SOFI CDT EPSRC Centre for Doctoral Training in Soft Matter and Functional Interfaces

NEWS LETTER

Dec 2020



Virtual group photos of Cohort 7!













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Note from the Editor

What's this? An early X-mas prezzie? It IS beginning to look a lot like Christmas! Despite the restrictions and lockdowns, there's still newsletterworthy stuff going on, so here you are. Don't miss a couple dates for the diary on page 3 and another potential X-mas present from Tom McLeish on the last page, if this newsletter is not enough for you. This is the last edition from me, so I'd like to say thanks to Lian and Linda for their huge input and help, Charlotte Pugsley for the proof-reads and everyone else who has contributed great articles over the last couple years! And good luck to the editor to come! Merry Christmas and a Happy New Year to you all. *Kalila* ©

Building a Cohort During a Global Pandemic

Back in January 2020, when Cohort 7 started receiving offers for their place on the SOFI CDT, it's safe to say none of us could have imagined what was ahead. "In a normal year" has become a staple phrase during our training because this year has been anything but normal.

On our first day, we were welcomed into the SOFI hub by Lian, however, the hub looked very different to previous years. We found ourselves in masks and spaced two meters apart, not quite the perfect conditions for fifteen strangers to get to know one another. Luckily, we had some help, and the next day we began our team-building led by the lovely Piero. On Tuesday, we were blessed with sunshine (something of a rarity in Durham), so we headed outside. If you want a group of people to identify shapes while blindfolded, we're your cohort, just don't ask us to lower a rod to the ground using sticks. On Wednesday, we headed to Go Ape in Newcastle where we spent the day swinging through the trees... some more reluctantly than others. It is a SOFI tradition to host a get-together with the previous cohort, and this year was no exception thanks to our good friend Zoom.

Since our induction week, we have tackled three case studies on plastic, ice cream and dirty water and have become pros at virtual presentations. We've also been hit with even more restrictions and a national lockdown, but through the power of technology with many Zooms, quizzes and even virtual escape rooms, fifteen strangers have become fifteen friends.

This year has been a great challenge for many, and we'd like to thank Lian and Linda for their incredible hard work running the CDT. Looking ahead to 2021, cohorts 7's only desire is that we finally get a long-awaited trip to the pub together, but for now, the only group photo we could manage was a virtual one – see the front page!



Written by Jenny Harnett

Meet Cohort 7

Introducing the new cohort:

- Katherine Carter completed an integrated master's in Chemistry at Durham University.
- Ben Coyne completed a master's in Chemistry at Durham University with an industrial year at DuPont Teijin Films.
- James Cresswell completed an integrated master's in Chemistry at the University of Nottingham with a year in industry at Croda.
- Sebastian Croft completed an integrated master's in Physics at the University of Leeds.
- Luc Dewulf completed an integrated master's in Chemical Engineering at the University of Sheffield.
- David Evans completed an integrated master's in Physics at the University of Edinburgh.
- Thomas Gregson completed an integrated master's degree in Chemistry at the University of Reading before working in industry for several years on the development of adhesives.
- Jenny Harnett completed an integrated master's in Physics at the University of Leeds.
- Tom Lark completed an integrated master's in Physics at Durham University.
- Anna Lykkeberg completed an integrated master's in Chemistry at the University of Edinburgh with a year in industry at Croda.
- Jessany Marsden completed a bachelor's and master's of research in Physics at Nottingham Trent University.
- Cameron McAllister completed an integrated master's in Physics at the University of Bristol.
- Corey Stewart completed an undergraduate degree in Chemistry and a master's in Physical Chemistry at the University of Leicester.
- Nicolò Tormena completed a bachelor's in Biotechnology and a master's in Biophysics at the University of Trieste, Italy.
- Jinyi Xuan completed a master's in Chemistry at Durham University.

Action shot of unidentifiable member of Cohort 7 at Go Ape.







SOFI CDT Newsletter

The Soft Matter Show(case) Must Go On!

Well, 2020 didn't really turn out like any of us had expected and SOFI/SOFI² CDT and everyone in the CDT will have been impacted by the darned Covid-19 to some extent. However, in the spring, as we all got used to living in lockdown, the CDT Management Board took the decision that the annual celebration of SOFI/SOFI² science – The Soft Matter Showcase – must go ahead. At that point in time, none of us had participated in a fully online conference, let alone organised one. I (as a techno-numpty) was a bit apprehensive, but I need not have feared. Like most of what happens in the CDT, it was a roaring success – in spite of my Luddite tendencies. The event took place on July 9th and 10th and full credit for making it happen must go the CDT administration team - Linda, Joanne, Lyndsey and Thelma - who worked tirelessly and fearlessly in advance of, and during, the event to make sure it all went seamlessly well. To my recollection, there was but one minor technical hitch that was rapidly addressed.

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In many respects, things were not dissimilar to previous Showcase Conferences. There was an excellent programme of lectures, with each day kicking off with invited external speakers – Professor Rachel O'Reilly (University of Birmingham) and Dr Patrick Warren (Unilever and STFC) on the 9th and 10th, respectively. There were also notable contributions from SOFI Cohort 1 alumni Dr Rahul Chacko (University of Pennsylvania) and Dr Denise Li (then Mondelez, now University of Edinburgh). In addition, there were 11 lectures from current CDT PhD students from cohorts 3, 4 and 5. What was different was that all of this was delivered via the power of Zoom. I don't know about you, but before 2020, the only Zoom I was familiar with was the ice lolly (anyone < 30, google it)! Our ambition did not stop there. We (I say we, I mean the admin team) decided that it would also be possible to have a virtual poster session, also achieved using multiple Zoom meetings over the two lunchtimes. It was different, but it worked! Not only did it work, but the number of participants in Showcase 2020 was higher than any previous Showcase. In total, over the two days, there were 160 "attendees", including many Cohort 7 students who hadn't even joined us at that point, and colleagues from the US, Germany, Norway, Italy, Malaysia and India!

And finally, prizes were awarded to the best student oral and poster presentations. I know that the judges had an awfully hard job picking the winners, but the prizes for best oral presentation went to:

Lucas Le Nagard (Cohort 5 - University of Edinburgh) - Bacteria confined in soft vesicles can generate active membrane tubes

Adam O'Connell (Cohort 4 – University of Leeds) - Rheology and light scattering of locust bean gum

and the prizes for the best poster went to:

Kalila Cook (Cohort 5 – University of Leeds) - Developing Modelling and Experimental Tools to Examine Network Formation in Protein Hydrogels

and Philip Hope (Cohort 3 – Durham University) - Multivalent Fullerene Adducts for Functional Materials.

Congratulations to the prize winners and all CDT student presenters! Here's looking forward to a less complex and challenging 2021.

Written by Lian Hutchings (CDT Manager)

Save the dates!

- Discover L'Oréal Research and Innovation: **15/01/21, 13:30 to 14:45** via Teams. Registration details to follow.
- Mini MBA for cohorts 5 and 6: block out the weeks commencing March 22nd and March 29th in your diary!





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Burhan's SCI Scholarship

Burhan Hussein, Department of Chemistry and PhD Fellow of the Durham Energy Institution, has been awarded an SCI scholarship of £5,000 over two years to support his studies as part of the SOFI CDT on "Manipulating Interaction across Lipid Membranes" within the McGonigal Group at Durham University.

In addition to the scholarship, he will benefit from publishing opportunities, access to a high-calibre network to help launch his career and opportunities to present his work and raise his profile within the scientific community.



SCI Scholarships are prestigious and well respected by the industry. The SCI Scholars Fund was established in 1920 by the requests of Rudolph Messel and John Gray, both former presidents and founding members of SCI. SCI believes in nurturing the scientists of the future. Each year, SCI provides scholarships and bursaries to early career scientists including opportunities to attend or present at an international conference. Durham University, SOFI CDT, and Durham Energy Institute are pleased that Burhan Hussein has been offered this Scholarship and that his work on the fundamental understanding of how to manipulate transmembrane interactions necessary for artificial enhancement of photosynthesis will benefit from the additional contacts and support he will gain from this valuable opportunity.



SOFI Alumna profile: Jess Andrews

I joined SOFI Cohort 2 in 2015, and after the initial training period learning about all things soft matter, I started my PhD in the Steed group at Durham. I studied the controlled crystallisation of pharmaceuticals using tailored supramolecular gels. I aimed to produce gelators, or gel-forming molecules, that formed a non-covalent interaction with the crystallising drug molecule. These interactions provide a template which stabilises high energy crystal forms of the drug and allows them to crystallise more readily. This technique can be incorporated into traditional screening methodologies to ensure the solid-form landscape of a drug candidate is well understood in early pharmaceutical development.

I am currently working as a Research Scientist in the National Formulation Centre at CPI. I first heard of CPI through a SOFI case study and I have wanted to work there ever since! I feel very fortunate that the CDT helped me identify the next step in my career, and I am pleased to be directly applying the skills I gained during my PhD.





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'Soft Matter Science and the COVID-19 Pandemic' – New Publication by Prof. Wilson Poon and Group

Professor Wilson Poon and researchers at the University of Edinburgh (including cohort 5 student, Lucas Le Nagard) have recently published an article in the journal Soft Matter on 'Soft matter science and the COVID-19 pandemic', outlined below.

The COVID-19 pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has been, and remains, a major public health challenge around the world. Scientists from many disciplines have joined forces to fight this pandemic, from biomedical scientists working on potential cures and vaccines to engineers designing and supervising the production of specialised devices such as respirators. Fighting a pandemic also requires a detailed understanding of the fundamental science underpinning disease transmission, much of which lies in the soft matter domain. Coronaviruses indeed consist of a lipid bilayer shell with embedded proteins enclosing the viral genetic material. These colloidal particles of about 100 nm in diameter, made of surfactants and macromolecules, travel in other soft matter objects, namely respiratory droplets and aerosols that contain a significant concentration of biopolymers and salts.

This article surveys aspects of soft matter science relevant to the understanding of Covid-19 transmission, focusing on the "outside story" (when viral particles are outside of the human body). It offers a perspective on gaps in the soft matter knowledge base highlighted by this pandemic, and suggests questions that need to be addressed in order to more efficiently respond to viral pandemics, now and in the future.

Reference: W. C. K Poon, et al. Soft matter science and the COVID-19 pandemic. Soft Matter, 2020, 16, 8310-8324. DOI: 10.1039/D0SM01223H



Schematic representation of some of the soft matter science relevant to COVID-19 spread, reproduced from Poon, et al. Respiratory droplets and aerosols containing salt and biopolymers are depicted in red, while viral particles are in black (not to scale!).







'Spinning Buckets' – A Research Podcast by Daniel and Alex, Cohort 6

In case you don't already have enough research in your life, Daniel Williams and Alex Gresty (Cohort 6) have launched a new podcast to satisfy your thirst for knowledge. 'Spinning Buckets' is a weekly talk show that invites guests to talk about their research in a way that anyone can understand (absolutely no academic jargon allowed). The show invites guests from a whole host of backgrounds to discuss a range of topics, from the formation of planetary discs to using big data science to predict voting patterns to the influence of language on public opinion of refugees; it really is a mixed bag! The goal of the podcast is to make research accessible for all, by removing technical terms and getting guests to explain every detail of what their research entails. If you've got a spare 30 minutes, give it a listen or check out their Instagram and Twitter (@spinningbuckets) to find out some more about upcoming episodes!

Written by Alex Gresty (Cohort 6)



'SOFI Sessions' – A PhD Podcast from Members of Cohort 5

Adjectives such as 'unprecedented' and 'extra-ordinary' are being thrown around a lot these days (no doubt this newsletter already contains one or two...), so I'll refrain from using them to describe Cohort 5's latest adventure. Having said that, none of us in January would have conceived the possibility that, come December, our voices would be playing through headphones in Sweden, Israel and Saudi Arabia!

In the summer, Piero ran an innovation training activity with C5 after musing with Lian about the plight of SOFI students stuck at home; it was out of this that 'The SOFI Sessions' was born! We release a regular podcast on topics related to being a PhD student, hoping that undergraduates might learn more about SOFI and its students and what it's like to do a PhD in the UK. To date, we have over 350 downloads and listeners from 17 countries (including one from an unknown country - Cohort 8 to welcome SOFI's first North Korean student?).

Charlotte, Ruth, Burhan, Veronica, Merin, Lucas, Jack, and Seth all regularly contribute, but we've had guest appearances from other C5 members as well as Lian and Piero. We're planning on having more guests in future series about current soft matter research, PhDs and faith, and minority representation in academia.

If you'd like to listen to us, you can search for SOFI Sessions on Spotify, Apple Podcasts or Google, or go straight to our Podbean page https://sofisessions.podbean.com. We're also on Twitter with the handle @SOFI_Sessions and Instagram as sofi_sessions.











Prof. Tom McLeish on Writing 'Soft Matter: A Very Short Introduction'

I love the Oxford University Press (OUP) 'Very Short Introductions' and have a shelf-full of them at home, so was really chuffed when towards the end of my term as SOFI's first Director, I was asked to write one on Soft Matter! Four of the early cohort's PhD students offered their help in drafting diagrams and checking text, so it became a real SOFI project; I am very grateful to Peter Wyatt, Rebecca Fong, Vishal Makwana and Vanessa Woodhouse.

The road had a few bumps in it – I tend to read the humanities Very Short Introductions rather than the science ones (I had recently read the ones on Kant and Aristotle before starting the writing on Soft Matter) – so they were my guide on the level of challenge. The initial report I got back from OUP was tough - 'far too difficult!'. Pushback on the different expectations they seemed to have for sciences and humanities was to no avail. But the rewrite did the trick, and according to the reviews in so far, clearly has left it at the 'challenging - but that's a good thing' level, which I am pleased about. I always had in mind that it should be helpful as the first general reading a SOFI student might use in week 1.

I also wanted it to be more than science – so really enjoyed setting the great soft matter examples within their rich history, introducing some extraordinary characters, and stepping back just a little with some philosophy of science too. Hope you enjoy it! (and VSIs are great for Christmas presents....).

Written by Professor Tom McLeish



SOFI CDT

NEWSLETTER



'The Isolated Lives of PhD Students' – A Lockdown Blog by Cohort 6

During the first lockdown, the members of our cohort (Cohort 6) realised that everyone was handling being stuck inside and having to work from home massively different. With all of us having just chosen our projects but going into lockdown before we could even make a start, we found it exceptionally difficult to know if we were doing enough or even what we needed to be doing. To show each other, and anyone else who was interested, what a typical day in lockdown was like for us, we all wrote a short 'Day in the Life' blog post. We hoped it would help people understand that no matter what they were doing, it was enough.

To read the full account of how Alex, Daniel, Charles, Laura, Joe, Eugenia and Phoebe spent and survived the day, visit their blog Isolated PhD Students' at 'The Lives of (https://soficohort6.wordpress.com/).



Members of Cohort 6 in the good old days.

Written by Daniel Williams (Cohort 6)

Keep up with all the SOFI news online! Find us on

SOFI CDT SOFI' CDT www.dur.ac.uk/soft.matter/soficdt/

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