

Hazelab Newsletter –Imperial College London

March 2021 – October 2021

Hello friends of Hazelab! Welcome to another update from Hazelab at Imperial College London. For more news follow us on twitter @ImperialHazelab, visit our [website](#) or watch our [video](#).

New arrivals

Firstly, we would like to wish a warm welcome to our newest member of the Hazelab family, PhD student **Nikolaos Kalogeropoulos**! Nikolaos Studied at Imperial for his Masters degree, and will now be pursuing a PhD on “Multiscale and Data-Driven Simulation of Wildfires for the Protection of Rural Communities Worldwide”. Welcome to Hazelab, Nik!

Over the summer, Hazelab also had the joy of hosting several UROP summer research students: Han, Clarissa, Edward, Jamie, and Francesco.

Edward studied the fire performance of aluminium columns via numerical simulations. **Clarissa** helped develop a field scale model of flaming and smouldering wildfires in tropical peatland using cellular automata. **Jamie** worked on AI approaches towards identification and segmentation of flames within images. **Han** worked on numerical models of ember flight during wildfires, to understand and mitigate against them. **Francesco** developed a set of fire-themed Heat Transfer problems for the 2nd year Undergraduate Mechanical Engineering course led by Guillermo. Thank you, UROP students, and we wish you the best in your future endeavours!



Graduating Students

This has been a dramatic year for people graduating from Hazelab – we have had four members submit their theses and pass their vivas! We would like to *proudly* congratulate **Agung** (Peat fires), **Mohammad** (Travelling fires), **Xuanze** (battery fires), and **Zhenwen** (battery fires) for all passing your vivas, and making the field of fire science burn a little brighter. From the aforementioned graduating students, Xuanze will be leaving Hazelab, and moving a few doors down to the battery research group, where he will continue to utilise his expertise in the world of burning batteries! Zhenwen is moving to China while Mohammad is staying at CERIB in France. Dr Agung Santoso is returning from Indonesia as a postdoctoral staff member to work on Arctic wildfires in a project funded by the Leverhulme Centre for Wildfires, Environment and Society.

Leonardo Caracci completed a final year project exploring the fire risk to London residents using the London Fire Brigade incident database. He scored well in his final report, and did a fantastic job presenting his work to the London Fire Brigade’s data analysis team. He is currently working on publishing this work in a scientific journal. **Hannah Nevill** completed her final year project on visualisation methods of evacuees during a forest fire, successfully integrating her work into the bigger WUINITY platform. **Nikolaos** worked on developing an improved algorithm for forest fire trigger buffer calculations called K-PERIL, which he integrated into WUINITY and will continue to develop as part of his PhD. Finally, **Olivia Keaton** for her final year project developed a finite element model to study the heat transfer through a timber beam and predict charring rates. We thank you all for your contributions and wish you all the best in your future career!

Conferences and Outreach

Despite some anticipated Covid-related challenges, this academic year has been an exceptional time for outreach from Hazelab to the fire science community and beyond!

Matt, Ben, Francesca, and Harry all presented posters on their research at the 2021 IAFSS virtual conference, which many of Hazelab also attended and even helped run (**Simona, Rikesh and Harry** all taking lead with official media for the event via twitter!).

At the Application of Structural Fire Engineering 2021 conference, **Ben** presented his work on Numerical validation of Firefoam for narrow facade cavity fires.

Matt and Guillermo were also special guest speakers on facade fires and peatland fires for the new and rapidly growing Fire Science Show podcast, run and hosted by ITBs own Wojciech Węgrzyński!

Prof Rein was also featured in a [video about wildfires](#) by The Sun newspaper, in which he demonstrates the principles of fire dynamics with matches, and discusses good and bad wildfires, firefighting and fire safety.

Awards

Guillermo was awarded the FORUM Mid-Career Researcher Award, which recognizes exceptional achievement and demonstrated leadership in the field of fire safety science. **Francesco Restuccia**, Hazelab alumni, was awarded an honourable mention for best thesis for the thesis titled "Self-heating ignition of natural reactive porous media", conferred by Imperial College. While **Xinyan Huang**, also Hazelab alumni, was awarded the 2020 Early Career Proulx Award. Congratulations to all!

Francesca was awarded the first prize at the 2021 Imperial PhD Summer Showcase. The competition is organized by the Graduate School annually to celebrate the research being carried out by the College's PhD students. Francesca submitted a 3-minute video entitled "Fire Safety of Glass Facades" and won over the jury with her stunning illustrations and engaging explanation.

Hazelab's 2018 review paper on smoke emissions from smouldering wildfires has been selected for the Special Issue in the International Journal of Wildland Fire in celebration of the journal's 30th anniversary. The paper was selected as one of the top 15 reviews published in the past 12 years (more than 700 papers!).

SFPE Greater London Student Chapter

The chapter received a 2021 Bronze Award of Chapter Excellence! This is our second award after the 2020 Silver award, we are now working hard for a gold award in 2022!

To promote the field of fire safety and the amazing people that have advanced and brought innovation to the field, we have launched PYROPEDIA, where we develop Wikipedia biographies for our favourite past and present fire safety pioneers. We are currently focusing on diversity, and therefore are promoting scientists and engineers from minority groups. For our first Wikipedia article we worked on the biography of Margaret Law from Arup and the Fire Research Station UK, who was a key proponent in fire-safe building design and external flaming. We have also announced the second edition of [Flash Points](#), a student communication competition for UK based students.

The chapter's monthly publicly available fire science webinars continue:

- **Xinyan Huang** from Hong Kong Polytechnic University– Fire Hazard of Dripping
- **Iza Vermesi** from Bureau Veritas– Fire Engineers What They Do?
- **Sandra Vaiciulyte** from Arup London– Human Behaviour in Response to Wildfires
- **Laura Schmidt from WPI Australia** – Char Fall-Off in Cross Laminated Timber Structures
- **Birgitte Messerschmidt from NFPA** – Fire Safety in US Since 1980
- **Egle Rackauskaite from Arup London** – Fire Experiment in a Large and Open Plan Compartment: x-ONE

Sign up to our mailing list by emailing sfpelondonstudentchapter@gmail.com for further updates!

Collaborations

A collaboration between Hazelab, CERIB and Arup was carried out earlier this year, in which two experiments were carried out on the largest mass timber compartment fire in



history (around 380 m²), with the aim of understanding how timber performs in larger spaces. A team of Hazelab members (**Harry, Rikesh, and Simona**) were invited to attend and assist in the design and data collection of the experiments. Being at the height of the pandemic, this involved turbulent travel, plenty of self-isolation, and preparing instrumentation in hotel suites! Initial reports from these experiments are [available here!](#)

A very important paper led by Hazelab was finally published. The paper reports observations from a large-scale fire experiment x-ONE conducted in Poland in 2017. The objective of x-ONE was to capture experimentally a natural fire inside a large and open plan compartment. With an open-plan floor area of 380 m², x-ONE is the largest compartment fire experiment carried out to date! The products of this collaboration between Imperial Hazelab, CERIB, ITB, the Polish fire service and Arup will be published as an open access paper available on Fire Technology from the 1st of October 2021.

Coping with the Pandemic

During the pandemic, **Dwi** created artistic images of Hazelab members by modifying photos in very creative and personal ways. The images are inspired by our individual work and have been collected into an online artbook. They are really, really cool, thank you Dwi - [Check out the Artbook!](#)



Our team is adapting and thriving in the new world of remote learning. During the pandemic, our team created and ran a home experiment for the heat transfer laboratory session for second-year mechanical engineering students. **Harry and Guillermo** helped lead development and running of the lab for 168 Mechanical Engineering students, all from the comfort of their home offices!

That's everything from us for now!

Written by Francesca Lugaresi & Harry Mitchell