

Newsletter of the International Association of GeoChemistry

Number 64, June 2016

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From the President

It is hard to believe that I've now been IAGC president for over 18 months and am well into the second half of term. mv Ι have thoroughly enjoyed the especially role. interacting with our membership via e-mail and especially at the various conferences that I have attended. One of



the challenges of being based in Australia is the distance from the major centres of research in Europe, North America, and increasingly East Asia, as well as the relatively small academic community. It does change your perspective local conferences are anywhere on the same (or adjacent) continent, even though it might involve several hours travel by air, and easy-to-get-to is anywhere that I can reach within 24 hours. I know that I share these problems with some of my fellow geochemists elsewhere, and for us academic societies such as IAGC provide a vital role in keeping us connected.

This year I am very much looking forward to the Water-Rock Interaction meeting in Evora, Portugal in October. I also would like to mention the International Symposium on Environmental Geochemistry in Galway, Ireland, in August



which is the latest meeting from the Environmental Geochemistry Working Group. One of the major features of IAGC is that the working groups organise these focused workshops and conferences. While I always enjoy attending the larger international conferences, I have always found the IAGC working group meetings scientifically stimulating and very enjoyable; I particularly appreciate the interaction and the opportunity for discussion that these meetings afford. For those of you who haven't attended one of the IAGC meetings. I encourage you to do so as they are well worth it. Keep an eve on the newsletters or check the Working Groups pages on the IAGC website for details.

Finally, I would like to encourage you to share any ideas that you have that would help IAGC continue to be of value to the geochemistry community. IAGC has several functions including awarding student grants and recognising prominent geochemists via its awards program. Thoughts and ideas as to how we might do better in these endeavours, other things that you would like to see us do, or anything else that you think would improve what we do would be welcome. Feel free to send comments and ideas to myself or any of the other committee members.

Best Wishes,

Ian Cartwright IAGC President

Association News

2017 Award Nominations

The IAGC will be accepting award nominations for 2017 **through December 31**.

The Kharaka Award - bestowed to up to two deserving scientists (which may include senior graduate students) from developing countries.

The award consists of a framed certificate plus an IAGC membership and *Applied Geochemistry* subscription for a term of three years. http://www.iagc-society.org/kharaka_award.html

The Harmon Distinguished Service Award - bestowed on a deserving candidate to recognize outstanding service by an IAGC member to the Association or to the geochemical community that greatly exceeds the normal expectations of voluntary service: http://www.iagc-society.org/distinguished_service.html

IAGC Fellow - bestowed to a scientist who has made significant contributions to the field of geochemistry:

http://www.iagc-society.org/iagc_fellows.html

Renew Your Membership for 2017!

Don't forget to renew your IAGC membership for 2017 by January so don't miss any vou issues of *Elements* magazine! Our annual membership fee is STILL only \$25 and includes a hard copy subscription to Elements as well as online access. Membership also rewards you with lower cost registration rates at IAGC-sponsored working group conferences. Online access to our journal, Applied Geochemistry, is also available.

Renew with a credit card

Renew with a check

Check your membership status



Certificate of Recognition - awarded to IAGC Members for outstanding scientific accomplishment in a particular area of geochemistry, for excellence in teaching or public service, or for meritorious service to the Association or the international geochemistry community:

http://www.iagc-society.org/certificate recognition.html

Hitchon Award –Awarded to authors of the most highly-cited paper in Applied Geochemistry 5 years earlier, according to SCOPUS. This award consists of a certificate to the author and all coauthors of the paper. The recipients also will receive a complementary 1-year membership to IAGC for the year following receipt of the award, if not already an IAGC member. The award recipients will be cited in the IAGC Newsletter and website. The abstract of any paper receiving the Hitchon Award may be reprinted in the IAGC Newsletter after the award is announced. http://www.iagc-society.org/hitchon.html

2016 Awards

We are pleased to announce our Society Awards for 2015. Congratulations to all the recipients, and thank you for your service to the IAGC and the geochemical community!

Harmon Distinguished Service Award



Brian Hitchon has had a very long standing affiliation with the IAGC and has served in many capacities through the years. Brian was born in St. John, New Brunswick, Canada in 1930 and was educated in England, receiving his Ph.D. from Manchester University in

1955. After two years as a geologist with the Northern Rhodesia Geological Survey he returned to Canada in 1957 and joined the Alberta Research Council in Edmonton, Alberta. He has held many positions there, including Research Fellow, Vice-President for Facilities, and Acting Director to (currently) emeritus. He retired in 1989 and started Hitchon Geochemical Services Ltd., branching out into publishing with Geoscience Publishing Ltd. In 1995. He was Secretary of the Association from 1984-1992, as well as Executive Editor of Applied Geochemistry (1986–1993). He has also been the longeststanding chair of the Water-rock Interaction Working Group, leading it 1974-1983, and hosted the 3rd WRI meeting in Edmonton, Albert, Canada in 1980. His service to the IAGC also includes the review of the early history of the Association in the first issue of Applied Geochemistry in 1986, as well as an introductory piece in the AG Special Issue that reflects on the 40th Anniversary of the IAGC in the June issue, 2009. For his long record of service to the IAGC and for his contributions to the geochemical community. Brian Hitchon receives the Harmon Distinguished Service Award for 2016.

IAGC Fellow

Sigurður R. Gíslason, IAGC Member and long-time GES Working Group leader, is a prominent Icelandic geochemist and Research



Professor in aqueous geochemistry at the University of Iceland. He studies the geochemistry of precipitation, surface water. ground water and geothermal water in Iceland. the

geochemistry of basalt weathering and basaltwater interaction and its importance in the Earth's long-term carbon cvcle. the environmental effects of volcanic eruptions, and carbon sequestration in basaltic rocks through



both field and laboratory experimental studies. With more than 170 peer-reviewed research publications, more than 5000 research paper citations, and an h-index of 40, Gíslason's major scientific contributions relate to (1) the measurement of the dissolution rates and dissolution mechanisms of volcanic glasses as a function of glass composition, aqueous solution composition and temperature; (2) quantifying the chemical/physical erosion rates of basaltic terrains and their contribution to the global cvcle: and (3)measuring carbon the environmental effects of volcanic eruptions. For these outstanding research contributions, Sigurður R. Gíslason is named IAGC Fellow for 2016.

Kharaka Award

Kingsley Odigie is from Nigeria, and is currently postа doctoral researcher at Geological the US Survey in Santa Cruz, California. He completed an undergraduate degree in microbiology and forensic science with a minor in chemistry at San Jose State



University while working at two jobs to support himself. He continued on to a PhD program at University of California Santa Cruz where he had a US Department of Energy Office of Science Graduate Fellowship. His dissertation, "Pyrogenic Remobilization of Toxic Metals," used isotopic lead composition to investigate sources of toxic metals from wildfires. His work focuses on lead and toxic metal mobility related to wildfires in southern California, central Africa, and South America, and illustrates an important application of geochemistry to the solution of the global problem of toxic metals in the environment, in tune with what Gunter Faure called "our obligation to humankind...to monitor the quality of the environment both locally and on a global scale." From this work he has a number of publications, including in *Environmental Science and Technology* and *Applied Geochemistry*. Kingsley is a young geochemist from a developing country with a great career ahead of him in trace metal cycles and climate change related issues. The IAGC is happy to bestow the Kharaka award to Kingsley Odigie for recognition of his past and present accomplishments, and we wish him well in all his future endeavors in geochemistry.

Hitchon Award

The Hitchon Award is given annually to a paper of significance published in the IAGC journal, *Applied Geochemistry*. **New in 2016**: We have revamped the criteria for the Hitchon award to be less subjective – The award will now be given to the *Applied Geochemistry* paper from 5 years ago (to allow for time to make an impact) that has the most citations according to SCOPUS. All authors will receive recognition here in the IAGC Newsletter and on the IAGC website, as well as a complimentary 1-year membership, and a framed certificate.

The first recipient of the **Hitchon Award** applying these new criteria is Kirk Nordstrom's **2011** paper "Hydrogeochemical processes governing the origin, transport and fate of major and trace elements from mine wastes and mineralized rock to surface waters" with 87 citations since its publication in 2011. *Full Citation:*

Nordstrom, D.K., 2011. Hydrogeochemical processes governing the origin, transport and fate of major and trace elements from mine wastes and mineralized rock to surface waters. Applied Geochemistry, 26, 1777-1791. cites = 87



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Additionally we would like to recognize three 2011 papers for **Honorable Mentions**:

- Zuo, R., 2011. Decomposing of mixed pattern of arsenic using fractal model in Gangdese belt, Tibet, China. Applied Geochemistry, 26, S271-S273. cites = 47
- Currell, M., Cartwright, I., Raveggi, M., Han, D., 2011. Controls on elevated fluoride and arsenic concentrations in groundwater from the Yuncheng Basin, China. Applied Geochemistry, 26, 540-552. **cites = 46**
- Zhu, G., Zhang, S., Huang, H., Liang, Y., Meng, S., Li, Y., 2011. Gas genetic type and origin of hydrogen sulfide in the Zhongba gas field of the western Sichuan Basin, China. Applied Geochemistry, 26, 1261-1273. cites = 43

Congratulations to all the 2016 Hitchon Award and Honorable Mention authors!

Elsevier PhD Student Research Grant Winners

The IAGC is happy to announce the recipients of the 2016 Student Research Grants, sponsored by Elsevier and the IAGC. Every year, we have many strong research proposals from students from around the world, and every year the awards become even more competitive. We set another record with 37 submissions this year. The success of these 4 grantees demonstrates the high caliber of their research. Congratulations to our grantees!

Andrea Rielli, Monash University,

Australia – "Sulfur cycling at subduction zones - Implications for the redox state of the deep Earth and arc metallogeny"

Andrea earned his BSc in Earth Sciences and MSc in Geoscience and Geotechnologies at the University of Pisa (Italy). He is currently conducting his PhD research at the School of Earth, Atmosphere and Environment, Monash University. His work is focused on understanding the role of subduction in the oxidation of the Earth's mantle, with particular attention on the cycling of redox-sensitive elements, such as sulfur, at subduction zones. Andrea is studying the metasomatic alteration



of ultra-high pressure peridotites from the Western Gneiss Region of Norway with the aid of synchrotron XANES spectroscopy, *in-situ* sulfurcarbon isotopes measurement, and LA-ICP-MS analyses. He believes that a better understanding of redox processes at subduction zones will help build more accurate models for the genesis of arcrelated ore deposits, the temporal evolution of the atmosphere, and constrain the chemical exchanges between surface and interior of our planet.

Tracey Crossingham, University of Queensland, Australia – "Hotspot

volcanism down under: A product of mantle plumes or the unique structure and motion of the Australian plate?"



Tracey graduated with a BSc Geological in Sciences from the University of Queensland in 2011, and began researching Cenozoic volcanism in Eastern Australia as an Honors student in 2012. Following graduation she continued to pursue keen interest in а

eastern Australian volcanism as a PhD student within the School of Earth Sciences at UQ. Her work largely focuses on understanding the depth of origin of two seismically shallow hotspot tracks



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of eastern Australia: the central volcanoes and Tasmantid Seamounts. Volcanic samples were collected through terrestrial fieldwork and participation in a research cruise aboard the Marine National Facility Research Vessel, RV Southern Surveyor. Tracey will use noble gas helium isotopes to identify the depth of origin of these two hotspot tracks. Helium isotopes will be complemented by ⁴⁰Ar/³⁹Ar geochronology, major and trace element geochemistry, and radiogenic isotopes to further evaluate the timing of magma emplacement, distinct mantle source components, and the interaction between the upwelling magma and the lithosphere.

Ana Martínez Fernández, University of California Santa Cruz – "Effects of ocean acidification on benthic foraminifera and corals"



Ana Martínez Fernández B.Sc. earned a in **Environmental Sciences** the Universidad from Autónoma de Madrid (Spain) in 2009. She spent a year at Umeå Universitet and at the Climate Impact Research Centre of Abisko (Sweden) where she

became involved in several research projects related to plankton, pollution and climate change. She is currently a Ph.D. student in the Department of Earth and Planetary science at the University of California, Santa Cruz. Ana is using a multidisciplinary approach to investigate the effects of ocean acidification on Caribbean corals and benthic foraminifera. She is using $\delta^{15}N$ and $\delta^{13}C$ as paleoceanographic proxies to study the impacts of nutrients input through submarine groundwater discharge on calcification of corals living in a natural, low-aragonite saturation environment. She is also studying coral gene expression to assess the potential for adaptation and acclimation to ocean acidification. **Ibiyemi Ogungbuyi, University of Cape Town, South Africa** – "The Geochemistry and Source Region of Carbonatites and Associated Alkaline Rocks in Zandkopsdift Namaqualand, South Africa and Southern Namibia."



Ibivemi obtained her BSc (Hons) in Geology from the University of Ilorin (Nigeria) in 2005 and her MSc in Geochemistry and Mineral Exploration at the University of Ibadan, (Nigeria) in 2010. Her research

focuses on Dicker Willem carbonatites and related silicate rocks. Her work focuses on unravelling the timing and sources of enrichment using Lu/Hf, Rb/Sr, Nd/Sm, and U/Pb radiogenic isotopes, and also determining rare earth minerals of economic importance by X-Ray Diffraction and Electron Microprobe Analysis. Her work will generate high quality ICP-MS trace element data that will further improve understanding on the petrogenesis of rocks in the study area.



Letter from Editor-in-Chief of Applied Geochemistry

In this spring edition of the IAGC newsletter. I would like to share with some important vou journal updates.

In mid of June, the 2015 Impact Factor release came out by Thomson



in-chief (Figure 1). A major new development is the editorial system for Elsevier called EVISE®, which will go live on July 7 replacing the outdated Elsevier Electronic Submission (EES) system for our journal. This will bring the second major change in manuscript processing in history, the first one having been the change from hard-copy submission to the electronic submission system (EES) now 15 years ago. The new system can now integrate seamlessly with Elsevier's other researcher-facing platforms, including Scopus, ScienceDirect, and Mendeley. This will add a lot new functionality, significantly improving efficiency and effectiveness for authors, reviewers and editors. For example, there's an annotation tool enabling

reviewers to annotate PDF or source files associated with manuscripts directly. This can save a huge amount of time. In EES, commenting on these manuscript files often required lengthy reports referencing line numbers, which often were even lacking. Another nice tool is that both editors and reviewers can now use a RAG tool (red, amber, green) to see clearly what tasks are most important.

This year, we have a number of reviews published on attractive themes like on arsenic geochemical characteristics in groundwater or on developing a scientific framework for urban geochemistry http://www.journals.elsevier.com/appliedgeochemistry/review-articles/.

The 35th International Geological Congress to be held end of August at Cape Town will host a Hydrogeology symposium on and Hydrochemistry of Arid and Semi-Arid Africa: A Tribute to W. M. Edmunds. Contributors of this symposium will be invited to join a special tribute issue on Mike Edmunds. A special issue already published this year is about "Environmental Impacts of Mining and Smelting" (http://www.journals.elsevier.com/appliedgeochemistry/special-issues), and another quite useful one is in the pipe about Statistical analysis of geochemical compositions: problems, perspectives and solutions. Clearly, they were quite a tremendous peace of work for our guest editors, and I am full of gratitude to see our journal well enriched with those attractive volumes.



Figure 1. Impact factor development of our journal Applied Geochemistry for the last 15 years.

All the best. Michael Kersten



Charitable Giving

Members can make a charitable gift to the IAGC, either for general fund support or for special initiatives during online membership renewal. You may donate at any time online, either during your membership renewal or separately. Please donate right now through the IAGC web site (www.iagc-society.org/donate.html)

IAGC is a 501(c)3 non-profit organization and donations to the Society are tax-deductible in the U.S. (EIN: 48-0943367).

The following members donated while renewing their membership dues for 2016. Thanks for your generosity and for supporting the IAGC and our mission!

Gwendolyn Macpherson

Bret Leslie

Russell Harmon

Janet herman

Robert Zielinski

Marilena Stimpfl

William Ullman

Patrice de Caritat

Iñaki Vadillo-Perez

Miriam Kastner

Radomir Petrovich

Cynthia Venn

Bernhard Mayer

Rona McGill

Richard Wanty

Suzanne Anderson

Teodora Szocs

Alan Shiller

Nakaya Harue Kristin Salzsauler Marie Pavish David Naftz



2016 Meetings

Water Rock Interaction 15 (WRI-15)

> 16-21 October, 2016 Évora, Portugal http://wri15portugal.org/

Essentials of water-rock interactions

- 1. Recent developments on groundwater reactive transport modeling in fractured and porous media
- 2. Future challenges on aqueous geochemistry and biogeochemistry: from nano- to basin-scale approaches
- 3. New trends on isotope hydrology, isotopologues and noble gases
- 4. New insights into thermodynamics and kinetics of water-rock interactions
- 5. Developments on water-gas-rock interactions
- 6. Advances and technological challenges in experimental design for laboratory and field investigations of water-rock interactions

Particular environments

- 1. Water-rock interaction in volcanic systems and natural hazards
- 2. High- and low-enthalpy geothermal systems
- 3. Organic geochemistry and pore water chemistry of sediments and sedimentary basins
- 4. The origins and special challenges of high salinity continental fluids
- 5. Emerging issues related with ore deposits and ore forming processes
- 6. Geochemical controls and influences on the genesis of conventional and unconventional oil and gas fields
- 7. Insights on the evolution of karst water systems and global climate changes

- 8. Improvements in water-rock interaction and ecohydrology of arid and semi-arid environments
- 9. Advances on water-rock interactions in tropical and subtropical settings
- 10. Developments on water-rock interaction studies ascribed to astrobiology

Case studies and applications

- 1. Developing issues on water-rock interaction ascribed to energy resources
- 2. Water-energy nexus: special challenges of shale gas and other low permeability reservoirs
- 3. Controls and impacts on groundwater quality and quantity
- 4. Challenges of water-rock interaction at high temperatures and pressures
- 5. Alternatives for deep geological repository of nuclear waste
- 6. Updating gas-water-rock interaction processes for CO2 geological sequestration
- 7. Water quality at active and abandoned mines
- 8. Transport, fate and tracers of contaminants in shallow and deep aquifers
- 9. Tracer isotopes for tracking processes and contamination: advances in stable and radiogenic isotope
- 10. Recent approaches on water-rock interaction and its impacts on human health
- 11. Water-rock interaction vs. stone decay and conservation ascribed to Cultural Heritage
- 12. Geomicrobiology in groundwater environments: microbe-mineral-water interactions

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35th International Geological Congress

27 August - 4 September, 2016 Cape Town, South Africa <u>http://www.35igc.org/</u>

Hydrogeology and Hydrochemistry of Arid and Semi-Arid Africa: A Tribute to W. M. Edmunds

Arid often environments are complex hydrogeological systems. Because of limited recharge and intense evapotranspiration, groundwater recharge rates are low and paleowaters in such regions commonly are derived from precipitation infiltration that occurred centuries or millennia in the past. Flow mechanisms and recharge rates can differ substantially as a consequence of bedrock geology and landscape. For example, infiltration occurs by piston flow on decadal to century time scales in the Sahara Desert region, whereas preferential flow paths control recharge in the old cratonic landscapes of southern Africa. Chemical and isotopic methods are tools that provide insight into the nature of recharge, its timing, and its origin. Throughout a distinguished career of nearly 50 years at the British Geological Survey, W. Mike Edmunds (1941-2015) pioneered methodologies and approaches to resolve recharge rates, quantify water-rock interaction, and elucidate climate history. By applying an array of inert chemical tracers (e.g. trace elements, chloride mass balance, and Br/Cl ratios) and various isotopic indicators (e.g. stable, cosmogenic, radiogenic, and noble gas) to study the vadose zone and examine down-gradient changes in groundwater composition, he was one of the first to demonstrate how tracer based approaches may be used to resolve recharge rates study water-rock and recharge history, interaction, and recognize the limits of renewable groundwater across the Sahara-Sahel region. This symposium invites contributions related to measuring, monitoring, and understanding groundwater, both as a water resource and as an archive of environmental and climate change in semi-arid, arid, and hyper-arid regions of both northern and southern Africa.

Joint ISEH, ISEG, and Geoinformatics 2016

14 - 20 August, 2016 Galway, Ireland http://www.nuigalway.ie/iseh2016/

The **ISEH** (International Symposium on Environment and Health) conference series provides an internationally leading platform for interaction between scientists, consultants, and public servants engaged in the multi-disciplinary areas of environment and health. With fast economic development, the importance of environment and health is widely recognized in the world, and there is a growing demand for international experts from all over the world to work together on this topic of common interest. This conference provides an opportunity for a direct communication between international experts, and helps to foster and develop international collaborations. The 1st ISEH conference SESEH of (Sino-European Symposium on Environment and Health) 2012 was held at National University of Ireland, Galway, and the 2nd conference was upgraded to ISEH 2014 which was held in at Peking University in Beijing. ISEH 2016 is the 3rd conference in this series, which comes back to NUI Galway in order to build a stronger network for international experts working in this area.

The **ISEG** (International Symposium on Environmental Geochemistry) conference series started in the late 1980s. The initial local



symposium on environmental geochemistry was held in Finland. After that, the first truly international ISEG symposium was held in Uppsala, Sweden in 1991. From the beginning a core group of three geochemical scientists provided leadership to these symposia: Prof. Iain Thornton, Ron Fuge and Olle Selinus. It was decided that the ISEG symposia would be held every 3 years resulting in meetings on almost every continent since 1991. *Beginning in 2013, the IAGC became the official society sponsor of this very popular series.*

The **Geoinformatics** conference series was initiated by the International Association of Chinese Professionals in Geographic Information Sciences (CPGIS) in 1992. This international conference series has provided a unique forum for exchanging novel ideas and cutting-edge knowledge on geographic information sciences and technologies among GIS professionals worldwide. The 24th International Conference on Geoinformatics (Geoinformatics 2016) will be held at National University of Ireland, Galway (NUI Galway), Ireland, together with ISEH and ISEG, as a joint international conference. The Geoinformatics 2016 conference is organized by CPGIS and NUI Galway.

ISEH / ISEG Themes cover a wide range of issues in environment, health, GIS and Agriculture:

- Development in environmental chemistry, geochemistry, biogeochemistry
- Pollution: Air, water, and soil
- Pollutants: metals and metalloids; persistent organic pollutants and pesticides
- Technologies: new analytical technologies, soil remediation; waste water treatment; air pollution control
- Management and monitoring: social impact assessment, economics and policies

- Medical geology, endemic diseases, environmental health and public health
- Links between environment and health, environment and genetic interaction
- GIS and quantitative methods in environment and population health
- Sustainable development and health: agriculture, industry, traffic, urbanization
- Climate change and population health
- Agriculture: Food quality, Precision agriculture, nutrient management, agricultural soil quality, in-field variation

2017 Meetings

Applied Isotope Geochemistry 12 (AIG-12)

Mark your calendars! AIG-12 will be held at Copper Mountain Resort in Colorado, USA, 17-22 September, 2017. Keep an eye on our website at <u>www.IAGC-Society.org</u> for updates!



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