

Hello friends of Hazelab! Welcome to an 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](#).

It has been another busy but exciting few months for Hazelab! Recently, we had the 2025 Hazelab reunion, where current and former Hazelab members came together at Imperial College London to celebrate **13 years of ground-breaking research, collaboration, and community**.

The reunion was filled with great seminars on our group's research and history, dynamic group discussions reflecting on Hazelab's past and future, and plenty of networking across generations of researchers. A huge thank you to everyone who joined us and helped make the day so special.



### **Graduating and arriving students**

As more time passes, we say hello and goodbye to a number of amazing Hazelab members. **Dr. Rikesh Amin** successfully passed his viva and, after enjoying some very well earned time off, continues his academic career in the department of Civil Engineering, right next door to us. **Dr. Carlos Walker-Ravena** has also finished his postdoctoral research with us, now moving to research Lithium-ion battery fire safety in mines at Pontificia Universidad Católica de Chile.

This year we welcomed a lot of undergraduate students, working on various fire engineering topics for the year. **Yingfan Geng**, as his 3<sup>rd</sup> year Literature Review Project, conducted a historical literature review of the earliest fire models dating back to 1943. As a summer research student, he also investigated ways of automatically characterising firebrand characteristics in the built environment, and looked into machine-learning algorithms for computer vision detection of firebrands. **Sami Haque** is doing his Final Year Project on the wildfire spread simulations in Minecraft, understanding how wildfire currently spreads in Minecraft and making a “mod” to change the Minecraft wildfire spread to mimic the real world. **Frixos Papachristodoulou** is also doing his Masters' Project with us, investigating battery fires, and characterising the ejecta generated by batteries using our knowledge of firebrands. **Joel Koh** is the final Final Year Project student, doing simulation work on elevated fires in compartments, fires that may start in an elevated position such as a table or stove, and beyond the scope of compartment plume equations.

We are glad to be hosting a visiting researcher from Universitat Politècnica de València, **Carlos Guaraco-Figueira**. He is working on battery fires and will be studying in Hazelab as part of his PhD secondment.

### **Awards**

It has been a very good year for members of Hazelab, with plenty of important awards.

The most important award is of **Prof. Guillermo Rein**, OYC being inducted into the Order of Isabella the Catholic by the King of Spain. It is an incredible achievement, and one of the highest honours of the Kingdom of Spain, recognising **Guillermo's** contributions to fire science and safety. The award ceremony was organised by the Spanish embassy in London, with the Spanish Ambassador giving a speech, followed by a dedication from **Guillermo** (in Spanish).

Our own **Matthew Bonner** was awarded the best abstract award at the Society of Fire Protection Engineers 6<sup>th</sup> European Conference & Expo, where they presented their research on standardised facade tests and flammability.





We are also incredibly proud to say that two of our students received two of the best awards offered by the department of Mechanical Engineering at Imperial College London. **Dr. Harry Mitchell** received the Katapodis Prize for the best PhD thesis within the Thermofluids division of the Mechanical Engineering Department, and **Nikolaos Kalogeropoulos** received the Dr Ashraf Ben El-Shanawany Memorial Prize, for outstanding achievement by a PhD or EngD student to include research, public outreach, innovation and entrepreneurial achievement. Nick's award was celebrated in an award lunch with representatives of the department, Lloyd's Register Foundation who sponsored the award, and the supervisor and parents of Dr. Shanawany.

### Internal events and visitors

In March, the Hazelab team participated at the annual Department of Mechanical Engineering Research Showcase, presenting three posters on our research on fire dynamics in large timber buildings, wildfires and battery fires. We were honoured by the presence of some of our closest collaborators from Arup, Trigon, Hydrock now Stantec and the El-Shanawany family. It was an excellent opportunity to disseminate our research within the department and reconnect with some of our collaborators.

From January to March, Professor **Guillermo Rein**, assisted by **Alexander Castagna** and **Hanna Berry**, taught his module on Combustion Safety and Fire Dynamics to undergraduate and master students in the department. New successful learning opportunities, such as lab visits and office hours, were offered to the students by the team, which resulted in **Alexander Castagna** being invited to present these improvements to the wider teaching community at Imperial College. On the last day, the students were joined by Professor Andrew Whelton and 20 of his engineering students from Purdue University for a guest lecture on the impact of wildfires on the pollution of water supply systems.



In the new year we also hosted Mohd Zahirasri Mohd Tohir from Putra University Malaysia and Universidad de Navarra. We also hosted Elena Funk, PhD student on EV and Lithium-ion battery fires at King's College London and researcher at the Danish Fire Safety and Security Technology Institute. Finally, we were visited by Fernando Pérez Pérez from ETH Zurich for a week, with insightful discussions on experimental studies on the smouldering of wood.

In January, Hazelab hosted a seminar evening as part of the Society of Fire Protection Engineers UK Chapter. During this, Guillermo presented on Li-ion batteries and innovation blind-spots, Nick presented on Wildfires, and Harry presented on Mass timber building fires.

### Conferences and outreach

November was an incredibly productive month within the group, resulting in a total of 17 papers being written for four different conference submissions, resulting in one oral and one poster presentation in SFPE Europe in Edinburgh, three oral presentations in the Mediterranean Combustion Symposium in Corfu, five oral presentations in the International Seminar of Fire and Explosion Hazards in Rome, and four oral and three poster presentations at Interflam in London.



On the 8<sup>th</sup> of November **Alexander Castagna**, **Nikolaos Kalogeropoulos** and **Auriane Javaloyes** took Sirocco, our fire tornado, to the Royal Institution, where the annual Christmas Lectures, introduced by Michael Faraday, are held. Here they introduced fire science to high school students as part of the Earth Extremes outreach event.

In March, **Hanna** attended a school on battery research at the University of Warwick hosted by the Faraday Institute, where she learned about a wide range of research on battery technology and safety.

Earlier this year, **Harry** visited the UK House of Commons to present a poster on his PhD research on Mass timber building fire experiments, as a finalist in the Stem for Britain competition. Guillermo visited the Underwriters Laboratory (UL) and Fire Safety Research Institute (FSRI) offices and labs in January in his capacity as advisor to FSRI.

Finally, several Hazelab members attended the SFPE Europe Conference and Expo 2025. **Harry, Alex, and Auriane** had a great time volunteering to help with running the Conference, while **Afi** presented a poster on her research on peat smouldering, and Alex gave a presentation on numerical modelling of timber burning!

## **Publications**

It has been a successful few months for several new journal publications from Hazelab members! Please find links to our most recent papers below:

*Conceptual design of a wildfire emergency response system empowered by swarms of unmanned aerial vehicles*, International Journal of Disaster Risk Reduction, <https://doi.org/10.1016/j.ijdrr.2025.105493>

*Exploratory Simulations on the Effectiveness of Sand Protection Strategies Against Firebrand Accumulation in Wildfires*, Fire and Materials Journal, <https://doi.org/10.1002/fam.3286>

*Particles emitted from smouldering peat: size-resolved composition and emission factors*, Environmental Science: Atmospheres, <https://doi.org/10.1039/D4EA00124A>

*Quantifying fire evacuations in case of wildfire using trigger boundaries and case study of the 2018 Mati wildfire in Greece*, Safety Science, <https://doi.org/10.1016/j.ssci.2024.106691>

*Fire Inside the Cavity of a Non-flammable Facade: Step-by-Step Development of Multiphysics Computer Simulations*, Fire Technology, <https://doi.org/10.1007/s10694-024-01680-z>

*Predicting the Average Charring Rate of Mass Timber Using Data-Driven Methods for Structural Calculations*, Fire Technology, <https://doi.org/10.1007/s10694-024-01593-x>

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