

Editorial

The DEIS Summer School: How it all started

In a 2014 day dream, a very simple idea came to us: suppose we bring together a group of bright young people and involve them in a 3-day brainstorm on a topic they can relate to – what are the chances of coming out with no results? A rhetorical question indeed, or so one would think.

In our proposal to DEIS Adcom, one of the arguments used to invite DEIS to sponsor the event was: “To promote scientific debate and the exchange of ideas in the field of electrical insulation and dielectrics, the IEEE DEIS organizes a summer school in June 2015. The main purpose is to encourage a discussion between a group of junior researchers and PhD students on three related hot topics in dielectrics research”. Simple enough...

So, on the 19th of June 2015, three of us set out for Bologna, a beautiful city with one of the oldest universities in Europe. While we were thinking about how to shape the meeting, students and early career researchers from all over the world arrived. On the 21st we drove by coach to the castle on top of the hill in the medieval village of Bertinoro. This would be our home for the next three days, as it once was for Frederick Barbarossa, holy Roman emperor from 1155 to 1190.

One may wonder why we took the trouble of organizing the meeting in such a relatively remote location. Well, the main reason was that we wanted to meet in a quiet place, a place of contemplation with no distractions from the outside world ... and where there was no way to “escape”. What better place than a medieval castle? This would remain an important condition for the summer schools in the following years.

Paying homage to the concept of the “Autrans” workshops in France, started by Steve Rowe and John Fothergill in 2005, the summer school was organized in a novel way. The three-day program consisted of interactive brainstorm sessions with a limited number of introductory lectures given by the organizers. This interactive approach was chosen to place the students at the center of the event so that *they* would develop novel ideas to achieve a breakthrough in the field of dielectric interfacial phenomena. Moreover, the exchange of ideas between students of different backgrounds was thought to be an added value in the brainstorms.

After a few plenary introductions, the students were divided into three groups, each group led by one of the three musketeers (as the students later started calling us). In a quite natural and organic manner, we decided to act more as observers and interfere with the brainstorms as little as possible.

On the first day, each group raised important issues and uncertainties in the field of nanodielectrics. Plenary discussions were initiated by providing the students with a list of relevant questions related to the nature of nanometric fillers and their interaction with the host polymeric matrix. Moreover, more general topics, such as the existence of interfaces and interphases around nanoparticles, were discussed as well. Finally, some provocative contradictions and paradoxes about dielectric behavior at the nanoscale were suggested. Thus, the students gradually got to know each other better and became more familiar with the topics, which were relatively novel for some of them. At the end of the day, during a plenary session, the groups presented the results of their brainstorms and plans of action for the next day were made.

On day two, the groups were challenged to define a proposition about the behavior of interfaces at the nanoscale. Following this, possible experiments were defined with the aim of confirming or rejecting the hypothesis made in the proposition.

Finally, on the last day, the groups were challenged to prepare a research programme that would allow them further to explore their ideas, even after the end of the summer school.

From day one, the idea was to plant the seed for “something” during the summer school, something that would further develop after the meeting in Bertinoro had finished. The immersion of the students in a scientific brainstorm was just one element. It was also envisaged that the students would build a network amongst themselves and aim for some future collaborations. They were also offered the opportunity to organize a special session at one of the DEIS international conferences and, in 2016, they duly presented an evening session at the IEEE International Conference on Dielectrics in Montpellier, France.

When we evaluated this first summer school, we came to the following conclusions:

1. Within one day, any barriers between moderators and students had disappeared;
2. The brainstorm process was positively affected by the moderators staying in the background;
3. The students benefitted from an introduction on how to define a research project, starting with the definition of a proper research question;
4. Within the short period of just three days, groups of early stage researchers that had never met before were interacting openly and were able to define joint research programmes.

With this first summer school, we had thrown ourselves into the proverbial deep end. Apart from general aims and the introductory lectures, there had been no detailed preparation of the event – we strongly believed that we needed to focus on the needs of the students ... which would only become apparent as the event progressed. What we did was improvise, keeping in mind that stimulating an open discussion was most important. The challenge was not to interfere too much and only push and shove a little bit if absolutely needed. It was a risk, but there was never a doubt that we would be successful in some way.

The next five years

The first summer school had been a success, from the perspective of the organizers and the students. So, we looked at each other and said: “let’s do it again!” In 2016, Xi’an Jiaotong University in China co-hosted the event in a small cultural heritage village in Fufeng, not far from the Famen Temple, one of the largest Buddhist temples in China. This time there were four of us, the four musketeers. All students were Chinese and halfway through the first day we had become quite desperate. How to break down cultural and social barriers and have the students engage in the discussion? With a few tricks we were able to change the situation within one hour. We still don’t know exactly what happened, but it did, and this strengthened our feeling that our flexible, responsive summer school concept would probably work for all cultures. As was the case in Bertinoro, by the end of the summer school, networks had been formed and many new friends had been made.

In the following years, we went to Japan (2017) and back again to Bertinoro (2018). By 2019, we decided to change the main topic of the summer school to “extra-high voltage DC: challenges for science and technology”. But, equally important, we extended the summer school by two days during which a selection of international experts was invited to discuss these challenges with the students. It was really refreshing to see the interaction between the two groups.

We had decided to continue the summer school with the topic of HVDC in 2020 but we were stopped in our tracks by the pandemic.

The future

In total, 144 students from 18 different countries have participated in the five summer schools held thus far. The concept we devised in 2015 proved to be successful and worthy of repeating in the following years, each time, further refining and fine-tuning the way we interact with the participants. We learned that even in the short period of three days, networks can be built and progress can be made in engaging early stage researchers in scientific brainstorming that actually lead to something. Since 2015, the summer school participants have organized several sessions at international conferences and many of them still work together in some way or another.

In August 2021, hoping that world-wide vaccination will make travel possible again, we plan to host the DEIS summer school in Monmouth, Wales, where our venue will be Monmouth School, which was founded in 1614. So, not quite a medieval castle, but an historic and beautiful location nonetheless, situated in one of the UK's designated areas of outstanding natural beauty and with links to such diverse characters as the mythical King Arthur, the very real Charles Rolls, of Rolls Royce fame and Freddie Mercury. In January more information will be made available about the event.

While the way we, the four musketeers, operate is to a large extent determined by our personalities, our summer school concept should not be linked to us only. Indeed, for its long-term success it must not be linked to us only. There is a lot of space for other summer schools in different places in the world. We are convinced that many more early stage researchers can be reached. And, obviously, there are many different topics that can be considered for a brainstorm although in our case, the mechanism and dynamics of the summer school process are at least as important as the topic.

If, and only if, a situation can be created in which there are no barriers between the students and the teachers/moderators, we believe our summer school concept will work. We are gladly prepared to share our experiences and assist any other DEIS musketeers in the world who would like to organize a summer school.

One for all and all for one!

Peter Morshuis, Alun Vaughan, John Fothergill and Thomas Andritsch
The four musketeers