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# Subito! E-Newsletter #7: April 2019

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## 1 Introduction

Welcome to the SUBITO! 7<sup>th</sup> edition! We ESRs are fortunate enough to have industrial secondments during our contracts. Similar to internships, these are short periods hosted by an industrial partner to give us a taste of science professions outside of Academia. We have a variety of industrial partners specialising in material science, environment technology, high tech instruments, software development, the energy sector, and geoscience consulting. This issue focuses on Subitop industrial secondments, and brings you a short account of our EGU 2019 participation.

## 2 Decluttering digital image correlation data



Nico Schliffke, our ESR at Durham university, did his industrial project with LaVision developing optical imaging techniques to measure flow fields and deformation, or “digital image correlation” (DIC). This measures strain on given surfaces by comparing successive images on an object. DIC allows precise measurement of physical processes and has many uses in both industry and academia. The technique records images continuously, which produces large amounts of data. Yet, the deformation studied only occurs over short periods, which means there is a lot of unnecessary data recorded. Nico was involved in trying to reduce data clutter by linking when the data is recorded to a measurable characteristic in the experiment. He and the team developed a software which linked recording rates to specific displacement values between two points. They tested the feature successfully with a team at GFZ who set up an experiment to detect earthquakes in subduction zones. Nico finished his industrial project by reporting bugs and fixes in the software they developed.

This sort of software development and testing is quite different from Nico’s usual research, even if the experiment with GFZ brought it back to subduction zones. He was surprised to find he could contribute a lot to the project and that much of his Geodynamics background transferred over. For example, his experience in coding and in rock deformation applied directly to the project. He also found that handling his large PhD project helped him in more subtle ways, as he was already in the mindset of considering future development.

## 3 Hot rocks and tectonics



Manar Alsaif and Kristof Porkalob did a joint industrial secondment with Jan-Diederik van Wees at TNO Utrecht. Their secondment gave them a glimpse into applied research for geothermal energy. Their PhD projects are both centred on the Aegean region, so it made sense for them to do a joint industrial project on the geothermal potential of the Aegean.

Their main focus was on incorporating the tectonic history of the region into a geothermal model to see if it predicts today’s heat flow better than a static model. Essentially: does a complex tectonic history affect today’s geothermal potential? A previous study had already shown that the complex

distribution of rock types in the Aegean has a strong influence on the geothermal potential (Larede MSc thesis 2018). So, Manar and Kristof were tasked with incorporating slab migration and crustal stretching into the model using TNO's in house thermal modeller.

As they work on different aspects and regions of the Aegean, they found their backgrounds complimentary when setting up model input data. They quickly established a good team rapport between them and with their colleagues at TNO. Manar felt that this was the main difference compared to academia. She explains: "As the project was not commercial, the type of work was not that different from my usual research. But the pace was faster and we had the dedicated help of Jon Limberger, who has the technical expertise we lacked. So we had a close knit team each with a clear role."

During their 4-week secondment, they prepared the input data and started running models. Over the next couple of months, they will analyse their results and see what they find.

All in all, they found the project interesting as an application of their tectonic research - a matter which is not always obvious. It showed them that fundamental research does not have to be so far from applied commercial work.

#### 4 Academia...industry...academia...industry



We tend to use the collective term 'industry' for a huge range of organisations, and we often talk about academia vs. industry, ignoring the amount of variety in each. Even within the same sector, there are large differences from company to company, as we gathered from our two ESRs Malwina San-Jose and Joost van den Broek who both did their industrial secondments in the petroleum sector.

Malwina did her secondment at Midland Valley, a consultancy company which primarily develops geoscience software. As this company was recently acquired by a larger firm, Malwina noticed a big difference in work culture depending on company size. She highlights that "different people may be drawn to a larger corporate structure, while others might thrive in a small company or even a start-up."

Joost did his secondment with Lundin, a Scandinavian oil company and found it similar to working at university. He found Lundin to be quite science focused, and the project became more of a collaboration between Lundin and the university. Joost found Lundin most willing to share their data with academia. Malwina, on the other hand, came out of her secondment with the impression that industry was more focused on owning rather than sharing, as she found value was determined by commercial price. Surprisingly, Malwina found that what industry and academia most have in common is mutual disdain. This is quite different from Joost's experience of his scientifically oriented industrial partner and his equally willing to collaborate university.

Malwina's main impression is that the approach to science differs from industry to academia; she explains that "in industry, you're given problems and (are) looking for solutions, whereas in academia (research), you're looking for new problems. This leads to another huge difference in the time-scale of the workflows: industry is focused on short term, efficient, ready-to-go-solution producing, while it is not uncommon to think of our academic work in terms of years-long projects, or even with the hope of decades away potential progress." She also finds a differing work life balance between the two, as academia tends to become imposed as a lifestyle, not just a profession. A couple of other ESRs have reported the same impression, that it is easier to distinguish personal from professional life in industry. Joost's experience, however, suggests that there is also a cultural element to this, as he reports that a good work-life balance is perfectly attainable in his Norwegian university.

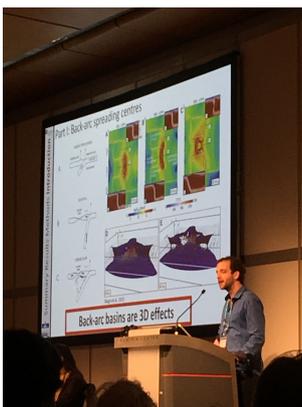
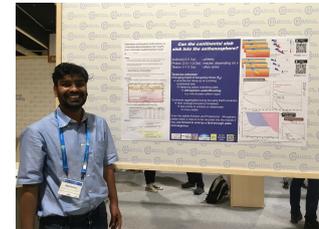
Apart from these cultural differences, our ESRs have reported that there is a lot of science that can be done between science and industry. Joost's secondment with Lundin is heading towards a collaborative publication, while Malwina's secondment exposed her to efficient tools that can facilitate her PhD structural analyses. A few of our other ESRs have also reported that their industrial secondments gave them a higher awareness of the myriad tools available, and they encourage other researchers to tap into industry resources to facilitate some of their work.

All in all, the impressions we got from our ESRs point out that it is more relevant to compare individual employers rather than group generalisations, such as 'industry vs. academia'. Especially as this comparison leaves out all other science related careers such as private research, governmental

work, science policy and management, and others. Many of our ESRs recommend trying both sides, even if you are set on a particular career path, a short secondment or internship can give you a lot of perspective, which is invaluable in itself.

## 5 Subitop at EGU 2019

This year's general assembly of the European Geosciences Union (EGU) in Vienna was a great success, both in general and for SUBITOP in particular. We thank EGU's organising committee as well as all the conveners for organising a wonderful conference. As the largest geoscience conference in Europe, EGU is one of the best opportunities to get thorough feedback. It makes all of us aware of the importance of adopting a complex Earth system approach with interdisciplinary research and strong collaboration. It is now clear that ultra-sophisticated high-resolution 3D models and geological observation are subject to large uncertainties. Now more than ever, our attempts at understanding subduction initiation and dynamics have the need of structural, petrological, geochemical, and plate kinematic constraints. Not to mention that geodynamic and geomorphic processes need to be even more connected. SUBITOP falls nicely into this framework and we were pleased to participate in EGU under this banner.



Eight SUBITOP ESRs attended the EGU general assembly this year, giving 11 presentations between them. This year was characterised by the ESRs deepening their research, as we saw from the various scientific ideas presented. The majority of the ESRs are working towards the ends of their projects and welcome any chance for discussion to improve their research. Of course, we acknowledge the indispensable help and guidance from all the supervisors and advisors involved in our work. At EGU 2019, we also saw an increasing number of measures aimed to reduce the conference's carbon footprint and to promote diversity and equality within EGU. In our minds, both aspects set an example for future conferences. We are pleased to see changing mentalities regarding diversity and equality and the environment. At the same time, it became clear to many of us that the gap between research communities has never been so small and so great in the same time. Even at the scale of Europe, a monopoly on research

by relatively rich countries exists and more needs to be done to enable eastern European researchers to promote their research in effective ways. We note a particularly revealing presentation on this by Liviu Matenco.

We also enjoyed Serge Lallemand's clear and informative medallist talk highlighting the varieties of subduction initiation, a subject close to our hearts. The EGU assembly left us with our heads full of ideas and our spirits lifted, ready to tackle the last sprints of our doctoral projects.



## 6 Upcoming events

- **Topo Europe 2019:** May 5-10 2019, Granada, Spain

**Note:** This conference, organised by the SUBITOP ESRs, will focus on subduction zones from surface to depth. It will include 3 days of scientific presentations, communication workshops, and a 2-day field trip through the Betics. The conference will also host the last official SUBITOP project meeting.

- **2019 Ada Lovelace Workshop;** 25-30 August 2019, Siena, Italy
- **Goldschmidt 2019:** August 18-23 2019; Barcelona, Spain

## 7 Contacts and further information

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### **Further information on the intranet**

(requires login - please contact Micha Dietze if you are missing login credentials)

- Grant and Consortium Agreements
- Information and details on the entire SUBITOP Team (ESRs, PI's, Private Partners, Partner Schools)
- Newsletters and further official documents
- Information on SUBITOP workshops and short courses
- SUBITOP logo and document template files

## 8 The SUBITOP Group



Newsletter by Manar Alsaif, Joost van den Broek, and Antoine Auzemery, in collaboration with other ESRs.