

THE EUROPEAN FEDERATION OF GEOLOGISTS: SHAPING THE FUTURE OF GEOSCIENCE THROUGH OUTREACH AND EDUCATION

The European Federation of Geologists (EFG) is a non-governmental organisation representing over 50,000 geoscience professionals from 25 countries. Founded in 1981, EFG was established with the aim to work towards the safer and more sustainable use of the natural environment, promote the responsible exploitation of natural resources and protect the public from natural hazards. One of the ways the organisation achieves these goals is through their outreach and education efforts. In this exclusive interview, we have had the pleasure of speaking to EFG's president, Vitor Correia, who discusses the organisation's activities in increasing public awareness, and facilitating training and education in geoscience.

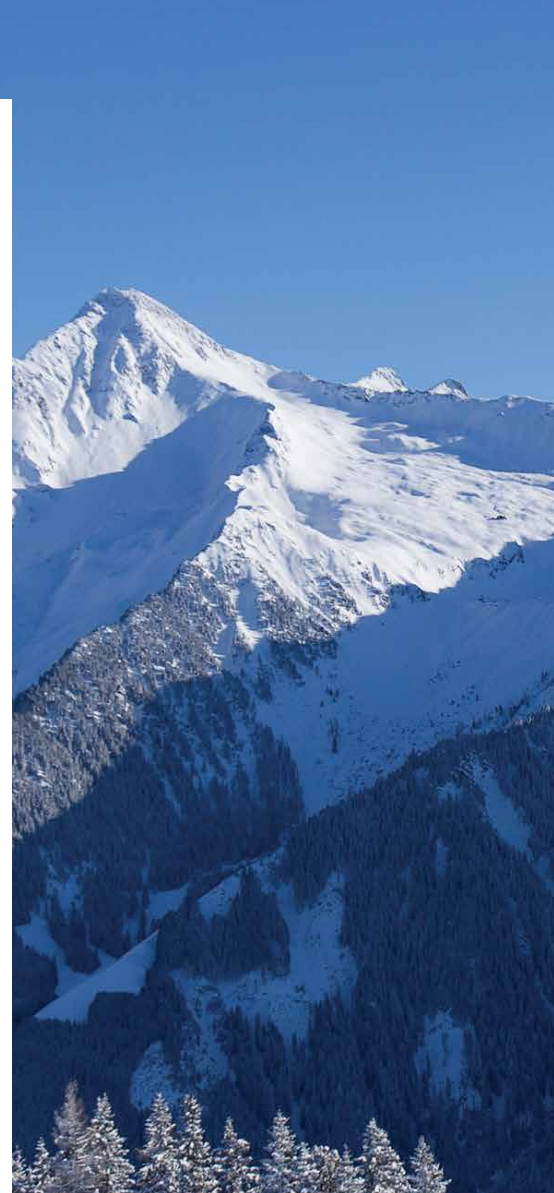
Please start by describing EFG's position on the importance of education and outreach in geological science.

I'd like to address this topic at two different levels.

The first is the importance of basic geological knowledge. Geology and the climate are the forces that shape the landscape and define where the resources we need for survival are. In this century, with climate change and a rising global population, the list of challenges that geoscience is needed to tackle is longer, and includes the capacity to counter soil erosion and maintain soil fertility, and ensuring the availability of water (both in terms of quantity and quality) for drinking and watering crops. This list also involves the exploration and exploitation of raw materials, the contribution to finding and using clean energy sources and the capacity to increase resilience against natural hazards (namely floods, landslides and droughts). Geoscience education at the elementary and secondary school levels should provide concepts that help young people (future citizens and policy makers) to understand natural systems, their constraints and the behaviours that we all need to adopt to live and survive in a planet under stress. However, as a recent survey from EFG's Panel of Experts on Education pointed out, geoscience education varies a

lot in Europe (in terms of teaching time and subjects addressed).

The second level is about professional practice and competence. Geoscience encompasses a wide spectrum of different areas, including scales ranging from atoms to stars and time periods ranging from milliseconds to hundreds of millions of years. Because of this, it's virtually impossible to have a specialist whose expertise covers the many different topics where geological knowledge and societal needs meet. This is why EFG recognises competent geologists in 14 different areas (e.g. CO₂ storage, minerals, geothermal energy), thus ensuring that these professionals have the necessary academic qualifications, combined with adequate professional experience and a superior track record. To keep up-to-date, competent geologists (holders of the professional title EurGeol) are required to present their annual Continuing Professional Development records to EFG. In this framework, Continuing Professional Development ensures the systematic maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for the execution of professional and technical duties throughout a practitioner's working life. This is why I linked education and outreach to professional practice and competence. In my opinion, training and



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education are essential to address the pace of technological change in the geosciences, as well as the danger of skills' obsolescence.

Tell us a bit about EFG's EuroWorkshops programme, and how it will help to create a community of well-trained geologists that collaborate across national boundaries.

This is a fairly new programme. As I said, EFG requires annual records of Continuing Professional Development from its registered professionals. However, we realised that some professionals have limited training options, either because the offer is scarce in some specialities and countries, or because the costs of education and training courses are prohibitive. The EuroWorkshop programme was created to tackle this challenge. On top of that, because of our panEuropean coverage (the EFG includes members from 26 countries, from the Atlantic to the Urals), we realised that we had excellent conditions to offer the practical

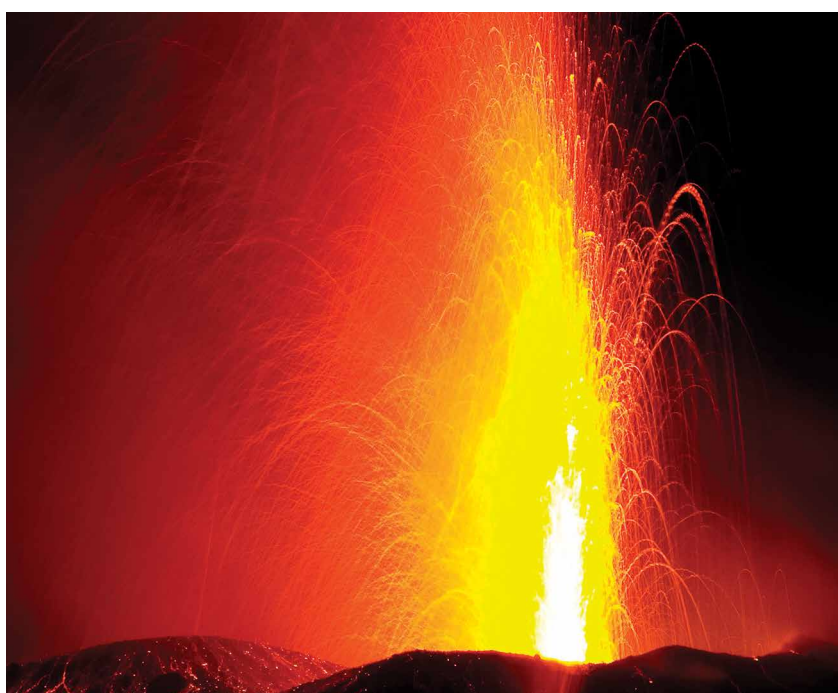
component of training in locations with clear linkages to specific geoscience topics. For instance, we can offer field training on porphyry copper deposits (common in South America and Asia, but less common in Europe) in Serbia or Bulgaria. If the subject is earthquake protection, we can learn from the Italian experience. If it is tunnelling and engineering geology, Switzerland has outstanding options. If it is mine rehabilitation, Germany and Portugal have best practice examples.

As you mentioned, we also decided that this programme should promote the exchange of experiences from different contexts and generations. For this reason, we reserve 50% of the seats to attendants from outside the hosting country and we provide financial support to young professionals and students participating in the EuroWorkshops, fostering collaboration across European geosciences professionals.

We just tested the concept in the organisation of our first EuroWorkshop in

May. It was held in Greece and the topic was geothermal energy. We followed a two-day training model (an indoor workshop on the first day, followed by a full-day field trip on the second), and the results, measured in terms of the number of participants and their satisfaction, were above our expectations. We have already received suggestions for 11 EuroWorkshops, to be held all over Europe, with the support of EFG's National Associations, and the challenge we face now is to increase the periodicity of the EuroWorkshops. At the start, we believed that organising one or two EuroWorkshops per year would be enough to cover training needs of Geoscience professionals, but the inputs received demonstrated we need more.

The creation of the EuroWorkshops was definitely a good idea that will be expanded soon.



What is EFG's training course endorsement programme? How does it benefit the teaching and training of future geologists?

This is another mechanism we use to support training and dissemination of knowledge to professional geologists. The EFG endorsement works like a quality seal, which we offer to courses organised by EFG's National Associations. To apply for the endorsement, the National Association provides the course plan to EFG, along with the CVs of the trainers and generic information on the course structure, schedule and duration. This is analysed by a Council, and if the course meets our quality requirements, the endorsement is made, and EFG disseminates the training program to its audience of nearly 50,000 geologists in Europe. The advantage we get in return

is transferred to the EurGeols, who benefit from reduced fees in training courses that are endorsed by EFG.

This initiative and its development was led by the Coordinator of our Panel of Experts on Education (EFG has 10 Panels of Experts, who provide high quality advice and information to society and policy makers). The Panel of Experts on Education has been active in developing a qualification framework for geology based on learning outcomes, thereby increasing the transparency of Earth Sciences qualifications and ultimately facilitating academic and professional mobility across Europe. Considering this background, one can say that EFG's endorsement programme is a modest contribution towards the recognition of qualifications and enhanced professional mobility in Europe.

Perhaps the biggest challenge of our time is the threat of anthropogenic climate change. Does EFG encourage young people to pursue careers in helping to mitigate the effects of climate change, in areas such as geothermal energy or geoengineering?

I agree that climate change is probably the biggest challenge mankind is facing. To deal with it we will need integrated solutions, using inputs from different sciences. This is happening already in some areas, such as in the design of nature-based solutions to counter floods. In this case, inputs from physics, biology and geosciences, combined with insight from social sciences and engineering are being used to prevent loss of human life, damage to property and destruction of infrastructure as a consequence of floods.

However, I have the impression that the majority of universities are not prepared to change the way geoscience is being taught. We still see the classical separation between science fields and disciplines, with little integration between them. And note that this is happening at the dawn of artificial intelligence, which will use algorithms and huge amounts of data. In my opinion, and I recognise this might be polemic, if the geosciences want to offer positive and relevant contributions to help us cope with climate change, we should start teaching geoscience students more coding, statistics and data mining, and facilitating horizontal integration with other sciences (including social sciences) fields.

We normally don't address young people or students directly. However, many of our members work and teach at universities, and I know they are aware of this predicament.

I'd like to thank you for this opportunity to explain why we believe that geoscience education is critical to help the new generations dealing with future major challenges, and why EFG is keen in promoting the competence of geoscience practitioners.

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