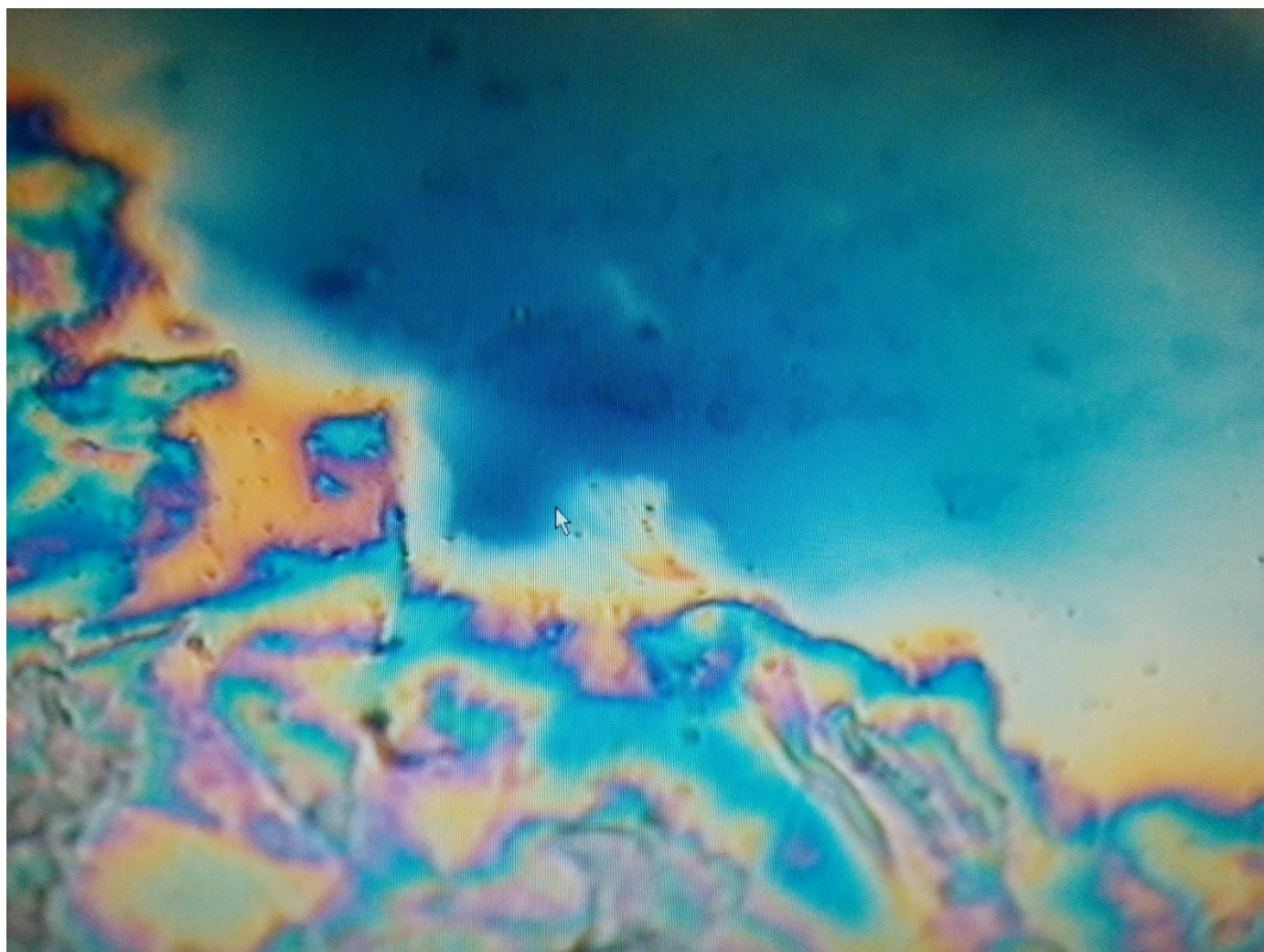


Centre for Doctoral Training in Fuel Cells and their Fuels

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CDT Fuel Cells and
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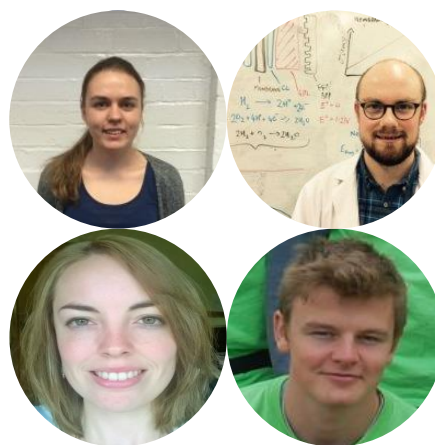
UCL

Welcome

Welcome to the January 2016 edition of the new newsletter for the Engineering and Physical Sciences Research Council funded Centre for Doctoral Training in Fuel Cells and their Fuels which is a research partnership between the Universities of Birmingham, Nottingham, Loughborough, Imperial College London and University College London.

This newsletter was compiled by University of Birmingham Editors James Walker and Aimee Jackson with contributions from Site Editors Tom Heenan (UCL), and Sharleigh Talbot (Loughborough University), as well as students from our partner universities. The editors are grateful to Project Officer John Hooper for his assistance. Readers can contact the editors with comments and contributions at:

hfc-cdt-editors@contacts.bham.ac.uk



Top: Aimee and James.

Bottom: Sharleigh and Tom.

Thanks to Hal Robbs for our cover image: his metallated polymer of many colours. Other highlights in this edition include an insight into the recent conferences and a round-up of public outreach activities from across our network.

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Our Researchers: The Newbies

Ten new students started their PhDs within the CDT in 2015. We're sure readers would love to hear all about them and we managed to catch up with a few of them.

Six members of the new cohort will be based at the University of Birmingham:



From left, Birmingham-based students; Oujen, Melissa, Pete, Sathish and Ellie cleaning one of our fuel cell vehicles.

Peter Mardle

grew up in Bristol and completed a masters in chemistry at the University of



Southampton. In his PhD, he hopes to synthesise core shell nano-wires for use as the catalyst in PEFCs. In Peter's

spare time he likes to travel, play squash and watch sports.

Oujen Hodjati-Pugh

is a Persian-Welsh hybrid. He was born in London and bred in



the valleys of Shropshire. He studied Chemical Engineering with Energy and Environment at the University of Manchester. In his PhD, he will focus on SOFC stack development and design. Oujen is a keen Karate student and instructor, who also enjoys experimental cooking and traveling.

Alan Stephen,

also based in Birmingham, is focussing on Biological Hydrogen



Production from Biomass Wastes. Prior to joining the CDT, he completed a Masters in Biochemistry, Molecular and Cellular Biology at the University of Oxford. In his spare time, he's involved with charities.

Graham Stevenson,

who'll be pursuing his PhD at Imperial College London, is originally from a small town outside Glasgow called Irvine. He



He moved to Glasgow to study a masters degree at the University of Strathclyde in Applied Chemistry and Chemical Engineering where he specialised in physical chemistry. Graham will be researching lanthanum strontium titanates for use as anodes in solid oxide fuel cells, and monitoring the ex-solution phenomena that occurs when these are reduced, in order to design microstructures with catalytic properties. Outside of his PhD, he enjoys going to the gym, cooking and playing a few of his musical instruments.

Unfortunately, we didn't manage to catch up with the rest of the cohort. The editors can only assume their hydrogen tanks are running low. We hope to feature them in future editions. 😊

What Have We Been Up To?

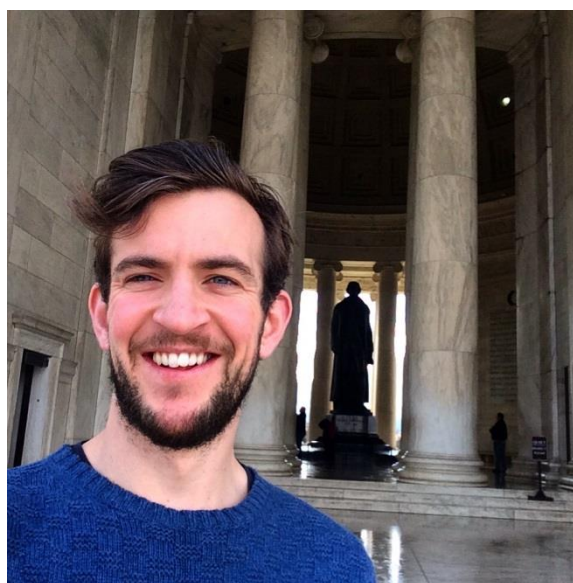
Transportation Research Board 95th Annual Meeting – Washington D.C.

In January, final year PhD student Scott Hardman attended the 95th Annual meeting of the Transportation Research Board (TRB). The conference is the largest of its kind, attracting 14,000 participants this year. The conference covers all aspects of transportation from Trains & Planes, to Alternative Fuels and novel bridge design. No hover crafts featured though, much to Scott's disappointment.

Scott was attending sessions on alternative fuel vehicles, mostly battery electric vehicles and fuel cell vehicles. These talks concentrated on issues with introducing these vehicles to markets, and finding ways to encourage consumer uptake. Many of the speakers sought to make recommendations to policy makers on how they can support the development of battery electric and fuel cell vehicles.

Scott was presenting research which he conducted in 2015 whilst at the Institute of Transportation Studies at University of California, Davis. This research

explored a number of themes, but Scott's TRB presentation provided insights into why consumers make the decision to purchase battery electric vehicles and the importance of financial purchase incentives.



Scott and his new friend Thomas Jefferson.

Supergen 2015

The 2015 H2FC Supergen conference was held in the beautiful city of Bath, where researchers from across our network met to discuss developments in fuel cell and hydrogen research. Of our CDT students, first year Graham Stevenson presented 'Engineering Ceramic Scaffold Electrodes for SOFCs and SOECs', and second year student Thomas Heenan presented 'Lab Based X-ray Computed Tomography Investigations of SOFCs at Multiple

Length Scales'. Interesting talks were given by many leading figures and, as always, a brilliant conference dinner was provided, this time in the city centre Assembly Rooms. The students are very much looking forward to Supergen 2016.

3MT at Supergen

Congratulations to Vikrant who won the 3 Minute Thesis competition at Supergen.



Vikrant proudly accepting his certificate.

4th Nano Today Conference

Andrew McInnes from Loughborough University recently travelled to Dubai to participate in the 4th Nano Today conference. Andrew presented work on the enhancement of photoelectrochemical water splitting using oxidised titanium nanoclusters. He found Dubai to be an incredible city, thoroughly enjoyed the conference and appreciated the cosmopolitan nature of

the venue. The conference dinner was held on the 3rd day in the middle of the desert - after a rally / safari through the sand dunes!

Community Day, Sunday 6th September 2015

Sophie, Melissa and Yaxiang took part in University of Birmingham's Community Day on 6th September, using their Sunday to inform the local community about hydrogen and fuel cells. There were two demonstrations, one inside Aston Webb with the hydrogen fuel cell-powered Scalextric, and one outside in Chancellors Court with the Green Microcab.



Melissa and Yaxiang with the Hydrogen Fuel Cell Powered Scalextric track.

The Scalextric grabbed the attention of attendees of all ages; children enjoyed the fast cars and the adults were intrigued by the alternative power supply. This provoked conversations surrounding sustainable energy,

hydrogen capacity as an energy carrier, and the inner workings of a fuel cell. Outside with the Microcab, Sophie guided curious visitors around the car, telling them about the fuel cell. Questions predominantly concerned costs, refuelling and hydrogen sources.



Sophie outside with the Green Microcab.

Naked Scientists

The Naked Scientists is an award-winning broadcast organisation that produces weekly shows, articles, news stories and special podcasts. Thanks to the Royal Academy of Engineering, Rosie Davies spent 8 weeks working with them as an intern. During this time, she produced weekly news pieces in both audio and written formats that were published on their website. The radio news pieces went out on BBC Radio Cambridgeshire, BBC 5live and were also broadcast in South Africa and Australia! At the end of her placement, she produced a whole hour long show

on the topic of Big Data, which you can listen to here: <http://www.thenakedscientists.com/HTML/podcasts/naked-scientists/show/20151117/>.

All her great content can be accessed using this link: <http://www.thenakedscientists.com/HTML/about-us/who-are-we/people/rosalind-davies/>

Rosie's Charity Challenges

Rosie has also made progress in her year of charity challenges, with learning to unicycle in October, and using a space hopper to commute in to work in November. You can see the video of that here: <https://www.youtube.com/watch?v=DrjEcfTr2Ho> and you can donate to the excellent cause by going to www.justgiving.com/RADCC2015.

Outreach Activities

Brownies in Chem Eng

Organised through the public engagement team at Birmingham, Birmingham PhD student Aimee assisted Jon Wood to deliver an evening practical session to a local Brownie pack, in order to gain their Science badge.

The session included 4 experiments specially designed to be exciting and engaging for the group of 7-10 year olds. The first experiment involved making slime from PVA glue and washing detergent. The second experiment was making a balloon powered car, which led nicely into the third experiment, which was a demonstration of a rocket propelled by isopropyl alcohol. The fourth experiment was on a slightly different theme, and involved looking at some plant cells under a microscope.

The evening was very successful, and another local Brownie pack has booked in for a similar evening.

UCell Update

The last few months of 2015 provided some interesting events for UCell. In November, the team were invited to Oxford University to give a guest lecture hosted by their Energy Society, discussing the advantages, limitations, and misconceptions of the hydrogen economy. UCell went to Teen Tech in December engaging with young individuals, demonstrating the importance of hydrogen fuel cell technology, and hopefully inspiring them to pursue careers in STEM subject areas. The group have also been asked to give a guest lecture at Max Fordham, an engineering company whose projects include the Tate Britain and the Theatre Royal Glasgow. The talk will take place in early 2016, discussing how hydrogen and batteries may help improve sustainable housing designs, with a host of other activities to follow. Hear more about these exciting future activities in the next newsletter.

Before we go, see if you can spot yourself in our Christmas montage:

Thanks to Lois for organising the Birmingham Christmas events, and to Sophie for the Photos



A Few Words from John Hooper:



I circulated an email before Christmas but would like to thank everyone once again for the card and gifts Lois presented me with at the Birmingham Christmas party. I appreciate very much the kind words, support and appreciation - and spent most of Christmas trying to turn that obstinate wooden man into a cube which he still refuses to do! My theory is he must be an old wooden man who is not as supple as he used to be! The biscuits and tea on the other hand were far more approachable and delicious. Thanks again and as always, it's a pleasure working with you all!

Announcements & Closing Remarks

Don't forget to let John Hooper (J.C.Hooper@bham.ac.uk) know about any conferences that you attend, along with your talk or poster title.

That's all for this issue - thanks for reading! Any comments, captions or contributions to the next edition can be sent to the editors at hfc-cdt-editors@contacts.bham.ac.uk or tweet us at @FuelCellsCDT. You'll also find us on Facebook as 'Fuel Cells and their Fuels CDT'.