Grand challenges: How the EGU is leading the way on global scientific issues

For nearly half a century the European Geosciences Union (EGU) (formerly the European Geophysical Society) has committed itself to the pursuit of excellence in the Earth, planetary and space sciences. In its current reincarnation it reaches over 12,500 members through 17 open access journals, meetings, education and outreach activities. In this interview, *Research Features* speaks to its president, **Jonathan Bamber**, about his vision for one of the leading organisations in the world that combines geology with all other geosciences and its key position in the wider scientific community.

Jonathan Bamber is the President of the European Geosciences Union (EGU) and leads the organisation in its dynamic role engaging new visionaries in the geosciences, be they in the laboratory already or still in the school classroom. With its huge scientific scope from volcanology to space exploration, the EGU attracts over 14,000 scientists to its annual General Assembly and little wonder; at its heart is a message about accessibility and collaboration.

Research Features spoke to Jonathan about how the EGU provides a service for new and seasoned scientists alike, taking on our generation's biggest scientific puzzle, climate change, and the advent of 'Big Data' in the geosciences.

Hello Jonathan! How would you define your role as the President of the European Geosciences Union (EGU)?
I see the position as one, primarily, of leadership, to provide a vision and sense of direction for the Union: Where are we going? Where do we want to be in the future? How do we want to progress the science? And what we can do to benefit our members.

What are the EGU's core principles in terms of history, heritage, and background and which areas of the geosciences is the organisation currently focusing on?
The EGU used to be called the European Geophysical Society (EGS), and that had been in existence since the 1970s. In 2002, we were successful in merging two organisations with complimentary and largely non-overlapping remits, the EGS and the European Union of Geosciences (EUG). We have combined geology with almost all other aspects of geoscience into a single society, and we are the largest organisation in the world that has that scope and breadth.

In terms of the areas we cover, we currently have 22 divisions in the EGU, including for example atmospheric science, biogeoscience, energy resources in the environment, earth and space science informatics, non-linear processes and planetary and solar system science to give the reader an idea of the breadth of the union.

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Regarding our core principles, we are a bottom-up organisation run by our members for our members and working to communicate and deliver excellence in geosciences for the benefit of humanity, worldwide; we do that in a very open and transparent way. We are a non-profit organisation; all income we generate is fed back into services for our members and the geoscience community.

How influential has the EGU been on geosciences since it was established? Are there any personal achievements that you are particularly proud of?
I am particularly proud of the EGU's level of engagement with what we call Early Career Scientists (ECS). In the last two years, more than half of our meeting attendees have been what we define as ECS. If the ECS are not fully engaged and involved in the organisation and the science, then the discipline has no future. It is important that we make sure that they are a fully integrated part of the Union.

The other area that I think we have really pioneered in our field is open access publishing. All 17 of our core journals have been open access from their start. Now open access publishing is relatively accepted and even the big commercial publishers are acknowledging that it is the future of scientific publishing. The research we do is generally funded by taxpayer's money (sometimes by industry), so I think it is a public duty that we make our findings available to the public. It also allows colleagues in a developing country to have access to the journal contents; institutes in those countries often cannot afford the subscription fees that most commercial publishers charge.

The EGU offers a fantastic awards and medals programme. What are the benefits of this for aspiring scientists and researchers?
These are to recognise the outstanding scientists in our field. We want to honour those that have contributed in an extraordinary way to their discipline. We also have a Union Service Award, which is to recognise people who have provided

exceptional service to the Union, but the majority of our awards are for scientific excellence. I think it is always very gratifying to be recognised for the achievements that you have had in your field and I think it benefits the recipient because it provides a very visible recognition of the quality of their science and significance of their contribution.

The EGU offers a regular news service. How important is this for spreading the message about the EGU's work and news related to the Earth, planetary, and space sciences?
We see this as absolutely fundamental. It is something that we are constantly developing and we are trying to find more effective ways to get our message out. We have some 12,800 Facebook followers and 26,000 Twitter followers. I do think Twitter is a great way to reach a big audience, and importantly for us an audience that goes far beyond our core community of fellow scientists. There are a lot of general public, policy makers and other people not working directly in geosciences out there who are following the latest science that we are involved with. We think the geosciences are an important discipline not just for those of us already interested in it, but for the health of the planet and the people on it.

Jonathan Bamber, President of the EGU.

Education appears to be very high on the agenda for the EGU, with initiatives that include Geosciences Information for Teachers (GIFT) workshops, Planet Press and Teacher's Corner. Could you elaborate more on these and why, apart from the obvious reasons of improving access to education, they are so vital?
For the health of our discipline we need to ensure that educators and those being educated, students of all ages, are engaged with the work that we are doing; that they understand that the geosciences are important for all sorts of reasons. If we do not have bright young kids wanting to become geoscientists then the discipline is not going to prosper. We also feel that as academics and researchers we are in a privileged position. We are excited about the work that we are doing and we feel we have a duty and commitment to the wider community to demonstrate that excitement to others.

You mentioned earlier that the geoscience research is mainly publicly funded and also occasionally funded by industry. Do you think geoscience research receives as much funding and attention as it should?

Anthropogenic climate change is the biggest challenge that the human race has faced … and the solutions are going to come from the geoscience community

The answer to this is 'sort of'. If you ask any researcher, "are you getting enough funding?", they will probably say, "we could always do with more".

At the last EGU meeting one of the speakers was Sir David King, the former Chief Scientific Advisor to the United Kingdom government. He famously said, "climate change is the most severe problem that we are facing today—more serious even than the threat of terrorism" (http://science.sciencemag.org/content/303/5655/176). I also believe that anthropogenic climate change is the biggest challenge that the human race has faced since civilisation began but also that some of the solutions, and most of the evidence, is going to come from the geoscience community. I also feel that we do have the capability to solve this so-called 'wicked problem', and that with more commitment from governments internationally to fund research, we would be able to develop solutions and adaptation strategies in a timely manner. Right now, it's not looking too promising.

On another note, the EGU has several collaborations with other societies across the world. Why are these collaborations so important to the progression of science overall?
We have what are called 'memorandums of understanding' with other associations, and we are organising a joint symposium in 2018 on natural hazards with the Asia Oceania Geosciences Society. Our motivation for seeking out these partnerships is that we are dealing with global challenges. No one university, person or nation has all the solutions, technology, and expertise to tackle some of these grand challenges. International collaboration is fundamental to our ability to tackle these grand challenges.

Where do you see geoscience research going over the next ten years or so? Are there any areas you are excited about or think will be the main focus of researchers?
One area I do see developing which I think affects many aspects of geoscience, is what is called 'Big Data' science. In many fields of geoscience, we are going from relatively data poor positions decades ago, to one where we now have access to very large volumes of data. Much of this is satellite data that has been collected 24/7, 365 days a year, but also from new sensor technologies and even citizen science data sources. Because of our ability to access data wherever they are, all kinds of new and exciting opportunities for what is called 'Data Mining' have opened up.

• *To learn more about the EGU, become a member or follow their ongoing work, please visit their website at www.EGU.eu.*

Contact

Jonathan Bamber
School of Geographical Sciences
University Bristol
Bristol
BS8 1SS
UK

E: president@egu.eu
W: www.egu.eu

European Geosciences Union