

Intro

Erich Wimmer's key note talk kick started a summer school with an exciting story of his personal journey and work in the field of computational materials science – with experience in academia, industry and even running a company (Materials Design s.a.r.l.).

Demanding several days awaited – a series of master classes each focusing on time/length scale beyond the familiar grounds for most of the participants; a series of work shops on engaging presentations, communication through infographics and a technical session on data visualization using Mathematica leading to group projects and individual presentations.

Master classes – diversity of phenomena due to physics at different scale

Each master class involved participation and discussion from the participants, mediated in part by the speaker and in part by group leaders. This approach, common to all Hermes summer schools, allowed to really “digest” the content.

Nicola Spaldin had opened the series of master classes. After introducing density functional theory (DFT) Nicola focused on her pioneering application of DFT to study the fundamental questions in Physics, paving the way for a unified theory beyond the Standard Model. Following her talk, Nicola challenged the participants to come up with and present an idea for the original use of DFT to address some of the real life problems.

Next, Soraia Pimenta covered topics in computation mechanics of composite materials. Soraia followed her talk with a hands on exercise focused on a particularly interesting topic from her presentation – the size effects on the longitudinal tensile strength of some fibre-reinforced polymers. With guidance, participants built a simple model using Excel or Mathematica to illuminate how the phenomenon stems from the stochastic variability of fibre strength.

Thursday evening was a “free mingle” time, relaxing and socializing in the beautiful settings of the Lodge.

On Friday morning Sauro Succi gave a master class on the Lattice Boltzmann method – a tool used to study all sorts of liquids, from blood flow to air turbulence to ice cream bubbles (without artificially building in the bubble partitions by hand!).

Friday ended with a classic wine tasting and a poster session.

Kurt Kramer delivered the final master class, on polymer physics. Among the principle problems in this subfield, is to be able to predict and model protein folding and polymer dynamics in general.

Telling the scientific story

Lulu Piney's workshop was on the use of infographics and imagery to tell a story. Through multiple examples, the participants learnt how to partition their story in terms of the information to be communicated via infographics and that which is better left as text – linking the two modes of communications effectively.

Next, Craig Carter and his team delivered a series of talks with a supervised hands-on session on technical aspects of data visualization using Mathematica software. Participants used the skills to then work on a groups create and interactive data visualization slide to present individually in 5 minutes on one of the master class topics.

The series of communication workshops was concluded with an inspiring, electric performance of a communication trainer and presenter with a truly unique style – Piero Vitelli (Island 41). He taught about the art of an engaging presentation, focusing on the very human emotional and psychological aspects that go into making a presentation unforgettable.

Conclusion

Each of the Hermes organisers is a PhD student who had previously attended the summer school. Continuing in the spirit of Hermes 2012 and Hermes 2014 summer schools, Hermes 2016 provided an enriching experience for all participants once again, carrying forward the main aims and ethos

1. training participants in the theory and simulation of materials beyond the remit of their own PhD field and discipline,
2. training in communication – an ability to cast technical scientific content into clear and accessible form using modern media devices and to engage and educate the audience,
3. using innovative learning and teaching strategies to ensure a high quality programme with effective knowledge exchange,
4. developing a lasting international network of PhD students and academics.

Scholarships

Funding from CCP5 along with other sources of funding enabled us to balance the summer school budget whilst offering five full scholarships to participants from India, Africa and Iran. A list of speakers and participants is available on our website, in the online version of the summer school booklet

http://hermessummerschool.org/Hermes2016Booklet_Final.pdf