



# International Association of GeoChemistry

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## INTRODUCING THE NEW IAGC COUNCIL MEMBERS

We are happy to announce six new council members for terms beginning in January 2020. The voting council for the International Association of GeoChemistry (IAGC) consists of six regular members and the four chairs of our active working groups. We are grateful for the service of our outgoing regular council members **Patrice de Caritat** (Geoscience Australia), **Stephen Grasby** (Geological Survey of Canada), **Sophie Opfergelt** (Université Catholique de Louvain, France), and **Avner Vengosh** (Duke University, USA). Finally, we give a sincere thanks to our departing working group chairs of **Richard Wanty** (US Geological Survey), who chaired the Applied Isotope Geochemistry Group and **Thomas Kretzschmar** (CICESE, Mexico), who chaired the Water-Rock Interaction Group. Everyone in the IAGC is grateful for your services to the geochemical community.

### Working Group Chairs



**Romain Millot** holds a PhD in isotope geochemistry, awarded 2002, from the Institut de Physique du Globe de Paris (University of Paris, France) and is currently a researcher at the Bureau de recherches géologiques et minières (BRGM), French Geological Survey in Orléans (France). He is a senior project manager in the field of multi-isotope tracing in the environment. He has published more than 60 papers in peer-reviewed journals (14 as lead author) concerning river weathering mass budgets, thermo-mineral and geothermal water characterization, metal pollution source investigation, mineral resources characterization, and the development of analytical tools in isotope geochemistry. Since joining the BRGM in 2003, he has worked on the development and utilization of isotopic tracers in water-rock interactions. He is also involved in projects at the national scale (ANR, ADEME, ANDRA, Water Agency

funding) and at the European level (FP6/7 projects: AquaTERRA, Hiti, AquaTRAIN; EIT RawMaterials project: EuGeLi). In 2013, Romain obtained his habilitated doctoral degree from the University of Orléans. Romain is the new IAGC Chair of the Applied Isotope Geochemistry Working Group.



**Pierpaolo Zuddas** is a professor of geochemistry at Sorbonne University (France). Italian by upbringing and education, he lived and worked in Italy, Canada and France. His career in geochemistry took him from a position with the Marine Salt Agency (Italian Ministry of Finance) to the Non-Nuclear Energy Division of the European Union and then to academic university positions in Italy, Canada and France. He applies thermodynamics, kinetics and surface chemistry to study mineral-solution interactions in aquatic environments and carbonate geochemistry. He has used expertise in the field of water-rock interaction to develop theoretical, experimental and field studies on fluid migration and reactivity in several natural and artificial conditions. He taught at the universities of Cagliari and Palermo (both Italy), McGill (Canada), Lyon (France), where he also served as Chair of the Institute of Environmental Engineering Eco-development. He supervised 18 PhD dissertations of students from different backgrounds and origins. Pierpaolo coordinated, managed or co-managed international programmes on water quality in mining basins, urban and rural areas and media-hosting CO<sub>2</sub> geological sequestration. He also served for agencies and energy companies as a technical expert in supranational and national scientific grants to assess risk in water resources. He served as Secretary General for the Fourteenth International Symposium on Water-Rock Interaction. Pierpaolo is the new IAGC Chair of the Water-Rock Interaction Working Group.

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of pure and theoretical science, but is primarily an applied science that adds value to mineral exploration, environmental stewardship, whole Earth ecology, the timing and causes of evolution, paleoclimate and even food authentication. This short course introduced to the greater geoscience community the utility of using isotopes to understand the processes that govern mass transport in the geosphere. This short course volume is dedicated to both radiogenic and stable isotope applications for the geosciences.

The concept of this book was envisioned by Professor Kurt Kyser (1951–2017), formerly of Queen's University (Ontario, Canada). The volume begins with the application of isotopes to the exploration of volcanic massive sulfide deposits. The next three chapters focus on the application of radiogenic isotopes to mineral and fluid systems, and Chapter 5 introduces current approaches to data assessment, primarily for detrital zircon samples, and introduces some new approaches which aid in the simultaneous treatment of large sets of data. Chapter 6 applies noble gas isotopes to geothermal systems, and in Chapter 7 heavy metal isotopes are used to trace anthropogenic contaminants in the environment. The final chapter is about the application of clumped isotopes and their utility in obtaining information about paleo-environments. This volume does have some glaring omissions, however: there are no discussions on transition-metal isotopes or on the application of isotopes to understanding clay minerals and the hydrosphere. It is our hope that other researchers will be inspired by this work and that, as techniques continue to evolve, a complementary volume will be organized in the future.



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## Regular Council Members



**Sergey V. Alexeev** is currently Head of the Hydrogeology and Engineering Geology Department in the Institute of the Earth's Crust (Irkutsk, Russia). He graduated from the Lomonosov Moscow State University (Russia) in 1981 and received his PhD in 1987. His thesis was entitled "Cryogenesis of Ground Waters and Hard Rocks of the Daldyn-Alakit Region (Western Yakutia)". He then earned his Doctor of Science degree with the thesis "Cryohydrogeological Systems of the Yakutian Diamond-bearing Province". From 2013 to present, he has been the Chairman of the Dissertation Council with specializations in hydrogeology, engineering geology, geocryology and ground engineering. He is currently investigating the origin of chloride brines in the sedimentary basins of the Siberian platform and developing a theoretical model for high-salinity groundwater. He uses multiple isotopic tracers to study the evolutionary processes in water-rock systems and found evidence that chloride brines form as a result of the transformation of connate water under closed conditions and slow water exchange. Additionally, isotopic tracers can be used to assess the enclosing rocks' role in the formation of the chemical and isotope composition of the brine.



**Dirk KIRSTE** is an associate professor of aqueous geochemistry at the Simon Fraser University in Vancouver (Canada). Dirk graduated with a BSc (Honours) from the University of British Columbia (Canada), an MSc from the University of Waterloo (Canada) and PhD from the University of Calgary (Canada). After graduating, he worked as a post-doctoral researcher with Geoscience Australia and the Australian National University. Dirk's research is primarily directed towards understanding the processes that control the composition of groundwater and surface water. His research involves both laboratory and field-based work investigating the chemical and isotopic composition of water, minerals and gases. Using variations in the chemistry, he addresses problems in the environment, problems in characterizing and predicting the effects of anthropogenic forcings, and problems in resource exploration and evaluation. He applies a broad range of techniques, including developing field-based sampling and monitoring strategies; applies different analytical methods; designs laboratory-based experimental procedures; and, develops and applies computer simulations.



**Huaming Guo** is a professor of hydrogeology at the China University of Geosciences (Beijing, China). He has had visiting placements at the Karlsruhe Institute of Technology (Germany), US Geological Survey in Denver (USA), and Columbia University (USA). Professor Guo was Chair of the Sino-German workshop in Beijing entitled Geogenic Arsenic in the Environment and was Co-Chair of the 7th International Conference on Arsenic in the Environment "Environmental Arsenic in a Changing World" (or "As 2018") in Beijing. Currently, he is the co-Editor-in-Chief of the *Journal of Hydrology*, and Associate Editor of *Applied Geochemistry*. His three primary research interests are (1) Sources, fate and transport of inorganic pollutants (e.g., arsenic, fluoride, uranium, and chromium) in aquifer systems; (2) Characteristics and mechanisms of arsenic and fluoride adsorption on natural geomaterials; (3) Biogeochemical behaviours of contaminants during mineral-water-microbe-organics interactions.



**François Chabaux** is a professor at the University of Strasbourg (France). He was awarded a PhD from University Paris 7 (France) in 1993. He was appointed to assistant professor at the University of Strasbourg in 1994, full professor in 1998 and Professor CE in 2012. From 2013 to 2017 he was Director of the Laboratoire d'Hydrologie et de Géo chimie de Strasbourg. He is an associate editor of *Applied Geochemistry* and of *Comptes Rendus Geoscience*. François has been involved in the development and application of the methodology of U-series nuclides to constrain the timescales of weathering and erosion processes in the critical zone. With his colleagues in Strasbourg, he has investigated the nature of the water-rock interactions that control the chemical composition of waters in watersheds and in aquifers by applying geochemical tracers and, more recently, coupled hydrogeochemical models. An important part of his work was carried out on the Strengbach watershed (Vosges mountains, France), contributing to making this watershed one of the current reference sites of the French critical zone observatory network (OZCAR). François also gave the 2019 IAGC Ingerson Lecture at the 1<sup>st</sup> IAGC International Conference in Tomsk (Russia).



**Elisa Sacchi** graduated in Earth sciences in 1990 and obtained her PhD in geochemistry in 1995. She has been a researcher (since 2002) and an associate professor (since 2015) at the University of Pavia (Italy) and is currently in charge of teaching geochemistry and environmental geochemistry. She has been awarded numerous fellowships and contracts (Government of Canada Award, University of Torino, Université de Paris XI, Australian Nuclear Science and Technology Organisation) and has worked as a consultant for Italian and international institutions (INFN, ANDRA, OCDE Nuclear Energy Agency, ANSTO) in the fields of radioactive waste disposal and radiochemical contamination monitoring. Occasionally, she works as an "expert" with the International Atomic Energy Agency. Her main interests are in water, sediment and soil pollution, water-rock interaction and environmental applications of isotope geochemistry. Elisa has authored 50 papers in peer-reviewed journals, written two books, two book chapters and more than 70 contributions to national and international conferences. She is an associate editor for *Applied Geochemistry*.



**Elisabeth (Liz) Widom** is a professor and isotope geochemist at Miami University (Oxford, Ohio). Liz received a BA from Cornell University (New York, USA) (1984) and a PhD from the University of California Santa Cruz (USA) (1991). She completed a postdoctoral fellowship at the Carnegie Institution of Washington's Department of Terrestrial Magnetism (Washington, DC, USA), followed by a National Research Council Postdoctoral Fellowship at the National Institute of Standards and Technology, prior to starting a faculty position at Miami University (1997). Since then, Liz has been honored to be a Pemberton Fellow at Durham University (UK) (2005) and a Fulbright Scholar at the Universidad Nacional Autónoma de México (2012). She has served as Department Chair at Miami since 2014, and has held the Janet & Elliott Baines Professorship since 2015. Liz's research involves the application of trace elements and isotopes (radiogenic and stable) to address a range of geologic problems. Current research foci include investigations of processes and timescales operating in active magmatic systems; the composition and evolution of the Earth's mantle, with ongoing projects on ocean islands, subduction zones, and intra-plate continental settings; and the application of radiogenic isotope systems to environmental contaminant tracing and nuclear forensics.