J-R, Magand O &amp; Bourles D</em></td>
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<td>11:45</td>
<td>Spatio-Temporal Variation of Total Mercury Concentrations in Antarctic Snowpack</td>
<td><em>Han Y, Huh Y, Hong S, Hur SD &amp; Motoyama H</em></td>
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<td>12:00</td>
<td>Stable Isotopes of Snow Precipitation at Concordia Station (East Antarctica)</td>
<td><em>Dreossi G, Stenni B, Braida M, Scarchilli C, Valt M, Cagnati A, Frezzotti M, Bonazza M, Genoni L, Frosini D, Karlcek D &amp; Udosti R</em></td>
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<tr>
<td>12:15</td>
<td>Seasonal Shifts in Concentration, Age, and Lability of Carbon Exported from the Greenland Ice Sheet (GrIS)</td>
<td><em>Bhatia M, Das S, Charette M, Xu L &amp; Kujawinski E</em></td>
</tr>
</tbody>
</table>
13c: Air Quality and Climate: Bridging the Scales

Session chaired by Mian Chin & Lorraine Remer

11:30 **Keynote:** Global Assessments of Linkages between Air Quality and Climate
   *Dentener F*

12:00 **Invited:** Modeling Local and Remote Impacts of Amazonian Biomass Burning Aerosols

12:15 **Invited:** Aerosol Spatial Scales in Observations and Models: Implications for the Aerosol Direct Effect
   *Colarco P*

(Session 13c continues on Friday 19th PM on page 435)
13e: Land-Atmosphere Interactions: The Role of Aerosols

Session chaired by Almut Arneth, Annica Ekman & Janne Rinne

09:30 Invited: Global Constraints on Biogenic Particles
Heald C, Spracklen D & Guenther A

09:45 Invited: Vegetation and Climate: The Potential Role of Terpene Emissions and Aerosol Particle Formation on Local Climate Conditions
Bonn B

10:00 Primary Biological Organics in Ambient PM in the Southeastern U.S.
Shaw S, Casuccio G, Edgerton E, Lersch T, Rohr A & Thorne P

10:15 Keynote: Biogenic Volatile Emissions and their Contribution to Organic Aerosol Mass
Kiendler-Scharr A, Wildt J, Mentel T, Dal Maso M, Kleist E & Tillmann R

10:45 Invited: Impact of Biological and Mineral Dust Aerosols on Mixed-Phase Clouds
Hoose C, Anquetil-Deck C, Burrows S, Hummel M, Kristjansson JE & Möhler O

11:00 Invited: Putting Constraints on the Life Cycle of Organic Carbon Based on Ecosystem Scale Flux Measurements
Karl T

11:15 Fossil Fuel Derived Deposition Drives Export of Ancient, Labile Carbon from Alaska’s Glaciers
Stubbins A

Session 13c follows this session in this room. For details see page 411.
14a: Critical Zone Processes at Multiple Scales

Session chaired by Heather Buss & Jérôme Gaillardet

09:30 **Keynote:** Integrating Climate and Landscape Controls on Regolith Depth, Chemistry and Mineral Assemblage

*Rasmussen C, Lybrand R, Jardine A, Pelletier J, Troch P & Chorover J*

10:00 **Invited:** Quantifying Rates and Mechanisms of Shale Weathering Across a Continental-Scale Climosequence

*Brantley SL, Dere A & White T*

10:15 Influence of Soil Shielding on Local to Global Chemical Weathering Rates

*Hartmann J, Moosdorf N & Lauerwald R*

10:30 **Invited:** The Effect of Time and Climate on Volcanic Soil Formation

*Gislason S, Eiriksdottir E, Alfredsson H, Sigfússon B, Jones M & Oelkers E*

10:45 **Invited:** Assessing the Factors Controlling the Temporal Variations of Weathering Fluxes in a Tropical Watershed: Mule-Hole (South India)


11:00 **Invited:** Seasonal Magnesium Isotope Variations in Soil Solutions Reflecting Physico-Chemical Processes Controlling Soil Weathering Fluxes


11:15 **Invited:** Probing the Silicon Isotope Signature of Supply Limited Chemical Weathering in the Cordillera Central of Costa Rica


11:30 Agriculture’s Impact on the Si Cycle by Accelerated Biomineralisation

*Sullivan L & Parr J*

11:45 Modeling of Soil Degradation in the Czech Critical Zone Observatories

*Kram P & Hruska J*

12:00 Assessing Organic Carbon Distribution in the Koiliaris Critical Zone Catchment (Greece) by Using Geostatistical Techniques

*Aksoy E, Panagos P, Nikolaidis N & Montanarella L*

12:15 **Invited:** Christina River Basin Critical Zone Observatory: Carbon-Mineral Interactions from Molecular to Basin Scales in the Anthropocene

*Yoo K, Aufdenkampe A, Chen C & Sparks D*
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
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<tbody>
<tr>
<td>09:30</td>
<td>Sr Isotopic Composition of Manganese Nodules: Recorder of Cambrian Ocean</td>
<td>Harlavan Y, Bar-Matthews M &amp; Matthews A</td>
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<tr>
<td>09:45</td>
<td>The Strontium Stable Isotope Composition of Seawater during Glacial Intervals</td>
<td>Stevenson E, Burton K, Parkinson I, Anand P, Hathorne E &amp; Mokadem F</td>
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<tr>
<td>11:00</td>
<td>Paired Sr Isotope (87Sr/86Sr, δ88/86Sr) Systematic of Pore Water Profiles: A New Perspective in Marine Weathering and Seepage Studies</td>
<td>Liebetrau V, Haeckel M, Eisenhauer A, Scholz F, Hensen C &amp; Reitz A</td>
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<tr>
<td>11:45</td>
<td>Isotopic Fractionation of Cadmium into Calcite</td>
<td>Horner T, Rickaby R &amp; Henderson G</td>
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<tr>
<td>12:00</td>
<td>Cd Behaviour in Arctic Estuarine Systems Using Cd Isotopes and Concentrations Analysis</td>
<td>Lambelet M, Rehkämper M, Van De Flierdt T, Xue Z, Kreissig K, Coles B, Andersson P &amp; Porcelli D</td>
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</table>

(Session 15i continues on Friday 19th PM on page 436)
16b: Understanding the Fate and Transformations of Metal and Radionuclide Contaminants in Unsaturated and Saturated Subsurface Environments
Session chaired by Scott Brooks, Dawn Wellman, Henning Prommer & Ann Miracle

09:30 **Keynote:** Pore-Scale Process Coupling and Its Effect on the Apparent Rates of Uranyl Surface Complexation

10:00 Impact of Groundwater Composition and Diffusive Transport Limitations on Uraninite Stability

10:15 A Meso-Scale Laboratory Study of Stable Isotope Variations during Uranium Bioremediation
* Druhan J, Steefel C, Conrad M & DePaolo D

10:30 Multi-Isotopic Constraints on Contamination History, Contaminant Migration and Structure of the F-Area Acidic Plume, Savannah River Site
* Christensen IN, Denham ME, Conrad ME, Bill M & Wan J

10:45 On Modeling H+ and U Transport Behavior in an Acidic Plume
* Spycher N, Mukhopadhyay S, Sassen D, Murakami H, Hubbard S, Davis J & Denham M

11:00 Evaluation of Chromium Reductive Immobilization and Oxidative Re-mobilization in Flow-Through Aquifer Sediment Columns

11:15 Cr Isotope Fractionation during Biogeochemical Reduction of Cr(VI) by Hanford Native Aquifer Microbial Communities
* Qin L, Christensen J, Brown S, Yang L, Conrad M, Sonnenthal E & Beller H

11:30 Nuclear Imaging of ⁹⁹ᵐTc Transport and Immobilisation through Porous Media

11:45 Non-Invasive Geophysical Imaging for Characterization of Engineered in situ Radionuclide Precipitation
* Clark B, Gilow J, Preston P, Ilgner B & Morie S

12:00 **Invited:** Technical and Policy Challenges in Deep Vadose Zone Remediation of Metals and Radionuclides
* Wellman D & Truex M

(Session 16b continues on Friday 19th PM on page 437)
17a: Biogeochemical Cycling in Watersheds

Session chaired by Martin Novak & Maria Dittrich

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<tr>
<th>Time</th>
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<th>Authors</th>
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<tbody>
<tr>
<td>09:30</td>
<td>Monitoring Nutrients Cycles at Catchment Scale</td>
<td>van Tol D &amp; van der Grift B</td>
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<tr>
<td>09:45</td>
<td>Combining Spot Samples and Continuous Sampling to Study Small Catchment Storm Runoff</td>
<td>Palmer M, Gkritalis-Papadopolous A &amp; Mowlem M</td>
</tr>
<tr>
<td>10:30</td>
<td>Invited: Isotope Constraints on the Biogeochemical Cycling of Calcium (Ca) in a Base-Poor Forest Ecosystem</td>
<td>Farkaš J, Déjeant A, Novák M &amp; Jacobsen S</td>
</tr>
<tr>
<td>10:45</td>
<td>Invited: Magnesium Isotope Fractionation in a Hardwood Forest of Southern Québec, Canada</td>
<td>Worsham S, Holmden C &amp; Bélanger N</td>
</tr>
<tr>
<td>11:00</td>
<td>Usefulness of Stable Isotopes in Small Catchment Studies: Overview of Results from the Stressed Ecosystems of Central Europe</td>
<td>Novak M, Buzek F, Jackova I, Chrustny V, Farkas J, Fottova D, Voldrichova P, Stepanova M &amp; Prechova E</td>
</tr>
<tr>
<td>11:30</td>
<td>Sources and Sinks of Acetate in an Acidic Peatland</td>
<td>Hädrich A, Heuer V, Herrmann M, Hinrichs K-U &amp; Küsel K</td>
</tr>
<tr>
<td>11:45</td>
<td>Controls on Lignin Degradation in a Temperate Deciduous Forest</td>
<td>Klotzbücher T, Kaiser K &amp; Kalbitz K</td>
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</table>

Session 17j follows this session in this room. For details see page 418.
# 17g: Dynamics, Mobility and Bioavailability of Trace Elements in Contaminated Environments

Session chaired by Michael Komarek, Melanie Davranche, Carla Koretsky & Martin Mihaljevic

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<th>Authors</th>
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<tbody>
<tr>
<td>09:30</td>
<td>Cr(VI) Adsorption on γ-Alumina</td>
<td>Koretsky C &amp; Reich T</td>
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<tr>
<td>09:45</td>
<td>Bacterial Cells can Biosorb and Accelerate the Transport of Heavy Metals Mixtures in Soils</td>
<td>Desaunay A &amp; Martins JMF</td>
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<tr>
<td>10:00</td>
<td>Bioavailability and Toxicity of Metals in an Estuary Contaminated by Acid Mine Drainage</td>
<td>Braungardt C, Money C &amp; Achterberg E</td>
</tr>
<tr>
<td>10:15</td>
<td>Sediment Diagenesis Modelling in a AMD Contaminated Reservoir</td>
<td>Torres E, Couture RM, Shafei B, Ruiz Cánovas C &amp; Ayora C</td>
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<tr>
<td>10:30</td>
<td>Post-Deposition Diffusion of $^{137}$Cs in Lake Sediments</td>
<td>Klaminder J, Appleby P &amp; Renberg I</td>
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<tr>
<td>10:45</td>
<td>Stability and Transformation of Pb Smelter Fly Ash in Soils</td>
<td>Ettler V, Mihaljevic M &amp; Sebek O</td>
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<td>11:00</td>
<td>Trace Metal Concentrations and Pb Isotopes of Sediments from Barkley Sound, British Columbia</td>
<td>Ikehata M, Shiel AE &amp; Weis D</td>
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<td>11:15</td>
<td>Selenium Uptake in Otoliths from Cold-Water Fish Species Captured Downstream from Coal Mining</td>
<td>Friedrich L, Halden N &amp; Palace V</td>
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<tr>
<td>11:30</td>
<td>Environmental Geochemistry of Cu in Agricultural Soils Treated with Cu-Based Fungicides</td>
<td>Komarek M &amp; Cadkova E</td>
</tr>
<tr>
<td>11:45</td>
<td>Strontium Incorporation into Carbonate Granules Secreted by Earthworms</td>
<td>Brinza L, Mosselmans FW, Schofield P, Quinn PD &amp; Hodson ME</td>
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<tr>
<td>12:00</td>
<td>Agricultural Impact on P and Metal Availability in Stream Sediments</td>
<td>Hund SV, Shiel AE, Brown S, Lavkulich LM &amp; Weis D</td>
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</table>
17j: Biogeochemical Processes in Redox-Dominated Environments: From Cold Seeps to Soils

Session chaired by Gert De Lange, Céline Pallud, Christian Hensen & Anniet Laverman

12:00 Lignin Decomposition in Paddy Soils as Affected by Redox Conditions
_Čerli C, Liu Q, Hanke A, Kaiser K & Kalbitz K_

12:15 Impact of Ferrihydrite Coating and Aeration Conditions on Microbial Selenium (Se) Reduction and Retention in Artificial Soil Aggregates
_Kausch M & Pallud C_

(Session 17j continues on Friday 19th PM on page 440)
19e: Simulation of Geofluids from Melts to Aqueous Solutions

Session chaired by Lars Stixrude & Ariel Chialvo

09:30 **Keynote**: Melts in the Deep Mantle: Insights from First Principles Molecular Dynamics
*de Koker N, Stixrude L & Karki B*

10:00 **Invited**: Fluid-Fluid Phase Separation Under Metamorphic Conditions: MD Simulations of a Generalized Composition H₂O-CO₂-NaCl
*Kalinichev A*

10:15 Atomic Environment of Y in Silicate Melts from Molecular Dynamics and X-Ray Absorption Spectroscopy
*Haigis V, Simon S, Wilke M & Jahn S*

10:30 **Invited**: Molecular Dynamics Simulation of the Electrical Double Layer on Smectite Clay Surfaces
*Bourg I & Sposito G*

10:45 **Invited**: Viscosity of MgO-SiO₂ Melt System from First Principles Simulations
*Karki B*

11:00 Silicic Acid: An Experimental and *ab Initio* Study of Explicit Solvation and Reaction Kinetics
*McIntosh G, Swedlund P & Sohnel T*

11:15 **Invited**: Theories of Fluids at Extreme Conditions
*Nezbeda I*

11:30 Direct Molecular Simulation of Aqueous Electrolyte Solubility
*Moucka F & Smith W*

11:45 **Invited**: Metal Complexation in Hydrothermal Fluids: Insights from *ab Initio* Molecular Dynamics
*Sherman D & Mei Y*

12:00 **Invited**: Liquid Carbonates Investigated by First-Principles Molecular Dynamics Simulations
*Vuilleumier R, Seitsonen A, Sator N & Guillot B*

12:15 Isotope Fractionation due to Temperature Gradients: Molecular Dynamics Simulations
*Goel G, Lacks D, Van Orman J, Lundstrom C & Lesher C*
20j: Structure, Elasticity and Thermodynamics of Minerals

Session chaired by Michael A. Carpenter, Tiziana Bozza Ballaran & Alan Woodland

09:30 Medal: Tilts Without Tears – Structure and Elasticity of Feldspars

Angel R

10:15 Keynote: The Nanoscale Structure of Complex Perovskite-Type Oxides with Superb Dielectric Properties

Mihailova B

10:45 Structural Distortion of MgSiO₃ Perovskite and the Influence of Fe and Al at Pressures of the Earth’s Lower Mantle

Bozza Ballaran T, Kurnosov A, Glazyrin K, Merlini M, Hanfland M & Frost DJ

11:00 Raman Spectroscopic Insight into Structural Changes in Berlinites with High Pressure and Temperature

Watenphul A & Schmidt C

11:15 A Novel Technique for F/OH Apatite Series Synthesis and Early Results on Thermodynamic Mixing Properties of Fluor-Hydroxyapatite Solid Solutions

Hovis G

11:30 Na-Bearing Majoritic Garnets in the System Mg₃Al₂Si₅O₁₂–Na₂MgSi₅O₁₂ at 11–20 GPa: Solid Solutions and Structural Peculiarities

Bobrov A, Dymshits A, Bindi L, Litasov K, Shatskiy A, Ohtani E & Litvin Y

11:45 Elastic Anomalies due to Spin State Transitions in Cobaltate Perovskites: Analogue Behaviour for Fe²⁺ in (Mg,Fe)SiO₃

Zhang Z, Koppensteiner J, Schranz W & Carpenter MA

12:00 Anelastic Processes in Minerals at High Temperature: Examples of Quartz and Spinel

Redfern S, Peng Z, Walsh J & Daraktchiev M

12:15 Elasticity and Anelasticity of Relaxor Ferroelectrics

Carpenter M, Bryson J, Kisi E, Farnsworth S & Catalan G

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<td>01d</td>
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<td>05h</td>
<td>09e / 09b</td>
<td>17i</td>
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# 01d: Mars and the Moon: New Discoveries from Sample Science to Recent Missions

Session chaired by Anne Peslier, Tomas Magna & Carsten Münker

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<tr>
<td>14:00</td>
<td><strong>Invited:</strong> A New Moon&lt;br&gt;<strong>Neal C</strong></td>
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<td>14:30</td>
<td>The Volatile Content of Primitive Lunar Volcanic Glasses&lt;br&gt;<em>Hauri E, Saal A, Rutherford M &amp; Van Orman J</em></td>
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<td>14:45</td>
<td>Volatile Loss via Outgassing of the Lunar Magma Ocean&lt;br&gt;<em>Bahlevan K &amp; Karato S</em></td>
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<td>15:00</td>
<td>Origin and Flux of Lunar (Micro-) Impactors: Constraints from N-Ar Analyses of Single Luna 24 Grains&lt;br&gt;<em>Füri E, Marty B &amp; Assonov S</em></td>
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<td>15:15</td>
<td>Sulfur Speciation in Lunar Apatite&lt;br&gt;<em>Boyle J, Ma C, Eiler J, Liu Y, Stolper E &amp; Taylor L</em></td>
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<td>15:30</td>
<td>Lithium Isotope Composition of Lunar Crust – Rapid Crystallization and Post-Solidification Quiescence?&lt;br&gt;<em>Magna T &amp; Neal C</em></td>
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<td>Lunar Zircon: Primitive $\delta^{18}$O of Dry Evolved and Mafic Magmas&lt;br&gt;<em>Valley J, Spicuzza M &amp; Ushikubo T</em></td>
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<td>16:00</td>
<td>Age and Nature of Meteoritic Components on the Moon&lt;br&gt;<em>Fischer-Gödde M &amp; Becker H</em></td>
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<td>Constraints on the Formation of a Lunar Core from Metal-Silicate Partitioning of Siderophile Elements&lt;br&gt;<em>Rai N &amp; van Westrenen W</em></td>
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<td>16:30</td>
<td>Deciphering Mafic and Felsic Lunar Magmatic Events: Insight from Zircon&lt;br&gt;<em>Grange M, Nemchin A, Timms N, Pidgeon B &amp; Meyer C</em></td>
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<td>Portable Rb-Sr Geochronology&lt;br&gt;<em>Anderson FS, Nowicki K &amp; Whitaker T</em></td>
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02a: Redox Evolution of the Early Mantle, Oceans and Atmosphere

Session chaired by David Catling & Bernie Wood

14:00 **Keynote:** Whither the Whiff?
Anbar A, Kendall B, Reinhard C & Lyons T

14:30 Positive Ce Anomalies and U-Enrichment in Archean Volcanics: Implications for Oxygenated Oceans
Said N, Kerrich R & Manikyamba M

14:45 Fe(II) Oxidation Under Very Low O₂ Conditions: New Rate Law and its Implication
Kanzaki Y & Murakami T

15:00 **Invited:** Oxygen Overshoot and Recovery during the Early Paleoproterozoic
Bekker A & Holland H

15:15 **Invited:** The Anatomy of the Great Oxidation Event
Poulton S, Bekker A, Farquhar J, Zerkle A, Johnston D & Canfield D

15:30 Transitional Oxygenation Recorded in the Paleoproterozoic Tumee Creek Group, Western Australia
Williford K, Van Kranendonk M, Ushikubo T, Kozdon R & Valley J

15:45 Abundant Marine Sulphate in the Palaeoproterozoic: Models Come and Go, but the Rock Record Endures
Melezhik V, Fallick A & Rychanchik D

16:00 Freeze-Fry Cycles in the Paleoproterozoic Tumee Creek Group, Western Australia
Van Kranendonk M, Lepland A & Yamaguchi K

16:15 Molybdenum Isotopes as Oceanic Paleoredox Proxy of the Paleoproterozoic Shunga Event
Asael D, Rouxel O, Reinhard C, Lyons T & Kump L

16:30 Se Isotope Evidence for Atmospheric Oxidation at ~0.6 Ga
Pogge von Strandmann P, Elliott T, Catling D & Poulton S

16:45 Redox Evolution of the Late Neoproterozoic to Early Cambrian Ocean on Yangtze Platform, China
Chen X, Vance D, Ling H, Archer C, Shields G & Och L
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| 14:00 | Newly-Discovered Abyssal Peridotite Mantle Xenoliths Constrain Mid-Ocean Ridge Melting Models  
*Pearce J, Leat P, Barry T & Tindle A* |
| 14:15 | **Keynote:** Mantle Melting and Melt Transport beneath Oceanic Spreading Ridges  
*Kelemen P* |
| 14:45 | Waves, Channels, and Diffusive Porous Flow: Geochemical Implications for Melt Migration in an Upwelling Heterogeneous Mantle  
*Liang Y & Schiemenz A* |
| 15:00 | Generation of HIMU and EM-1 Reservoirs by CO₂-Fluxed Lower Mantle Melting: Implications for OIBs, Kimberlites and Carbonatites  
*Collerson K, Williams Q, Ewart T & Murphy D* |
| 15:15 | Melting Properties of Chondritic Mantle to the Core-Mantle Boundary  
*Andrault D, lo Nigro G, Bolfan-Casanova N, Garbarino G & Mezouar M* |
| 15:30 | Melting of Peridotite to 140 GPa  
*Fiquet G, Auzende A-L, Siebert J, Corgne A, Bureau H, Ozawa H & Garbarino G* |
| 15:45 | The Garnet-Spinel Transition in Fertile and Depleted Mantle: Experimental Data, Thermodynamic Calculations and Implications for Magmatic Processes  
*Klemme S* |
| 16:00 | Melting Conditions with PRIMELT: Examples and Future Work  
*Gazel E, Herzberg C & Asimow P* |
| 16:15 | On the Thermal and Dynamic Requirements for Mantle Melting  
*Tirone M & Ganguly J* |
| 16:30 | Experimental Study of Partition of Rare Elements between Minerals and Melts of Diamond Forming Eclogite-Carbonatite and Peridotite-Carbonatite Systems  
*Okonova V, Vasiliev P, Kuzyura A, Litvin Y, Wall F & Jeffries T* |
| 16:45 | Numerical Modelling for Peridotite Phase Melting Trends in the SiO₂-Al₂O₃-FeO-MgO-Cao System at 2 GPa  
*Bonadiman C & Coltorti M* |
**05h: Kimberlite, Carbonatite, and Strongly Alkaline Magmatism: Source-Forming Processes and Relations to Basaltic Magmatism**

Session chaired by Sebastian Tappe, Dejan Prelevic & Graham Pearson

**14:00** **Keynote:** Alkalic Magmas and the Diversity of Mantle Compositional Variation  
*Carlson R*

**14:30** Near-Source Compositions of Italian Kamafugite Melt  
*Nikogosian I & Van Bergen M*

**14:45** Melt Compositions and Processes in the Kimberlite Province of Southern West Greenland  
*Pilbeam L, Nielsen T & Waight T*

**15:00** Melt Inclusions in Coexisting Perovskite, Nepheline, Magnetite and Clinopyroxene in Pyroxene Melilitolite from Kerimasi Volcano, Tanzania  
*Guzmics T, Mitchell RH, Berkesi M, Szabó C & Milke R*

**15:15** Superplume Control of East Africa Rift Volcanism: Helium Isotope Evidence from Alkaline Magmatism of Tanzania  
*Hilton D, Halldorsson S, Barry P, Fischer T, De Moor M, Ramirez C, Mangasini F & Scarsi P*

**15:30** **Invited:** Craton Destabilization and Alkaline Magmatism in Equatorial East Africa  
*Tiberindwa J, Link K, Barifaijo E & Foley S*

**15:45** Origin of Cameroon Line Basanites from Metasomatized Lithosphere  
*Marzoli A, Aka F, Chiariadina M, Reisberg L & Merle R*

**16:00** Paleozoic Tholeiite Magmatism in the Kola Province, Russia: Relations with Alkaline Magmatism  
*Arzamastsev A & Arzamastseva L*

**16:15** Alkaline Mantle Melts Pinpoint Late Triassic Thinning of the Southern Alpine Lithosphere (Ivrea Zone, Italy)  
*Schaltegger U, Müntener O, Ulianov A, Ovtcharova M, Petcheva I, Antognini M & Girlanda F*

**16:30** U-Pb Zircon Ages of the Alto Paranaiba and Juína Kimberlitic Provinces, Brazil  
*Basei M, Svisero D, Iwanuch W & Sato K*

**16:45** Confocal Raman Spectroscopic Characteristic of Pseudoleucite in Alkaline Intrusive Rocks: Central Anatolia, Turkey  
*Deniz K & Kadioğlu YK*
06d: The Geochemical and Geodynamic Implications of Melt and Fluid Flow in the Mantle Wedge

Session chaired by Taras Gerya & Marco Scambellurizx

14:00 **Keynote:** How Does the Slab Component get Across the Mantle Wedge?
Hermann J & Pirard C

14:30 Modes of Mantle Flow and He Travel in the Northern Lau Backarc Basin
Arculus R, Nebel O, Jenner F, Mavrogenes J & Dyrw N

14:45 Mantle Diapir or Mantle Wedge Plume of NW Rota-1 Volcano, Mariana Arc

15:00 Pristine Mantle Xenoliths from the Active Bismarck Arc
McAlpine S & Arculus R

15:15 Metasomatic Pyroxenites and Peridotites in the Mantle Wedge: Tracing the High Nb/Ta Reservoir
Chen Y, Ye K, Guo S & Liu J

15:30 Melts Migrating through the Mantle Wedge: Evidences from Patagonian and Western Pacific Mantle Xenoliths
Melchiorre M, Faccini B, Coltorti M, Grégoire M, Bonadiman C & Benoit M

15:45 Focusing of Upward Fluid Migration due to Mineral Grain Size Variation
Wada I, Behn M, Parmentier M & Shaw A

16:00 Evidence of Slab Melt Transfer in the New Caledonian Fore-Arc Ophiolite
Pirard C, Hermann J & O’Neill H

16:15 Timing of Dehydration Melting and Fluid Flow during Continental Subduction-Zone Metamorphism in the Dabie Orogen
Chen R-X & Zheng Y-F

16:30 The Arrested HP Antigorite Dehydration Front from Cerro del Almirez (SE Spain)
Padrón-Navarta JA, López Sánchez-Vizcaíno V, Garrido CJ, Gómez-Pugnaire MT & Marchesi C

16:45 Serpentinite Channel and the Role of Serpentinite Buoyancy for Exhumation of High-Pressure Rocks (Voltri Massif, Western Alps)
Malatesta C, Gerya T, Scambelluri M, Federico L, Crispini L & Capponi G
### 08e: Current Challenges in Predicting Trace Metals Mobility in the Environment

**Session chaired by Thorsten Schäfer, Christophe Tournassat & Thorsten Stumpf**

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| 14:00 | **Keynote:** Ion Diffusion in Argillaceous Materials  
*Van Loon L*                                        |
| 14:30 | Metal Mobility in Clay Formations – From Batch Experiments with Mineral Suspensions to Column Setup  
with Compacted Clay  
*Kautenburger R, Moeser C & Beck HP*               |
| 14:45 | Sorption and Redox Behavior of Neptunium on Opalinus Clay and Callovian–Oxfordian Argillite  
*Banik NL, Marquardt C, Schild D, Rothe J & Schäfer T* |
| 15:00 | LTD Phase I.: Long-Term Real-Scale Diffusion Experiment Results  
*Haylova V, Martin A, Eikenberg J & Sus F*           |
| 15:15 | Experimental Studies on Cesium Retardation on Brazilian Crystalline Rocks: Petrography, Porosity and Distribution  
Coefficients  
*Belline JB, Siitauri-Kauppi M, Kelokaski M, Gomes MEB & Formoso MLL* |
| 15:30 | In-Diffusion of Some Chemical Species in a Weathered Granite  
*Park C-K, Baek M-H & Jeong J-T*                   |
| 15:45 | Sorption of Lanthanide Ions to Mineral Surfaces Monitored by Luminescence Spectroscopy Techniques  
*Eidner S, Brennenstuhl K, Zilm-Gramckow S & Kumke M* |
| 16:00 | Using TRLFS to Explain Increased Uptake of Eu(III) and Cm(III) into Biologically Produced Apatite  
*Holliday K, Handley-Sidhu S, Renshaw J, Macaskie L & Stumpf T* |
| 16:15 | Adsorption of Thallium(I) onto Geological Materials: Effect of pH and Humic Matter  
| 16:30 | Selenide Retention by Mackinawite: A Multi-Edge XAS Approach  
*Finck N, Dardenne K & Bosbach D*                      |
| 16:45 | Release Mechanisms of Sr and Cs from the Weathered Hanford Sediments  
*Um W & Chang H*                                      |
# 09b: New Insights into Geochemical Monitoring of Volcanic Activity

**Session chaired by Sandro Aiuppa & Burton Mike**

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<td>Sawyer G, Tsanev V, Scaillet B, Pichavant M, Burgisser A,</td>
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<td>Alletti M &amp; Molina I</td>
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<td><strong>Invited:</strong> 1998-2010 More Than Ten Year of Soil CO₂ Flux Measurement at Solfatara of Pozzuoli (Campi Flegrei, Italy)</td>
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<td>Airborne Measurements of Volcanic Particles and Gases with Small Aircrafts – Examples of Measurements in the Eyjafjallajökull Ash Plume over Germany and Iceland</td>
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<td>Evolution of the LUSI Mud Volcano: Fluid Chemistry and Remote Sensing</td>
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<td>Hartnett H, Vanderkluysen L &amp; Clarke A</td>
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<td>Interpreting CO₂ Measurements in Volcanic Gas Plumes: The Need for Integration with Geophysical Data</td>
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09e: Timescales of Magma Evolution, Degassing, and Ascent through the Crust

Session chaired by Heather Handley & Mark Reagan

14:00  Time Scales of Metasomatism, Differentiation and Degassing at Volcán de Colima
       Reubi O, Sims KWW, Eikenberg J, Reagan M, Varley N & Bourdon B

14:15  Keynote: Do $^{226}$Ra-$^{230}$Th Isochrons Provide Realistic Crystallization Ages?

14:30  Rejuvenation of an Old Magmatic System at Parinacota Volcano, Chile
       Hora JM, Wörner G, Kronz A, Banaszak M, Singer BS & Johnson CM

14:45  Eruptive History and Chemical Evolution of the Acigöl Volcanic Field, Central Anatolia, Turkey, Based on Geochemical and Isotopic (Sr-Nd-Pb, $\delta^{18}$O) Constraints and Ion Microprobe Zircon Analysis
       Siebel W, Schmitt A, Danisik M, Aydin F & Kiemele E

15:00  Short Magma Residence Times for Kilauea Volcano Based on High-Precision Pb Isotope Ratios
       Heaton D, Pietruszka A, Garcia M & Marske J

15:15  Magma Degassing Timescales from Vesicle Size Distribution and Bubble Composition Heterogeneity in MORB Glasses
       Colin A, Burnard P & Marty B

Session 09b follows this session in this room. For details see page 430.
11f: Natural and Synthetic Platinum-Group Minerals (PGM): Tracers of Processes at High and Low Temperatures – Sponsored by IMA COM and SGA

Session chaired by Oskar Thalhammer, Federica Zaccarini & Anna Vymazalova

14:00 **Keynote:** Low-Temperature Pt–Pd Mineralisation: Examples from Brazil
*Cabral AR, Lehmann B & Brauns M*

14:30 Mobility of Platinum and Gold in the Australian Regolith – Spectroscopic and Electron Microscopic Analyses
*Reith F, Ta C, Eitschmann B, Lenehan C & Brugger J*

14:45 The Alteration Sequence of PGM in the Gossan of the Aguablanca Ni-Cu-(PGE) Sulphide Deposit, SW Iberia
*Suárez S, Prichard H, Velasco F, Fisher P & McDonald I*

15:00 Geochemistry and PGE Mineralogy of Chromitite Seams of the Eastern Bushveld Complex, South Africa
*Tredoux M, Zaccarini F, Garuti G, Kottke-Levin J & Gauert C*

15:15 Podiform Chromitites from the Turkish Ophiolites: An Overview to the Mineralogy of Platinum-Group Elements
*Uysal I, Zaccarini F, Garuti G, Kaliwoda M, Hochleitner R, Akmaž RM & Saka S*

*Bedard LP, Esbensen KH & Barnes S-J*

15:45 PGE Complexes at Superliquidus Temperature: Embryos for Platinum-Group Minerals?
*Helmy H, Ballhaus C, Wohlgemuth-Ueberwasser C, Wirth R & Tredoux M*

16:00 Experiments on the Wetting Properties of Precious Metal-Rich Sulfosalt Melts Against MSS
*Tomkins A*

16:15 Mineralogical Residence of Platinum Group Elements (PGE) in the Fe-Ni-Cu Sulfide Deposits of the Ivrea Verbano Zone (Italy)
*Kollegger P, Zaccarini F, Garuti G & Thalhammer O*

16:30 Formation of Platinum-Group Minerals from an Evolving Sulfide Liquid at Sudbury, Canada
*Dare S, Barnes S-J, Prichard H & Fisher P*

16:45 Correlation of δ¹³C and PGE Contents in Magmatic Ores
*Semenova D, Ponomarchuk V & Ryabov V*
11g: The Rare Earth Elements: Their Deposits, Geochemistry, and Environmental Impact

Session chaired by Michael Bau, Ulrich Schwarz-Schampera & James R. Hein

14:00 REE in Fossil Biogenic Apatite
   Herwartz D, Tütken T, Jochum K-P & Sander PM

14:15 Rare Earth Elements in Crude Oil

14:30 Loparite Composition in Stratified Lovozero Alkaline Intrusion
   Kogarko L, Lahaye Y & Williams T

14:45 REE Mineralization of High Grade REE-Ba-Sr and REE-Mo Deposits in Mongolia and China
   Kynicky J, Xu C, Chakhmouradian A, Reguir K, Cihlarova H & Brtnicky M

15:00 Unusual U-REE Deposits at Mt Isa, Australia and Potential Links to Mid-Crustal Anorogenic Granites
   McGloon M, Tomkins A & MacRae C

15:15 Mid and Heavy REE in Carbonatites at Lofdal, Namibia

15:30 Potential REE Deposits along the Red Sea Coast of Egypt
   Roberts J & Ibrahim T

15:45 Rare Earth Element Variation in Hydrothermal Fe-Oxide Cu-Au Systems
   Schmidt Mumm A & Ciobanu C

16:00 Translocation and Fractionation of Rare Earth Elements in Intensely Weathered Lateritic Profiles in Western Australia
   Du X, Rate A & Gee M

16:15 Rare Earth Elements (REE) Recovery as a By-Product of Fertilizer Production – Conceptual Evaluation
   Simandl L, Simandl G & Fajber R

16:30 Comparison of Land-Based REE Ore Deposits with REE-Rich Marine Fe-Mn Crusts and Nodules
   Hein J, Conrad T & Koschinsky A

16:45 REE Geochemistry, Mineralogy and Origin of Manganese Mineralization in the Derbent (Mahkeme Hill), Yozgat (Turkey)
   Oksuz N, Karakus A & Yurteri C
12c: Chronologies and Rates of Climate Change

Session chaired by Edouard Bard & Dominik Fleitmann

14:00 Timing and Duration of Heinrich Events in the North Atlantic
McManus I

14:15 Bahamian Speleothems Reveal Increased Aridity Associated with Heinrich Events
Arienzo M, Swart P, Broad K, Clement A, Eisenhauer T & Kakuk B

14:30 Quantitative Reconstruction of Millennial-Scale Temperature Variations in Central Europe
Ménot G & Bard E

14:45 How Precisely can We Date Climate/ocean Instabilities of the Last Interglacial?
Hillaire-Marcel C

15:00 \(^{230}\text{Th}\) Inventories in New Sediment Cores from the Eastern Equatorial Pacific: Constraints on the \(^{230}\text{Th}\) Constant-Flux Proxy
Marcantonio F, Ibrahim R, Singh A & Lyle M

15:15 Speleothem Record of Permafrost in Siberia and Aridity in Mongolia during the Last 450 kyr
Vaks A, Gutareva O, Breitenbach S, Avirmed E, Kononov A, Osinzev A & Henderson G

15:30 Quaternary Soil and Climate Change Inferred from TL Dating of Quaternary Terraces in Taleghan Basin, Iran
Moeini A & Alizade Paeen Afrakaty E

15:45 Keynote: Chronology of Climate Archives – A Never-Ending Story
Kromer B

16:15 1500 yr Cyclicility during Mid-Holocene in the Eastern Mediterranean
Bar-Matthews M & Ayalon A

16:30 North Atlantic Influence on Rainfall in the Dead Sea – Sahel Watersheds: Implication for Holocene Climate Fluctuations
Stein M, Kushnir Y & Kagan E

16:45 Climatic Conditions during the Holocene Based on Levantine Continental Shelf Sediment Cores
Mor-Federman T, Bookman R, Almogi-Labin A & Herut B
13c: Air Quality and Climate: Bridging the Scales

Session chaired by Mian Chin & Lorraine Remer

14:00 Keynote: Aerosol-Cloud-Precipitation Interactions in the Climate System
Andreae MO

14:30 Invited: Which Emission Sector is Winning the Mitigation Competition When Direct, Indirect and Semi-Direct Effects are Investigated Separately?
Bauer S & Menon S

14:45 Invited: Assessing Impact of Aerosol Intercontinental Transport on Regional Air Quality and Climate: What Satellites can Help
Yu H

15:00 Invited: The Impact of Transported Pollution on Arctic Climate

15:15 Invited: Temporal Trend in Anthropogenic Sulfur Aerosol Transport from Central and Eastern Europe to Israel

15:30 Invited: Effects of Future Climate Change on Air Quality over East Asia
Park R, Kim M, Jeong J & Song C-K

Satheesh SK, Moorthy KK, Babu SS, Srivastava N & Vinoj V

16:00 Invited: Estimating Ground Level PM2.5 Concentrations in Atlanta Metro Area Using Spatial Statistical Models

16:15 Invited: Observing the Diurnal Variability of Aerosol Optical Depth (AOD) from a Geostationary Satellite: Implications for Air Quality and Climate Monitoring
Kondragunta S, Ciren P, Xu C, Laszlo I & Zhang H

16:30 Aerosols, Chemistry and the Onset and Evolution of Fog Layers
Boers R

16:45 Optical Properties, Size Distribution and Composition of Aerosol Particles in the Urban Area of Sao Paulo
Artaxo P, Backman J, Rizzo L, Jorge F & Kulmala M
15i: Metal Stable Isotope Signals in Earth’s Oceans and Seas

Session chaired by Thomas Bullen & Matthew Fantle

14:00 $\delta^{44/40}$Ca Variability in Modern Shallow Water Carbonates
Holindén C, Papanastassiou D, Blanchon P & Evans S

14:15 Unconstrained Fluxes to the Ocean: Calcium Isotopes in Dust-Producing Regions
Fantle M, Tollerud H, Eisenhauer A & Holindén C

14:30 Chromium Isotopes in the World’s Oceans: Potential Tracers of Redox Environments
Amor K, Galer S, Andersson P & Porcelli D

14:45 Chromium Isotopes in Saanich Inlet Sediments and Waters
Scheiderich K, Holmden C & François R

15:00 Molybdenum Isotope Fractionation in Pelagic Euxinia: Evidence from the Modern Black and Baltic Seas
Nägler TF, Neubert N, Böttcher ME, Dellwig O & Schnetger B

15:15 Marine Mo Isotope Inventory: The Role of Igneous Rock Weathering
Voegelin AR, Nägler TF, Neubert N, Pettke T, Steinmann M & Pourret O

15:30 Causes and Consequences of Isotopically Heavy Dissolved Molybdenum in Rivers
Vance D, Keech A, Matthews A & Archer C

15:45 Abiotic and Biotic Control of the $\delta^{65}$Cu and $\delta^{66}$Zn Composition of Seawater
Little S, Vance D & Sherman D

16:00 Fe and S Isotope Compositions of Hydrothermal Sulfides from the Northern Lau Basin

16:15 Fractionation of $^{238}$U/$^{235}$U during Weathering and Hydrothermal Alteration

16:30 Pb Concentrations, Stable Isotopes and $^{210}$Pb in Seawater, Phytoplankton, Zooplankton, Sardines, Anchovy from the Gulf of Lion
Strady E, Veron A, Chiffoleau JF & Radakovich O

16:45 Modelling Vertical Stable Isotope and Elemental Distributions in the Upper Ocean
Reynolds B & de Souza G
16b: Understanding the Fate and Transformations of Metal and Radionuclide Contaminants in Unsaturated and Saturated Subsurface Environments

Session chaired by Scott Brooks, Dawn Wellman, Henning Prommer & Ann Miracle

14:00 Invited: A Coupled Ion Exchange, Surface Complexation, Calcite Dissolution, and Mass Transfer Model to Describe Uranium(VI) Desorption and Reactive Transport at the Rifle (USA) Field Site

Davis J, Hay M, Fox P & Williams K

14:15 Residence Time Analysis of Metal-Desorption and Mineral-Dissolution Kinetics Using a Damkohler Approach

Bearup L, Navarre-Sitchler A, Maxwell R & McCray J

14:30 Fate of U(IV) during Microbially-Driven Mn(II) Oxidation in Sediments


14:45 Cr(OH)$_3$(s) Oxidation Coupled with Heterogeneous Mn(II) Oxidation

Namgung S & Lee G

15:00 Cr(OH)$_3$(s) Oxidation by Birnessite Under Common Groundwater pH Conditions

Lee Y & Lee G

15:15 Physical Versus Chemical Non-Equilibrium Model for Simulating U(VI) Adsorption


15:30 Mechanisms Controlling the Release, Transport and Attenuation of Mercury in Riverine Sediments


15:45 Structural Incorporation of Selenium in Iron Sulfides

Diener A & Neumann T

16:00 Structural Incorporation of Uranium during the Fe(II)-Induced Transformation of Ferrihydrite

Lezama Pacheco JS, Massey MS, Michel FM, Bargar JR & Fendorf S

16:15 The Leaching of Arsenic and Heavy Metals from Pyrite Slags Depots in the Upper Banks Under Conditions of Highly Dynamic Groundwater-Surfacewater Interaction


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| 16:45 | Exploring Carbonate Aquifers and their Susceptibility for Metal Release during CO₂ Leakage | Wunsch A, Navarre-Sitchler A, Maxwell R & McCray J}
17i: Linking “Omics” to Biogeochemical Fluxes

Session chaired by Peter Girgius, Jutta Niggemann & Thorsten Dittmar

14:00 Linking Geochemistry to Microbial Community Structure and Function in Sulfidic Geothermal Systems of Yellowstone National Park
Jay Z, Planer-Friedrich B, Rusch D & Inskeep W

14:15 Insights into Marine Microbial Communities that Couple Anaerobic Biogeochemical Cycles to Remote Oxidants
Girguis P, Song P & Nielsen M

14:30 Controls on Microbes in an Actively Venting Chimney and in Low-Temperature Hydrothermal Fluids
Perner M & LaRoche J

14:45 Enzymatic Extracellular Superoxide in Microbial Mn(II) Oxidation
Learmann D & Hansel C

15:00 Sulfate Reduction in Peatlands – Ecophysiology of a Rare Microorganism that Contributes to a Process with Increasing Importance for the Global Climate
Pester M, Hausmann B, Deevong P, Wagner M & Lay A

15:15 Coupling Isotope Labelling with Compound Specific Stable Isotope Analysis of Microbial Biomarkers
Dippold M, Apostel C, Sauheitl L, Glaser B & Kuzyakov Y

15:30 “Geo-Metabolomics” – A Key for Understanding Function and Reactivity of Dissolved Organic Matter
Niggemann J, Gerdts G & Dittmar T

15:45 Comparison of Internal and External Metabolites Produced by a Diatom
Kujawinski E, Kido Soule M & Longnecker K

16:00 Compositional and Structural Dynamics of Dissolved Organic Matter in Taihu Lake, China

16:15 Assessing the Role of Microorganisms in Biogeochemical Processes by Protein Immunodetection Using nanoSIMS

16:30 Isotopic Analysis of Microarrays to Link Microbial Identity and Function
17j: Biogeochemical Processes in Redox-Dominated Environments: From Cold Seeps to Soils

Session chaired by Gert De Lange, Céline Pallud, Christian Hensen & Anniet Laverman

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Koretsky C                                    |
| 14:30 | Sub-Micromolar Oxygen Dynamics at Redox Boundaries of Lakes  
Kirf M, Schubert C & Wehrli B               |
| 14:45 | Redox Front Variability and Phosphorus Flux Across the Sediment-Water Interface  
Druschel G, Smith L, Shufelt N, Watzin M, Pearce A & Rizzo D |
| 15:00 | Potential Rates of Denitrification Linked to Iron and Sulfur Oxidation in Aquatic Sediments  
Laverman A, Yan C, Viollier E, Deflandre B, GeorgeOna-Nguema G & Pallud C |
| 15:15 | Environmental Controls on Potential Nitrate and Sulfate Reduction Rates in a Range of Aquatic Sediments  
Pallud C, Laverman A, Gu C & Van Cappellen P |
| 15:30 | Redox Dynamics Resulting from Chemical and Physical Fluxes in Surficial Permeable Sediments  
Glazer B, Fram J, Murphy J, Fogaren K & Sansone F |
| 15:45 | Geochemistry of Cold Seeps – Fluid Sources and Systematics  
Hensen C, Scholz F, Reitz A, Liebetrau V, Haeckel M, Schmidt M, Wallmann K & Romer RL |
| 16:00 | Mechanics of Bacterial Sulfate Reduction Deduced from Sulfur and Oxygen Isotopes in Pore Fluid Sulfate  
Antler G, Turchyn AV, Rennie V, Herut B & Sivan O |
| 16:15 | A Multi-Component Reactive Transport Model Assessment of Microbial Processes and Trace Metal Cycling Across a Gradient in Sulfate Reduction Rates along the California Margin  
Schneider Mor A, Steefel C & Maher K |
| 16:30 | Subsurface Biogeochemistry of Hydrothermal Flow at the Hook Ridge, Bransfield Strait  
Hepburn L, Mills R, Aquilina A, Copley J, Glover A & Tyler P |
19h: High Pressure Behavior from Impacts to Interiors

Session chaired by Nico de Koker & Kanani Lee

14:00 **Keynote:** Helium Rain and Core Erosion in Gas Giant Planets
   *Militzer B*

14:30 Ferrous Iron Diffusion in Ferro-Periclase Across the Spin Transition – A DFT Study
   *Ammann M, Brodholt J & Dobson D*

14:45 Multimegabar Phase Relations of Major Earth and Planetary Materials
   *Tsuchiya T, Dekura H, Metsue A & Kuwayama Y*

15:00 The Composition of the Earth’s Outer Core from First Principles
   *Côté A, Brodholt J & Badro J*

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<td><strong>Invited:</strong> Using Ambient Pressure X-Ray Photoelectron Spectroscopy to</td>
<td>Mueller K, Shavorskiy A, Bluhm H &amp; Starr D</td>
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<td>Investigate the Reduction of c(2x2)-O/Ni(100) by Hydrogen</td>
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20f: Melts and Glasses: From Deep Earth Interiors over Environmental Applications to Volcanological and Geophysical Challenges

Session chaired by Roberto Moretti & Daniel Neuville

14:45 **Keynote:** *In situ*, High-Pressure/-Temperature Experimental Determination of Structure-Property Relations in Silicate Melt-C-O-H-N Systems

*Mysen B*

15:00 The Influence of Melt Structure on the Partitioning of Trace Elements

*Simon S, Wilke M, Klemme S, Caliebe WA & Kvashnina KO*

15:15 Evidence of Fe-Oxide Clusters in Obsidians

*Galoisy L, Calas G & Menguy N*

15:30 Effect of Alkali Content and Fe Oxidation State on the S Oxidation State and Solubility in Rhyolitic Glasses

*Giuli G, Paris E, Mori R, Glatzel P, Cicconi MR, Scaillet B & Eeckhout S*

15:45 Effect of Helium on Structure of SiO₂ Glass Probed by Raman Spectroscopy

*Shen G & Lazor P*

16:00 Molecular Scale Origin of Nuclear Waste Glass Properties

*Calas G, Cormier L, Delaye J-M, Galoisy L, Jollivet P & Peugeot S*

16:15 Structure of CaO-Al₂O₃-SiO₂ Melts Studied by Molecular Dynamics and Diffraction Experiments

*Jahn S, Haiqis V, Drewitt J, Kozaily J, Bytchkov A & Hennet L*

16:30 An Example of Fluid Immiscibility during the Subvolcanic Emplacement of a Boron-Rich Acidic Melt: The Capo Bianco Aplit (Elba Island, Italy)

*Dini A*

16:45 The Influence of F, P and B Content on Pegmatitic Melt Viscosity

*Bartels A, Knipping J, Behrens H, Holtz F & Schmidt B*
20j: Structure, Elasticity and Thermodynamics of Minerals

Session chaired by Michael A. Carpenter, Tiziana Boffa Ballaran & Alan Woodland

14:00 Structural Systematics of Mg-Fe$^{2+}$-bearing Spinels and Spinelloids
   Woodland A, Angel R & Koch M

14:15 The Crystal Chemistry of (As,Sb,Bi)-bearing Dumortierite
   Groat L, Evans J, Grew E & Pieczka A

14:30 The Effect of Pressure on Tetrahedral Tilting in Feldspars
   Sochalski-Kolbus L & Angel R

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22a: General Low-Temperature Geochemistry

Session chaired by Leona Zemanova

14:30 The Interaction between Central and South America from Sr-Isotope Chemostratigraphy of Cenozoic Coral Reef Successions

14:45 Mineralogical and Chemical Variations in Kaolin and Alunite Deposits in Vicinity of the Aksaray Region (Central Anatolia, Turkey)
Karakaya N & Çelik Karakaya M

15:00 Geochemistry of Cheshmeh Sefid Manganese Deposit, Sabzevar, Khorasan Province, Iran
Moghaddasi SJ & Ghanbari M

15:15 Palaeotemperature Estimation by Tandem $\delta^{18}O$ Measurement of Calcium Carbonate and Gypsum Hydration Water
Hodell D, Turchyn A & Wiseman C

15:30 Fluid Inclusions in Stalagmites Used as a Quantitative Thermometer in Paleoclimate Research
Krüger Y, Marti D, Hidalgo Staub R, Fleitmann D & Frenz M

15:45 Stable Isotope Constraints on Fluid Flow in the Cascadia Accretionary Prism: Evidence for Large Flow Transients during Recent Deformation
Sample J & Tripati A

16:00 Fluoride Removal from Solution by Calcite — pCO$_2$ Sorption Kinetics
Turner B, Sleap S, Krabbenhoft K & Sloan S

16:15 A Novel Application of (U-Th)/He Geochronology to Constrain the Age of Small, Young Meteorite Impact Craters: A Case Study of Monturaqui Crater, Chile
Ukstins Peate I, van Soest M & Wartho J-A

16:30 Marcasite in Clastic Sediments – Formative Processes and Deep Time Stability
Schieber J & Cheshire M

16:45 Assessing Cementation in the El Capitan Reef Complex and Lincolnshire Limestone Using $^{13}$C-18O Bond Abundances in Carbonates
Loyd S, Dickson T, Hudson J, Eller J & Tripati A
22d: Isotope Archaeometry
Session chaired by Ernst Pernicka, Thilo Rehren & Bernd Lehmann

14:00  Provenance Study of Swahili Metals Using Lead Isotopic Analysis
      Fenn T, Killick D & Ruiz J

14:15  Marine and Terrestrial Palaeoclimate Proxies from the Stable Isotope Analysis of North African Molluscs
      Prendergast A, Stevens R, O’Connell T, Hunt C & Barker G

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Conference in Brief

Program starts with Plenaries
08:30 each day
Floor 2 / Congress Hall
see page xxv

Including Awards:
Tuesday, Wednesday, Thursday
09:10 – 09:25
see page xxvi

Oral Sessions:
Monday – Friday
09:30 – 12:30 and 14:00 – 17:00
For rooms,
see individual session pages.

Poster Sessions:
Monday – Thursday (not Friday)
17:00 – 19:00
Floors 1 – 4 / Congress Hall Foyers

Lunch:
12:30 – 14:00
Boxed lunches (ticket only)
Floor 3 / Forum Hall Foyer
Buffet lunches (ticket only)
Floor 1 / Restaurant Zoom

Wireless Internet Access
Network name: Goldschmidt

Conference Timetable Overview
see pages x – xi

...just went negative!

- Enhanced negative ion performance
- Class leading ion counting

See us on stand 11 + 12

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info@isotopx.com  www.isotopx.com