

GEOANALYSIS 2018

8-13 July, Macquarie University, Sydney, Australia



GEOANALYSIS 2018

8-13 July
SYDNEY



<http://geoanalysis.info/>

10th International Conference on the Analysis of Geological and Environmental Materials

PROGRAM

Sunday 8th July 2018

Workshops

11 Wally's Walk 210 (E5A)

09:00 Registration for Workshops open

10:00 **Workshop I - Transportable Analytical Instruments and Material Analysis**

Christabel Brand (Portable XRF Services), Andrew Somers (SciAps), Maurice Wicks (AXT)

Theory and application of transportable analytical instruments for elemental and mineralogical applications for industry and research

Transportable analytical instruments are now mainstream tools for diverse applications within industry and research. This workshop will provide a theoretical and practical background with applied examples for using "off the shelf" transportable analytical instruments for elemental and mineralogical compositions.

Topics to be covered include sample preparation, instrument configurations and settings, safe operation, understanding qualitative and quantitative data and QA/QC. Case studies will be presented and discussed. Participants are encouraged to bring 3-5 slides illustrating some of their own applications, and challenges, pertaining to transportable elemental and mineralogical analyses.

11:30 *Morning Tea Break*

13:00 *Lunch Break*

14:00 **Workshop II - Application of LA-ICPMS/MC-ICPMS to exploration needs**

William Powell (Rio Tinto), Elena Belousova, Romain Tilhac, Stephen Craven (CCFS, Macquarie University)

Theory and application of Laser Ablation ICPMS and MC-ICPMS for elemental analysis and isotopic dating - applications for industry and research

This workshop will provide a theoretical and practical background with applied examples for the application of Laser Ablation ICPMS methods to exploration geology and related fields in industry and research.

Topics to be covered include sample preparation, targeted sampling strategy, introduction to the *TerraneChron*[®] method (integrated U/Pb, Hf and trace element analysis of zircon), U/Pb dating of accessory minerals. Case studies will be presented and discussed. Participants are encouraged to bring 3-5 slides illustrating some of their own applications, and challenges, pertaining to the topics of this workshop.

15:30 *Rio Tinto Afternoon Tea Break*
Registration for Conference opens

Rio Tinto

17:00 End of Workshop II
Registration for Conference closes

Scientific Sessions

08:15 **Graduation Hall, 12 Wally's Walk (E7B)**
Registration for Conference
Posters set up

Mason Theatre, 12 Wally's Walk (E7B)

09:00 **Conference Opening**
Michael Heimlich, *Assoc. Dean Industry and Corporate Engagement*
Thomas Meisel, *President International Association of Geoanalysts (IAG)*
Dorrit Jacob, *Chair Organising Committee Geoanalysis 2018*

Session 1 - Reference Material Production and Applications Mason Theatre, 12 Wally's Walk (E7B) Chairperson: Thomas Meisel

09:30 **Keynote Presentation**
Diversification of Geologic Reference Materials, new needs, new requirements
Stephen Wilson
U.S. Geological Survey, Crustal Geophysics & Geochemistry Science Center, Denver, CO, USA

10:00 **Homogeneous pressed powder pellets as new MRMs for *in situ* microanalytical techniques**
Dieter Garbe-Schönberg¹, S. Müller¹, S. Nordstad¹, L. Schönberg¹, M. Wiedenbeck² and A.D. Renno³
¹CAU Kiel University, Geosciences, Kiel, Germany
²GFZ Helmholtz Zentrum Potsdam, Potsdam, Germany
³Helmholtz Zentrum Dresden-Rossendorf, Dresden, Germany

10:20 **Using robust plasma conditions to examine preferred values for BCR-2G and ATHO-1G relative to NIST glasses**
Ivan Belousov¹, Leonid Danyushevsky², Jay Thompson², Michael Shelley³ and Paul Olin²
¹TMVC Research Hub, University of Tasmania, Private Bag 79, Hobart, TAS 7001, Australia
²CODES, University of Tasmania, Australia
³Laurin Technic, Australia

10:40 *Morning Tea Break sponsored by Bruker and Cameca/Nu*



11:10 **Trace elements concentration and distribution in microanalytical reference materials suitable for sulfide and FeNi alloy analyses**
Olivier Alard, Rosanna Murphy, Yoann Gréau, Timothy D. Murphy and Claude Merlet
Dept. of Earth and Planetary Sciences, Macquarie University, Sydney and ARC Centre of Excellence Core to Crust Fluid Systems, Macquarie University

11:30 **Development and characterization of five new USGS shale reference materials**
Stephen A. Wilson¹ and Justin E. Birdwell²
¹U.S. Geological Survey, Crustal Geophysics & Geochemistry Science Center, Denver, CO, USA
²U.S. Geological Survey, Central Energy Resources Science Center, Denver, CO, USA

11:50 **Apatite reference materials for oxygen and chlorine isotope analysis**
Alicja Wudarska^{1,2}, Michael Wiedenbeck², Frédéric Couffignal² and Ewa Słaby¹
¹Institute of Geological Sciences of the Polish Academy of Sciences, Warsaw, Poland
²GFZ German Research Centre for Geosciences, Potsdam, Germany

12:10 **Study of mineral component in technogenic soils of Irkutsk Region by X-ray electron probe microanalysis**
Olga Yu. Belozerova and G.A. Belogolova
Vinogradov Institute of Geochemistry, Siberian Branch of Russian Academy of Sciences, 664033 Irkutsk, Russia

12:30 **Geo-analysis - Dealing with the analytical challenges with ICP-MS**
Naoki Sugiyama
ICP-MS Product Manager, Agilent Technologies International, Japan



13:00 *Agilent Lunch Break - Atrium, 12 Wally's Walk (E7B)*

Session 2 - Geoanalysis in mining, exploration and remediation
Mason Theatre, 12 Wally's Walk (E7B)
Chairperson: Sarah Gilbert

13:50 **A Super-SIMS for resource technology**
Alex D. Renno¹, Shavkat Akhmedaliev², Georgii Belokonov¹, Roman Böttger², Johannes von Borany², Jens Gutzmer², Peter Kaefer³, Markus Meyer³, Pavol Noga⁴, Georg Rugel¹, Collin J. Tiessen^{1,5}, Jörg Voigtländer³, Nicole Wagner³, Michael Wiedenbeck⁶, Armin Winter³, Hao Sheng Wu¹ and René Ziegenrücker¹
¹*Helmholtz-Zentrum Dresden-Rossendorf, Helmholtz Institute Freiberg for Resource Technology, 09599 Freiberg, Germany*
²*Helmholtz -Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, 01328 Dresden, Germany*
³*Helmholtz-Zentrum Dresden-Rossendorf, Department of Research Technology, 01328 Dresden, Germany*
⁴*Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava, Advanced Technologies Research Institute*
⁵*André E. Lalonde AMS Laboratory, University of Ottawa, Canada*
⁶*Helmholtz-Zentrum Potsdam - Deutsches GeoForschungsZentrum GFZ*

14:10 **Li abundances of magmatic zircons in Eocene-Oligocene porphyry Cu mineral systems of Yunnan, China**
Mei-Fei Chu¹, Yu-ya Gao², Qiu-li Li², Yong-Jun Lu^{3,4}, Xian-Hua Li² and Suzanne Y. O'Reilly⁵
¹*Institute of Oceanography, National Taiwan University, Taiwan*
²*Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China*
³*Geological Survey of Western Australia, Perth, Australia*
⁴*CET and CCFS, School of Earth Sciences, the University of Western Australia, Perth, Australia*
⁵*CCFS and GEMOC, Macquarie University, Sydney, Australia*

14:30 **Microanalysis of Cu Slag: Understanding the role of mining waste in ongoing environmental contamination**
Mike Ashelford and Damian Gore
Department of Environmental Sciences, Macquarie University, Sydney

14:50 Group Photo

15:10 *Afternoon Tea Break sponsored by Bruker and CAMECA/Nu*



15:30 Poster Session/Lab tour - Graduation Hall, 12 Wally's Walk (E7B)

17:00 **Icebreaker Reception - Atrium, 12 Wally's Walk (E7B)**

Scientific Sessions

Session 2 - Geoanalysis in mining, exploration and remediation
Mason Theatre, 12 Wally's Walk (E7B)
Chairperson: Timothy Murphy

- 09:00 **Keynote Presentation**
Horizon scanning: An industry perspective on PFAS, an emerging contaminant of concern
Danielle Toase, Jason Lagowski and Ian Ross
Arcadis Australia Pacific
- 09:30 **Geoanalysis in industry: Rio Tinto**
William Powell and Alan Kobussen
Rio Tinto. 1 Research Avenue, Bundoora 3083, Victoria, Australia
- 09:50 **A machine-learning interpretation of regional geochemical patterns in northern Australia**
Evgeniy Bastrakov¹, John Wilford¹, Patrice de Caritat¹, Karol Czarnota¹, P. Main¹, Andrzej Wygralak² and Sean Chua¹
¹*Geoscience Australia*
²*Northern Territory Geological Survey*
- 10:10 **Tracing Hg mobility and distribution in a historical mercury mine ecosystem**
Michael Pribil¹, Danny Rutherford¹, JoAnn Holloway¹, Ben McGee¹ and Johanna Kraus²
¹*USGS, Denver Federal Center, Denver, CO, 80225*
²*USGS, Fort Collins Science Center, Fort Collins, CO, 80526*
- 10:30 **Comminution and sizing of gold particles in geological samples and reference materials**
Lou Daniel and Drew Parsons
Murdoch University, Perth, Western Australia

10:50 *Morning Tea Break sponsored by Bruker and Cameca/Nu*



11:20 *Company Presentations*

12:30 *BBQ Lunch Break - Lawn, 12 Wally's Walk (E7B)*

Session 3 - Dating, geochemical mapping and imaging with elements and isotopes
Mason Theatre, 12 Wally's Walk (E7B)
Chairperson: Jon Woodhead

- 14:00 **Exploring the range of U-containing minerals for geochronological applications**
Elena Belousova^{1,2}
¹*Dept. of Earth and Planetary Sciences, Macquarie University, Sydney*
²*ARC Centre of Excellence Core to Crust Fluid Systems, Macquarie University*
- 14:20 **U-Pb geochronology of grandite by femtosecond laser ablation high resolution inductively coupled plasma mass spectrometry**
Chen Lei, Hou Kejun, Zhu Qiaoqiao, Li Yanhe and Wang Qian
MLR Key Laboratory of Metallogeny and Mineral Assessment, Institute of Mineral Resources, Chinese Academy of Geological Sciences, Beijing 100037, China

14:40 **Impact of atmospheric air and laser fluence on accuracy of zircon U-Pb dating**
Jay M. Thompson, Sebastian Meffre, and Leonid V. Danyushevsky
CODES, University of Tasmania

15:00 **G-Chron - IAG's proficiency testing programme for zircon geochronology**
Michael Wiedenbeck
GFZ-Potsdam, Telegrafenberg, 14473 Potsdam, Germany

15:20 *Afternoon Tea Break sponsored by Bruker and Cameca/Nu*



15:45 *Mason Theatre, 12 Wally's Walk (E7B)*
IAG General Meeting

16:15 Poster Session/Lab tour - Graduation Hall, 12 Wally's Walk (E7B)

17:30 *Atrium, 12 Wally's Walk (E7B)*
Thermo Fisher Wine Tasting Evening
Hosted by Macquarie University Deputy Vice Chancellor Prof Sakkie Pretorius



Wednesday 11th July 2018

Field Trip / Laboratory Demos

08:30 **Field Trip to Boolaroo and the Hunter Valley**
Bus Departure from Macquarie University Campus, return at approx. 19:00

Pasminco lead smelter

1. Boolaroo, the former Pasminco Lead smelter in the North Lake Macquarie area has created extensive environmental contamination through the dissemination of metal-rich slag to public places such as parks, and to local households in the form of garden soil amendments. Dr Tony Morrison (Macquarie University) has spent a lot of effort understanding the mineralogy and chemistry of the slags around Boolaroo. The contamination includes lead, with secondary amounts of copper, zinc, selenium, cadmium and acidic leachate. Tony has found that the distributed slags are leaching metals into the environment. Professor Mark Taylor, Associate Professor Heather Handley and Dr Paul Harvey (all from Macquarie University) have assessed the present-day contamination of the site and found a clear and present environmental risk. The conference field trip will visit the site, and Dr Tony Morrison will give an on-site talk while we have morning tea in the area.

Wine country at Pokolbin

2. After Boolaroo, we will drive to the vineyards of the delightful Hunter Valley, where we will have the opportunity to walk in the wonderful Hunter Valley Gardens (entry fee payable), visit one of a number of vineyards and winemakers (Brokenwood, McGuigan or Tempus Two), and have lunch in one of a number of local cafes. We will briefly discuss some of the geology and geochemical challenges of the area en route to the vineyards. Included in the fee are morning and afternoon tea/refreshments and transport. Lunch and incidentals (entry fee Hunter Valley Gardens, wine tasting or purchases) are not included.

TBA **Laboratory tours and demonstrations**

Scientific Sessions

Session 3 - Dating, geochemical mapping and imaging with elements and isotopes

Mason Theatre, 12 Wally's Walk (E7B)

Chairperson: Elena Belousova

09:00 **Award Ceremony**

09:30 **Keynote Presentation**

LA-ICPMS as an imaging tool: past, present, and future

Jon Woodhead

School of Earth Sciences, The University of Melbourne, VIC 3010, Australia

10:10 **Dating ⁸⁷Rb/⁸⁶Sr in minerals using LA-ICPMS, achievements and problems**

Charlotte M. Allen, Karine Harumi Moromizato and Mitchell DeBruyn

CARF Institute for Future Environments, Queensland University of Technology, Brisbane, QLD 4000

10:30 **Testing the limits of *in-situ* Rb-Sr dating of igneous minerals by LA-ICP-QQQ**

Ahmad Redaa¹, Juraj Farkas¹, Sarah Gilbert¹, Thomas Zack², Fred Fryer³, Benjamin Wade¹ and Alan Collins¹

¹*The University of Adelaide*

²*University of Gothenburg*

³*Agilent Technologies*

10:50 *Morning Tea Break sponsored by Bruker and Cameca/Nu*



11:10 ***In-situ* Rb-Sr dating of authigenic clays from soils and sediments: Potential and limitations**

Juraj Farkas¹, Grant Cox¹, Morgan Blades¹, Sarah Gilbert¹, Benjamin Wade¹, Alan Collins¹, Thomas Zack², Stefan Loehr³, David Chittleborough¹, Hamed Al Sarakhi¹, Ahmad Reeda¹, Lise Jensen¹ and Fred Fryer⁴

¹*University of Adelaide, Department of Earth Sciences, Adelaide*

²*University of Gothenburg, Department of Earth Sciences, Sweden*

³*Macquarie University, Department of Earth and Planetary Sciences, Sydney*

⁴*Agilent Technologies Ltd., Australia*

11:30 **Laser Induced Breakdown Spectroscopy: Mineralogical mapping of drill core and thin sections**

Gary Thompson¹ and Derek H.C. Wilton²

¹*Office of Applied Research and Innovation, College of the North Atlantic, St John's, NL Canada*

²*Department of Earth Sciences, Memorial University, St. John's, NL A1B 3X5*

Session 4 - Instrumentation and new developments

Mason Theatre, 12 Wally's Walk (E7B)

Chairperson: Olivier Alard

11:50 **Atom probe microscopy as a tool for geoanalysis**

David W. Saxey¹, Steven M. Reddy^{1,2}, Denis Fougerouse^{1,2} and William D.A. Rickard¹

¹*Geoscience Atom Probe, Advanced Resource Characterisation Facility, John de Laeter Centre, Curtin University, Perth, Australia*

²*School of Earth and Planetary Sciences, Curtin University, Perth, Australia*

12:10 **SHRIMP analysis of water abundances and oxygen isotopes**

Trevor Ireland¹, Janaina Ávila¹, Peter Holden¹, Simon Turner², Michael Turner² and Joerg Hermann³

¹*Research School of Earth Sciences, Australian National University, Canberra*

²*Department of Earth and Planetary Sciences, Macquarie University, Sydney;*

³*Institute of Geological Sciences, University of Bern, Bern*

12:30 *Lunch Break*

13:50 **High precision, high accuracy silicon isotope determination in quartz using SIMS, by reducing the topography effect**

Yu Liu¹, Xian-Hua Li¹, Qiu-Li Li¹, Xiao-Chi Liu¹, Guo-Qiang Tang¹ and Fang Huang²

¹State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China

²CAS Key Laboratory of Crust-Mantle Materials and Environments, School of Earth and Space Sciences, University of Science and Technology of China, Hefei 230026, China

14:10 **SIMS analyses employing a flood gas tracer**

Michael Wiedenbeck¹, and Ziliang Jin^{1,2}

¹GFZ-Potsdam, Telegrafenberg, 14473 Potsdam, Germany

²Arizona State University, School of Earth and Space Exploration, Tempe, AZ 85287, USA

14:30 **2008-2018 – “The Portable XRF Decade”**

Aaron Baensch

International Mining Group, Olympus Scientific Solutions, Waltham, MA, USA

15:00 *Afternoon Tea Break sponsored by Bruker and Cameca/Nu*



15:20 **Poster Session - Graduation Hall, 12 Wally's Walk (E7B)**

16:30 **Lab tours**

19:30 **Geoanalysis Conference Dinner Cruise, Sydney Harbour**

Scientific Sessions

Session 4 - Instrumentation and new developments
Mason Theatre, 12 Wally's Walk (E7B)
Chairperson: Yongsheng Liu

- 09:00 **Keynote Presentation**
***In situ* carbon isotope analysis by laser ablation MC-ICP-MS**
Wei Chen, Jue Lu, Shao-Yong Jiang, Kui-Dong Zhao and Deng-Fei Duan
State Key Laboratory of Geological Processes and Mineral Resources, Collaborative Innovation Center for Exploration of Strategic Mineral Resources, Faculty of Earth Resources, China University of Geosciences, Wuhan, 430074, China
- 09:30 **Portable heavy metal analyzer based on hydride generation-glow discharge micro-plasma sources**
Chun Yang, Dong He and Zhenli Zhu
State Key Laboratory of Biogeology and Environmental Geology, School of Earth Sciences, China University of Geosciences, Wuhan, China, 430074
- 09:50 **The limitation of Os isotopic analysis for geological samples using Faraday cups equipped with 10¹³ Ω amplifiers by NTIMS**
Guiqin Wang¹ and Jifeng Xu²
¹*State Key Laboratory of Isotope Geochemistry, GIG, CAS, 510640 Guangzhou, China*
²*China University of Geosciences, 100083 Beijing, China*
- 10:10 **Zirconium stable isotope analysis by double-spike MC-ICPMS**
John B. Creech^{1,2}, Edward Inglis¹, Zhengbin Deng¹ and Frédéric Moynier¹
¹*Institut de Physique du Globe de Paris, 1 rue Jussieu, 75328 Paris cedex 05, France*
²*Dept. of Earth and Planetary Sciences, Macquarie University, Sydney, Australia*
- 10:30 *Morning Tea Break sponsored by Bruker and Cameca/Nu*
- 11:10 **Determination of Zr and Nb concentrations in chromium matrices using Agilent 8900 ICP-QQQ and Elan ICP-DRC-MS**
Yi-Jen Lai^{1,2} and Maria Schönbacher²
¹*Macquarie University GeoAnalytical, Department of Earth and Planetary Sciences, Macquarie University, Sydney, Australia*
²*ETH Zurich, Institute of Geochemistry and Petrology, 8092 Zürich, Switzerland*
- 11:30 **Simultaneous sensitive determination of selenium, silver, antimony, bismuth and lead in geological materials by liquid spray dielectric barrier discharge induced plasma-chemical vapor generation**
Xing Liu, Zhenli Zhu, Huasheng Shan and Zhengyu Bao
State Key Laboratory of Biogeology and Environmental Geology, School of Earth Sciences, China University of Geosciences (Wuhan), Wuhan, Hubei 430074, P. R. China
- 11:50 **Rapid determination of elements and isotopes in NH₄F-modified geological sample powders by LA-(MC)-ICP-MS**
Wen Zhang, Zhaochu Hu, Yongsheng Liu and Junyi Xie
State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Wuhan 430074, China



- 12:10 **Success and pitfalls during the dissolution of silicate rocks in a microwave oven with a solution of NH₄HF and HNO₃**
Thais Takayassu Magaldi, Margareth Sugano Navarro and Jacinta Enzweiler
Institute of Geosciences, UNICAMP Campinas, SP, Brazil
-
- 12:30 *Lunch Break*
-
- 13:30 **The effect of laserprobe optical path design on laser ablation of minerals with low melting points**
Leonid Danyushevsky^{1,2}, Sarah Gilbert³, Jeremy Thompson², Paul Olin¹ and Olivier Alard⁴
¹TMVC Research Hub, University of Tasmania, PB 79, Hobart, TAS 7001, Australia,
²CODES, University of Tasmania, Australia
³Adelaide Microscopy University of Adelaide, Australia
⁴CCFS/GEMOC, Dept. EPS, Macquarie University, Sydney, Australia
- 13:50 **High-resolution fs-LA-ICP-MS single shot measurements of Mg/Ca in foraminifers**
Klaus P. Jochum, Ralf Schiebel, Brigitte Stoll, Ulrike Weis, Anna Jentzen and Gerald H. Haug
Climate Geochemistry Department, Max Planck Institute for Chemistry, 55020 Mainz, Germany
- 14:10 **Geoanalysis 2021 in Freiberg, Germany**
Axel Renno
- 14:20 Closing Remarks
- 14:30 Poster Session - Graduation Hall, 12 Wally's Walk (E7B)
- 15:30 **Closing Drinks Reception Port Botany Café and UBar
Macquarie Campus Commons**

Post-Conference Field Trip

Saturday 14th - Monday 16th July 2018

Post-Conference Field Trip - South Coast, NSW

This three-day field trip travels along the beautiful coast of southern New South Wales starting at Sydney's Macquarie University Campus on the morning of Saturday 14th July and returning late on Monday 16th July. You will get a good impression of the geology of the Permo-Triassic Sydney Basin sequence and the underlying deformed early Palaeozoic Wagonga Beds. The sedimentary rocks in this part of the Sydney Basin include glacio-marine conglomerate, sandstone, and mudstone that were deposited when this margin of Australia was at high southern latitudes. The coastal scenery between Sydney and Batemans Bay is spectacular. The vegetation includes spotted gums, casuarina or sheoaks, and burrawang palms. Eastern grey kangaroos are common near the beaches and campgrounds. There is abundant birdlife. Includes transport, all meals, and two nights of twin-share cabin-style accommodation in Kioloa.

Posters

Graduation Hall, 12 Wally's Walk (E7B)

08:15 Monday 8th - Posters set up

#		Presenting Author
P1	<p>Certified reference material for determination of total cyanide in soil Lkhagvasuren Batzorig¹, Urjin Oyuntungalag¹, E. Tegshjargal¹, Sebastian Recknagel², Holger Scharf² and Juergen Rausch³ <i>¹Central Geological Laboratory, Ulaanbaatar, Mongolia</i> <i>²Federal Institute for Materials Research and Testing, Berlin, Germany</i> <i>³Federal Institute for Geosciences and Natural Resources, Hannover, Germany</i></p>	Lkhagvasuren Batzorig
P2	<p>$\delta^{18}\text{O}$ measurements of gem-quality apatite crystals and their application as reference material Łukasz Birski¹, Elżbieta Krzemińska², Ewa Słaby¹ and Zbigniew Czupyt² <i>¹Institute of Geological Sciences, Polish Academy of Sciences, Warsaw (Poland)</i> <i>²Polish Geological Institute – National Research Institute, Warsaw (Poland)</i></p>	Łukasz Birski
P3	<p>Ga isotopic compositions of various reference materials Lanping Feng, Lian Zhou, Zhaochu Hu and Yongsheng Liu <i>State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Wuhan 430074, China</i></p>	Lanping Feng
P4	<p>A suite of nine soil reference materials for targeted environmental geochemical analysis Charles J.B. Gowing¹, Michael J. Watts¹, Katherine V. Knights², John Wheeler¹, Charles R. Brettle¹, Andrea J. Mills¹, Mark K. Kalra¹, Mohmed Raja¹, Andrew L. Marriott¹, Judith Mather² and Peter Heath² <i>¹British Geological Survey, Keyworth, Nottingham, NG12 5GG, UK</i> <i>²Geological Survey of Ireland, Beggars Bush, Dublin, D04 K7X4, Ireland</i></p>	Charles Gowing
P5	<p>MUSTAFAA-3 and -4: Two new Reference Glasses for <i>in-situ</i> analysis of phosphates Joachim Krause¹, Stephan Klemme², Jasper Berndt², Gerhard Brüggemann³, Klaus Peter Jochum⁴, Denis Scholz⁵, Jan Schulz-Isenbeck¹, Brigitte Stoll⁴, Andreas Stracke² and Klaus Mezger⁶ <i>¹Helmholtz-Zentrum Dresden-Rossendorf, Helmholtz Institute Freiberg for Resource Technology, Chemnitz Strasse 40, 09599 Freiberg, Germany,</i> <i>²Institute for Mineralogy, Westfälische Wilhelms-Universität Münster, Corrensstraße 24, 48149 Münster, Germany,</i> <i>³Curt-Engelhorn-Zentrum Archäometrie gGmbH, D6 3, 68159 Mannheim, Germany,</i> <i>⁴Max Planck Institute for Chemistry, 55128 Mainz, Germany</i> <i>⁵Institute of Geosciences, Johannes Gutenberg University Mainz, 55128 Mainz, Germany,</i> <i>⁶Institut für Geologie, Universität Bern, 3012 Bern, Switzerland</i></p>	Joachim Krause
P6	<p>A new pyrrhotite reference material for micro-beam determination of sulfur isotopes Lei Chen¹, Xianhua Li², Yu Liu², Qiuli Li², Bin Hu¹ and Changfu Fan¹ <i>¹MLR Key Laboratory of Metallogeny and Mineral Assessment, Institute of Mineral Resources, Chinese Academy of Geological Sciences, Beijing 100037, China</i> <i>²State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China</i></p>	Lei Chen

#		Presenting Author
P7	Characterisation of three ultramafic PGE reference materials Thomas Meisel ¹ and O. Marcus Burnham ² ¹ Montanuniversität, 8700 Leoben, Austria ² Geoscience Laboratories, Ontario Geological Survey, Sudbury, ON, Canada P3E 6B5	Thomas Meisel
P8	The GeoPT Proficiency Testing Programme as a scheme for the certification of reference materials Phil J. Potts ¹ , Peter C. Webb, Michael Thompson ² , J.M. Cook ³ and Charles J.B. Gowing ³ ¹ Faculty of Science, Technology, Mathematics and Computing, The Open University, Milton Keynes, MK7 6AA, UK ² School of Biological and Chemical Sciences, Birkbeck University of London, London, WC1E 7HX, UK ³ British Geological Survey, Keyworth, Nottingham, NN12 5GG, UK	Phil Potts
P9	The analysis of nothing and nearly nothing – concepts for reference materials for the Super-SIMS Axel D. Renno Helmholtz-Zentrum Dresden-Rossendorf, Helmholtz Institute Freiberg for Resource Technology, 09599 Freiberg, Germany	Axel Renno
P10	Box-profile implants as geochemical reference materials for EMP and SIMS Hao Sheng Wu ¹ , Georgii Belokonov ¹ , Roman Böttger ² , Frédéric Couffignal ³ , Frans Munnik ² , Axel D. Renno ¹ , Michael Wiedenbeck ³ and René Ziegenrücker ¹ ¹ Helmholtz-Zentrum Dresden-Rossendorf, Helmholtz Institute Freiberg for Resource Technology, 09599 Freiberg, Germany ² Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, 01328 Dresden, Germany ³ Helmholtz Zentrum Potsdam, Deutsches GeoForschungsZentrum (GFZ), Germany	Axel Renno
P11	The nanogram-scale heterogeneity of IAEA-CO-1 calcite Alexander Rocholl ¹ , Z. Jin ^{1,2} , Stanisław Hałas ³⁺ and Michael Wiedenbeck ¹ ¹ GFZ-Potsdam, Telegrafenberg, 14473 Potsdam, Germany ² GFZ-Potsdam & Arizona State University, School of Earth and Space Exploration, Tempe, AZ 85287, USA ³ Maria Curie-Skłodowska University, 20-031 Lublin, Poland †deceased	Alexander Rocholl
P12	UQAC-FeS: A new series of base metal sulfide quality control reference material for LA-ICP-MS analysis Dany Savard ¹ , B. Bouchard-Boivin ¹ , Sarah-Jane Barnes ¹ and Dieter Garbe-Schönberg ² ¹ LabMaTer, Université du Québec à Chicoutimi, 555 boul. Université, Chicoutimi, QC, Canada, G7H 2B1 ² CAU Kiel University, Institute of Geosciences, D-24118 Kiel, Germany	Dany Savard
P13	Determination of Uranium(U) and Thorium by inductively coupled plasma mass spectrometry in geological reference materials Hyung Seon Shin, Hana Cho, Chansoo Park and Min Yeong Park Korea Basic Science Institute, Ochang-eup, Cheongju-Si, 28119, South Korea	Hyung Seon Shin
P14	The Mud Tank zircon revisited: New ID-TIMS ages reveal complex crystallization history Jay M. Thompson ¹ , Leonid V. Danyushevsky ¹ , Sebastien Meffre ¹ and Fernando Corfu ² ¹ CODES, University of Tasmania ² Department of Geosciences and CEED, University of Oslo	Jay Thompson
P15	A simple method for preparing homogeneous and stable solid powder standards: applied to sulfide analysis by LA-ICP-MS Wenwu Yang ¹ , Zhaochu Hu ¹ , Yongsheng Liu ² , Wen Zhang ¹ and Tao Luo ¹ ¹ State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Wuhan 430074, PR China ² School of Earth Science, China University of Geosciences, Wuhan 430074, PR China	Wenwu Yang

#		Presenting Author
P16	<p>C, H and S content in 36 geological reference materials Oliver Alard, Lauren Gorojovsky, Michael Förster and Annanuer Halimulati <i>Department of Earth and Planetary Sciences, Macquarie University</i></p>	Olivier Alard
P17	<p>The stability over an 18-year period of consensus values as composition location estimators in results from the GeoPT proficiency testing programme Peter Webb¹, Phil J. Potts¹, Michael Thompson², Stephen Wilson³ and Charles J.B. Gowing⁴ ¹<i>Faculty of Science, Technology, Engineering and Mathematics, The Open University, Milton Keynes, MK7 6AA, UK</i> ²<i>School of Biological and Chemical Sciences, Birkbeck University of London, Malet Street, London, WC1E 7HX, UK</i> ³<i>U.S. Geological Survey, Box 25046, MS 964D, Denver Federal Centre, Denver, CO 80225, USA</i> ⁴<i>British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, NG12 5GG, UK</i></p>	Peter Webb
P18	<p>Certification of coal fly ash reference material Lkhagvasuren Batzorig, Urjin Oyuntungalag, D. Gantsetseg, Ts. Bolormaa and N. Bolormaa <i>Central Geological Laboratory, Ulaanbaatar, Mongolia</i></p>	Lkhagvasuren Batzorig
P19	<p>U-Pb doped synthetic reference material for <i>in-situ</i> hematite geochronology Liam Courtney-Davies¹, Marcus Richardson², Sarah E. Gilbert³, Cristiana L. Ciobanu¹, Max R. Verdugo-Ihl¹, Nigel J. Cook¹, Kathy Ehrig⁴ and Benjamin P. Wade³ ¹<i>School of Chemical Engineering, University of Adelaide, 5005 SA</i> ²<i>6 Ophir Street, Goodwood, 5034 SA</i> ³<i>Adelaide Microscopy, University of Adelaide, SA</i> ⁴<i>BHP Olympic Dam, Adelaide, 5000 SA</i></p>	Liam Courtney-Davies
P20	<p>Assessment of trace-element homogeneity in gem quality zircons from Mud Tank, NT Sarah E.M. Gain¹, Elena A. Belousova¹, Norman J. Pearson¹, Ivan Dainis² and William L. Griffin¹ ¹<i>CCFS/GEMOC, Macquarie University, North Ryde, NSW 2109</i> ²<i>Henley Beach, South Australia</i></p>	Sarah Gain
P21	<p>Determination of sulfate sulfur in Au-bearing ores by wavelength-dispersive X-ray fluorescence analysis Victor Chubarov and Alena Amosova <i>Vinogradov Institute of Geochemistry, Siberian Branch of the Russian Academy of Sciences, 664033, Irkutsk, Russia</i></p>	Alena Amosova
P22	<p>Determination of the elemental composition and manganese valence state in Co-bearing ferromanganese crusts by wavelength-dispersive X-ray fluorescence analysis Victor Chubarov and Alena Amosova <i>Vinogradov Institute of Geochemistry, Siberian Branch of the Russian Academy of Sciences, 664033, Irkutsk, Russia</i></p>	Alena Amosova
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P24	<p>Investigation of Lake Baikal bottom sediments by XRF and EPMA methods Olga Yu. Belozerova¹, Tatyana S. Aisueva¹ and Egor V. Ivanov¹ <i>Vinogradov Institute of Geochemistry, Siberian Branch of Russian Academy of Sciences, 664033 Irkutsk, Russia</i></p>	Olga Belozerova

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P25	<p>In-situ Sr isotopic measurement of scheelite using fs-LA-MC-ICPMS Chao Li^{1,2}, Limin Zhou¹ and Zheng Zhao¹ ¹National Research Center for Geoanalysis, Beijing 100037, China ²Institute of Mineral Resources, Chinese Academy of Geological Sciences, Beijing 100037, China</p>	Chao Li
P26	<p>Quantitative approaches to determination of elements in lake sediments by total reflection X-ray fluorescence Galina V. Pashkova^{1,2}, Maria M. Mukhamedova^{1,2} and Tatiana S. Aisueva³ ¹Institute of the Earth's Crust SB RAS, Irkutsk, Russian Federation ²Irkutsk State University, Irkutsk, Russian Federation ³Vinogradov Institute of Geochemistry SB RAS, Irkutsk, Russian Federation</p>	Galina Pashkova
P27	<p>Au speciation in humic acids and Fe(III) compounds after sorption from chloride solutions Bagai-ool Saryg-ool^{1,2}, Irina N. Myagkaya¹ and Elena V. Lazareva¹ ¹Sobolev Institute of Geology and Mineralogy SB RAS, Novosibirsk, Russia ²Novosibirsk State University, Novosibirsk, Russia</p>	Bagai-ool Saryg-ool
P28	<p>Thermochromatic method application for express local prospecting of gold mineralization productivity Alexander Tatarinov¹, G. Yalovik², Lubov Yalovik¹ and Vasiliy Tatarinov³ ¹Geological Institute, Siberian Branch of Russian Academy of Sciences, Ulan-Ude, Russia ²Territorial Fund of Geological Information, Siberian Federal District, Novosibirsk, Russia ³Vinogradov Institute of Geochemistry, Siberian Branch of the Russian Academy of Sciences, Irkutsk, Russia</p>	Vasiliy Tatarinov
P29	<p>Method for estimating the basic composition of fine-dispersed inclusions of native gold in a matrix of a sulfide mineral by electron microprobe Vasiliy Tatarinov and A. Finkelstein Vinogradov Institute of Geochemistry, Siberian Branch of the Russian Academy of Sciences, 664033, Irkutsk, Russia</p>	Vasiliy Tatarinov
P30	<p>Use of pXRD in the quantitative assessment of alteration in epithermal Au deposits Dane Burkett^{1,2}, Ian Graham² and Giverny Chomiszak² ¹Olympus Corporation of Asia-Pacific, Singapore ²University of New South Wales, Australia</p>	Dane Burkett
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P32	<p>U-Pb zircons dating by LA-SF-ICP-MS at Geological Institute GIN RAS (Moscow) Victor S. Sheshukov¹, Alexander B. Kuzmichev¹, Alexander S. Dubensky¹, Olga I. Okina¹, Kirill E. Degtyarev¹, Nadezhda A. Kanygina¹, Nikolay B. Kuznetsov¹, Tatiana V. Romanjuk² and Sergey M. Lyapunov¹ ¹Geological Institute, Russian Academy of Sciences (GIN RAS), 119017, Russia, Moscow, ²PE RAS, 123242, Russia, Moscow, B.Gruzinskaya 10</p>	Alexander Dubensky
P33	<p>Isotopic composition of lead in bivalve shells using LA-ICP-MS Igor Pessoa and Mauro C. Geraldés Universidade do Estado do Rio de Janeiro Rua, Maracana, Rio de Janeiro (RJ) - 20559-900</p>	Igor Pessoa

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P34	<p>In situ U-Th-Pb dating and Sr-Nd isotope analysis of bastnaesite by LA-(MC)-ICP-MS Yue-Heng Yang¹, Fu-Yuan Wu¹, Qiu-Li Li¹, Yamirka Rojas-Agramonte^{2,3}, Jin-Hui Yang¹, Yang Li¹, Qian Ma¹, Lie-Wen Xie¹, Chao Huang¹, Hong-Rui Fan¹, Zi-Fu Zhao⁴, Cheng Xu⁵, Yan Liu⁶ and Ki-Yi Wang¹ ¹<i>Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, 100029, P. R. China,</i> ²<i>Institut für Geowissenschaften, Johannes Gutenberg-Universität, 55099 Mainz, Germany</i> ³<i>Universidad de los Andes, M1-307, Bogotá, Colombia</i> ⁴<i>School of Earth and Space Science, University of Science and Technology of China, Hefei, 230026, P. R. China</i> ⁵<i>Laboratory of Orogenic Belts and Crustal Evolution School of Earth and Space Sciences, Peking University, Beijing, 1000871, P. R. China</i> ⁶<i>Institute of Geology, Chinese Academy of Geological Sciences, Beijing, 100037, P. R. China</i></p>	Yue-Heng Yang
P35	<p>High precision U-Pb dating of terrestrial and extraterrestrial materials at SPIDE2R lab, ANU S. Zink, Y. Amelin and V. Bennett <i>Research School of Earth Sciences, The Australian National University</i></p>	Sonja Zink
P36	<p>High-speed 3D imaging of geological materials using rapid-response laser ablation cell technology Cosmin Stremtan¹, Stijn M. van Malderen² and Gavril Săbău³ ¹<i>Teledyne CETAC Technologies, Omaha NE, USA</i> ²<i>Dept. of Chemistry, Ghent University, Ghent, Belgium</i> ³<i>Geological Institute of Romania, Bucharest, Romania</i></p>	Cosmin Stremtan
P37	<p>Provenance determination of cigars using 11/10B ratios by ICP-QMS with single pulse signal acquisition mode Wei Guo¹, Zhiwei Wu¹, Qin Shuai² and Shenhong Hu¹ ¹<i>State Key Laboratory of Biogeology and Environmental Geology, School of Earth Sciences, China University of Geosciences, Wuhan, 430074, P. R. China</i> ²<i>Faculty of materials science and chemistry, China University of Geosciences, Wuhan, 430074, P. R. China</i></p>	Wei Guo
P38	<p>Multiple sulfur isotopes with SHRIMP-SI Janaína N. Ávila, Trevor R. Ireland, Peter Holden, Peter Lanc and Andrew Latimore <i>Research School of Earth Sciences, The Australian National University</i></p>	Janaina Avila
P39	<p>“Soft” Ablation Cell for LA-ICP-MS investigations of large precious samples Haihong Chen, Yongsheng Liu, Ming Li, Zhaochu Hu and Wen Zhang <i>State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Wuhan 430074, China</i></p>	Haihong Chen
P40	<p>Development of CA-ID-TIMS zircon U-Pb dating technique at Institute of Geology and Geophysics, Chinese Academy of Sciences ZhuYin Chu¹, Junjie Xu^{1,2}, Wei Wang^{1,3}, Chaofeng Li¹, Mengjie Wang^{1,3} and Jinghui Guo¹ ¹<i>Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China</i> ²<i>School of Ocean Sciences, China University of Geosciences, Beijing 100083, China</i> ³<i>College of Earth Sciences, University of Chinese Academy of Sciences, Beijing 100049, China</i></p>	Zhu-Yin Chu
P41	<p>An evaluation of total uncertainty in WDXRF Geoanalysis Richard M. Conrey, Laureen C. Wagoner and David G. Bailey <i>Geosciences Dept., Hamilton College, 198 College Hill Rd Clinton, NY, USA 13323</i></p>	Rick Conrey
P42	<p>Use of a single background per analyte in WDXRF geoanalysis: Minimization of spectral interference Richard M. Conrey, Laureen C. Wagoner and David G. Bailey <i>Geosciences Dept., Hamilton College, 198 College Hill Rd, Clinton, NY, USA 13323</i></p>	Rick Conrey

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P43	<p>Determination of nitrogen in experimental and natural samples using EPMA and CHNS analyser</p> <p>Michael W. Förster¹, Stephan Buhre², Olivier Alard¹ and Stephen F. Foley¹</p> <p>¹ARC Centre of Excellence of Core to Crust Fluid Systems (CCFS), Department of Earth and Planetary Sciences, Macquarie University, NSW 2109, Sydney</p> <p>²Institute of Geosciences, Johannes Gutenberg University, 55099 Mainz, Germany</p>	Michael Förster
P44	<p>Removal of Hg interferences for common Pb correction when dating minerals by LA-QQQ-ICP-MS</p> <p>Sarah Gilbert¹ and Jack Gillespie²</p> <p>¹Adelaide Microscopy, University of Adelaide, South Australia</p> <p>²Centre for Tectonics, Resources, and Exploration (TRaX), Department of Earth Sciences, School of Physical Sciences, University of Adelaide, South Australia</p>	Sarah Gilbert
P45	<p>Is the handheld XRF device a useful field tool for volcanologists?</p> <p>Heather Handley¹ and Paul Harvey²</p> <p>¹Volcanic and Magmatic Research Group and MQ Centre for Energy and Environmental Contaminants, Department of Earth and Planetary Sciences, Macquarie University, Australia</p> <p>²MQ Centre for Energy and Environmental Contaminants, Department of Environmental Sciences, Macquarie University, Australia</p>	Heather Handley
P46	<p>A practical method for measuring high precision calcium isotope ratios without chemical purification for calcium carbonate samples by multiple collector inductively coupled plasma mass spectrometry</p> <p>Dong He, Zhenli Zhu and Lingyun Zhao</p> <p>State Key Laboratory of Biogeology and Environmental Geology, China University of Geosciences (Wuhan), Wuhan, 430074, China</p>	Dong He
P47	<p>The system of simultaneous double laser ablation for <i>in-situ</i> micro-analysis</p> <p>Chao Huang^{1,2}, Lie-Wen Xie^{1,2}, Yue-Heng Yang^{1,2} and Jin-Hui Yang^{1,2}</p> <p>¹State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China</p> <p>²Institutions of Earth Science, Chinese Academy of Sciences, Beijing 100029, China</p>	Chao Huang
P48	<p>UV-femtosecond laser ablation, fluorination and GC-IRMS analysis of four sulfur isotopes</p> <p>Alexander Ignatiev, Tatiana Velivetskaya and Victoria Ykovenko</p> <p>Far East Geological Institute FEB RAS, Vladivostok, Russia</p>	Alexander Ignatsiev
P49	<p><i>In situ</i> lithium isotope ratio in natural and synthetic glasses by LA-SF-ICP-MS</p> <p>Margareth Sugano Navarro, Gustavo Macedo de Paula Santos and Jacinta Enzweiler</p> <p>Institute of Geosciences, UNICAMP Campinas, SP, Brazil</p>	Margareth Navarro
P50	<p>New software for data reduction of LA-ICP-MS data sets</p> <p>C. Ashley Norris¹ and Leonid Danyushevsky²</p> <p>¹Norris Software, 650 Molesworth Rd, Molesworth, TAS, 7140, Australia</p> <p>²University of Tasmania, Churchill Avenue, Sandy Bay, Hobart, Tasmania, 7000, Australia</p>	Ashley Norris
P51	<p>Nanoscale Inhomogeneities in Nacre: New Analytical Challenges for the Atom Probe</p> <p>Laura M. Otter¹, Katja Eder², Oscar Branson³, Julie M Cairney² and Dorrit E. Jacob¹</p> <p>¹Department of Earth & Planetary Science, Macquarie University, Sydney, NSW 2109, Australia</p> <p>²Australian Centre for Microscopy and Microanalysis, The University of Sydney, Sydney, NSW 2006, Australia</p> <p>³Research School of Earth Sciences, Australian National University, Canberra, 2601 ACT, Australia</p>	Laura Otter

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P52	<p>A geoscience Atom Probe facility David W. Saxey¹, Steven M. Reddy^{1,2}, Denis Fougerouse^{1,2} and William D.A. Rickard¹ ¹<i>Geoscience Atom Probe, Advanced Resource Characterisation Facility, John de Laeter Centre, Curtin University, Perth, Australia</i> ²<i>School of Earth and Planetary Sciences, Curtin University, Perth, Australia</i></p>	David Saxey
P53	<p>Analytical capabilities of the Cameca 1280 SIMS instrument Michael Wiedenbeck, Alexander Rocholl and Frederic Couffignal <i>GFZ-Potsdam, Telegrafenberg, 14473 Potsdam, Germany</i></p>	Michael Wiedenbeck
P54	<p>Effect of signal acquisition mode on isotope ratio precision and accuracy in ICP-quadrupole-MS Zhiwei Wu, Wei Guo and Shenhong Hu <i>State Key Laboratory of Biogeology and Environmental Geology, School of Earth Sciences, China University of Geosciences, Wuhan, 430074, P. R. China</i></p>	Zhiwei Wu
P55	<p>A novel sample cell for reducing the "Position Effect" in Laser Ablation MC-ICP-MS isotopic measurement Lie-Wen Xie^{1,2}, Lei Xu^{1,2}, Qing-Zhu Yin³, Yue-Heng Yang^{1,2}, Chao Huang^{1,2} and Jin-Hui Yang^{1,2} ¹<i>State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, Chinese Academy of Sciences, P.O. Box 9825, Beijing 100029, P.R. China</i> ²<i>Institutions of Earth Science, Chinese Academy of Sciences, P. O. Box 9825, Beijing 100029, P. R.China</i> ³<i>Department of Earth and Planetary Sciences, University of California at Davis, Davis, CA 95616, USA</i></p>	Li-Wen Xie
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P57	<p>Achieving clumped isotope efficiency to characterize palaeoenvironmental variation: the next generation of equipment and automation Sean T. Murray and Martin J. Kennedy <i>Macquarie University, NSW Australia, 2109</i></p>	Sean Murray
P58	<p>LA-ICP-MS analysis routine for trace elements in olivine Marina Veter, Stephen F. Foley and Dorrit E. Jacob <i>CCFS/GEMOC, Department of Earth and Planetary Sciences, Macquarie University</i></p>	Marina Veter
P59	<p>The influence on PA factors by P/A correction under different signal response values of Agilent 7500Ce Fang Ma <i>Key Laboratory of Orogenic belts and Crustal Evolution, Ministry of Education, School of Earth and Space Sciences, Peking University, Beijing, 100871</i></p>	Fang Ma
P60	<p>Calibration systematics of the LA-ICP-MS at the Geological Survey of Brazil Lynthener Bianca Takenaka^{1,2}, Sandra Andrade² Letícia Muniz³ Joseneusa Brilhante Rodrigues¹ Carlos Eduardo Ganade de Araújo¹ and Maria Alice Ibañez Duarte¹ ¹<i>Geological Survey of Brazil-CPRM</i> ²<i>São Paulo University – USP</i> ³<i>Rio de Janeiro State University – UERJ</i></p>	Lynthener Oliveira
P61	<p>Laboratory study of multiple sulfur isotope fractionation during SO₂ photolysis Tatiana Velivetskaya, Alexander Ignatiev and Victoria Yakovenko <i>Far East Geological Institute FEB RAS, Russia</i></p>	Tatiana Velivetskaya

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P62	<p>Chlorine analysis with XRF to determine salinity of pore water in the Baltic Sea sediments</p> <p>Siim Pajusaar Toivo Kallaste and Tarmo Kiipli <i>Tallinn University of Technology, Department of Geology, 19086, Tallinn, Estonia</i></p>	Siim Pajusaar
P63	<p>Analysis of organic materials by LA-ICPMS using carbon as internal standard, an example grass study</p> <p>Charlotte M. Allen and Karine Harumi Moromizato <i>CARF Institute for Future Environments, Queensland University of Technology, Brisbane, QLD 4000</i></p>	Karine Harumi-Morimozato
P64	<p>Wavelength dispersive X-ray fluorescence determination of major oxides in bottom and peat sediments for the paleoclimatic studies</p> <p>Alena Amosova¹, Victor Chubarov² and Galina Pashkova³ ¹<i>Vinogradov Institute of Geochemistry, Siberian Branch of the Russian Academy of Sciences, 664033, Irkutsk, Russia,</i> ²<i>Vinogradov Institute of Geochemistry, Siberian Branch of the Russian Academy of Sciences, 664033, Irkutsk, Russia,</i> ³<i>Institute of the Earth Crust, Siberian Branch of the Russian Academy of Sciences, 664033, Irkutsk, Russia</i></p>	Alena Amosova
P65	<p>Struggle with inhomogeneously quenched melts</p> <p>Zsanett Pintér^{1,2,3}, Stephen F. Foley^{1,2}, Gregory M. Yaxley³ and Tracy Rushmer¹ ¹<i>Department of Earth and Planetary Sciences, Macquarie University</i> ²<i>ARC Centre of Excellence for Core to Crust Fluid Systems (CCFS)</i> ³<i>Research School of Earth Sciences, Australian National University</i></p>	Zsanett Pinter

Sunday 8 th July 2018	Monday 9 th July 2018	Tuesday 10 th July 2018	Wednesday 11 th July 2018	Thursday 12 th July 2018	Friday 13 th July 2018
11 Wally's Walk 210 (E5A) 9:00 Workshop Registration 10:00 Workshop I: Transportable methods 11:30 Morning Tea 13:00 Lunch 14:00 Workshop II: LA-ICPMS 15:30 <i>Rio Tinto Afternoon Tea</i> Conference Registration opens End Workshop 2 Registration closes	8:15 Registration Poster setup 9:00 Opening Reference materials 9:30 Wilson 10:00 Garbe-Schönberg 10:20 Belousov 10:40 Morning Tea 11:10 Alard 11:30 Wilson 11:50 Wudarska 12:10 Belozerova 12:30 Agilent Sugiyama 13:00 Agilent Lunch Mining and remediation 13:50 Renno 14:10 Chu 14:30 Ashelford 14:50 Group Photo 15:10 Afternoon Tea 15:30 Poster session Lab tour 17:00 Ice breaker 19:00 End Ice Breaker	Toase 9:00 Powell 9:50 Bastrakov 10:10 Pribil 10:30 Daniel 10:50 Morning Tea 11:20 Company presentation 12:30 BBQ Lunch Dating and imaging 14:00 Belousova 14:20 Lei 14:40 J. Thompson 15:00 Wiedenbeck 15:20 Afternoon Tea 15:45 IAG General Meeting - non members welcome 16:15 Poster session Lab tour 17:15 End IAG Meeting ThermoFisher Wine Tasting 19:30 End Wine Tasting	7:30 Field Trip 10:00 Lab tours and Demos	9:00 Award Ceremony 9:30 Woodhead 10:10 Allen 10:30 Redaa 10:50 Morning Tea 11:10 Farkas 11:30 G. Thompson Instrumentation & new developments 11:50 Saxey 12:10 Ireland 12:30 Lunch 13:50 Y. Liu 14:10 Wiedenbeck 14:30 Baensch 15:00 Afternoon Tea 15:20 Poster Session 16:30 Lab tour 19:30 Conference Dinner Cruise	9:00 Chen 9:30 Yang 9:50 Wang 10:10 Creech 10:30 Morning Tea 11:10 Lai 11:30 X. Liu 11:50 Zhang 12:10 Enzweiler 12:30 Lunch 13:30 Danyushevsky 13:50 Jochum 14:10 Renno - Geoanalysis2021 14:20 Closing remarks 14:30 Poster session 15:30 Closing Reception 17:30 End of Event
Mason Theatre, 12 Wally's Walk (E7B) Posters on Display Company Exhibition					
Post Conference Field Trip Sat 14 th -Mon 16 th July South Coast NSW					