

AFM images of poly(styrene-co-butadiene) random copolymer spin coated onto mica and graphite surfaces

The images, created by SOFI student Jake McClements, show a poly(styrene-co-butadiene) random copolymer spin coated onto mica (top images) and graphite (bottom images) surface at increasing concentrations (left to right). The resulting polymer morphology is examined at the nanoscale using Atomic Force Microscopy. A better understanding of how polymers behave at surfaces at the nanoscale could be beneficial in applications such as composite materials and the miniaturisation of devices and sensors. *Soft Matter*, 2017, DOI: 10.1039/C7SM00994A

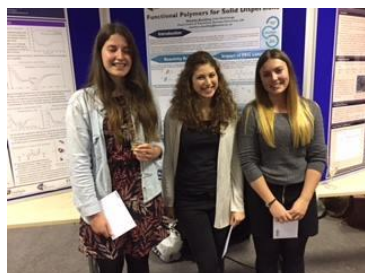


News from the management board

Warm welcome to Cohort 4 beginning this September! Also check up on everyone's most recent posters on the SOFI CDT website for up to date research: <https://www.dur.ac.uk/soft.matter/soficdt/posters/>

Soft Matter Showcase

Cohorts 1, 2 and 3 came together this July for the third, and highly successful, SOFI CDT showcase. The conference started with a poster session, congratulations to Morfo, Natasha and Vanessa for winning the poster prize which included giving an oral presentation to us all the next day. Other engaging talks were given from industry and academics on a broad range of topics; from the structural evolution of colour in birds, to self assembly of bacteria with light, and why does the microscale matter in food? The conference was followed by an Industry day where private one to-one meetings



were had with Industry and academics followed by group discussions on where research was heading in soft matter and what the big challenges for the future were going to be. The showcase was rounded off by a spectacular banquet in the castle.



Down to Business for Cohorts 1 and 2



This year saw the second part of the four week business school in Durham University. Cohorts 1 and 2 spent two weeks working on a short project in groups considering how best to commercialise an idea of their choice. Each group met with a panel simulating a meeting with potential investors where they discussed aspects of their formulated business plan.

Natasha Rigby



Hi, I'm Natasha from Cohort 3. As an undergraduate I studied Natural Sciences (Chemistry and Physics) in Durham and I then studied Food Science at the University of Leeds for my Master's degree. I've really enjoyed being

a part of the SOFI CDT and especially taking part in such a wide range of case studies. My PhD project is based in Physics at Durham University, with Dr Margarita Staykova and co-funded by Mondelēz. We aim to design functional, stimuli-responsive capsules for food use, incorporating a responsive polymer microgel core and a lipid bilayer coating and following on from previous research in the Staykova group into cell membrane area regulation. Outside of my PhD, I play violin in a local orchestra and sing in Durham University Choral Society.

David Crosby

Hi! My name is David, a cohort 3 student. I graduated from the University of Edinburgh in 2016 with a Masters in Physics. During my degree I realised I wanted to pursue a career in research but wanted to focus on industrial relevant projects, making the SOFI CDT program ideal. My favourite part of the initial six months training is the multi-disciplinary approach and the close links with industry. After the initial six month training period I am now back at Edinburgh working with Dr Tiffany Wood on the structure and rheology of topical formulations, sponsored by GSK. The main focus of my project is to characterise the structure and rheology of skin creams as they are being applied to a substrate (i.e. skin). Aside from my academic work I aim to be taking part in many more outreach events.



SOFI out and about

SOFI students have been travelling more than ever to conferences far and wide, with even Cohort 3 students already presenting their research. Allesandro Papoole and Morfo all attended and presented at the UK Colloids Symposium in Manchester, Morfo took home the 4th best poster prize! Denise Li recently travelled to Uppsala, Sweden for a lipid conference to present an oral presentation on her latest research. Phillip Hope and Jessica Andrews presented their posters in Cambridge for the International Symposium for Macrocyclic and Supramolecular chemistry. The picture shows Phil meeting Fraser Stoddart, the winner of last years Chemistry Nobel Prize!



Sophie Ayscough (your new editor) travelled to Grenoble, France for the Neutrons in structural Biology conference. Closer to home, Daniel Coward won a prize for his presentation during the Macro group UK young researchers meeting in Edinburgh, and Rashmi Seneveratne attended a Membrane technology meeting: Nanoparticle technologies for membrane protein research in Leeds.

Check us out!

As well as travelling to conferences SOFI students have been busy with their research and several publications are now out there. Have a read and see what exciting science SOFI produces.

Miller, E. J.; Treby, W.; Farokh Payam, A.; Piantanida, L.; Cafolla C.; Voitchovsky, K., Sub-nanometer Resolution Imaging with Amplitudemodulation Atomic Force Microscopy in Liquid. *J. Vis. Exp.* **2016**, 118, e54924.

Coward, D. L.; Lake, B. R. M.; Shaver, M., P., Organometallic-Mediated Radical Polymerisation in Metal-Catalysed Polymerisation: Fundamentals to Applications. **2017** CRC Press, 179-202.

Li, N. Y.; Perutková, S.; Iglíč, A.; Rappolt, M., My first electron density map: A beginner's guide to small angle x-ray diffraction. *Electrotehniski Vestnik*, **2017**, 84(3), 69-75.

Lizundia, E.; **Makwana, V. A.;** Larrañaga, A.; Vilasbe, J. L.; Shaver, M. P., Thermal, structural and degradation properties of an aromatic-aliphatic polyester built through ring-opening polymerisation, *Polym. Chem.*, **2017**, 8, 3530-3538

Robertson, B.; Thompson, R. L.; Robinson, I. A.; McLeish, T. C. B., Theoretical Prediction and Experimental Measurement of Isothermal Extrudate Swell of Monodisperse and Bidisperse Polystyrenes. *J. Rheol.*, **2017**, 61, 931

McClements, J.; Koutsos, V., The morphology and contact angles of Poly(styrene-co-butadiene) random copolymer nanodroplets on a mica surface. *Soft Matter*, **2017**, Advance Article

PhD placement in Stellenbosch

Rebecca is currently undertaking a three-month placement at the University of Stellenbosch, South Africa as part of the Newton Fund PhD exchange program, working with Prof. Peter Mallon. The project involves the use of positron annihilation lifetime spectroscopy to investigate the free volume properties of PVA films. There is also plenty of time to explore the Western Cape (and the South African wine regions).



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https://twitter.com/sofi_cdt.

SOFI Staff: Rosalind Allen



I am a professor of Biological Physics in the School of Physics and Astronomy at the University of Edinburgh. I studied Natural Sciences (chemistry) at Cambridge University before doing a Masters in chemistry at the University of Pennsylvania (1999-2000). Having discovered a liking for theoretical work, I did my PhD in theoretical chemistry at Cambridge University, under the excellent supervision of Professor Jean-Pierre Hansen. My PhD research was on molecular dynamics simulations of water molecules in a pore. I then moved as a postdoc to the Biochemical Networks group of Pieter Rein ten Wolde at the AMOLF institute in Amsterdam, where I developed methods for efficient simulation of rare events, in particular stochastic switching of genetic networks. By this time I was eager to start doing experiments as well as simulations and when I moved to Edinburgh University in 2006 I helped to set up a microbiology lab and began working on how bacteria grow, using experiments and simulations. My main current research interests are how bacteria respond to antibiotics and evolve resistance to them, and how many different species of microbes interact in complex ecosystems.