

Goldschmidt 2005

CONFERENCE PROGRAMME

Wednesday May 25th 2005

Symposium S01**Room: Renfrew 126****Accessory Mineral Geochemistry I: Igneous Petrogenesis and Crystal Chemistry****Convenors:****John M. Hanchar & Paul W. O. Hoskin****08:30 Valley J & Lackey JS:***KEY* Magmatic Zircon, Titanite, and Garnet: Oxygen Isotope Disequilibrium is Good**09:00 Palin M:**

Zircon Chronochemistry of the Mesa Falls Tuff (Yellowstone, USA): Progressive Remelting of a Felsic Source by Underplated Mafic Magma

09:15 Miller C, Lowery L & Bea F:*INV* Zircon and Zr/Hf Ratios: Assessing Magmatic Fractionation in the Crust**09:30 Nasdala L:***INV* High-Resolution Spectroscopy of Radiation-Damaged Zircon**09:45 Hroie K, Hidaka H & Gauthier-Lafaye F:**

U-Pb Geochronology and Geochemistry of Zircon from the Franceville Series at Bidoudouma, Gabon

10:00 Harlov D, Prochazka V & Förster H:

Monazite-Zircon-Fluorapatite Associations in the Melechov Granite Massif, Czech Republic

Symposium S02**Room: Renfrew 126****Accessory Mineral Geochemistry II: Metamorphic Petrogenesis and Tectonics****Convenors:****Joe Pyle & Matt Kohn****10:15 Seydoux-Guillaume A:***KEY* Nanometrical Study of Polyphasic and Discordant Monazites**10:45 Crowley J, Chatterjee N, Bowring S, Sylvester P, Myers J & Searle M:**

U-(Th)-Pb Dating of Monazite and Xenotime by EMPA, LA-ICPMS, and IDTIMS: Examples from the Yilgarn Craton and Himalayas

11:00 McFarlane C:

Monazite Thermochronology Applied to the Challenger Mine, S. Australia

11:15 Tomkins H & Ross G:*INV* Biogenic and Metamorphic Monazite in a Neoproterozoic Turbidite Sequence, Windermere Supergroup, Southern B.C.**11:30 Gleadow A, Raza A, Kohn B & Spencer S:**

The Potential of Monazite for Fission-Track Dating

11:45 Penniston-Dorland S & Ferry J:

Coupled Dichotomies of Apatite and Fluid Composition in Contact Metamorphosed Siliceous Carbonates

(Symposium S02 continues on page 86)

Symposium S04 **Room: Administration Auditorium**
Advances in Experimental and Theoretical Methods for
Characterization of Mineral-Fluid Interfaces

Convenors: **Andrew Stack, Paul Fenter & Steve Higgins**

- 08:30 Hiemstra T, Rahnemaie R & van Riemsdijk W:**
 The Structure of the Double Layer Near Goethite in the Presence of Mono and Bivalent Electrolyte Ions
- 08:45 Chaka A, Lo C & Trainor T:**
 Predicting the Impact of the Environment on the Structure and Chemistry of Metal Oxide Surfaces
- 09:00 Cooke D, Kerisit S, Marmier A & Parker S:**
 Atomistic Simulation of the Mineral-Water Interface in Contact with Charged Surfaces
- 09:15 Sahai N & Anseau M:**
INV Identification of Active Site and Reaction Mechanism for Epitaxial Apatite Nucleation at the Pseudowollastonite Bioceramic-Bone Interface
- 09:30 Zakaznova-Iakovleva V, Harmer S, Nesbitt W, Bancroft M, Tse J & Skinner W:**
 High Resolution Valence Band Spectra of Silicates
- 09:45 Jordan G, Aldushin K & Schmahl WW:**
INV Kinematics of Interlayer Reactions
- 10:00 Hunger S, Benning LG & Tarasov KA:**
 Greigite – Now you see it now you Don't: An *in situ* ED-XRD Study
- 10:15 Park C, Fenter P, Sturchio N & Regalbutto J:**
INV Resonant Anomalous X-Ray Reflectivity: a New Structural and Spectroscopic Probe of Metal Adsorption at Mineral-Water Interfaces
- 10:30 Kendall T & Martin S:**
 Spatially-Resolved Ion Mobility on Carbonates
- 10:45 Boily J:**
 Calibration of Surface Complexation Reactions with Zeta Potentials
- 11:00 Allen H, Liu D & Ma G:**
INV Water and Organic Adsorption and Structure at Alumina and Silica Surfaces
- 11:15 Kirkpatrick J, Reinholdt M & Kalinichev A:**
 Amino Acid - Mineral Interaction: Experimental NMR and Computational MD Investigation of Glutamate-Intercalated Hydrotalcite
- 11:30 Konec C, Musorrafiti M, Voges A, Al-Abadleh H & Geiger F:**
INV Tracking Interfacial Acidities, Charge Density, Potential, and Energy Density at Carboxylic Acid-Functionalized Silica/Water Interfaces using Second Harmonic and Sum Frequency Generation
- 11:45 Phillips B & Lee Y:**
INV NMR Spectroscopic Techniques for the Study of Organic Ligand Interaction with Calcite Surfaces

Symposium S14 **Room: Renfrew 112**
Cenozoic Magmatic Evolution of the Western U.S.

Convenors: **Anita Grunder & Rick Carlson**

- 08:30 Farmer L, Bailey T & Knox K:**
INV Reassessment of the Sources and Space-Time Patterns of Late Cretaceous and Younger Magmatism, Colorado
- 08:45 Christiansen RL:**
KEY Post-Laramide Tectonomagmatics of the U.S. Cordillera
- 09:00 Glazner A, Farmer L, Walker D, Carlson R & Bowers T:**
KEY The Curious Decoupling of Cenozoic Magmatism and Plate Tectonics in Western North America: a NAVDAT Analysis
- 09:15 Gans P:**
INV Puzzling Aspects of Cenozoic Cordilleran Magmatic Activity: Do we Need a New Paradigm?
- 09:30 Christiansen E:**
INV Miocene Magmatic Transition in the Northern Basin and Range Province, Western United States
- 09:45 Hooper P, Camp V, Reidel S & Ross M:**
 The Columbia River Basalts
- 10:00 Reidel S:**
 Heterogeneity in Columbia River Basalt Group Dikes and the Flows they Feed: Implications for Significance and Time Scale of Magma Processes
- 10:15 Camp V, Ross M & Hooper P:**
INV The Calc-Alkaline Paradox of the Inland Pacific Northwest
- 10:30 Hart W, Brueseke M, Shoemaker K & Bondre N:**
INV Revisiting the Tectonomagmatic Implications of Oregon Plateau Basaltic Volcanism
- 10:45 Leeman W:**
INV Lithospheric vs. Asthenospheric Contributions to Basaltic Magmatism in the Snake River Plain - Yellowstone (SRPY) Hot-Spot Track
- 11:00 Reid M, Graham D, Cooper L & Lassak T:**
INV On the Enigmatic Basalts of the Eastern Snake River Plain, Idaho
- 11:15 Hughes S:**
 Geochemical Evidence for Multiple, Chemically-Evolved Mafic Magma Reservoirs beneath the Eastern Snake River Plain (ESRP)
- 11:30 Nash B & Perkins M:**
INV The Yellowstone Hotspot in Space and Time: Evidence from Silicic Volcanism
- 11:45 Morgan LA, Pierce KL & McIntosh WC:**
INV Patterns of Rhyolitic Volcanism along the Track of the Yellowstone Hotspot

Symposium S18**Room: CNR 010****Diffusion-Reaction Systems in the Earth Sciences: New Characterization and Modeling Approaches****Convenors:** Carl I. Steefel, Philippe Van Cappellen & Sumit Chakraborty

- 08:30** **Jamtveit B & Malthe-Sorensen A:**
KEY Fracturing-Assisted Reactive Transport
- 09:00** **Cole D, Labotka T, Larson P, More K, Kenik E, Fayek M, Stadermann F & Riciputi L:**
Mineral Reaction Interfaces and Associated Porosity Generation
- 09:15** **Navarre A, Steefel C & Brantley S:**
Conversion of Rock to Saprolite: a Study of Weathering Rinds
- 09:30** **Liu C, Majors P, Zachara J & McKinley J:**
INV Microscopic Reactive Diffusion of U(VI) in Subsurface Sediments: Characterization and Modeling
- 09:45** **Hu Q, Ewing R, Steefel C, Tomutsa L & Hudson B:**
INV Multiple Approaches to Studying Diffusion Processes in Geological Media
- 10:00** **Felmy A, Liu C & Straatsma T:**
The Importance of Diffusion at the Microbe-Mineral Interface: Electrical Double Layer Effects and the Impact on Precipitation/Dissolution
- 10:15** **Kang Q & Lichtner P:**
INV Lattice Boltzmann Pore-Scale Model for Coupled Multi-Component Flow, Diffusion, and Reaction
- 10:30** **Boudreau B:**
KEY Bubble Growth in Soft Sediments: Diffusion Meets Solid Mechanics
- 11:00** **Jourabchi P, Regnier P & Van Cappellen P:**
INV Quantitative Interpretation of pH Distributions in Aquatic Sediments: a Reaction-Transport Modeling Approach
- 11:15** **Bolton EW & Berner RA:**
INV Oxygen Diffusion and Consumption in Eroding Black Shales: a Control on Long-Term Atmospheric Oxygen
- 11:30** **Maerki M, Müller B & Wehrli B:**
INV Mineralization Pathways in the Sediments of Lake Baikal – A Microsensor and Modeling Study
- 11:45** **DePaolo D & Smith M:**
Isotopic Effects in Reactive Fluid-Rock Systems with Fracture-Dominated Flow and Matrix Diffusion

(Symposium S18 continues on page 87)

Symposium S23**Room: Renfrew 125****Fractionation Mechanisms in Non-Traditional Stable Isotopes****Convenors:** Alan Matthews & Albert Galy

- 08:30** **Johnson C, Roden E, Beard B & Crosby H:**
Fractionation of Fe Isotopes during Biogenic Mineral Formation by Dissimilatory Fe(III) Reduction (DIR)
- 08:45** **Schauble E:**
KEY Modeling Stable Isotope Fractionation in Crystals
- 09:15** **Tossell J:**
Calculating the Partitioning of the Isotopes of Mo between Oxidic And Sulfidic Species in Aqueous Solution
- 09:30** **Polyakov Y, Mineev S & Clayton R:**
INV Iron and Tin Isotope Equilibrium Fractionation Factors from Mössbauer and Synchrotron Radiation Data
- 09:45** **Williams L & Hervig R:**
Probing Crystal Growth Mechanisms with Non-Traditional Isotopes
- 10:00** **Schuessler J, Schoenberg R, Behrens H & von Blanckenburg F:**
Experimental Calibration of the Fe Isotope Fractionation between Pyrrhotite and Silicate Melt
- 10:15** **Bain D & Bullen T:**
INV Chromium Isotope Fractionation during Oxidation of Cr(III) by Manganese Oxides
- 10:30** **Maher K & Larson P:**
Copper Isotope Fractionation at High Temperature: Investigating Copper Mineralization at Corocohuayco, Perú
- 10:45** **Galy A:**
KEY Distinguishing between Kinetic and Equilibrium Isotopic Fractionations using 3 Isotopes
- 11:00** **Carder E, Galy A, McKenzie J, Vasconcelos C & Elderfield H:**
Magnesium Isotopes in Bacterial Dolomites: a Novel Approach to the Dolomite Problem
- 11:15** **Dessert C, Galy A & Elderfield H:**
Mechanisms of Mg Isotopes Fractionation during CaCO₃ Biomineralisation
- 11:30** **Tipper E, Galy A & Bickle M:**
Process-Related Covariation in Mg and Ca Isotopes in the Riverine Dissolved Load
- 11:45** **Farquhar J, Johnston D, Wing B, Ono S, Canfield D & Habicht K:**
INV Multiple Isotope Effects Associated with Biogeochemical Networks

Symposium S40 **Room: Agricultural Science 106**
Interfacial Biogeochemical Processes

Convenors: **James Frederickson, Javiera Cervini & Stephan Kraemer**

- 08:30 Hering J:**
KEY Sorption and Surface Precipitation as Controls on the Reactivity and Bioavailability of Sorbates and Sorbents
- 09:00 Johnson K & Fein J:**
 Bacterial Adsorption Controls on Mineral Solubility
- 09:15 Campbell K, Malasarn D, Saltikov C, Newman D & Hering J:**
 Effect of Sorbed Arsenic Species on Bacterial Reduction of HFO
- 09:30 Roden E:**
INV A General Rate law for Bacterial Fe(III) Oxide Reduction
- 09:45 Eggleston C, Khare N & Lovelace D:**
INV Direct Electrochemistry of Cytochrome C on Oxide Electrodes
- 10:00 Behrends T & Van Cappellen P:**
 Transformation of Hematite into Magnetite – How do Bacteria Contribute?
- 10:15 Scherer M, Larese-Casanova P & Williams A:**
INV Fe(II) Adsorption at the Oxide-Water Interface: From Macroscopic Observations to Spectroscopic Measurements
- 10:30 Peiffer S & Gade W:**
 Does Surface Acidity of Ferric (oxy)hydroxides Affect Reactivity Towards H₂S?
- 10:45 Rosso K, Wang Z, Ainsworth C & Fredrickson J:**
INV Rates of Uranium Electron Transfer: a Theoretical Perspective
- 11:00 Kretzschmar R, Heidmann I & Christl I:**
INV Effects of Metal Cation Binding on the Colloidal Stability of Kaolinite-Fulvic Acid Particles
- 11:15 Mikutta C, Lang F & Kaupenjohann M:**
 Citrate Impairs the Diffusion of Phosphate into Goethite
- 11:30 Martin S, Jun Y, Kendall T & Duckworth O:**
INV Nucleation and Growth of Manganese Oxide Films
- 11:45 Bylaska E, Tsemekhman K, Ilton E & Rosso K:**
INV Self-Consistent Self-Interaction Corrected DFT Studies of Annite

(Symposium S40 continues on page 88)

Symposium S54 **Room: Renfrew 111**
Nanogeoscience

Convenors: **Kevin Rosso & R. Lee Penn**

- 08:30 Banerjee S, Penn L, Berquo T, Guyodo Y & Popa R:**
INV Accurate Multidisciplinary Identification of Nanophase Iron Minerals in Simulated Pedogenic Environment
- 08:45 Navrotsky A:**
INV Nanoparticle-Mediated Processes and the Ostwald Step Rule
- 09:00 Frandsen C, Bahl C & Mørup S:**
KEY Antiferromagnetic Nanoparticles
- 09:30 Reich M, Utsunomiya S, Becker U, Wang L & Ewing R:**
In situ Observation of Thermodynamic Size Effects on Melting of Natural Gold Nanoparticles
- 09:45 Kim C & Waychunas G:**
 Reactivity of Iron Oxyhydroxide Nanoparticles with Heavy Metals as a Function of Particle Size
- 10:00 Madden A & Hochella, Jr. M:**
INV Nanoscience Meets Geochemistry: Size-Dependent Reactivity of Hematite
- 10:15 Penn RL, Anschutz AJ, Jentzsch T & Erbs J:**
 Reactivity of Ferrihydrite Nanoparticles Prepared With and Without Added Carbonate, Arsenate, and Other Oxoanions
- 10:30 Harrington L & Myneni S:**
INV The Structural Chemistry of Hydroxyl Moieties in Ferric Polymers
- 10:45 Rustad J & Casey W:**
KEY Computational Subcolloidal Mineralogy
- 11:15 Teng H & Fan C:**
INV Controls of Step Length and Direction on Crystal Solubility
- 11:30 Wang Y & Xu H:**
INV Nanogeochimistry: Geochemical Reactions in Nanopores
- 11:45 Balaz P & Alacova A:**
 Relationship between Freundlich Equation Constants for Zinc Sorption on Nanocrystalline Calcite

Wednesday May 25th 2005: Morning Session

Symposium S57 **Room: Agricultural Science 204**
NOM-Metal Complexation and the Mobility of Metals

Convenors: **Paul Bloom & Yona Chen**

- 08:30** **Tipping E, Lofts S, Lawlor A & Shotbolt L:**
KEY Humic Ion-Binding Modelling and its Application to Field Processes and Ecotoxicology
- 09:00** **Benedetti MF:**
KEY Metal Binding to NOM from Database to Field Systems
- 09:30** **van Riemsdijk W & Weng L:**
INV Fundamental Aspects of Interaction between Metals and Humics in the Environment
- 09:45** **Gérard E, Jaffrain J, Boudot J & Ranger J:**
 Influence of SOM on Aluminium Mobility in a Forested Brown Acidic Soil: A View from Soil Solutions Held at Different Matrix Potentials
- 10:00** **Chen Y, Kaschl A & Gat P:**
 The Binding of Cadmium, Copper and Iron by Fractions of Dissolved Organic Matter and Humic Substances Originating from Compost
- 10:15** **Reszat T, Hendry J & Ranville J:**
 Quantifying Uranium Complexation in Groundwater DOC using Coupled Detection Methods
- 10:30** **Kaste J, Friedland A, Bostick B & Schroth A:**
 Lead Transport and Speciation in Organic Horizons of Forest Soils
- 10:45** **Perdue EM, Hertkorn N & Kettrup A:**
INV A Potentiometric and ¹¹³Cd NMR Study of Cadmium Complexation by Natural Organic Matter at Two Different Magnetic Field Strengths
- 11:00** **Aiken G, Ryan J & Nagy K:**
INV Interactions between Dissolved Organic Matter and Mercury in Aquatic Environments
- 11:15** **Nagy K, Waples J, Aiken G & Ryan J:**
 The Influence of Dissolved Organic Matter on Cinnabar Dissolution
- 11:30** **Gu B:**
 Role of Humic Substances in Metal Complexation, Reduction and Reoxidation Processes
- 11:45** **Palmer N & von Wandruszka R:**
 Reduction of Inorganic Arsenic with Humic Materials

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25:am

Symposium S63 **Room: Albertson 102**
**Recent Advances in Electron Microbeam Induced X-Ray
 Microanalysis: Instrumentation, Hyperspectral Data
 Handling, and Applications to Geochemistry**

Convenors: **Dale Newbury, Greg Meeker & Paul Carpenter**

- 08:30** **Carpenter P:**
KEY Quantitative Electron Probe Microanalysis: State of the Art
- 09:00** **Newbury D:**
KEY SEM/EDS X-Ray Spectrum Imaging Above 100 kHz with the Silicon Drift Detector (SDD), and How to Locate the Proverbial Needle in a Haystack, Even When you Don't Know it's a Needle that You are Seeking!
- 09:30** **Kotula P, Keenan M, Goldstein J & Carpenter P:**
INV STEM and SEM X-Ray Spectral Imaging with Multivariate Statistical Analysis: Application to the Microanalysis of Meteorites
- 09:45** **Meeker G, Lowers H & Brownfield I:**
INV Microanalysis of Particulate Mineral Material in the Real World; How Analytical Errors Affect Results used by the Health, Regulatory, and Legal Communities
- 10:00** **Donovan J & Rowe M:**
INV Techniques for Improving Quantitative Analysis of Mineral Glasses
- 10:15** **Fournelle J:**
INV Al and Si Quantitation in Routine Silicate EPMA: Maybe not so Routine
- 10:30** **Kelly J, Gosses J, Webber C, Staffier K & Fournelle J:**
INV PENELOPE Computer Simulations of Secondary Fluorescence in EPMA
- 10:45** **Sakamoto T, Shimada N, Abe D, Nakamura T, Nozaki W, Shimada K & Iida A:**
 SR-XRF Analyses of Trace Elements in Electrum from Several Epithermal Gold Deposits, Japan

Wednesday May 25th 2005: Morning Session

Symposium S81

Room: Albertson 201

Watershed Scale Geochemistry

Convenors:

Russell Harmon, Berry Lyons & David Long

- 08:30 Velbel M:**
KEY Solute Geochemical Mass Balance and Forest Biomass in Small Appalachian Blue Ridge Watersheds
- 08:45 Peters S, Hargreaves B & Haight S:**
Solute Behavior in Agricultural vs Forested Watersheds during Storm Events: Implications for DOC Sources
- 09:00 Price J, Patino L & Velbel M:**
Geochemical Mass Balances and Weathering Rates in Forested Watersheds of the Southern Blue Ridge: Solving More Equations in More Unknowns Through Incorporation of Rare Earth Elements
- 09:15 Lindeman M, Long D, Pijanowski B & Stevenson RJ:**
Exploring the Effects of Urban and Agricultural Land Use on Surface Water Quality
- 09:30 Jardé E, Gruau G & Mansuy-Huault L:**
The Coprostanol/Sterol Ratio as Indicator of Organic Matter Provenance in Soils and Rivers
- 09:45 Chetelat B & Gaillardet J:**
Human Impacts on Boron Geochemistry of the Seine River, France
- 10:00 Glanzman R & Squires E:**
Boise Valley Groundwater Geochemistry – Origin, Infiltration Rate and Transport Characteristics
- 10:15 Giammar D, Yuan Z & Falke S:**
Geochemical Indicators of Natural and Anthropogenic Water Inputs to a Lake in a Mixed Land Use Watershed
- 10:30 Dosseto A, Douglas G & Turner S:**
Understanding Radioactive Disequilibrium in River-Borne Material: Dependence on Colloid/Particle Size
- 10:45 Parker S, Poulson S & Gammons C:**
Diel Cycles in Stable Isotopes of Dissolved O₂ and Dissolved Inorganic Carbon in the Big Hole River, Montana
- 11:00 Alagappan R:**
Ecohydrochemical Studies in the Achankovil River Basin. Western Ghats. South India
- 11:15 Gruau G & Jardé E:**
Export of DOM by Rivers: Assessing the Relative Effects of Climate Change and Human Activities using Long-Term Records
- 11:30 Kautz C & Martin C:**
Chemical Weathering and Erosion in New Zealand Monitored by Bedload and Suspended Sediments
- 11:45 Young C, Hoover D, De Carlo E, Mackenzie F & McManus M:**
Impact of Storm Runoff from Subtropical Watersheds on Coastal Water Quality and Productivity

Symposium S82

Room: Albertson 101

Mineralogy and Geochemistry of Acid Mine Drainage and Metalliferous Minewastes

Convenors:

David J. Vaughan & John L. Jambor

- 08:30 Majzlan J, Nielsen U & Grey C:**
The Existence and Mobility of Hydronium Ion in the Structure of Jarosite
- 08:45 Hudson-Edwards K, Smith A, Dubbin W & Wright K:**
Jarosites in Acid Mine Drainage Environments: Formation, Mineralogy, Stability
- 09:00 Sidenko N & Sherriff B:**
The Attenuation of Ni, Zn, Cu, by Secondary Fe Phases from Surface and Ground Water of Two Sulfide Mine Tailings Deposits
- 09:15 Hammarstrom J, Piatak N & Seal R:**
Mineralogical Controls on Acid-Mine Drainage from Waste Piles in the Vermont Copper Belt
- 09:30 Logsdon M, Saran J, Yeomans B & Cherry J:**
Use of a Mine-Tailing Line as a Geochemical Reactor for Treating Acid-Rock Drainage: Bingham Canyon (USA)
- 09:45 Alpers CN, Majzlan J, McCleskey RB, Nordstrom DK & Navrotsky A:**
Thermodynamic Data for Hydrated Ferric Sulfates and Application to Secondary Minerals at Iron Mountain, California
- 10:00 Peterson R:**
Dehydration and Rehydration of Melanterite with Significant Copper Content
- 10:15 Ndur S & Norman D:**
Arsenic Distribution in the Sansu Tailings Dam, Anglogold Ashanti Gold Mine, Obuasi, Ghana
- 10:30 Petrunic B & Al T:**
Arsenopyrite Weathering in Tungsten Mine Tailings: a TEM Analysis
- 10:45 Yang Y & Liu C:**
Anthropogenic Heavy Metal Discrimination in Stream Sediments around an Abandoned Zinc Smelter by using Isotope Tracers
- 11:00 Nimick D, Cleasby T & McCleskey B:**
Seasonality of Diel Cycles of Dissolved Trace-Metal Concentrations in a Rocky Mountain Stream
- 11:15 Gammons C, Shope C & Xie Y:**
Causes of Diel Cycling of Zn in Streams with Near-Neutral pH Draining Abandoned Mine Lands
- 11:30 Bostick B, Landis J & Gehrke G:**
Seasonal Mineralogical Transformations Influence Heavy Metal Release from Mine-Impacted Coeur d'Alene River (ID) Wetlands
- 11:45 Conca JL & Wright J:**
The Mineralogical Facies Developed within an Apatite II PRB for Pb, Cd and Zn Acid Mine Drainage

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25:am

Wednesday May 25th 2005: Morning Session

Symposium S02**Room: Renfrew 126****Accessory Mineral Geochemistry II: Metamorphic
Petrogenesis and Tectonics****Convenors:****Joe Pyle & Matt Kohn****13:30 Möller A:***KEY* Constraints on Age and Duration of Metamorphic Events from *in situ* U-Pb Dating and Geochemical Characterization of Zircon**14:00 Kelly N & Harley S:***INV* Timing of Zircon Growth during High-Grade Metamorphism: Constraints from Garnet-Zircon REE**14:15 Baldwin J, Brown M, McDonough W, Piccoli P & Timpa S:**

Zircon Paragenesis and Timing of UHT Metamorphism in the Anápolis-Itaçu Complex, Brazil

14:30 Chen D, Deloule E, Xia Q, Li B & Ni T:

Synchronized Study on Micro-Scale U-Pb Ages and Oxygen Isotopes for Metamorphic Zircons from Dabie-Sulu Orogen, Eastern Central China

14:45 Wang X & Yao X:

Metamorphic Zircon and its Inclusion Minerals from Coesite-Bearing Eclogites of the Dabie Mountains (East-Central China)

15:00 Sorensen S:*INV* Accessory Minerals, Trace Elements, Fluids and Subduction**15:15 Spear F, Cheney J & Wark D:**

Application of Accessory Phase/Trace Element Thermometry to Blueschists from Syros and Sifnos, Greece

15:30 Henry D:

Fluorine – X-Site Vacancy Avoidance in Natural Tourmaline: Internal vs. External Control

15:45 Davis W & McNicoll V:

U-Pb Discordance in Titanite and the Interpretation of the Thermal History of Metamorphic Rocks

16:00 Nicolescu S & Reiners P:

(U-Th)/He Dating of Epidote and Andradite Garnet

16:15 Stockli D:*INV* Application of Multiple (U-Th)/He Geo- and Thermochronometers with Closure Temperatures <~250°C**Symposium S08****Room: Renfrew 125****A-Type Granites and Related Rocks Through Time****Convenors:****Carol Frost, Roberto Dall'Agnol & Tapani Ramo****13:30 Dall'Agnol R, Frost CD & Rämö OT:***INV* A-Type Granites and Related Rocks Through Time**13:45 Bonin B:***KEY* A-Type Granites: Definitions, Facts and Speculations**14:00 Christiansen E:**

Cenozoic and Proterozoic A-Type Silicic Magmas of the Western US

14:15 McLemore V & Rämö OT:

1.4 and 1.2 Ga Bimodal A-Type Magmatism in SW New Mexico and SE Arizona, USA

14:30 Lowell G, Harrison R & Unruh D:

Contrasting Rift-Margin Volcanism in the St. Francois Terrane of Missouri at 1.47 Ga

14:45 Goodge J & Vervoort J:

Hf Isotope Compositions of Laurentian Anorogenic Granites

15:00 Rämö OT, Elliott BA, Peck WH, Johanson B & Alviola R:

A-Type Granites and AMCG Suites; An Isotopic Study from SE Finland

15:15 Rosa MLS, Menezes RCL, Conceição H, Macambira MJ, Galarza MA, Oliveira EC, Marinho MM & Rios DC:

Geochronology of a Rare Alkaline Magmatism: The Blue Sodalite-Syenite Ore (NE Brazil)

15:30 Rubiolo D & Hickson C:

Mesozoic Alkaline Magmatism as a Window to Interpret Geotectonic Evolution of the Central Andes

15:45 Frindt S & Haapala I:

Cretaceous Gross Spitzkoppe Stock in Namibia: Genuine A-Type Granites Related to Continental Rifting

16:00 Wei C, Zheng Y & Zhao Z:²⁰⁷Pb-²⁰⁸Pb Decoupling of Alkali Feldspar from a Late Mesozoic A-Type Granite in Eastern China: Implications for Magma Dynamics**16:15 Whalen J:***KEY* A-Type Granites: >25 Years Later

Symposium S16

Room: CNR 010

Computer Modeling of Reactive-Transport in the Near-Surface Environment

Convenor:

David Sherman

15:15 Parkhurst D, Kipp K, Engesgaard P & Charlton S:

KEY PHAST – A Program for Simulating Ground-Water Flow, Solute Transport, and Multicomponent Geochemical Reactions

15:30 Cooper D, Hull L & Wright K:

Geochemical Modeling of Decontamination Solutions for Building Surfaces

15:45 Zhang G, Spycher N, Sonnenthal E & Steefel C:

Reactive Transport Modeling of Acid Gas Generation and Condensation

16:00 Driesner T, Kostova B & Heinrich CA:

Hydrodynamic and Thermodynamic Modelling of the Formation of the Yuzhna Petrovitsa Hydrothermal Pb-Zn Ore Deposit, Madan, Bulgaria

16:15 van der Grift B & Griffioen J:

Geochemical Transport Modeling of a Phreatic Drinking Water Pumping Station

Symposium S18

Room: CNR 010

Diffusion-Reaction Systems in the Earth Sciences: New Characterization and Modeling Approaches

Convenors:

Carl I. Steefel, Philippe Van Cappellen & Sumit Chakraborty

13:30 Tirone M & Morgan JP:

INV Non-Equilibrium Thermodynamics: Diffusion Controlled Partial Melting

13:45 Soler J, Gimmi T, Cartalade A, Wersin P & Van loon L:

INV *In situ* Diffusion at Mont Terri URL

14:00 Malmström M, Destouni G & Berglund S:

Spreading versus Mixing Effects on Reactive Transport in Groundwater

Presentation by the Clarke Medallist

14:15 Van Orman J:

Diffusion in Mantle and Core Materials

14:45 Liang Y:

INV Diffusion and Reaction in Multicomponent Partially Molten Silicates: Dissolution-Reprecipitation

15:00 Lundstrom C:

How Solid Solution Minerals React with Melt during Diffusion-Reaction

Symposium S21

Room: Agricultural Science 106

Energetic Considerations for the Emergence and Proliferation of Life in Extreme Environments

Convenors:

Mitch Schulte, Tom McCollom & Tori Hoehler

15:15 Edwards K, Santelli C & Bach W:

KEY Microbial Weathering of Ocean Crust

15:45 Hand K, Carlson R & Chyba C:

INV Oxidant Production via Electron Bombardment: Progress in Experimental Simulations of the European Surface Environment

16:00 Arkadakskiy S, Muehlenbachs K, Mendoza C & Szatkowski B:

Anaerobic Oxidation of Natural Gas in Soil – The Geochemical Evidence?

16:15 Rogers K & Amend J:

INV What's on the Menu for Thermophilic Heterotrophs?

Symposium S37 **Room: Renfrew 111**
Igneous Processes and their Rates from U-Series Studies

Convenors: Aaron Pietruszka, Jorge Vazquez & Kari Cooper

- 13:30 Reid M & Cooper K:**
INV A Mixed Message from U-Series Crystal Ages
- 13:45 Snyder D, Widom E, Pietruszka A & Carlson R:**
INV Time Scales of Chemically Zoned Magma Chamber Formation: U-Series Disequilibria in the Fogo Trachyte Deposits, São Miguel, Azores
- 14:00 Pietruszka A, Hauri E, Carlson R & Garcia M:**
 The ^{226}Ra Chronology and Magma Residence Time of Young Lavas from Loihi Seamount, Hawaii
- 14:15 Sims KWW & Hart SR:**
KEY Comparison of Th, Pb, Nd and Sr Isotopes in Oceanic Basalts: Implications for Mantle Heterogeneity and Magma Genesis
- 14:30 Standish JJ, Sims KWW & Dick HJB:**
 Producing U-Series Disequilibria thru Ultraslow Crustal Accretion
- 14:45 Saal A & Van Orman J:**
INV Diffusive Fractionation of ^{226}Ra - ^{230}Th in Oceanic Basalts during Shallow Level Interaction
- 15:00 Rubin K, van der Zander I, Smith M & Bergmanis E:**
INV ^{210}Pb - ^{226}Ra - ^{230}Th Disequilibria in Very Young Mid-Ocean Ridge Basalts
- 15:15 Reagan M, Tepley F, Gill J, Cooper K & Garrison J:**
KEY Degassing and Crystallization Time-Scales Implied by ^{210}Po - ^{210}Pb - ^{226}Ra Activities for Lavas from Anatahan, Arenal, and Mount St. Helens
- 15:30 Turner S & Berlo K:**
INV ^{210}Pb - ^{226}Ra - ^{230}Th Implications for the Timescales of Island Arc Magma Degassing
- 15:45 George R, Turner S, Reagan M, Sandiford M, Hawkesworth C & Hildreth W:**
INV Magma Differentiation and Storage at Katmai-Novarupta 1912: Comparing U-Series Time Scales with Thermal Models
- 16:00 Tepley F, Lundstrom C, Williams R & Gill J:**
INV U-Th-Ra Disequilibria and the Time Scale of Andesite Differentiation at Arenal Volcano, Costa Rica (1968-2003)
- 16:15 Zou H, Fan Q & Schmitt A:**
 U-Th Disequilibrium Constraints on the Origin of Holocene Lavas from Jingbohu, Long-Gang and Tianchi

Symposium S40 **Room: Agricultural Science 106**
Interfacial Biogeochemical Processes

Convenors: James Frederickson, Javiera Cervini & Stephan Kraemer

- 13:30 Traina S & Chen C:**
KEY Siderophore-Metal Interactions on Oxide Surfaces
- 14:00 Duckworth O & Sposito G:**
INV Formation of Manganese-Desferrioxime B Complexes by Dissolution of Manganese Oxides
- 14:15 Maurice P, Mishra B, Haack E & Bunker B:**
INV Effects of Siderophores on Pb Adsorption to Kaolinite
- 14:30 Bunker B, Mishra B, Haack E & Maurice P:**
INV Pb Speciation in the Presence of Siderophores and Clay Surfaces – XAFS Study
- 14:45 Carrasco N, Kretzschmar R & Kraemer S:**
 The Effect of Synthetic and Biogenic Surfactants on Iron Oxide Dissolution
- 15:00 Semrau J, DiSpirito A & Antholine W:**
INV Metal Binding by a Novel Biogenic Chalkophore, Methanobactin, and the Effect on Microbial Activity

Symposium S59

Room: Agricultural Science 204

Organic-Inorganic Interactions in Petroleum Hydrocarbon Systems

Convenors:

Geoffrey S. Ellis & Jeff Seewald

- 13:30 Hill R, Kaplan I, Aizenshtat Z, Tannenbaum E & Jarvie D:**
INV Reality or Myth: The Role of Minerals in Petroleum Generation
- 13:45 Kennedy M & Pevear D:**
INV Clay Mineral Control of Organic Carbon Deposition and Preservation in Petroleum Source Rocks
- 14:00 Ritter U & Groever A:**
Molecular Retention Processes in Source Rocks: Can They Explain Fractionation during Expulsion?
- 14:15 Bennett B, van Duin A & Larter S:**
INV Fluid-Rock Interactions in Petroleum Reservoirs: Alkylphenols
- 14:30 Helgeson H, Schmitt A, Richard L & Dick J:**
INV Phase Relations in the System CHO and the Generation of Petroleum in Hydrocarbon Source Rocks
- 14:45 Mango F:**
INV The Case for Catalytic Gas
- 15:00 Schimmelmann A:**
INV Hydrogen Isotopes in Organic Matter Maturation: a Synthesis
- 15:15 Sherwood Lollar B, Telling J, Lacrampe-Couloume G, Fu Q, Seyfried, Jr. W, Horita J & McCollom T:**
INV Carbon and Hydrogen Isotope Measurements in Abiogenic Hydrocarbon Synthesis
- 15:30 Fu Q, Sherwood Lollar B, Horita J, Lacrampe-Couloume G & Seyfried W:**
Hydrogen and Carbon Isotope Compositions of Hydrocarbons in Hydrothermal Carbon Reduction Processes
- 15:45 Seewald J & Boekelheide N:**
Experimental Investigation of Organic Acid Carboxyl Carbon Exchange with Aqueous CO₂
- 16:00 Tang Y, Ellis G, Zhang T & Jin Y:**
Effect of Aqueous Chemistry on the Thermal Stability of Hydrocarbons in Petroleum Reservoirs
- 16:15 Worden R & Carrigan W:**
INV Oil-Anhydrite TSR Reactions in the Permian Khuff Fm, Saudi Arabia

Symposium S64

Room: Albertson 102

Recent Developments in Microbeam Cathodoluminescence with Applications to Mineralogy

Convenors:

Ian Coulson & Paul Mainwaring

- 13:30 Edwards P, Martin R & Lee M:**
KEY Simultaneous Cathodoluminescence Hyperspectral Imaging and X-Ray Microanalysis
- 14:00 Palenik CS & Buscaglia J:**
KEY Applications of Cathodoluminescence in Forensic Geology
- 14:30 Schieber J & Wintsch R:**
INV Scanned Color Cathodoluminescence Establishes a Slate Belt Provenance for Detrital Quartz in Devonian Black Shales of the Appalachian Basin
- 14:45 Wark D & Spear F:**
INV Ti in Quartz: Cathodoluminescence and Thermometry
- 15:00 Lee M, Martin R, Edwards P & Parsons I:**
INV Hyperspectral Cathodoluminescence Mapping of Calcite and Feldspar
- 15:15 Coulson I & Mainwaring P:**
INV Zoning Patterns in Metasomatic Minerals from the North Qôroq Centre, South Greenland: Insights and Significance from Cathodoluminescence
- 15:30 Vicenzi E, Sorensen S & Rose T:**
INV From Luminoscope to SEM-Based Hyperspectral Imaging: An Evolution of CL Technology
- 15:45 Harlow G, Sahm E & Hunt J:**
INV CL in Support of Interpreting Gem Deposits
- 16:00 Gleeson S & Ickert R:**
The Relationship between Aluminium Contents and Cathodoluminescence in Hydrothermal Quartz Veins

Symposium S66**Room: Albertson 101****Soils as the First Factor in Ground-Water Chemistry****Convenors:****Gwen Macpherson & MaryLynn Musgrove****13:30 Reheis M, Forester R & Izbicki J:***INV* A Dust-Soil-Groundwater-Dust Cycle, Southwestern United States**14:00 Kurtz A, Pett-Ridge J, Lugolobi F, Derry L & Troester J:***INV* Solute Sources in a Tropical Granitoid Watershed, Luquillo, Puerto Rico**14:30 Jin L, Williams E, Walter L & Hamilton S:**Carbonate and Plagioclase Weathering Rates in Pleistocene Glacial Drift Deposits:
Solute Fluxes from Soils to Shallow Groundwater Systems**14:45 Dworkin SI:**

Origin of Radiogenic Sr in Surface Waters of Central Texas, USA

15:00 Macpherson GL, Johnson WC & Gatto LW:

REE in Konza Prairie LTER Site (USA) Soil – Allochthonous?

15:15 McMahon P & Bohlke J:*INV* Variability of Nitrate Sources in a Regional Aquifer: Role of Soil Processes and
Land use**15:45 Hartog N:**

Redox Controls on Denitrification at the Soil-Aquifer Interface

16:00 Townsend M & Macko S:

Evapoconcentration not an Indicator of Nitrate in Kansas Ground Water

16:15 Likhoshvay A & Grachev M:

Reversible Sorption of Phosphate Anions by Sediments of Lake Baikal

Symposium S72**Room: Albertson 201****The Bacterial Surface and its Role as a Reactive Interface****Convenors:****Jeremy Fein, Susan Glasauer & Vernon Phoenix****13:30 Beveridge T:***KEY* Bacterial Surface Structure, Physicochemistry and Geo-Reactivity**14:00 Ferris G:***KEY* Interfacial Free Energy Relationships in Bacterial Surface-Mineral Interactions**14:30 Gorman-Lewis D, Jensen M & Fein J:**Measuring the Enthalpy of Proton, Lead, and Cadmium Adsorption onto *Bacillus subtilis***14:45 Borrok D, Borrok J, Fein J & Kiessling L:***INV* A Link between Bacterial Surface Adsorption and Chemotactic Response**15:00 Yee N, Kobayashi D & Ma J:***INV* The Kinetics and Mechanism of Selenate Reduction by *Enterobacter cloacea***15:15 DiChristina T:***INV* New Insights into the Molecular Mechanism of Microbial Metal Respiration**15:30 Gorby Y, Biju V, Pan D, Mclean J, Saffarini D, Fredrickson J & Lu P:**Display and Retraction of Outer Membrane, Cytochromes by *Shewanella oneidensis* in Response to Electron Acceptor Availability**15:45 Konhauser K & Lalonde S:***INV* Role of Proteins in Silicification**16:00 Templeton A, Tebo B, Staudigel H, Bailey B, Lisa H & Trainor T:***INV* Fe(II) and Mn(II) Oxidation and Biomineralization within Basalt-Hosted
Lithoautotrophic Biofilms**16:15 Dittrich M & Obst M:***INV* Role of the Cell Surface in Calcite Precipitation on Picocyanobacteria

