

SOFI CDT Newsletter

November 2015

SOFI Student: Alessandro Gulotta

My name is Alessandro Gulotta, I'm from Italy and I have a Food Science and Technology degree taken at University of Udine. After spending six months at the University of Massachusetts in Amherst as a visiting scholar, I decided to continue my career by doing a Ph.D. I then joined the SOFI CDT in Durham and, at the end of six months training, I decided to choose a Ph.D.



project based at the University of Leeds under the supervision of Prof. Brent Murray and Dr. Johan Mattsson. My project is partially funded by Mondelez International. I'm working on food grade gels and studying their characterization, as well as studying their interactions between co-solvents, salts, proteins added. Moreover, I'm going to characterize the physical behaviour of these gels. At the present time, I'm focusing on rheology analysis to understand how my samples are behaving under different conditions. Soon, I'm going to start working with laser scattering techniques and, to some extent, link the scattering data to the rheometry data.

SOFI Staff: Kison Voitchovsky

After completing a double bachelor in physics and mathematics at the University of Lausanne (now EPFL), I made my first steps as an experimentalist with a Masters in femtosecond spectroscopy of solvation effects awarded by the same institution in 2003. I continued my postgraduate studies at the University of Oxford where I obtained my PhD in 2007. My research focused on the



biomechanics of membrane proteins, in particular the influence of salt ions on the membrane stability, elasticity and structural dynamics at the molecular level. My work, largely based on atomic force microscopy (AFM) also highlighted the complex interplay between the properties of the biomembrane and that of the interfacing solution. The following 3 years were spent as a Research Fellow at the Massachusetts Institute of Technology, where I worked on AFM approaches to quantify the nanoscale organisation and dynamics of liquid at the interface with various solids, including soft and bio-like systems.

I returned to Switzerland in 2010, and following 2 years at EPFL as a senior research fellow, I have taken a Lectureship at Durham University since October 2013. Currently, my group's efforts focus on unraveling liquid-driven nanoscale phenomena occurring at biointerfaces. I have recently been awarded the IOP Early Career Award in Liquids and Complex Fluids for my contribution to the field.

A Message from the Editor

I hope you enjoy this issue of the newsletter. The newsletter is written and edited by SOFI CDT Cohort 1. Please join me with thanking my team-Ethan, Rahul, Jake and Edgar. See you on the next issue! Any comments, please get in touch.

Denise n.y.d.li@durham.ac.uk

SOFI Student: Laura Sawaik

I'm Laura Sawaik and I graduated with an MSc in physics from Queen Mary, University of London. I spent a year gaining research experience in the Biological and Soft Systems group at the University of Cambridge before enrolling at the SOFI CDT. I am now at the University of Edinburgh under the supervision of Prof. Wilson Poon. My project is on the rheology of concentrated suspensions, in particular



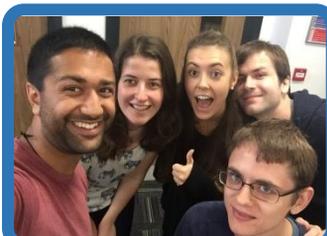
to understand the mechanism of shear thickening which has been under debate for about two decades. An example of shear thickening is a person running on the surface of a cornstarch in water solution, follow the link! <https://www.youtube.com/watch?v=f2XQ97XHjVw>. The same solution can be a fun way to involve children in physics demonstrations - an impact makes it solid where it would flow if pushed gently. I recently used this to participate in an outreach project.

A Word from the Chairman himself!

I had the pleasure of asking the almighty Prof. Tom McLeish, the Director of our SOFI CDT to give his views on the progress of Cohort 2 and the future plans for SOFI CDT!

"As the Director of the CDT I get all the fun stuff to do (mostly). But the best is seeing our SOFI CDT students take their significant steps towards fully-fledged science research careers. This autumn has brought the double pleasure of seeing our first cohort (the 'weight-lifting guinea-pigs' - they'll explain) getting into their PhD projects, popping up at conferences, making links with industrial partners on the one hand, and welcoming the new cohort 2 on the other. 'Class of '15' looks every bit the part that the ol' '14s did, and as I write have just blown Ian Robinson (industrial partner Lucite) and me away with their PolyParrot presentations at the end of the first case study. Ever keen to improve the SOFI experience, cohort 2 actually made and measured their own polystyrenes (sorry we didn't manage that for you, Denise and friends), and the *flowSolve* geometries this year were considerably wackier (thanks as always to the amazing Dr. David Hoyle for unflappable instruction into the fine arts of doing science with dodgy home grown software). Meanwhile I've been working with Profs. Brent Murray and Helen Gleeson towards a very exciting annual SOFI conference and industrial horizon scanning day for 2016 in Leeds. Cohort 1 will be

competing for their first oral conference presentations ... watch this space for the clash of the Titans." The Case Study involved each team inventing and pitching their own products with their very own polymer named "PolyParrot". Enjoy your prize. Best of luck for Case Study 2 which involves ice cream!



The winners of Case Study 1 from Cohort 2! Well done for your impressive work.

Outreach

There is a lot planned for the SOFI Outreach team. Newly elected outreach leaders are Denise, Jon and Jake, students from Cohort 1 and a student from each university. The aim is to make SOFI CDT a “noisy CDT” and help to educate the wider community about Soft Matter and our research. If you would like us to help or get involved with any outreach activity within your university, company or group then please send us an email: n.y.d.li@durham.ac.uk

SOFI CDT members are already getting out there and involved in local outreach projects and events. A few members of SOFI CDT have become STEM ambassadors, working as part of ChemSG, a group of volunteers from Durham University; funded by the RSC to engage with local children's groups of Scouts, Brownies and Rainbows through interactive science demonstrations. This October, Durham University hosted its annual three-day *Celebrate Science* festival on Palace Green, Durham. Exhibitors from university departments and industries demonstrated their work to excite and inspire the next generation of scientists. Durham Chemistry's contribution was *Amazing Materials*, which included thermochromic liquid crystal plates, polymer-based touchable bubbles, and demonstrations on the properties of liquid nitrogen, ferrofluids and superconductors amongst many others. SOFI CDT Cohort 1 students Ben and Jon were there to help enthuse the young scientists and recruit for Cohort 12 and beyond!



Ben representing SOFI at the Durham Celebrate Science event

SOFI Out and About

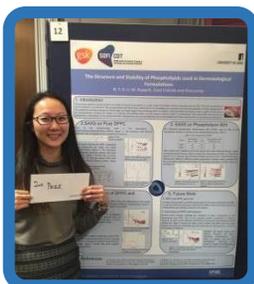
As well as getting into outreach activities, SOFI Cohort 1 have been busy attending science discussions and conferences. SOFI Students and Staff members travelled to London to attend a Royal Society Scientific Discussion on *Soft Interfacial Materials: from Fundamentals to Formulation* which was organised by Prof. Mike Cates FRS, Prof. John Seddon, Dr. Nicholas Brooks, Dr. Paul Clegg and Prof. Alex Lips. The event was organised so that after the talks, the speakers were able to take questions from the floor. SOFI academics Dr. Simon Titmuss, Prof. Wilson Poon and Prof. Tom McLeish all had their questions answered. Hopefully next year the SOFI students will pluck up the courage to contribute to some questions and the poster session!

The event was attended by Prof. Tom McLeish, who manage to catch Prof. Wilson Poon and SOFI students Denise and Ethan off guard, resulting in this rather amusing photo! Whether it is enjoying each other's company, the stimulating poster or the food. No one will know!



SOFI members at the Royal Society

SOFI student Ben presented a poster at a symposium held at Durham University titled *Advances in understanding materials using extensional flow*. Ben will be presenting a poster again at the British Society of Rheology meeting in Glasgow next month.



Denise with her poster!

Leeds SOFI students Alessandro, Papoole and Denise attended the annual Food Science and Nutrition PhD conference where Denise won 2nd prize for her poster. Finally, Dan C is attending the *Frontiers in Green Materials* conference in London in December (<https://www.ice.org.uk/events/frontiers-in-green-materials>) and will be presenting a poster titled "Expanding the Monomer Scope of Iron-Mediated Controlled Radical Polymerisation". SOFI Cohort 1 are very busy indeed, enjoy all of your conferences and poster sessions!

Congratulations Kison!

SOFI CDT academic, Dr. Kison Voitchovsky, received the IOP (Institute of Physics) Liquids and Complex Fluids Early Career Award at the IOP *Complex fluids under extreme conditions* conference on the 15th of September, 2015. The event, organised by SOFI CDT academic Dr. Margarita Staykova and attended by Cohort 1 students Ethan and Rahul, featured talks on a diverse range of topics, from the phase behaviour of concentrated protein solutions (Prof. Roland Winter) and the effect of sound waves on particle-stabilised droplets (Dr. Valeria Garbin) to the freezing of highly-confined liquids (Dr. Hugo Christenson, another SOFI CDT key academic) and the use of structured surfaces to reduce surface drag (Prof. Glen McHale).

Kison also presented his award lecture on the topic of the nanostructure of mixtures of propylammonium nitrate with *n*-alkanols near a mica surface. The conference also included a poster session, during which SOFI student Ethan presented his research on the design and characterisation of biointerfaces.



Kison accepting his well deserved award. Congratulations again!

Meet us at...

Prof. Brent Murray is busy working with the University of Leeds to organise **the most important** SOFI annual conference, to be held on 28-30 June 2016. After the success of this year's 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 three day event 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. More information will be provided in the near future.