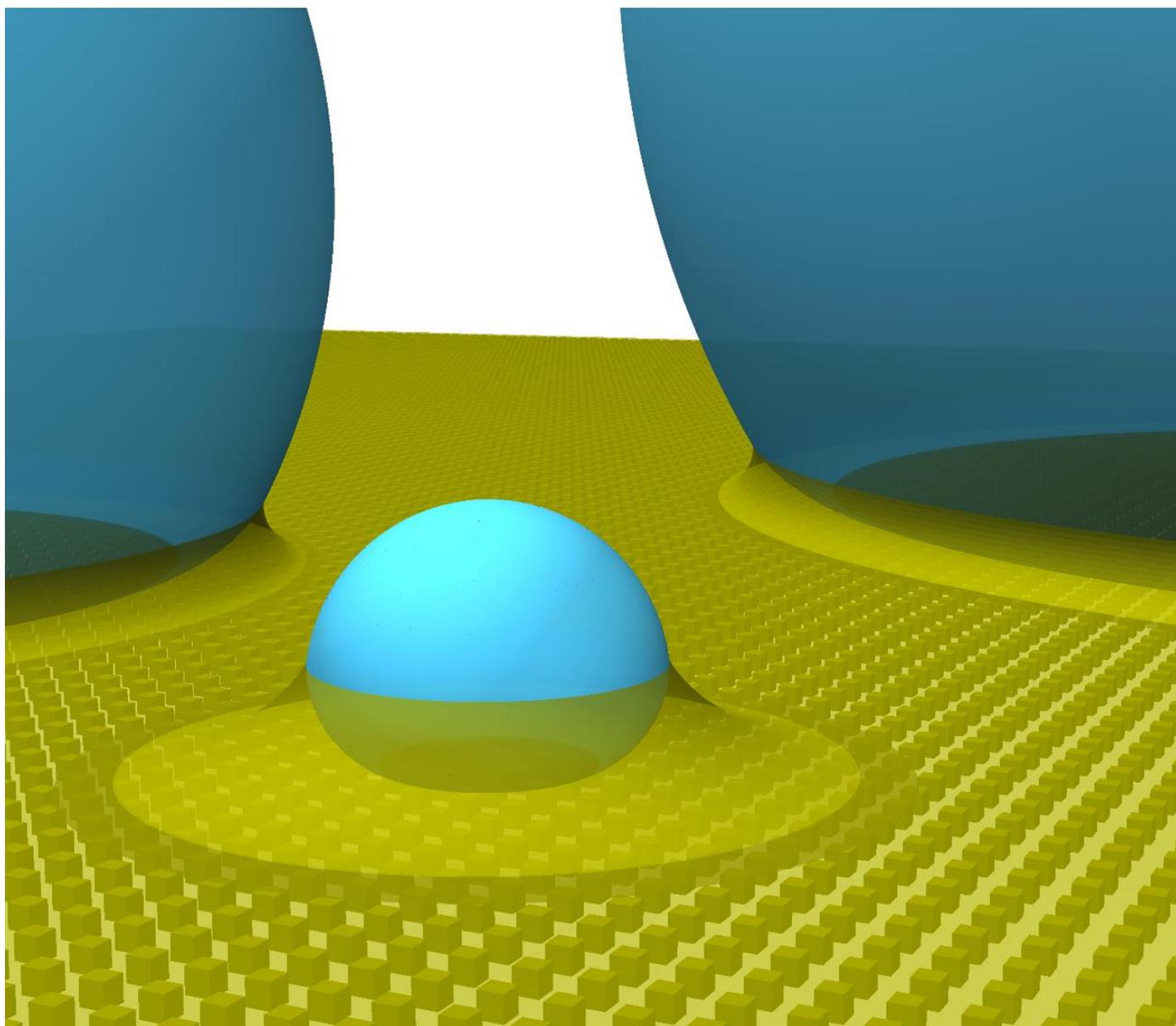




# SOFI CDT NEWSLETTER

EPSRC Centre for Doctoral Training in  
Soft Matter and Functional Interfaces

September 2016



**Liquid droplets spreading on lubricant impregnated textured surfaces.**

Research from Durham's Halim Kusumaatmaja, who is our featured SOFI staff member this issue.



## Soft Matter Showcase 2016

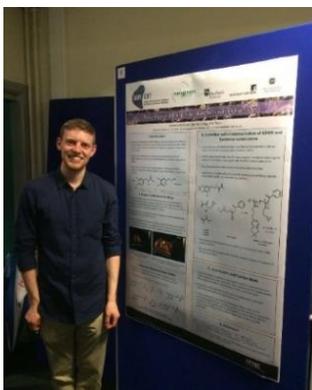
In June SOFI students and academics attended the second Soft Matter Showcase in Leeds where there were a range of talks spanning a variety of soft matter topics. Prize winning posters from the previous evening's student poster session also gave Ethan, Rahul and Dan Taylor the chance to give short talks on their work. The day ended with a conference dinner in the town hall.

The industry day followed. Following a quick overview of the extensive and interesting SOFI research already being undertaken in Durham, Leeds and Edinburgh, we heard some of the current research challenges in industry. During the afternoon, members of cohorts 1 and 2, industry and academics discussed some of the biggest challenges in soft matter in small groups, focussing on areas including polymers, food, agriculture, pharmaceuticals energy and construction.



### SOFI Poster Success!

The 2016 Durham Chemistry Postgraduate Gala Research Symposium took place on 15th June. All 2<sup>nd</sup> year PhD students were required to submit a poster describing their research and Jon Millican (cohort 1) was awarded a prize for his entry entitled "bioinspired functional adhesive polymers". Congratulations Jon!



### Peter Wyatt

Greetings. My name is Peter "Pete" Wyatt, my favourite colour is blue and I graduated from the University of Leeds with a Master's degree in natural sciences. I have



since returned to Leeds to work with Prof. Cliff Jones in soft matter physics as part of the SOFI CDT. We plan to create novel liquid crystal based devices for the use in televisions, smart phones, or even contact lenses. The key here is to utilize more complex liquid crystal phases and align them in a novel containment, which should result in faster switching speeds, or lower energy requirements, allowing the creation of faster, greener response displays. If I'm not in the lab, I'm probably skiing, or wishing it was snowing. I slalom race for the university and frequently compete in inter-uni competitions on giant toothbrushes here in the UK. I'm always happy to finish the day with *Aprés*.

### Morfo Zembyla

My name is Morfo Zembyla, and I am a cohort 2 SOFI CDT student. I graduated from the University of Leicester in 2014 with a bachelor degree in Chemistry and subsequently I did my masters degree in Food



Science at the University of Leeds in 2015. Then, I decided to continue my career by doing a PhD at SOFI CDT. The six month training period was really enjoyable especially the industrial challenges of case studies. Currently, I am back at Leeds University working with Prof Brent Murray and Dr Anwesha Sarkar on stabilisation of water-in-oil (W/O) emulsions using food grade materials. The aim of this project is to reduce the fat and, thus, the calorific content in foods by increasing the concentration of water, in the form of stable W/O emulsion droplets.

## SOFI out and about

It's been a busy few months with lots of SOFI staff and Students alike attending conferences and workshops all over the place! Outreach ambassadors Jake and Jon attended the Royal Society Summer Science Exhibition which took place in London from the 4th to the 10th of July. The whole of cohort 2 spent a week at the introduction to Diamond and ISIS summer school focussing on scattering methods and learning how the facility could be of use to them over the course of their PhD research. Denise meanwhile travelled to France to attend the 13th European Summer School on Scattering Methods Applied to Soft Condensed Matter. Rebecca recently attended the UK Neutron and Muon Science and User Meeting, held at Warwick University. Vanessa attended the Analytical Sciences Workshop and Circular Dichroism User Meeting, also



held at Warwick. Hugh and Jack travelled to Edinburgh for the PRACE parallel computing summer school. James visited Ancona, Italy for the SoftComp annual meeting, with Professors Wilson Poon and Cliff Jones and Dr Margarita Staykova also in attendance.

## Cohort 1 Business School

Cohort 1 attended the inaugural EPSRC CDT Summer School between the 18th and 29th of July. The course, at Durham University Business School, introduced students to some of the key concepts in entrepreneurship (e.g. entrepreneurial management), accounting (e.g. the double entry principle, calculating cash flow and balance sheets, NPVs and IRRs), and project management (e.g. critical paths in network diagrams). They were also taught how to develop a business model, aided by the Strategyzer Business Model Canvas. To put all of this into practice, the cohort worked in teams to build a business plan around a soft matter-inspired technology that they had brain-stormed. This was then pitched to mock investors at the Darlington site of the Centre for Process Innovation.

## SOFI Staff Profile: Halim Kusumaatmaja

I graduated with a Physics degree from the University of Leicester in 2004. Initially the plan was then to do a PhD in some quantum aspects of condensed matter theory. However, Julia Yeomans gave an excellent talk on interfacial phenomena, polymers and liquid crystals during my interview at Oxford – that was in fact my introduction to soft matter – and I ended up working with her for the next four years, developing a simulation method called lattice Boltzmann to study liquid spreading and wetting on rough and chemically heterogeneous surfaces. I then moved to Berlin in 2008 to take up a postdoc position at the Max Planck Institute of Colloids and Interfaces, where I worked on phase separation inside lipid vesicles, and studied the resulting shapes and morphologies of the lipid membranes. This was followed by another postdoc on the computational chemistry side of soft

matter at the University of Cambridge, focusing on self-assembly of colloidal particles and biomolecules. In April 2013, I took up a Lectureship at Durham University. In my group, we develop and use computer simulations to study the fundamentals and applications of soft matter science. For example, we are currently investigating how geometry (curvature and confinement) can be exploited to regulate the composition of lipid membranes and the thermodynamics of colloidal assemblies; we also have an industrial project with Procter and Gamble to optimise the design of liquid repellent surfaces.



## Introducing... Cohort 3!

Cohort 3 have now arrived in Durham and begun their SOFI training- we find out a little about their backgrounds here.

**Rashmi Seneviratne** studied chemistry at the University of Leeds

**David Crosby** studied physics at the University of Edinburgh

**Melinda Morelli** studied industrial chemistry at the University of Milan

**Joel David Briscoe** studied physics at the University of Leeds

**Aurimas Seimys** studied food science at the University of Leeds

**Philip Hope** studied chemistry at the University of Manchester

**Andrew Christy** studied chemical physics at the University of Edinburgh

**Natasha Rigby** studied food science at the University of Leeds

**Daniel Day** studied chemistry at the University of Leicester

**Yujie Jiang** studied physics at Fudan University

**Kasid Kahn** studied chemistry at Newcastle University

**Sophie Ayscough** studied chemistry at the University of York

**Dale Diamond** studied chemistry at the University of Leeds

## Coming soon...

The 1<sup>st</sup> annual SOFI Christmas Soft Ball! 19<sup>th</sup> December at Ramside Hall, Durham

Keep up with all the SOFI news online at [https://www.dur.ac.uk/soft\\_matter/soficdt/news](https://www.dur.ac.uk/soft_matter/soficdt/news) or find us on Facebook or Twitter at <https://www.facebook.com/softmattercdt/> and [https://twitter.com/sofi\\_cdt](https://twitter.com/sofi_cdt)