Subito! E-Newsletter #2: May 2017

Introduction

Welcome to the 2nd SUBITOP E-Newsletter! The first edition was published shortly after the workshop and short course in Greece, and, as in any dynamic group like ours, there are plenty of events which happened since, and we are very much looking forward to share them with you! In this E-Newsletter, we will mainly focus on the short course which took place in Edinburgh, April 3rd-9th and on EGU conference , April 23rd-28th. We are also happy to report a discussion we had with one of the partner school teachers, Ulrike Fallet, from Christelijk Lyceum Zeist, in the province of Utrecht. She explained us her vision about education and gave us some insight on the benefits of having such a link between research programs and pupils.

1 Highlights

In addition to successful abstract submission, posters and talk presentations for some ESRs (**E**arly **S**tage **R**esearchers) which will be discussed in detail later, advances have also been made on the school and industry partnerships. Most of the ESRs have now visited their partnerschools and have interacted with the pupils thanks to presentations and exercises. We were delighted about positive feedback from both the pupils and the ESRs. An example of there interactions is briefly exposed in the interview section. Concerning industry partnerships, most of the ESRs have now met their partners and discussed possible collaborative projects.

2 Edinburgh short course

From the 3rd to the 9th of April, 14 out of 15 ESRs as well as some PhD and Master students from Grenoble, Rennes and Warsaw met in Edinburgh for 5 days of numerical modelling classes in Python and 2 days of field excursion in the Cairngorms. The focus of the numerical modelling part was first to introduce all of us to modelling using Python (lead by Simon Mudd), and then to use this programming language to model 2D heat diffusion and advection in the mantle (lead by Jeroen van Hunen). The final part brought us back to the Earth's surface. We were introduced to landscape evolution models and how to model surface processes, as well as their coupling to with tectonic/deep processes Mikael Attal and Garcia-Castellanos). On Friday ESRs doing modelling in their projects presented the code(s) they are using as well as the analogue experiments they

Figure 1: Simon Mudd showing features left by glacial erosion, a corrie is visible in the background.

perform. A discussion about the advantages and disadvantages of each technique followed. To complete the "modelling" aspect, we got confronted with some real landscapes. To assess the importance of surface processes, in particular glaciation cycles, on landscapes evolution, we spent two days in the Cairngorms. The Cairngorms is a national park located in Northern Scotland. It is a particularly interesting area to study erosion processes related to glacial landscapes. Simon Mudd and Mikael Attal showed us how to recognize geological features related to glaciation and deglaciation in a landscape. For instance, we could observe Pot holes, which are large rocks previously stuck in ice blocks and are then released when the ice melts. We also had the opportunity to approach corries (cirques), which are formed when snow accumulates without melting over the years, to turn into ice which erodes the bedrock. The deepening of the hollow where the snow accumulates and the steepening of the walls around the icy area gradually leads to the corrie formation. This shape becomes visible when the glaciation period stops and the snow and ice melt.

3 European Geosciences Union (EGU)

From 23rd to 28th, 8 out of 15 ESR, several PIs and one school teacher attended the European Geoscience Union (EGU) general assembly, in Vienna. This conference involves a large number of scientists from Master and PhD students to Professors, as well as people who do not belong to academia such as journalists or teachers. People origin from Europe and universities all over the world, using a lot of different approaches to pursue their research (e.g. geophysics, geology, geochemistry etc). EGU is organized in several sessions, covering a large range of questions addressed by research in geosciences (basically, from atmospheric sciences, to deep earth studies and everything in between, without forgetting extra terrestrial topics). During these five days in Autria's capital, we could attend talks, Pico presentations (short interactive talks) from various speakers on their work, follow short courses and lectures but also discuss with a lot of researchers during breaks, dinners and poster sessions. This conference was an amazing opportunity to meet the rest of the geosciences community, to discuss ideas, present our work. We also got new perspectives for our projects and could think about some collaborations or simply get in touch with researchers interested in our work. Kristof (ESR 6), Nicholas (ESR 8), Boris (ESR 14) and Jessica (ESR 4) successfully submitted an abstract in January, which resulted in a poster presentation for Boris ("*Topographic analysis across the active to post-orogenic decaying Carpathian mountain range*"), Kristof ("*Preliminary results constraining the kinematics of subduction and exhumation processes on Skopelos island, Northern Sporades (Aegean Domain)*") , and Nicholas (" *Magmatism in geodynamical models of continental collision zones*") and in a talk for Jessica ("*3D Numerical modelling of topography development associated with curved subduction zones*") . We all got interesting feedback on our work and are very motivated with new ideas to go further in our research. Furthermore, some of us are actively thinking about organising a SUBITOP session for EGU 2018.

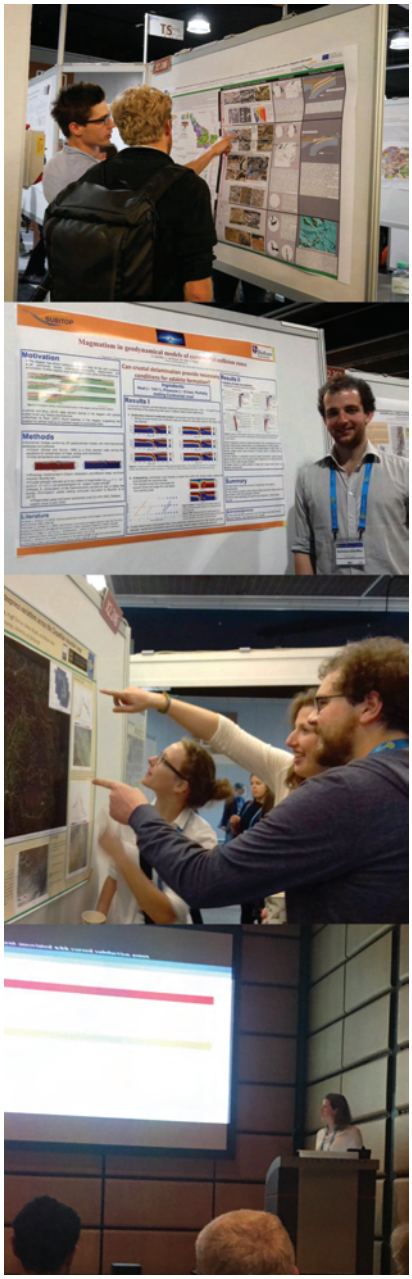

Figure 2: ESRs presenting their work.

4 Interview: Ulrike Fallet

Strolling in the poster session of EGU, you quickly end up saturated with colour scattered diagrams, maps of unfamiliar places, and figures drowned in endless titles and references. That is until you hit a bright blue poster depicting a sinking ship with migrants spilling over board. No isotopes there, no gravity waves, no rocks. Definitely not the ordinary scientific poster. Probably because its author is nothing like an ordinary scientist. Ulrike Fallet dropped out of academia in 2010, after a PhD in the NIOZ (Netherlands Institute for Sea Research), leaving paleothermometry behind to take a job as a high School teacher. *"I quit science because I could not combine the insecurity of being a scientist with having a family"* she explains, pointing out the *"short-term contracts, long working hours and moving around the world for building up a decent resume"*

Figure 3: Ulrike Fallet, Geography teacher at the "Christelijk Lyceum Zeist" highschool in Utrecht

You would think she is now falling in line of her new job, pouring her brand-new knowledge onto a group of apathetic teenagers. But Ulrike is not your average standing-in-front-of-a-class-and explaining-things teacher.

"I don't think this is how it works in the modern age" she claims passionately *" Now we have so much information, what students need to learn is how to sort and evaluate data, really think about it, evaluate it, and come up with good arguments to support their own opinion.(. . .) This is the same thing you are doing at university, at a higher level. You cannot start early enough to teach students how to think scientifically."*

Suggesting the "Mystery Method" as part of constructive learning, she pushes for project-based education, instead of ready-to-go solutions. Give the students a challenging question to work on, and eventually help them along with hints into the right direction. Maybe the key to make experience stick to their minds? *"One thing I really like to do is showing pictures from Mars and from Earth, for example the V-shaped valleys and the U-shaped valleys. And I let them find the pictures that belong to each other, inferring the meaning of each feature. Eventually, they come up with the idea that the only possibility to form the v shaped valleys is water. So there must have been water on mars."*

No wonder she jumped on the golden opportunity to join the Subitop network as soon as she got an email asking for teacher's applications. *"I wrote a really enormous letter about how great I am, and my school and my students, and why we are perfectly suited to do this job. . . "* she recounts eagerly.

Things really start blooming on 18th January. Antoine (ESR 2) shows up in class with a bunch of rocks and a map from "The Lord of the Rings", bringing the 32 students to recognize the Hobbit Shire as an alluvial plain, and the basaltic stones as coming from Mordor. Turns out that scientific thinking can make up for geological knowledge when it comes to concrete problems.

For Ulrike, teaching is all about communication. A skill way too often neglected when spreading science. Referring to the GIFT (Geoscience information for teachers) sessions at EGU, she seems pretty dismayed by some of the lectures. *"I'm listening to professors who are doing outreach for millions of years, and some of my students can present data better than them! When scientists communicate with the outside world, they very often forget about the audience, how much they know and don't know."* She also points out the importance of adapting to cultural differences. As a German expat in Utrecht, Ulrike has a first-hand experience of the additional challenge of international communication. *"You get a feeling of how difficult it can sometimes be to talk to French people, to Italian people, because it's not only the language but also the culture that comes with it."*

One of the aims of the Subitop outreach classes is to expose high-schoolers to foreign PhDs. A first step to get in touch with the international dimension of research world. As Ulrike likes to say :

"With everybody wanting to close the borders, I say: let's open them!"

5 Upcoming events

- **SUBITOP Third Short Course:** "Analogue Modelling", 3-7 July 2017 in Utrecht, the Netherlands.
- **SUBITOP Second Workshop:** 10-11 July 2017 in Utrecht, the Netherlands.
- **Nethermod 2017:** XV International Workshop on Numerical Modelling of Mantle and Lithosphere Dynamics, 27-31 August 2017 in Putten, the Netherlands. (Abstract submission deadline: August, 1st, 2017). http://nethermod.sites.uu.nl/
- **AGU abstract submission:** August, 2nd, 2017 (deadline)
- **SUBITOP Mid-term meeting:** Early May 2018, in Roma, Italy.

Newsletter by Malwina San-José, Antoine Auzemery, Jessica Munch, in collaboration with other ESRs.