



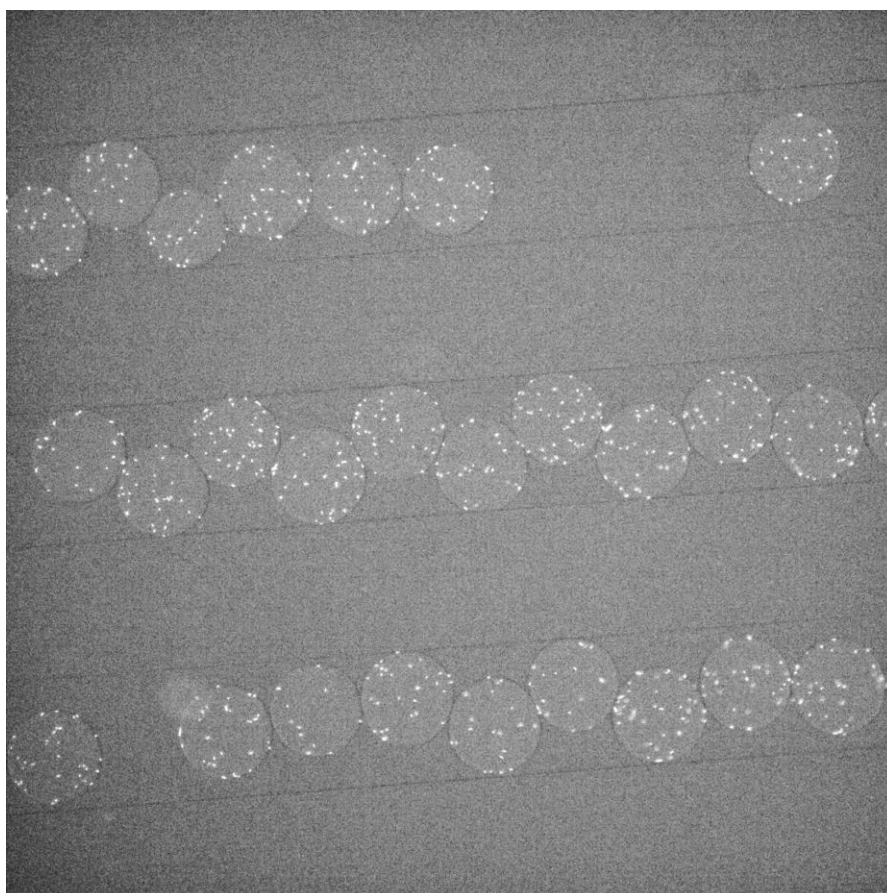
SOFI

CDT

NEWSLETTER

EPSRC Centre for Doctoral Training in
Soft Matter and Functional Interfaces

January 2017



Fluorescent Bacteria in Droplets

This image was created by SOFI student Daniel Taylor. Communities of fluorescent E-coli swim in 0.5 nanolitre droplets made up of growth media and antibiotic. By studying how these bacteria grow in confinement, it might be possible to further our understanding of antibiotic action during clinical infections.

January 2017



Changes at the top! Tom McLeish is sadly leaving his post as Director of the SOFI CDT and we can happily announce that Colin Bain will be taking up the post. We wish Tom McLeish all the best for the future and thank Colin for taking up the role.

Cohort 4 training hard

Cohort 4 have been busy with their SOFI training. In December the cohort travelled to Leeds for a week, being put to the test in the liquid crystal labs. They also got to help researchers in the Food department in Leeds outside of labs (picture below), by testing their beers! Congratulations to Cohort 4 students Rachel Goodband and Sarah Goodband who have just won the Blueprint Bright Ideas challenge in Durham - no doubt in some way due to their excellent SOFI training.



New radio stars

Over the space of three days, cohorts one and two were introduced to the world of science communication through a course headed up by academics from Imperial College London. The groups were introduced to the fundamentals of communicating science through written work, radio presentations and video segments.

Each team was then tasked with creating small media pieces on a variety of scientific topics using the skills they had learnt. The course culminated in a visit to the BBC headquarters in Glasgow where the groups presented a twenty minute mock radio program that was recorded live on site under the same conditions radio presenters deal with every day!



Introducing Cohort 4!

Here's a little on our newest cohorts backgrounds.

Hannah Jones studied Chemistry at Durham University.

Holly Linford studied Chemistry at Durham University.

Matthew Litwinowicz studied Natural Sciences, Physics and Chemistry at Durham University.

Zachary Gradwell studied Physics with Nanotechnology at the University of Leeds.

Ryan Jackson studied Physics (BSc), at Durham and then Physics (MPhil) at the University of Sheffield.

Luke Chambers studied Chemistry at the University of Sheffield.

Adam O'Connell studied Physics at the University of Oxford.

Richard Chilvers studied Chemistry at the University of Nottingham.

Sam Stubley studied Food Science at the University of Leeds.

Rachel Goodband studied Physics/Biophysics at Durham University with a year abroad in Pierre and Marie Curie University.

Sarah Goodband studied Physics/Biophysics at Durham University with a year abroad in Pierre and Marie Curie University.

Nia Verdon studied Physics at St Andrews University.

Carmen Morcillo-Perez studied Chemistry at Universidad Complutense de Madrid (with Erasmus year at Durham University).

Colin Gibson studied Chemistry at Durham University.

Lorenzo Metteli studied Chemistry at University of Trieste.

Jason Klebes studied Computational Physics at the University of Edinburgh.

Jack Williamson studied Chemistry at Durham University.

Polymerisation symposium in Durham

The biennial ionic polymerisation symposium was hosted this year in Durham and SOFI was strongly represented. Prof Lian Hutchings (CDT manager) organised the week-long event, Dr Michael Shaver (SOFI academic) gave a talk on his work and Jon Millican, Natasha Boulding, Vishal Makwana and Dan Day (SOFI PhD students) presented posters. The conference was an opportunity for researchers in the field from academia and industry to discuss the latest innovations in ionic and related living polymerisation techniques. As well as the talks, attendants were treated to a banquet at Durham castle and either a boat trip in Newcastle or a trip to Alnwick castle.



The symposium went down very well with many regular attendants commenting on the excellent standard of work being presented throughout the week. Particular congratulations to Jon who won the best poster prize for his work on bio-inspired functional adhesive polymers and Lian Hutchings for organising the conference.

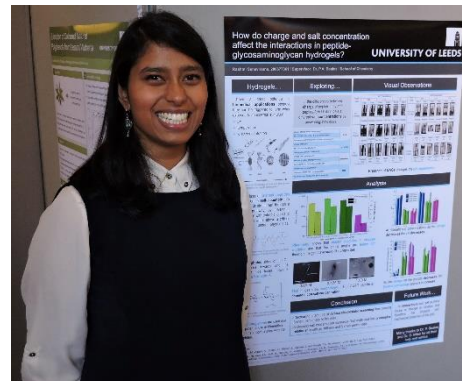
Outreach

SOFI students have been taking their research to the public in a range of outreach events. Natasha Rigby and Vanessa Woodhouse at Durham University did some outreach at Neville's Cross Primary School for Ada Lovelace day, doing a few activities loosely based around the theme of membranes which involved looking at cells under the microscope and making some alginate gels. David Crosby and Sophie Ayscough at the University of Edinburgh helped run a 'Soft Matter Kingdom' event (dressed as wizards and knights no less!) at an open event in Ikea making slime and pressurising marshmallows.



Cohort 1 student Ben Robertson spent September this year at the University of Queensland in Brisbane, Australia working with Dr Tim Nicholson in the Chemical Engineering Department. Ben was working on adding new molecular constitutive equations to the fluid dynamics software, *flowSolve*, and applying the new functionality to his work on predicting extrudate swell of polymer melts. In addition to the work there was plenty of time to relax in the warm weather, explore Australia and see the local wildlife.

Rashmi Seneviratne



Hi! I'm Rashmi from Cohort 3. I studied Chemistry at the University of Leeds, graduating with a MChem in 2016. I chose to do my PhD through the SOFI CDT because I wanted an industrially relevant, multi-disciplinary project. After completing the case studies in Durham I've returned to Leeds to start my PhD project on the properties of hybrid lipid polymer vesicle membranes with the addition of membrane proteins with Dr Paul Beales. This is a (small!) step towards creating an artificial cell, with other applications including drug delivery and sensory capabilities. In my spare time I practice martial arts, such as Thai boxing.

Dan Day

Hey, I'm Dan. I did a Masters in chemistry at Leicester which included a 12-month industrial placement at Scott Bader. This got me interested in polymer synthesis and steered me towards the SOFI CDT where I was lucky enough to join as a member of cohort 3. I am now 6 months in to my PhD project at Durham, with Lian Hutchings and industrial support from Synthomer and Croda. The aim is to synthesise and study block copolymers with different solubility parameters, that are capable of self-assembling into micelles when dispersed in a non-polar solvent. The thing I have enjoyed most so far about the CDT is the exposure to the chemical industry which has carried on into my project. When I'm not in the lab, I play the trombone and basketball.



SOFI out and about

SOFI students have been traveling around, getting the chance to present poster and presentations of their research. Peter Wyatt presented "Grating aligned liquid crystals for use in fast switching devices" at Eurodisplay 2017. Fun story: Pete's presentation crashed halfway through, so he had to run into the audience to retrieve my laptop to continue from. Best first presentation ever? The Eurodisplay conference explores displays and electronics and their impact on society. Kasid Khan attended 'Electrochem 2017' which was held at Birmingham university and presented a poster on 'targeting the electrochemical activity of biofilms'. Kas also travelled to Marseilles for a workshop on 'Redox films for energy conversion - bioelectrochemical and molecular systems'. Michael Heeran attended the RSC main group interest meeting in London and presented a poster on his work. Jake McClements has been showcasing his research through a presentation at the conference of the European Colloid and Interface Society in Madrid, Spain and at a Physical Aspects of Polymer Science conference in Swansea.



'Leeds liquid crystal crew'

-Peter Wyatt Left

Looking for volunteers to get Blogging!

[Softbites](#) is a new blog started by a group of graduate students and postdocs at Harvard university that aims to make soft matter research more accessible to undergraduates and high school students. They write summaries of current and classic papers in soft matter, and are currently looking for new scientists to write posts, so please fill out their [form for new writers](#) if you are interested! This is an opportunity for SOFI to strengthen links with one of the world's leading universities

Check us out!

Have a read of our recent publications and see some of the exciting science SOFI produces.

Coward, D.L.; Lake, B.R.M.; Shaver, M.P., Understanding Organometallic Mediated Radical Polymerization with an Iron(II) Amine-Bis(Phenolate). *Organometallics*, 36 (17), 3322 - 3328, 2017.

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

Keep up with all the SOFI news online at

https://www.dur.ac.uk/soft.matter/sofi_cdt/news

or find us on Facebook at

https://www.facebook.com/softmatter_cdt/

or Twitter at

https://twitter.com/sofi_cdt

SOFI Staff: Daniel Read

I am the (recently promoted!) Professor of Soft Matter in the School of Mathematics at the University of Leeds. I studied Natural Sciences at Cambridge (1991-1994: interesting fact - I shared a flat in my second year with Simon Titmuss who is now the SOFI co-ordinator at Edinburgh). Unusually for an academic, all my work since has been in one place: at Leeds. I did a PhD with Tom McLeish in the School of Physics, studying theory of phase separation and scattering in polymers. There followed a postdoc position, also with Tom, but also spending 50% of my time in Bradford, doing finite element simulations of phase separated polymer structures. After that, in 2000, I was lucky enough to get both an EPSRC Advanced Research Fellowship, and a lectureship in the School of Mathematics.



A good portion of my current research is obsessed with modelling the dynamics and rheology of polydisperse and branched polymer melts. On this particular topic, I'm currently co-authoring the second edition of "Structure and Rheology of Molten Polymers", with John Dealy and Ron Larson. I helped to create the "BoB" rheology algorithm, designed to predict the rheology of entangled polymers of any branched size or shape. I also collaborate with Oliver Harlen and Sarah Harris on a fluctuating finite element analysis (FFEA) code, used for coarse-grained modelling of globular proteins and soft colloids. I like to release software for others to use: both the BoB and FFEA are free to download. And (watch this space) I'm currently involved in a project to update the "RepTate" rheology software, which SOFI students currently use in their first case study. In SOFI, I have overseen the admissions activity, and teach both scattering and rheology in a couple of the case studies: so, pretty much all SOFI students have met me at some point!

I co-supervise a couple of them at present: Edgar Simmons and Tom Ridley. I'm also the Bulletin Editor for the British Society of Rheology.