

# IAFSS Newsletter – Imperial College London Update

Hello to all from Imperial College London! We hope you are all doing well since last June. Before beginning the update, we would like to give a big congratulations to our collective supervisor Professor Guillermo Rein, who received his professorship in fire science last September. With that major news out of the way, here are some more general updates.

## Graduating Students

Following the last newsletter, Dr Egle Rackauskaite submitted corrections from her viva and has now officially received her PhD, and has been working as a fire engineer at Arup London since May. Dr Izabella Vermesi, Dr Francesco Restuccia, and Dr Nils Roenner have also graduated in the last few months. Izabella is now working at Bureau Veritas, Francesco has stayed at Imperial for his post-doctorate studies and Nils has returned to Germany to work in data analysis at BSF.

We also said goodbye to one of our post-docs Dr Nieves Fernandez-Anez, who has taken up a new position as Associate Professor at Western Norway University of Applied Science. Congratulations Nieves, we wish you and everyone else the best of luck.

## New Arrivals

Despite saying goodbye to a few of our students, Hazelab has grown in size over the last few months. We now have a total of 14 PhD students and 3 Post-Docs. Among the new arrivals, we welcome Xuanze He and Zhenwen Hu from the University of Science and Technology of China (USTC) and the Harbin Institute of Technology (HIT) in China, who are each funded by a CSC scholarship to study different approaches to modelling self-heating ignition in batteries. We also welcome Benjamin Khoo from University College London (UCL) and Francesca Lugaresi from Imperial College, who are both funded by Arup to study facade fires. We are additionally joined by Wuquan Cui, who finished his master's thesis at the University of Maryland, and Dwi Marhaendro from Imperial College, who will both be studying as part of the ERC funded project on peat fires.

Our new Post-Docs are Guoxiang Zhao, who completed his PhD at Ghent University on the topic of modelling design fires for facade tests, and Hafiz Mohammed Fahad Amin, who completed his PhD at King Abdullah University of Science and Technology (KAUST) on the topic of the formation of soot particles, who will also both be joining our ERC funded project on peat fires.

## Conferences

Obviously the biggest conference news was last year's IAFSS 12<sup>th</sup> International Symposium. All members of Hazelab at the time attended, with eight members of the group giving presentations and six members presenting posters on their work. We were excited to find our own Franz Richter and visiting scholar Rahul Wadhvani won two of the Sheldon Tieszen Student Awards, and Yuqi Hu won the audience choice award for best poster. There also may have been some Avengers-esque fisticuffs with the University of Edinburgh fire lab (see photos below).



Figure 1: Left: Yuqi with his award winning poster. Right: Hazelab enjoying a delicious banquet, then taking it outside for an after dinner 'debate' with Edinburgh

Nils Roenner also presented a poster at 2017 conference for Fire Retardant Polymeric Materials in Manchester (FRPM 17) and won 3<sup>rd</sup> prize for best poster, which was on the topic of fire ignition.

In February, Franz Richter presented his work on timber in fire at 2018 SFPE Europe Fire Safety Conference in Rotterdam, where he met a positive response and good questions. He also later gave a webinar on this topic, which received a great response. In April, Hazelab gave three presentations at SFPE's 2018 12<sup>th</sup> International Performance-Based Codes and Fire Safety Design Methods in Hawaii, presenting work on fires in combustible cladding, timber in fire, and large scale fire experiments. They also managed to find some time outside of the conference to explore Hawaii's beautiful landscapes.



Figure 2: Hazelab takes full advantage of the international conference opportunities

In July, five members of Hazelab presented at the 37<sup>th</sup> International Combustion Symposium in Dublin. They presented on a range of topics from polymer flammability to biomass emission in large-scale peat fires. All the work was well received. Special congratulations also go to Xinyan Huang for winning the Bernard Lewis Fellowship.

In September, five members of Hazelab presented at the 3<sup>rd</sup> European Symposium on Fire Safety Science (ESFSS 2018) in Nancy. They presented one keynote, two papers, and two posters. Their keynote was presented by Guillermo Rein, who highlighted the important role of smouldering in wildland and building fires. Special congratulations also go to Franz Richter, who was shortlisted for best speaker of the conference.

## Other News

In September 2017, Hazelab turned their idea for a large scale natural fire experiment into reality inside an abandoned soviet era cow shed near Warsaw. With help from Arup, CERIB, ITB, EPSRC, and the local fire service, we were able to conduct the largest indoor, compartment fire experiment to date.



*Figure 3: Left: Hazelab meet the firefighters who helped with the Obora experiment. Right: Hazelab prepares the cow shed for incineration.*

Following the success of Obora, Hazelab conducted the 1<sup>st</sup> GAMBUT experimental field campaign and workshop of smouldering peat fires in Rokan Hilir, Riau, Indonesia. This activity was conducted in collaboration with the fire research group of Universitas Indonesia (UI), and lasted from 13 August to 3 September 2018. The experimental field campaign aimed to understand the behaviour of peat fires, in regard to their ignition, spread, gas emission, and extinguishment. The field setup was four plots, each with 10 by 10 m area of peatland. Simulated slash-and-burn were conducted to study the development of smouldering in terms of temperature, emission, surface infrared radiation, and depth of burn.

Hazelab alumnus Dr Virginia Alonso and current Hazelab member Edmund Ang teamed up to provide specialist evacuation and CFD fire modelling support, in collaboration with Forensic Architecture, as part of the fire investigation into the fatal fire at the Ali Enterprises textile factory in Karachi (Pakistan). 260 people were killed in the fire on 11 September 2012, and a further 32 were injured. The work has now been publicised on [ECCHR](#) (European Centre for Constitutional and Human Rights):

Hazelab members past and present, Dr Xinyan Huang and Dr Francesco Restuccia, alongside Michela Gramola, were awarded the Sugden Award from The UK Combustion Institute last October for their

paper *Experimental study of the formation and collapse of an overhang in the lateral spread of smouldering peat fires*. You can read the paper [here](#).

An Imperial-Arup collaboration won last year's C2i Collaborate to Innovate award in the built environment category, for their work: *Making the 38-storey, 52 Lime Street (Scalpel): Structural design of modern, open-plan buildings using the travelling fire methodology*. Congratulations to all involved.

Imperial College held a week celebrating diversity in STEM in January, where Hazelab showcased some of their research to students aged 7-13 years old from across London. The event was a big success – students seemed particularly taken by the demonstration of fire whirls.

Hazelab also returned to the Imperial Festival in April, following a successful stand the previous year. The event showcases research from across Imperial, connecting cutting edge research to issues that can capture the imagination of the public.



Figure 4: Eirik and Yuqi demonstrate Sirocco – Hazelab's fire whirl – to a crowd of fascinated onlookers at Imperial Festival 2017

In May, Hazelab took part in Fired Up! Edinburgh, a gathering of PhDs and Post-Docs studying fire from across the UK. The two days of presentations from all the participants showcased the incredible variety and quality of fire research this small island has to offer. It was a fantastic experience for both learning and connecting with other students. We offer our thanks to The University of Edinburgh for being such wonderful hosts, and we hope that we can do half as well in our attempts to organise the next one.

At the end of September, Hazelab will also presented at New Scientist: Live, the UK's biggest science festival. Held at ExCel, London, the festival contained over 100 exhibitors presenting on a broad range of topics. Hazelab's stand, opposite the Rolls Royce Bloodhound, attracted plenty of attention, and we received many great questions (why do fire tornadoes occur in real life, for example). We even ended up on a Welsh educational program. Let's hope we can repeat the event in the future.



Figure 5: Sirocco also manages to impress the audiences at New Scientist Live

In October, Guillermo Rein gave his inaugural lecture as a professor at Imperial College. The lecture theatre was packed with people wanting to learn more about “The Science of Fire”. The talk was fascinating, and we wish Guillermo much success in his new role.



Figure 6: Professor Guillermo Rein gives his inaugural lecture. I'm beginning to notice a theme with these fire whirls...

Finally, Hazelab would like to thank all of the academics who visited us and were kind enough to share some of their expertise with the group. These included Professor Arvind Atreya, Professor Ann Jeffers, Prof Joaquim Casal, Prof Yulianto Nugroho, Dr Juan Hidalgo, Dr Ricky Carvel, Dr Cristian

Maluk, Dr Cathelijne Stoof, Dr Simo Hostikka, Dr David Lange, Dr Yu Wang, Dr Wolfram Jahn, Dr Xinyan Huang, Dr Ruggiero, Dr Jie Ji, Dr John Gales, Zhenzhen Wang, Chloe Jeanneret, Ian Pope, Mateo Gonzalez, Marta Tena, Natalie Mazur, Bronwyn Chorlton, Ben Nicoletta, and Apollo Gerolymbos. Their talks allowed us to expand our knowledge of fire science beyond the restricted bounds of our respective PhD topics. Apologies to anyone we've forgotten



*Figure 7: Dr Cristian Maluk giving a talk on testing in structural fire engineering.*