

SOFI CDT Newsletter

February 2016

SOFI Student: Aixa Piñeiro

Hello, my name is Aixa and I graduated with a Chemistry degree at Universidad Autónoma de Madrid (Spain). My Masters was based on the growth of silicon nanowires to be used in lithium batteries. I had research experience for two years which included characterising silicon growth by the Czochralski method for solar cell



applications, including spending three months at the University of Michigan (EEUU). Currently, I am working at the Chemistry Department at Durham University, supervised by Prof. Colin Bain and funded by Akzonobel. The primary aim of my project is to find an accurate and reproducible method for studying the effects of droplet drying in agrochemical sprays. I would recommend this experience to prospective students because of the opportunity to work closely with an industry while studying a PhD.

SOFI Student: Jon Millican

Hi, I am Jon Millican. I graduated with an MChem in Chemistry from the University of York in 2012. I spent the fourth year of this course on an industrial placement at AkzoNobel in Slough, researching emulsion polymers for decorative coatings (and getting to meet the Dulux dog!) I then worked for several months in the solar energy sector in Shanghai, China, before



choosing to continue my studies in the SOFI CDT. I enjoyed the six month training program, especially the link to real industrial problems in the case studies and understanding how different fields interlink. I am now working with Prof. Lian Hutchings from Durham University and Dr. Tim Ryan from Epigem to produce biomimetic functional adhesive coatings. This has involved synthesising a variety of polymeric coatings and then studying them by techniques such as ellipsometry and atomic force microscopy.

SOFI Staff: Mike Shaver

SOFI Academic Dr Michael Shaver is the winner of the 2015 MacroGroup UK Young Researchers Medal. He'll be presenting his award lecture at the upcoming Warwick Polymer Conference. While he denies he is still young, he did agree to tell us a bit about his background.



Overall, I think my career is defined by really challenging trans-Atlantic moves. I obtained my Ph.D. in Inorganic Chemistry in 2005 from the University of British Columbia, Canada. An NSERC award for a postdoctoral fellowship supported a move to Imperial College London to do my first polymerisation reaction (!!)

under the direction of Vernon Gibson. Since then I have continued to embrace the dark side of soft matter, first with an appointment as Assistant Professor at the University of Prince Edward Island in Canada where I was subsequently promoted to Associate Professor. In 2012, I was convinced to make a third trans-Atlantic move, returning to the UK as a Chancellor's Fellow and Reader in sustainable polymer chemistry at the University of Edinburgh.

Our research sits at the interface between polymer chemistry and inorganic chemistry. We often approach challenges in soft matter by designing new catalysts and/or new monomers to tune properties – but keep the blinkers off and look at opportunities across all of chemical science. This means our team is necessarily diverse. We have projects in: medical diagnostics, developing polymer based miRNA sensors; materials science, developing new high refractive index polymers and self-healing polymers; polymer chemistry, developing new synthetic strategies to functional polyesters and thermoplastic elastomers; and even small molecule catalysis. Overarching our research interests is a focus on improving the sustainability of industrially relevant processes with particular expertise in controlled radical and ring opening polymerisations. Collaborations with companies include Samsung, Synthomer, GSK and Axis-Shield Diagnostics.

You can contact Michael via email: Michael.Shaver@ed.ac.uk

Hello Cohort 2!

Cohort 2 have been busy working their way through the industrial case studies as part of their initial training. Before Christmas there was a strong dairy theme, as the students worked on the formulation of ice cream with Unilever. This included some very enjoyable market research involving a lot of Magnums and Cornettos!

Following this, the cohort moved on to case study 3 which was run in conjunction with microfluidics company Epigem. The cohort was split into two teams and presented with the challenge of developing a method of detecting aflatoxin M1, a known carcinogen, in milk. In addition they were asked to find out and explain how aflatoxin M1, which is a metabolite of a toxin found in certain moulds, ends up in cows milk in the first place. The key challenge lay in developing a method sensitive enough to detect aflatoxin even at very low levels, using microfluidic technology.

Over the course of the three weeks the teams made their own microfluidic devices for removing fat droplets from milk, enjoyed a visit to Epigem headquarters in Redcar and spent time designing their own aflatoxin detecting microfluidic devices, with some very interesting results. In particular, the winning team's DNA origami based sensor was very inventive and simulations carried out to discover the most likely binding sites of the aflatoxin to the proteins in milk were very impressive.



Cohort 2 do some Outreach

After returning to Durham from three weeks working on Advanced Case Study 2 at Leeds University, Cohort 2 were unsure as to what was in store for them during "Outreach" week. On Wednesday morning it was announced that they would be preparing a two-hour science workshop for around 20 children aged 8-12, to be delivered on Friday morning at a local community centre. Naturally, post-announcement, chaos ensued as the cohort began to plan and prepare their activities for the event with the help of Lorraine and Paula from the Durham Outreach Team. It was decided that the theme for the event would be "Soft Science" and that the cohort would split into two groups to each plan and deliver an experimental activity on the day. Thus, "Team Polymers" and "Team Colloids" were formed. A number of exciting, soft matter based experiments were concocted including polymer slime races, homemade lava lamps and elephants' toothpaste. Whilst hoping to capture the children's interest in science, and soft matter in particular, the cohort hoped to promote a key message through the event: anyone can enjoy science and be a scientist. The success of this was evident in the final activity of the day, a true or false game. The children's unanimous decision that it was true, anyone can be a scientist, was a really rewarding end to the event, which overall ran very smoothly, considering the short timescale for preparation.

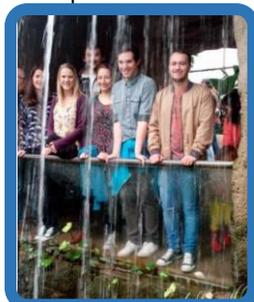


SOFI Out and About

From the 6th – 7th January Dan Taylor, SOFI Cohort 1 student, attended the Topical Research Meeting on the Physical Principles of Biological and Active Systems, organised by Edinburgh University in partnership with the IOP. Topics ranged from the physics of bacteria and antimicrobial resistance to the collective dynamics of motile organisms, all focusing on how physics could offer unique insight into biological problems that shared characteristics with more traditional physical systems. He shares his thoughts: "Multiple speakers at the conference were prominent academics that had produced work in my field; hearing them discuss their work and understanding their perspective and approach to research was invaluable and I hope this in turn will improve my own work. All in all I thoroughly enjoyed my first conference, both Edinburgh University and the IOP should be commended for providing the biophysics community with an interesting event that attracted excellent academic speakers."

SOFI Cohort 2 are busy on their UK tour. After spending three weeks in Leeds exploring different characterisation techniques, then back in Durham for some Outreach activities, they are now in Edinburgh for their final case study! But it's not all work and no play, they even managed to visit Tropical World when at Leeds in their spare time!

SOFI Cohort 1, on the other hand, will re-unite and return to Durham for some Enterprise training in April. However Alessandro and Papoole will not be joining as they will be over in the Netherlands at the Food Colloids Conference (www.foodcolloids2016.nl).



A Message from the Editor

Wow! What a busy three months! With both Cohort 1 and Cohort 2 a success, it's another jam packed newsletter. Thank you for all of your support. Looking forward to seeing you at the UK Soft Matter Showcase.

As always, any ideas, queries or feedback are appreciated, please email me at: n.y.d.li@durham.ac.uk

Durham International PhD Exchange Partnership

We have something exciting to announce! Durham has been awarded £120,000 by the Newton Fund to establish a PhD exchange partnership between the Durham Centre for Soft Matter and a consortium of South African universities coordinated by Stellenbosch University. This scheme will run alongside SOFI CDT and enable up to 10 PhD students from Durham University to visit South Africa for three months and 10 PhD students from South Africa to visit Durham. This scheme will also allow short staff visits to each country, the organisation of an annual mini-conference in SA and will allow our South African visitors (staff and students) to participate in our annual SOFI conference. For more information, please contact Lian Hutchings: l.r.hutchings@durham.ac.uk

Meet us at...

Prof. Brent Murray is busy working with colleagues at the University of Leeds to organise the most important SOFI annual conference, to be held on 28-30 June 2016. After the success of the previous SOFI Industrial Networking Event, held at the University of Edinburgh, the SOFI 2016 conference will capture all of what the networking event entailed and more. Events will include a poster session from SOFI Cohort 1 students, speakers, one on one meetings as well as networking. This jam-packed two-day event is something not to be missed.

The event will be a great way to get the SOFI community together as well as welcoming new SOFI members. Registration is now open, please follow the link: <http://store.leeds.ac.uk/browse/product.asp?compid=1&modid=1&catid=693>. Note that SOFI CDT students can claim back their registration fee with their travel budget!

The UK Soft Matter Showcase Conference will be followed by dinner at the Leeds Town Hall which will be something spectacular! This is definitely not an event to be missed. So let's get the whole Soft Matter Science community together. See you all there!

Any queries, please contact: Brent Murray: B.S.Murray@food.leeds.ac.uk or email soficdt@leeds.ac.uk.