# European Association of Geochemistry

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## WELCOME TO OUR NEW COUNCILLORS!

We are happy to report that 37% of EAG members voted at the council elections during the fall (autumn) of 2015, an excellent indicator of the vitality of the geochemical community. We thank all the EAG members who participated, and we are particularly grateful to all the candidates who agreed to stand. A warm EAG welcome is extended to Kirsten Küsel, Helen Williams, and Donald E. Canfield, all of whom will join the EAG council in January 2016. We are thrilled to have these three outstanding and dynamic scientists come on board because the growth of our society is only possible through the active participation and accomplishment of our council and committee members.

**Kirsten Küsel** is Professor of Aquatic Geomicrobiology at the Institute of Ecology of the Friedrich Schiller University in Jena (Germany). She studied geoecology at the University of Bayreuth (Germany), obtained her PhD in 1995 in microbiology at the Bayreuth Institute for Terrestrial Ecosystem Science, and was appointed Associate Professor of Limnology there in 2004. Since 2011, she has been a co-director of the German Centre for Integrative Biodiversity Research (iDiv) at Halle-Jena-Leipzig. Due to her interdisciplinary background, the research of her group encompasses studies of microbe–mineral interactions, subsurface microbiology, and element cycling in aquatic environments. She has always been interested in finding out the physical or chemical properties that dictate, or at least affect, the life of microbes which in turn will reveal what geochemical environmental changes microbes are responsible for.

**Helen Williams** is a Reader at the Department of Earth Sciences, Durham University (UK). She obtained her undergraduate degree from the University of Cambridge (UK), her PhD from the Open University (UK), and completed postdoctorates at ETH Zurich (Switzerland) and Macquarie University (Australia). In 2008, she was awarded a Natural Environment Research Council (NERC) Fellowship at the University of Oxford (UK) and, finally, she moved to Durham University in 2011. Helen researches how nontraditional stable isotopes can be used to understand the formation and evolution of planetary interiors: in 2012, she was awarded a European Research Council (ERC) Starting Grant to support this research. She is also using nontraditional stable isotopes as part of collaborative projects that explore weathering processes and biogeochemical cycling, and she is keen to further expand the applications of nontraditional stable isotope systems even more widely.

**Donald Eugene Canfield** is Professor of Ecology at the University of Southern Denmark and Director of the Nordic Center for Earth Evolution (NordCEE; also at the University of Southern Denmark). He received his PhD in geochemistry from Yale University (USA), under the supervision of Robert A. Berner. Don uses the study of modern microbes and microbial ecosystems to understand the evolution of Earth surface chemistry and biology through time. Don is a member of the US National Academy of Sciences. He has authored *Oxygen, a Four Billion Year History* (2014, Princeton University Press), coauthored *Aquatic Geomicrobiology* (2005, Elsevier), coedited *Fundamentals of Geobiology* (2012, Wiley-Blackwell), and edited the newly translated *Bass Becking's Geobiology* (1934 Dutch original; 2015 translated edition, Wiley-Blackwell). Don is an editor for the journals *Proceedings of the National Academy of Sciences of the United States of America*, *Geobiology*, and the *American Journal of Science*. He has served the ERC as an Advanced Grant panel member.

## FIVE QUESTIONS TO AL HOFMANN

Albrecht "Al" Hofmann is Emeritus Director of the Geochemistry Division of the Max Planck Institute for Chemistry in Mainz (Germany). Currently, he is also Adjunct Professor and Visiting Senior Research Scientist at the Lamont-Doherty Earth Observatory in Columbia University (USA), Adjunct Professor at the University of Nanjing (China), and Guest Professor at the China University of Geosciences in Wuhan (China). Al's research focuses on the isotope and trace element geochemistry of Earth's mantle. Al is also a former president of the EAG and the 2015 Urey Award Medallist.

### WHAT OR WHO INSPIRED YOU TO BECOME A GEOCHEMIST?

The "inspiration" to become a geochemist came from a rather coincidental turn of events. When I got to grad school at Brown [Brown University, USA], I had planned to become a structural geologist, but Bill Chapple, the structural geologist at Brown, had just gone back to Caltech [California Institute of Technology, USA] to redo and/or extend his PhD thesis because his original work had just been scooped by Biot. Bill was too busy at the time to answer my inquiry from Brown, so I took a geochemistry course from Bruno Giletti and decided that geochemistry could also be interesting. Bill and I became good friends, but it was too late for structural geology.

### WHICH CAREER CHOICES WERE THE MOST IMPORTANT?

I didn't really make career choices. Industry didn't offer me any jobs, but I did have offers of attractive postdocs, so I went that route. One smart thing I did was to take my American wife to Germany for a year-and-a-half after my PhD so she would get an idea what that country was like. That proved to have been a wise choice, when the Max Planck directorship was dropped into my lap ten years later.

### WHAT HAS BEEN YOUR GREATEST OBSTACLE?

I encountered very few obstacles personally. My only lasting regret is that my initiative (soon after the unification of Germany) to start a new Max Planck Institute to study deep-Earth geophysics and geochemistry was shot down.

### WHAT INSPIRES OR MOTIVATES YOU?

The luxury of curiosity.

### WHAT DO YOU THINK ARE THE MAIN CHALLENGES FOR GEOCHEMISTRY IN THE FUTURE?

One major challenge in geochemistry is, and will continue to be, the ability to actually analyze most or all of the atoms extracted from a very small sample in modern micro-analytical methods. We are still throwing most of the ions away. Another major challenge is in the application of "big data" approaches to recognize and solve geoscience problems. Our current geochemical databases are just a beginning.

## ... AND A HUGE THANKS TO OUR OUTGOING COUNCILLORS

We also are deeply grateful to Dan Frost, Britta Planer-Friedrich, Nathalie Vigier, and Maria Schönbächler, who left the council at the end of 2015. Dan Frost served the council for an exceptional six years and was on committees that included the recent Goldschmidt2015 Organising Committee; he has also been instrumental in developing the EAG more generally. Britta and Nathalie served on the Training & Outreach Committee and brought new initiatives and member benefits, such as the successful Student Sponsorship Program and Ambassador

Program. Maria served on the Communications Committee and has now taken it upon herself to coordinate the cartoon series that you see on this page. All these scientists have been fully committed to their council role, and their time and energy is deeply appreciated.

## EAG PHOTO CONTEST 2015: THE STORY BEHIND THE WINNING PHOTOS

In 2015, for the second time, EAG organized a geochemistry photo contest and we are excited to announce our two winners: Ingrid Smet for the theme "Earth, Fire, Air, Water", and Anton Bischoff for the theme "What is geochemistry for you?". They have won a 5-year membership and publication of their photos on the EAG website and as the banner of the EAG newsletters, as well as on this page.

Here is the story behind the winning photos.

### *Winning Photo of the Theme "Earth, Fire, Air, Water": The Beauty of Disequilibrium*

I took this particular picture during my August 2015 visit of Mount Papandayan, one of the many active arc volcanoes on the Indonesian island of Java. The historical eruptions were all phreatic explosions and the volcano´s magmatic activity resumed in November 2002. The present-day complex stratovolcano has four large summit craters which contain active fumarole fields. When the volcano´s early warning status allows visiting the area, it is a popular destination for those keen to explore hydrothermal phenomena such as bubbling mud pools, fumarole vents, sulphur deposits and small streams of mainly bluish water with milky white deposits zigzagging their way around. I was particularly intrigued by the zoned pattern that formed at the convergence of differently coloured hydrothermal streams.

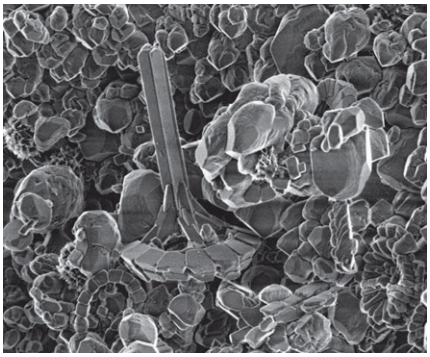
The beauty of disequilibrium. Photo by Ingrid Smet

As I wanted to learn more about the geochemical story behind the phenomenon, I sent this photograph to Dr Richard Henley (Australian National University), an experienced researcher of hydrothermal systems. He kindly informed me that the differently coloured water layers represent fast hydrothermal erosion with geochemical separation of elements. Upon contact with air saturated groundwater, the volcanic sulphur oxidises and forms a sulphuric acid with pH less than 1. This acid solution reacts with the surrounding hydrothermal breccias resulting in the formation kaolinitic clays and the dissolution of the rock´s other chemical components. The released FeO quickly becomes pyrite (black in the image) which in turn oxidises to FeO(OH) (orange in image) and sulfate. More soluble elements such as Na, K, Ca, Mg and Al dissolve and are flushed away by the stream, but where the acid water wets the rocks above the water level and evaporates, these elements are precipitated into alums and other salts (white in image). Silica initially also dissolves into the acid water but is precipitated upon changes in water temperature and pH (grey in image). The different processes separate the rock´s components and flush dissolved rock away – geology happening fast.

So the beauty is in how simple chemistry separates the elements one from another, with nothing being in equilibrium so that these processes self-organise into the colourful pattern of the image.

**Ingrid Smet**

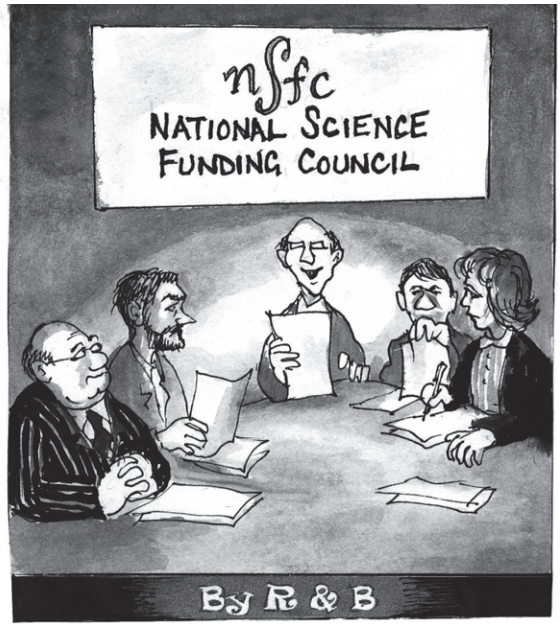
### *Winning Photo of the Theme "What is Geochemistry for You?": The Tower of Chalk*



The Tower of Chalk. Photo by Anton Bischoff

This image was taken with a scanning electron microscope at the University of Copenhagen in 2015. It was actually collected during my training on the instrument, along with an expert professor and a fellow student. We were looking at a piece of chalk from a chalk pit in Aalborg, Denmark. This chalk is Maastrichtian, making it a little more than 65 million years old. Chalk is usually made up of remnants of coccoliths. Coccoliths are tiny calcite shields made by microscopic unicellular marine algae. The image shows a single shield (about 5 micrometers in diameter), but they are usually formed along with several others to envelope the algae in what is called a coccolithosphere. What is interesting about this specimen is its large "spine" formation, almost resembling the Eiffel Tower. Usually coccoliths are simple flat discs, so we found this one to be really cool and collected what turned out to be a really nice image of it. I chose to submit the image to "what is geochemistry to you" because this was one of those things that really exemplifies how much beauty and awe you can find in what is basically a grain of dust.

**Anton Bischoff**




May I begin with the happy news that we have achieved a 100% rejection rate on this round.