

Hazelab Newsletter –Imperial College London

October 2023 – April 2024

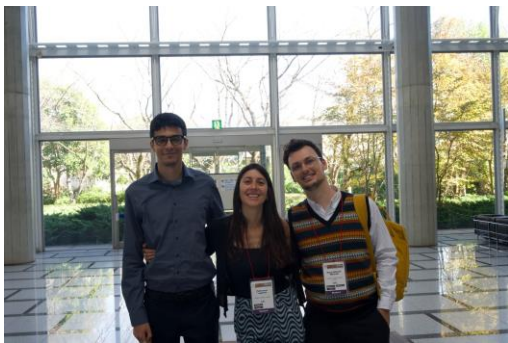
Hello friends of Hazelab! Welcome to another update of our recent activities on research and engineering. For more news follow us on twitter @ImperialHazelab, visit our [website](#), [publications](#), or watch our [video](#).

IAFSS 2023



One of the main events of the year for Hazelab was the IAFSS symposium in Tsukuba, Japan, that **Nikolaos Kalogeropoulos, Francesca Lugaresi, Harry Mitchell** and **Prof. Guillermo Rein** attended and met a large number of fellow fire scientists! Nikolaos presented his work on wildfire trigger boundaries, Francesca presented on mechanical failure of facades, and Harry presented his findings on smouldering fires in mass timber. We met a lot of collaborators and fellow IAFSS members, and were joined by Tommy, Francesca's son and the newest associate member of Hazelab! Hazelab had an amazing time in Japan with colleagues and friends from across the world (and singing Karaoke with some of them!). We can't wait to see you all again in La Rochelle in 2026!

Graduating and arriving students



We are pleased to congratulate **Dr. Harry Mitchell** and **Dr. Francesca Lugaresi** on completing their PhD studies in fire science and engineering! Harry's thesis, titled "Flaming and smouldering hazards in large timber compartments", studies flame spread, smouldering, and firebrands in large mass timber compartment experiments (CodeRed). Francesca's thesis, titled "Computational Study of Failure of Curtain Wall Facade Systems Exposed to Fire", models the numerical thermal and mechanical response of facade systems subjected to fire. Harry was examined by Dr. Erica Fischer (university of Oregon), and Francesca was examined by Dr. Matina Manes (University of Liverpool). Harry has started a postdoc in Hazelab on wildfires, and Francesca has joined as a postdoc the research group of Dr. Francesco Restuccia at Kings College to study battery fires. Best of luck, Dr. Mitchell and Dr. Lugaresi!!



We are especially thrilled to welcome two PhD students with outstanding backgrounds and a strong interest in fire research, **Alexander Castagna** and **Annabelle Hospital**. Alex starts his PhD studies on timber fires and wants to help engineers design a safer building, funded by Arup and EPSRC. Meanwhile, Annabelle is a part-time PhD student who is also working at CERIB (The Concrete Industry Study and Research Centre) in France, will be investigating smouldering in tall timber structures for her studies. Welcome to Hazelab, Alex and Annabelle!

Dimitra Tarasi joined as a visiting student for two months from the Technical University of Crete, Greece. She is developing global climate simulations including peat fires and worked with Hazelab on experiments and field trips to collect peat samples during her visit. We also had **Ignacio Alonso Calderon Espinoza**, a visiting student from the Pontificia Universidad Católica de Chile, visit us, during which he presented about his research on the timber compartments fires.



Conferences and Outreach

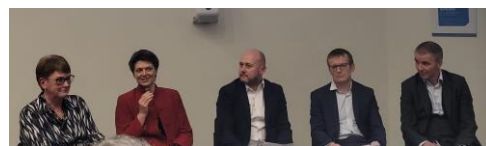
It has been a busy time for Hazelab outreach! In March, Hazelab presented posters of our research on mass timber, wildfires, and batteries at the Department Research Showcase. We then presented our research at an evening celebration of the UK's association to the Horizon Europe research scheme, meeting delegates from several research bodies and governments.

More recently, Hazelab, in collaboration with the SFPE UK Chapter and Greater London Student Chapter, hosted over 200 attendees from the fire engineering community for an evening seminar and panel discussion with Imperial alumna and Chair of the Independent Review of Building Regulations, **Dame Judith Hackitt**! Throughout the evening, Dame Hackitt and other panel members had a thought-provoking discussion with the audience on the future of building regulations and design in the UK.

Nick, Carlos and Guillermo attended the Hazards Forum's special event on wildfires as an emerging issue for the UK. The Hazards Forum discusses all aspects of hazards to life, property, and the environment of the UK. UK experts gathered to exchange lectures and discussions, including Guillermo giving a talk on wildfire dynamics, prompting discussions on future UK wildfire strategies.

Hazelab (**Nick, Carlos, and Afi**, with the help of Immy and Dimitra!) led a field trip to the Flow Country in Scotland, where we were welcomed by Prof. Roxane Andersen, an expert in peatland ecology, and together we sourced peat and vegetation samples for experiments. The samples will be used in peat fire experiments in the lab. We also attended the Flow Country research conference. It was fascinating how researchers have been using the Flow Country as a living laboratory to understand the effect humans and climate change are having on the natural environment. The trip was funded by Leverhulme Centre for Wildfires.

Hazelab is part of an EU Horizons project consortia called SEMEDFIRE, comprising of Imperial College London, European University of Cyprus, University of Wageningen, Pau Costa Foundation and Niemes Metropole. The project goal is to provide the foundation needed for the European University of Cyprus to develop tools and strategies to confront wildfires in Cyprus. Hazelab delivered a course on fire science to a diverse audience of stakeholders such as Cypriot Fire Brigade, Forestry Department, Ministry of Environment, UN Civil Defence, UK British Bases, fire engineers and researchers. A lecture was given by **Guillermo** on wildfire behaviour, building on his current collaboration with UK Met Office where he is providing a foundation for wildfire stakeholders in the UK. Nick presented his work on current models of wildfire hazards, and his PhD work that combines operational fire spread models and community evacuation modelling to inform decision makers of the different scenarios they may be confronted with should a wildfire ignite. **Carlos** created laboratory



video content that reinforced the lessons taught by Guillermo and Nick, which were then scaled to live demos for the course participants with support of the Cypriot Fire Brigade. These were inspired by the current fire operator training of UK Forestry Commission and we would like to thank Rob Gazzard for his support.

Awards

We are happy to announce that **Nick** has been awarded one of the SFPE student grant awards! Nick has been funded to explore the use of AI as a tool to predict wildfire spread and use it along with trigger boundaries to generate evacuation plans. Results are promising, with Google's new EPD-ConvLSTM model showing promise, cutting simulation time significantly and allowing for fast iterative probabilistic simulations.

Nick also received the Sheldon Tieszen award for best student-led papers in the IAFSS symposium! His paper on stochastic trigger boundaries introduces the k-PERIL algorithm and shows how trigger boundaries can be used to keep communities safe from wildfires by comparing required and available evacuation times, depending on wildfire spread.

Carlos was awarded a grant by the Leverhulme Centre for Wildfires to support him in leading the previously mentioned field trip to Flow Country in Scotland to collect peat and vegetation samples.

Afi was awarded a grant to develop a collaboration between Imperial College and NTU in Singapore, in which she will be developing and recording a series of informative videos on peatland fires!

Harry was awarded a grant acceleration grant by the Imperial Institute for Molecular Science and Engineering to support him in writing a grant on battery fires.

Written by Harry Mitchell, Nikolaos Kalogeroplous, Afi Mulyasih, and Carlos Walker-Ravena

Edited by Guillermo Rein