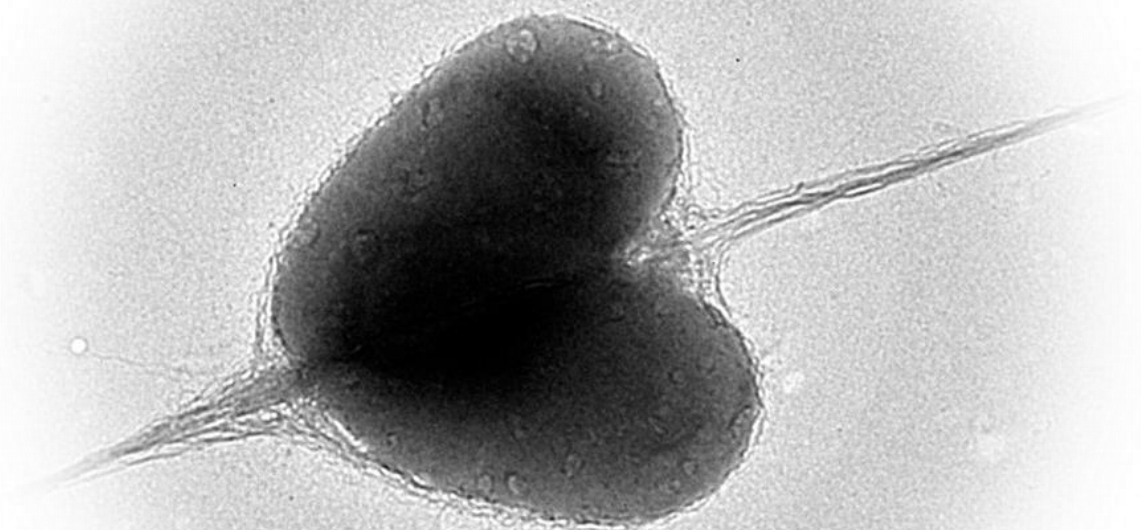




SOFI CDT NEWSLETTER

EPSRC Centre for Doctoral Training in
Soft Matter and Functional Interfaces

January 2017
Happy New Year!



Transmission Electron Microscopy image of two *E. coli* bacteria intersecting from work by SOFI student Joe French

SOFI STUDENT SPOTLIGHT



SOFI celebrates at the Soft Ball!

On the 19th December, the first ever SOFI CDT Christmas ball, the Soft Ball, took place at Ramside Hall just outside Durham. This was a great chance for the SOFT matter community within SOFI and beyond to get together and celebrate another successful year. The ball was attended by staff, students, partners and friends who enjoyed a delicious three course meal followed by a highly entertaining quiz featuring a variety of soft matter, Leeds, Durham and Edinburgh based questions and even a bonus round which involved modelling Durham Cathedral out of play-doh! Huge thanks to the ball committee which included cohort 2 students Rebecca and Phil as well as Julie and Lian who put so much time and effort into making this event a success. A fantastic time was had by all.



News from cohort 3

Cohort 3 kicked off their series of industry-led case studies with the now traditional venture into the world of polymers. As usual this involved an attempt to master flowSolve, software designed for modelling various aspects of polymer processing including extrusion, injection moulding and vacuum forming. Dr David Hoyle, Durham's resident flowSolve expert was on hand to guide the cohort through the process and found this year's designs to be more ambitious than ever. In particular there was some very inventive and skilful modelling of SOFI's own polymer "polyparrot" for use as super high speed optical cables, which won over the judges in the end. Congratulations to Natasha, Dan, YJ, Kasid and Andrew on your winning design!

Joseph French

Hello! My name is Joseph French and I hold a master's degree in bio-nanotechnology and a bachelors degree in biomedical sciences. I joined SOFI CDT due to my increased interest in soft matter as a result of my masters. I have



I have enjoyed the challenging nature of the case studies as well as the great cast of characters I've been part of in cohort 2. I chose my project investigating bacterial adhesion in Edinburgh after being seduced by E.coli, the interesting science and the beautiful city. Guided by my supervisors Prof Wilson Poon and Prof Vasileios Koutsos we aim to elucidate the physical interaction between bacteria and surfaces. By understanding the underlying mechanism surfaces can be designed to resist biofouling, a scientific global challenge I am eager to contribute solutions to. Other than my love of science I have a deep passion for music. I've played the guitar for over a decade and am learning the piano. I aim to compose my own music someday with one of my biggest influences being cerulean crayons.

Vanessa Woodhouse

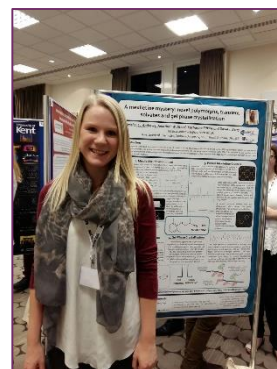
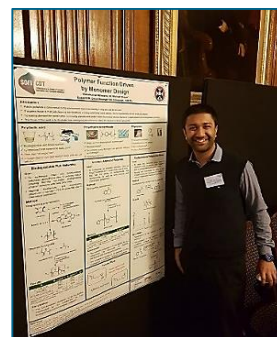
Hi, my name is Vanessa Woodhouse and I am a cohort 2 SOFI student. I graduated from the University of Leeds, where I studied physics, in 2015. Following this I joined the SOFI CDT and I am now pursuing my PhD in Durham. My



project is an investigation into antimicrobial peptoids with Dr Beth Bromley and Prof Mark Wilson. Peptoids are synthetic molecules which mimic the biological activity of naturally occurring antimicrobial peptides. I am studying them using both experimental and computational techniques with the aim of understanding the structures they form and how these link to their antimicrobial activity. In my free time I enjoy playing Korfbal, a sport which I was introduced to in Leeds and hope to bring to Durham in the future!

SOFI out and about

Once again SOFI students and staff have been busy doing lots of research and presenting their results at conferences all over the place! In particular there have been a lot of posters presented by students recently. Congratulations to Ben Robertson (cohort 1) who was awarded a prize for his poster entitled “extrudate swell on linear polymers” which he presented at the British Society of Rheology Midwinter Meeting in Reading, a fantastic achievement! SOFI was well represented at this event with Tom from cohort 2 and Professor Suzanne Fielding also in attendance. Tom presented a poster on his research into the dynamics of soft packed colloids. Jess and Vishal also presented posters recently. Jess attended a Macrocyclic and Supramolecular Chemistry conference in Edinburgh to present “a mexiletine mystery: novel polymorphs, transient solvates and gel phase crystallisation”, while Vishal travelled from Edinburgh to London to present his work on “polymer function driven by monomer design” at the Frontiers in Green Materials meeting in London where Dr Michael Shaver also gave a presentation. Jack (cohort 2) recently attended a NVIDIA GPU programming and machine learning workshop in Durham which involved learning to teach a computer how to tell the difference between pictures of coffee cups and tractors! Back in October SOFI’s affiliated college in Durham, St Mary’s hosted a “Smart Polymer Processing” event. This was attended by students Hugh, Rahul, Ben and Edgar and included talks from many SOFI staff members from across all three universities. Cohort 3



have been visiting industrial partner sites across the UK for their case studies , enjoying visits to Lucite International, Nestle, Epigem and Proctor and Gamble.

Keep up with all the SOFI news online at:

<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. SOFI now has Instagram! Follow [sofi_cdt](#) to see some of the fun that our cohorts are getting up to and images from our research.

Save the date! The 2017 UK Soft Matter Showcase will be held in Durham from 5th-6th July and will be followed by an industrial networking event on the 7th. Further detail to follow in the next newsletter.

SOFI Staff Profile: Helen Gleeson



I graduated with a Joint Honours degree in Maths and Physics from Manchester University in 1983, then undertook an industrially sponsored experimental PhD in the optics of liquid crystals having been inspired by an undergraduate lecture course. I spent three years in a rather unusual postdoc role, running an industrially funded research unit at Manchester, an experience that shaped my academic career during

which I’ve continued to interact with industry. I joined the academic staff in Physics at Manchester in 1989 as their first ever female lecturer, and subsequently held a number of posts in the University, including Associate Dean for Research in the Faculty of Engineering and Physical Sciences and Head of the School of Physics and Astronomy. Effectively, I was at Manchester for the whole of my academic career, until two years ago when I moved to Leeds as Cavendish Professor and the head of the Soft Matter

Physics Group. I took up the Head of School position earlier this year. My research concerns self-ordering and self-assembling materials, particularly liquid crystal phases. I’m an experimentalist and use a variety of approaches to understand liquid crystal structures - I aim to determine how the nanoscale properties of complex molecules affect their macroscopic physics. Much of my work involves understanding liquid crystal systems with reduced symmetry (for example chiral or biaxial phases), both in the bulk and in devices. I have investigated biological systems as well as synthetic liquid crystal materials and an important part of my research is to understand how liquid crystals can be used for novel photonic devices and applications. I have particularly enjoy developing novel experimental techniques to study these complex, self-organising materials and optically active media. The new experimental approaches I have developed include time-resolved and resonant x-ray scattering at synchrotrons and a variety of optical and electro-optical measurements (Raman scattering, Kerr effect etc.). These allow a deep insight into systems that show ferroelectric, ferrielectric and antiferroelectric properties, blue phases and unusual nematic systems.