



Microanalytical Reference Materials  
Topical Conference  
Colorado School of Mines  
Golden, CO  
Berthoud Hall Room 242



**Tuesday, May 15**

- 8:00-8:30 Registration, packet pick up, and opening remarks
- 8:30-9:15 O-01 **Klaus Peter Jochum**, Max Planck Institute for Chemistry  
*Microanalytical reference materials: successes and needs*
- 9:15-9:45 O-02 **Nicholas W. M. Ritchie and Eric Steel**, NIST  
*What is a standard? NIST's perspective*
- 9:45-10:15 O-03 **John.C. Rucklidge<sup>1,2</sup> and Mike.P.Gorton<sup>1</sup>**, <sup>1</sup>University of Toronto, <sup>2</sup>Astimex Scientific Limited  
*Selection of natural minerals for microanalytical reference materials*
- 10:15-10:45 Break
- 10:45-11:30 O-04 Invited **John M. Hanchar<sup>1</sup>, John Fournelle<sup>2</sup>, C. Hayward<sup>3</sup>, B. Dhuime<sup>4,5</sup>, C. Münker<sup>6</sup>, E. Mundy<sup>1</sup>, and Chris M. Fisher<sup>1,7</sup>**, <sup>1</sup>Memorial University, <sup>2</sup>University of Wisconsin, <sup>3</sup>University of Edinburgh, <sup>4</sup>University of St. Andrews, <sup>5</sup>University of Bristol, <sup>6</sup>Universität zu Köln, Zülpicherstr, <sup>7</sup>Washington State University  
*Synthesis and characterization of Ti-Y-Zr-Nb-Hf-Ta-La-Nd-Sm-Gd-Dy-Er-Yb-Lu doped haploandesite glass reference materials*
- 11:30-12:00 O-05 **William O. Nachlas**, University of Minnesota  
*Doping silica gel for the synthesis of trace element in quartz reference*
- 12:00-12:40 Vendor Talks: IAG, SPI, Probe Software
- 12:40-1:30 Lunch
- 1:30-2:00 O-06 **Keith Savino**, University of Rochester  
*A new synthesis method of doped hydroxyapatite for reference materials*
- 2:00-2:45 O-07 Invited **Michael Wiedenbeck**, Helmholtz Zentrum Potsdam  
*Challenges and strategies for the calibration of SIMS geochemical analyses*
- 2:45-3:15 O-08 **Chris M. Fisher<sup>1</sup>, John M. Hanchar<sup>2</sup>, S.D. Samson<sup>3</sup>, B. Dhuime<sup>4,5</sup>, J. Blichert-Toft<sup>6</sup>, J. D. Vervoort<sup>1</sup>, R. Lam<sup>7</sup>**, <sup>1</sup>Washington State University, <sup>2</sup>Memorial University, <sup>3</sup>Syracuse University, <sup>4</sup>University of Bristol, <sup>5</sup>University of St Andrews, <sup>6</sup>Université Claude Bernard, <sup>7</sup>INCO Innovation Centre, MicroAnalysis Facility, Memorial University  
*The utility of synthetic minerals as in situ isotopic reference materials: an assessment of hafnium- rare earth element (REE) doped synthetic zircon*
- 3:15-4:00 Break and Posters
- 4:00-4:30 O-09 **Allen. K. Kennedy<sup>1</sup> and Andreas Möller<sup>2</sup>**, <sup>1</sup>Curtin University, <sup>2</sup>University of Kansas  
*New monazite reference material for microanalysis*
- 4:30-5:00 O-10 **Axel D. Renno**, Helmholtz-Institute Freiberg for Resource Technology  
*Element- and method-specific test for microhomogeneity of major and trace elements in reference materials*
- 5:00 Adjourn



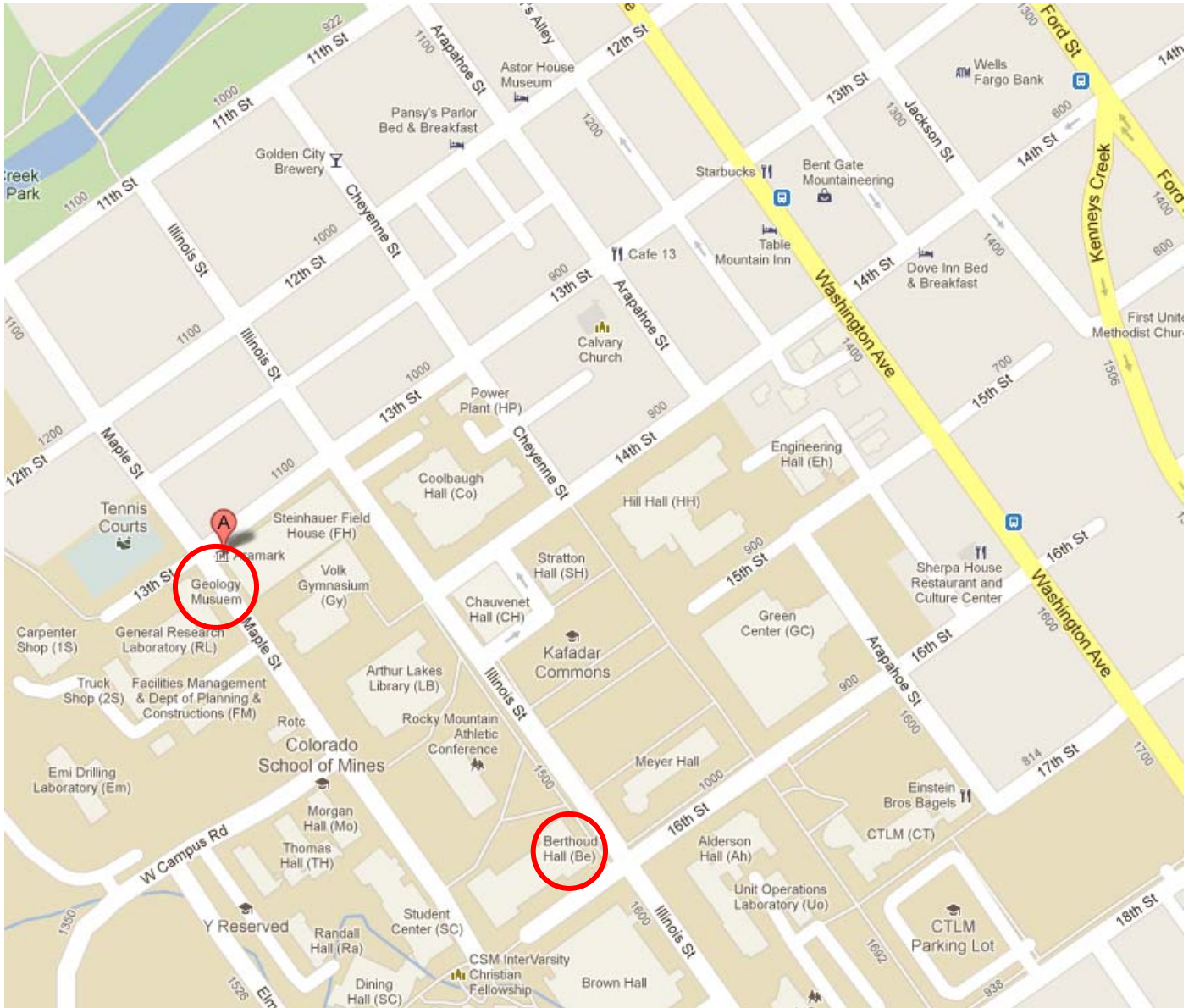
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**Wednesday, May 16**

- 8:00-8:45 O-11 Invited **Richard Ash**, University of Maryland  
*Standardization for natural and synthetic material analysis by LA ICP-MS*
- 8:45-9:15 O-12 **Leonid Danyushevsky, J. Thompson, Sarah Gilbert**, University of Tasmania  
*Using LA-ICPMS for assessing consistency between published values for silicate glass reference materials: Can we see beyond the matrix-related elemental fractionation*
- 9:15-9:45 O-13 **L.Paul Bédard and Alexandre Néron**, Sciences de la Terre, Université du Québec à Chicoutimi, Chicoutimi, QC Canada  
*Spatial geochemistry to characterize reference materials*
- 9:45-10:15 O-14 **John Konopka**, Thermo Fisher Scientific  
*Introduction to quantitative analysis by energy dispersive spectroscopy*
- 10:15-10:45 Break
- 10:45-11:15 O-15 **Nicholas Ritchie**, NIST  
*Breaking the 1% accuracy barrier in EPMA*
- 11:15-11:45 O-16 **John Fournelle**, University of Wisconsin-Madison  
*Complexities of using natural minerals as standard reference materials: personal experiences from a geological microprobe lab*
- 11:45-12:15 O-17 **Donggao Zhao**, University of Texas at Austin  
*Heterogeneity of the kakanui hornblende standard at the University of Texas at Austin*
- 12:15-12:45 O-18 **Paul K. Carpenter<sup>1</sup> and Ed P. Vicenzi<sup>2</sup>**, <sup>1</sup>Earth and Planetary Sciences, Washington University, St. Louis and <sup>2</sup>Museum Conservation Institute, Suitland, MD  
*Mineral reference standards and quantitative electron-probe microanalysis*
- 12:45-1:45 Lunch
- 1:45-2:15 O-19 **Juliane Gross<sup>1</sup> and Allan H. Treiman<sup>2</sup>**, <sup>1</sup>American Museum of Natural History, <sup>2</sup>Lunar and Planetary Institute  
*Lunar volatiles determined by electron microprobe: Lunar cordierite and apatite - compositions, volatile contents and implications on their origin*
- 2:15-2:45 O-20 **Steve N. Guggino**, Arizona State University  
*Synthesis and characterization of five new fluorine-bearing basalt reference materials (Fba Glasses) and their use in quantifying the fluorine content of the basaltic glass standards BCR-2G, BHVO-2G, GSA-1G, GSC-1G, GSD-1G, GSE-1G, ML3B-G, KL2-G, and ALV-519-4*
- 2:45-3:15 O-21 **Steve C. Kuehn**, Concord University  
*Secondary standards and sodium-loss: results from a large interlaboratory comparison using four natural volcanic glasses*
- 3:15-3:45 Break
- 3:45-4:00 O-22 **Heather Lowers, Steve Wilson, and Alan Koenig**, USGS  
*Development of a basaltic glass microanalytical reference material for multiple techniques*
- 4:00-4:15 **Steve Wilson**, USGS  
*Scoring of the round robin results*

- 4:15-5:00 Discussion of round robin results
- 5:00 Adjourn
- 6:00-8:00 Reception in the Geology Museum (1301 Maple Street) Hors d'oeuvres and drinks will be served





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**Thursday, May 17**

- 8:15-8:45 O-23 **Craig S. Schwandt**, McCrone Associates, Inc  
*What are the requirements for forensic materials and particles standards?*
- 8:45-9:15 O-24 **Jeanne Spencer**, Reservoirs Environmental, Inc  
*Standard reference materials for NVLAP*
- 9:15-9:45 O-25 **Greg Meeker**, USGS  
*A national repository for standard reference materials for asbestos-related disease*
- 9:45-10:15 O-26 **Doug Stoesser**, USGS  
*The LHT (Lunar Highlands Type) lunar regolith simulant series*
- 10:15-11:00 Break and posters
- 11:00-11:30 O-27 **Karen E. Wright, J. A. King** Idaho National Laboratory  
*Preparation and analysis of actinide standards*
- 11:30-12:15 Vendor Talks: Newmont, FEI, Thermo, Cameca
- 12:15-1:15 Lunch
- 1:15-1:45 O-28 **Alan Butcher**, FEI  
*Rock texture revolutionized and reading the value of information locked in rock fabrics – Opportunities for new classification schemes*
- 1:45-2:15 O-29 **Sarah Haser<sup>1</sup>, Axel D. Renno<sup>2</sup>, A. Bartzsch<sup>2</sup>, C. Weißflog<sup>1</sup>, D. Sandmann<sup>1</sup>, B. Schulz<sup>1</sup>, J. Gutzmer<sup>2</sup>**,  
<sup>1</sup>Institute of Mineralogy, Freiberg, <sup>2</sup>Helmholtz-Institute Freiberg for Resource Technology  
*Reference materials in automated quantitative mineralogy – experiences and approaches at the Freiberg Geometallurgy Laboratory*
- 2:15-2:30 Break
- 2:30-3:00 O-30 **Brian Gorman**, Colorado School of Mines  
*Overview of atom probe tomography and its applicability to oxides*
- 3:00-3:30 O-31 **Tom Kelly**, Cameca  
*Standards for atom probe tomography*
- 3:30-4:00 O-32 **S.W. Parman<sup>1</sup>, B.P. Gorman<sup>2</sup>, C.R.M. Jackson<sup>1</sup>, and R.F. Cooper<sup>1</sup>**, <sup>1</sup>Brown University, <sup>2</sup>Colorado School of Mines  
*Atom probe tomography of natural olivine: a potential APT reference material*
- 4:00-4:45 Break and Lab Tours
- 4:45-5:00 Wrap up and future directions



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## POSTERS

Posters will be on display for the entire conference

P-01 **Steve Wilson, Alan Koenig, and RaeAnn Orklid-Norton, USGS**

*USGS microanalytical reference materials: Current activities and future directions*

P-02 **Alexandre Néron, L.Paul Bédard, Sciences de la Terre, Université du Québec à Chicoutimi, Chicoutimi, QC Canada**

*Data processing for spatial geochemistry in reference materials*

P-03 **Sarah Gilbert<sup>1</sup>, Leonid Danyushevsky<sup>1</sup>, P. Robinson<sup>1</sup>, C. Wohlgemuth-Ueberwasser<sup>2</sup>, N. Pearson<sup>3</sup>, D. Savard<sup>4</sup>, M.Norman<sup>5</sup>, J. Hanley<sup>6</sup>**, <sup>1</sup>University of Tasmania, <sup>2</sup>University of Johannesburg, <sup>3</sup>GEMOC, Macquarie University, <sup>4</sup>Université du Québec à Chicoutimi, <sup>5</sup>Australian National University, <sup>6</sup>St. Mary's University

*A comparative study of six reference materials used for the analyses of the platinum group elements and gold by LA-ICPMS*

P-04 **Benjamin Wade, The University of Adelaide**

*Development of a new Ga-Ge-S reference material for LA-ICP-MS investigation*

P-05 **Alan Koenig, USGS**

*A summary of highlights and hurdles of quantitative LA-ICP-MS with and without microanalytical reference materials*

P-06 **John J. Donovan, CAMCOR, University of Oregon**

*An examination of beam sensitive standards*

P-07 **Catherin Crispin and John Armstrong, Geophysical Laboratory, Carnegie Institution of Washington**

*Low voltage and low overvoltage x-ray nanoanalysis with field emission electron microprobes and SEMs: Problems in quantitation for first-row transition elements*

P-08 **John H. Fournelle, University of Wisconsin**

*Toward a quartz sandstone SEM-CL intensity imaging reference material*

P-09 **Stephan Brémier, P. Pöml, F. Laheurte, R. Hasnaoui and C.T. Walker, European Commission, Joint Research Centre, Institute for Transuranium Elements**

*Characterisation of a reference material for the direct quantification of the noble gas xenon in electron probe microanalysis*

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