International Association for Fire Safety Science

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Fire Safety Science News

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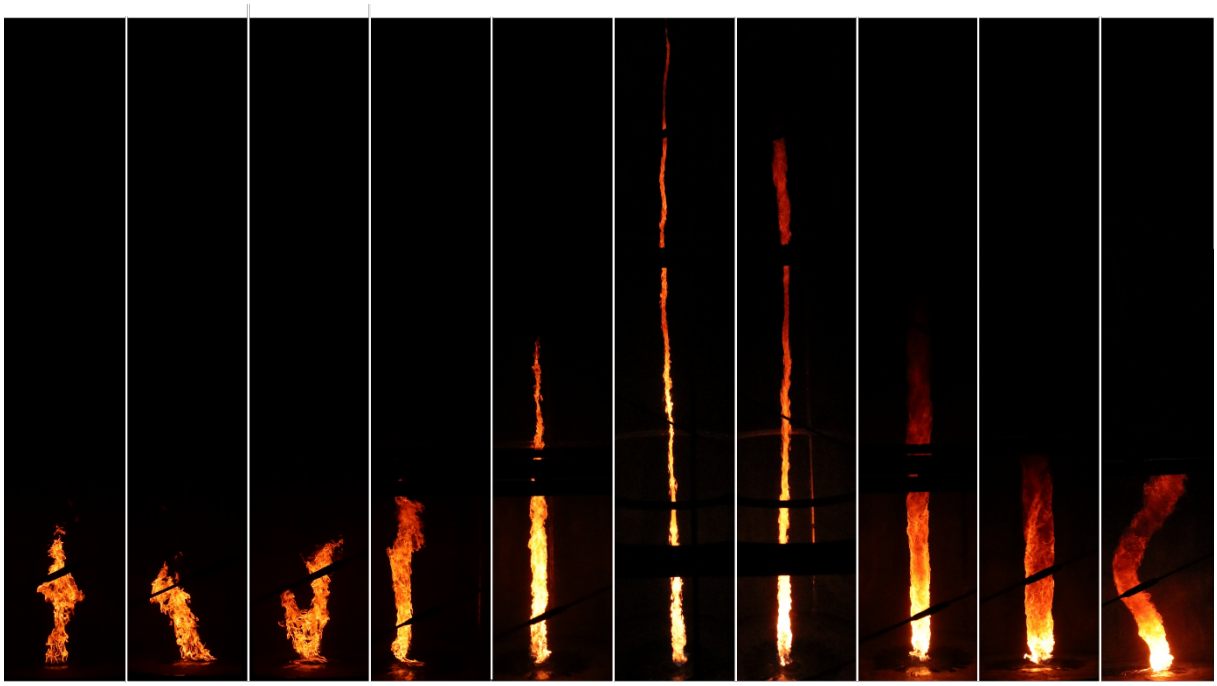


Fire whirls under different rotation strengths

IAFSS was founded in 1985 with the primary objective of encouraging research into the science of preventing and mitigating the adverse effects of fires and of providing a forum for presenting the results of such research

Secretariat Office: Email: office@iafss.org

EDITORIAL BOARD

The contributors to this newsletter are acknowledged in alongside their specific contributions.

Our Aims

Fire Safety Science News aims to be a platform for spreading the work of IAFSS members, and to be the place where fire safety scientists can read what is not readily found elsewhere, thus favoring news and trending research. A digital archive of previous issues can be found online.

IF YOU HAVE NEWS OR OPEN POSITIONS TO POST TO THE WEBSITE

The newsletter only comes out twice a year, but the IAFSS website is always available for current association news and information. If you have information that you would like posted on the website, contact the team of webmasters at webmaster@iafss.org and they will help you out. The IAFSS website and its social media will regularly update job postings form universities research institutes.

Table of Contents

Page
MEMBERSHIP REGISTRATION 4
UPDATES FROM IAFSS WORKING GROUPS 5
Large Outdoor Fires and the Built Environment (LOF&BE) Working Group 5
Human Behaviour in Fires (HBiF) Working Group 6
FIRE SAFETY JOURNAL: THE OFFICAL JOURNAL OF IAFSS 7
UPDATE FROM ISO TC92 8
NEWS FROM MEMBERS 9
AfriWUIFire 9
Berkeley Fire Research Lab, University of California 9
University of British Columbia 11
University of Cantabria 12
University of Canterbury 15
University of Edinburgh 17
Fire Testing and Research Center of Hubei Province 19
Fire Protection Research Foundation 21
FM Global 23
The Hong Kong Polytechnic University 23
Imperial College London 26
International Master of Science in Fire Safety Engineering and Ghent University 28
King's College 30
Linnaeus University 30
University of Liverpool 31
University of Lorraine 34
Lund University 36
University of Maryland 36
OFR Consultants 39
Université de Poitiers 40
University of Queensland 42
SFPE Foundation 44
University of Sheffield 46
The Slovenian National Building and Civil Engineering Institute 46
State Key Laboratory of Fire Science (SKLFS), University of Science and Technology of China 50
Toyohashi University of Technology 56
University of Waterloo 59
Victoria University 60
Worcester Polytechnic Institute 62
CONFERENCES AND MEETINGS 65
Upcoming Conferences and Meetings 65
Reports from Conferences 67
CALL FOR CONTRIBUTIONS 69

MEMBERSHIP REGISTRATION

Both current and new members can easily register online at www.iafss.org. *Current members: please sign-in before registering to maintain your account!*

Next year, when we ask you to renew your membership in IAFSS, you will see that the fees have increased from £25 to £50 per year. We recognize this will seem to be a very large increase; however, the need for higher membership dues is being driven by a number of factors.

First, look at all the benefits that you get for your membership fee! These include:

- Free online access to the Fire Safety Journal – the official journal of IAFSS (the new dues approximately equal the cost for two FSJ articles)
- Free access to all prior IAFSS Symposium Proceedings with full papers online
- Discounted registration fees for the IAFSS Symposium (the discount is more than the cost of yearly membership)
- Up-to-date job postings, PhD and post-doc opportunities, and latest news in fire safety science
- Access to, and participation in, working groups with international colleagues such as HBiF, LOF&BE, and MaCFP, including the growing webinar series.
- IAFSS Newsletters, where you can share your institution's activities and learn about others.
- Access to FRS fire research notes
- A vote in Association affairs
- Opportunities to network with colleagues

Looking forward, we want to do even more! We are currently exploring support for PhD Summer Schools (such as that recently held at the University of Maryland), support for new workshops or webinars, developing and expanding mentoring/networking opportunities for early career researchers, exploring partnerships at other fire related conferences, expanded student travel support to IAFSS symposia and more. Additional suggestions from you, our members, are always welcome. Per our mandate, supported activities will remain those that are beneficial to fire science and fire safety.

As you would guess, providing all that we do, and trying to do more, requires a sound financial footing and increased funding for the organization. A membership fee increase will help significantly with this. The fees for membership in IAFSS have not been changed in over 12 years. At the same time, we have expanded member benefits, upgraded our website, and our fixed expenses continue to rise due to inflation. Coupled to this, IAFSS re-registered with the UK Charity Commission as a Charitable Incorporated Organisation (CIO), which provides us protections over our past form of organization, enhances our ability to accept donations, and brings us into compliance with UK regulations. As a result of becoming a CIO, the organization will incur new, on-going costs associated with ensuring we comply with important regulations around such things as safeguarding members, diversity, equity and inclusion, data privacy and ensuring accessibility of our website.

At present, the reality is that dues cover only a fraction of the organization's expenses. For the remaining costs, IAFSS relies on income from investments and profit from our symposia, which as we learned with COVID-19, can be impacted by unforeseen events. Reliance on these two uncertain revenue streams for fixed expenses is not a best practice, nor does it leave any room for undertaking the many new initiatives that have been suggested by our membership. We hope you understand and are willing and able to help us continue to do more for you - our members - by continuing your membership next year and beyond, and continuing to volunteer your time for our association and to fire safety science and engineering more broadly. Thank you!

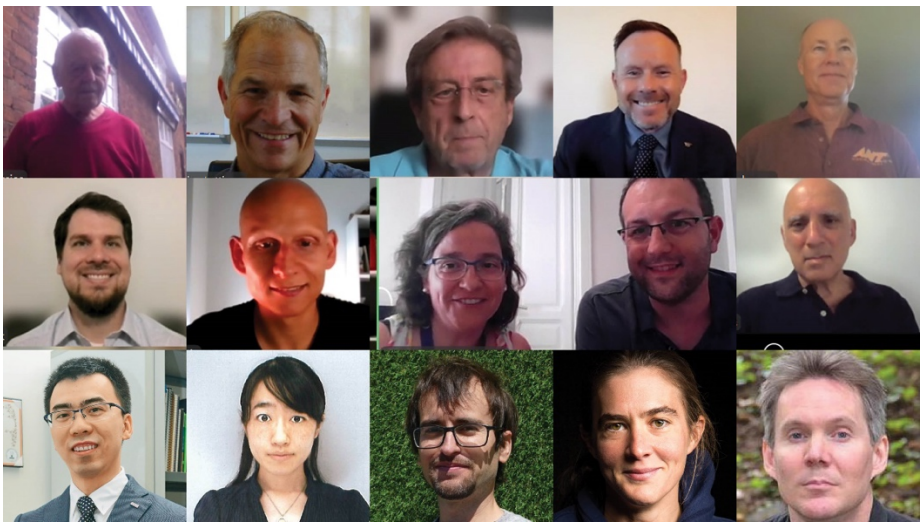
Please contact office@iafss.org with any questions about membership or how to register.

UPDATES FROM IAFSS WORKING GROUPS

Large Outdoor Fires and the Built Environment (LOF&BE) Working Group

The permanent working group under the International Association for Fire Safety Science (IAFSS), known as the Large Outdoor Fires and the Built Environment (LOF&BE), held two workshops at the 14th IAFSS Symposium in Tsukuba, Japan on October 22, 2023. The first session focused on the Emergency Management and Evacuation (EME) subgroup. The second workshop session focused on the Ignition Resistant Communities (IRC) subgroup. In both workshops, progress from each subgroup was reported; several working group members gave short, invited presentations; and open discussions were held. A total of 53 participates pre-registered for the EME workshop, while 46 participants pre-registered for the IRC workshop. Countries of origin of the attendees include United States, Canada, Japan, China, Australia, New Zealand, South Africa, Spain, France, United Kingdom, Germany, and Norway. The report is published in *Fire Technology*, please see here: Large Outdoor Fires and the Built Environment (LOF&BE): Summary of Workshops at 14th International Symposium on Fire Safety Science | Fire Technology (springer.com)

A study that was developed as the part of IAFSS LOF&BE, was awarded the 2024 Jack Bono Award for Engineering Communication from the Society of Fire Protection Engineers (SFPE) Foundation. The Jack Bono Award for Engineering Communications for 2024 is awarded based on the best paper published in the journal *Fire Technology* during the 2023 calendar year that has most contributed to the advancement and application of professional fire protection engineering. The Jack Bono Award for Engineering Communications is named after Jack Bono, a past president of SFPE who worked at Underwriters Laboratories Inc. (UL now UL Research Institutes) for 44 years. For more information, please see Jack Bono Award for Engineering Communication - Foundation (sfpe.org). The 2024 award was presented at the SFPE Annual Conference and Expo held October 6-8, 2024, in Louisville, KY, USA.



The award-winning paper, ***Use of Unmanned Aerial Systems in Large Outdoor Fire Firefighting***, Use of Unmanned Aerial Systems in Outdoor Firefighting | Fire Technology (springer.com), provides a review of these emerging technologies and the broader challenges present to apply these technologies globally to suppress large outdoor fires.

LOF&BE aims to bring the community together to tackle large outdoor fire problems such as wildland fires, wildland-urban interface (WUI) fires, urban fires, and informal settlement fires. At present, IAFSS LOF&BE, contains more than 200 members spread across more than 25 countries. Samuel L. Manzello, Sara McAllister, and Sayaka Suzuki, serve as the co-leaders of the IAFSS LOF&BE working group. LOF&BE - International Association for Fire Safety Science (iafss.org). For more information, please contact Samuel L. Manzello (manzello@tohoku.ac.jp).

Signed
Samuel L. Manzello (Tohoku University, Japan and Reax Engineering, USA)
Sara McAllister (USDA Forest Service, USA)
Sayaka Suzuki (Institute of Science Tokyo, Japan)

Human Behaviour in Fires (HBiF) Working Group

The IAFSS Human Behaviour in Fires (HBiF) permanent group is currently focused on two tasks, namely, 1) the development of a research roadmap for our field and 2) a webinar series to promote the exchange of knowledge.

Regarding the research roadmap, we have published the second journal paper out of our work, which presents the results of two workshops conducted by the group to identify the reasons behind the gaps in the human behaviour in fire field. The paper is called "Determinants of Gaps in Human Behaviour in Fire Research" and has been published in Fire Technology. This paper was the result of a collective effort involving Enrico Ronchi, Katelynn Kapalo, Nikolai Bode, Karen Boyce, Arturo Cuesta, Yan Feng, Edwin R. Galea, Paul Geoerg, Steve Gwynne, Eric B. Kennedy, Max Kinateder, Michael Kinsey, Erica Kuligowski, Gerta Köster, Ruggiero Lovreglio, Axel Mossberg, Rosaria Ono, Michael Spearpoint, Ken Strahan & Stephen D. Wong. You can find an open access link to download the article here: https://doi.org/10.1007/s10694-024-01625-6

We are currently working on two additional tasks, namely a detailed review of the research gaps and the development of a research agenda for the human behaviour in fire field.

Our webinar series is continuing, and recordings of our past events are available on the working group's YouTube channel, where we crossed the milestone of 3,800 views and 220 subscribers. You can subscribe to our YouTube channel here: https://www.youtube.com/channel/UCSqMIEaZ08r5BrtOb5q2d0Q

Our most recent webinar is:
Webinar 11 – Early career researchers on evacuation modelling – by Juraj Kmec (Czech Technical University in Prague) and Yuxin Zhang (The Hong Kong Polytechnic University)
Recording: https://www.youtube.com/watch?v=29inGAl5jik

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We would like to thank all task group leads for the research roadmap:
Natalie van der Wal, Delft University of Technology, The Netherlands
Erica Kinkel, Delft University of Technology, The Netherlands
Milad Haghani, University of New South Wales, Australia
Ruggiero Lovreglio, Massey University, New Zealand
Mary Button, Delta Fire Engineering Ltd, UK
Kate Kapalo, International Association of Fire Fighters, USA
Stephen Wong, University of Alberta, Canada

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Erica Kuligowski (RMIT University, Australia) - erica.kuligowski@rmit.edu.au
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FIRE SAFETY JOURNAL: THE OFFICAL JOURNAL OF IAFSS

Fire Safety Journal is the official journal of IAFSS. Its scope is purposefully wide, as it is deemed important to encourage papers from all sources within this multidisciplinary subject. Research covers a range of topics including but not limited to:

- Fire chemistry and physics
- Fire dynamics (including gas explosions)
- Active fire protection systems, including detection and suppression
- Passive fire protection methods
- People/fire interactions (physical, physiological and psychological)
- Fire safety management
- Assessment and quantification of fire risk (including acceptability of risk)
- Fire investigation
- Fire safety design (including consumer items, industrial plant, transportation, buildings)
- Fire safety legislation
- Fire safety education.
- Original contributions relating to any of the above topics are invited, particularly if they incorporate a quantitative approach to the subject in question.

Editors are Luke Bisby and Bart Merci

Link to Fire Safety Journal (ScienceDirect)

UPDATE FROM ISO TC92

Update from WG14

After passage by global ballot, ISO TC92/WG14 has added a new work item in ISO TC92, under ISO TC92/WG14 (Large Outdoor Fires and the Built Environment Working Group). ISO/TC 92 - Fire safety. As part of this, ISO TC92/WG14 will be developing an international standard for post-fire data collection methods from large outdoor fires. Post-fire data collection for large outdoor fires will be reviewed based on available studies conducted for wildland-urban interface fires, urban fires, including post-earthquake urban fires, and informal settlement fires. These studies will be used to develop a standardized data collection methodology for large outdoor fires that may be used in the event of future large outdoor fire disasters. A standardized approach, at the international level, is required to be able to assess and compare fire spread and damage across all these large outdoor fire types. The approved work item is here: ISO/AWI 24944 - Standardized Post-Fire Data Collection Methods from Large Outdoor Fires. If you are aware of relevant studies that ISO TC92/WG14 should consider as we progress this international standard, please contact the convenor of ISO TC92/WG14, Samuel L. Manzello (manzello@tohoku.ac.jp; manzello@reaxengineering.com)

Signed:
Samuel L. Manzello, convenor of ISO TC92/WG14, with Tohoku University, Japan and Reax Engineering, USA

NEWS FROM MEMBERS

News submitted by members are included in this section, the contributions are not arranged in any specific order. Editorial edits have been made in the submissions.

AfriWUIFire

AfriWUIFire team attended AJ-CORE Workshop and welcomed new members

AfriWUIFire team members, Dr. Natalia Flores-Quiroz, Prof. Richard Walls (Stellenbosch U.), Prof. Doug Harebottle (Sol Plaatje U.), Prof. Sayaka Suzuki (Science Tokyo, formally TokyoTech), Prof. Samuel L. Manzello (Tohoku U.) Prof. Rejoice Tsheko, Mr. Guy Godiraone Yuyi, and Ms. Ednah Kgosiesele (BUAN) attended the AJ-CORE Researchers' Joint Workshop held in Maun, Botswana, April 16-18, 2024. The workshop was hosted by Botswana Ministry of Communications, Knowledge and Technology (MCKT), in partnership with the Japan Science and Technology Agency (JST) and the National Research Foundation (NRF) of South Africa. AfriWUIFire team presented the visions and plans of the project titled "Fire Safe African Homes on the Wildland Urban Interface (AfriWUIFire)" during the workshop. Publication of AJ-CORE booklet is announced during the workshop. Please check here.

Six early-career members joined AfriWUIFire recently; Dr. Miss Hasimawaty Binti Mat Kiah (PostDoc at Stellenbosch U.), Mr. Emile van Zyl (Master student at Stellenbosch U.), Dr. Phetole Ramatsoma (PostDoc at Sol Plaatje U.), Ms. Patricia Maswibilili (BUAN), Mr. Keita Kameyama (Master student at Science Tokyo) and Mr. Yuki Hara (Master student at Science Tokyo).

AfriWUIFire was presented at 6th South Africa-Japan University Forum (SAJU6)

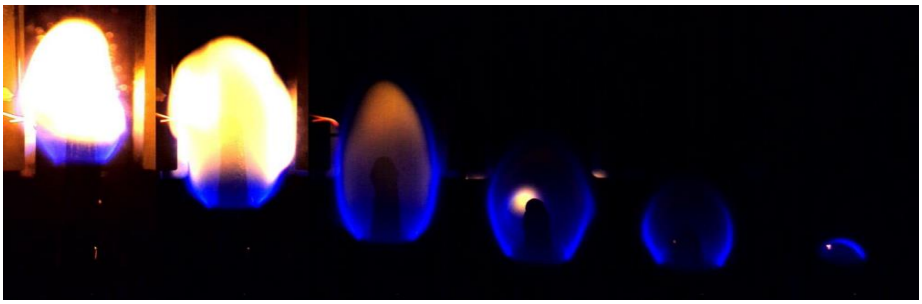
Dr. Natalia Flores-Quiroz of Stellenbosch University was invited to present AfriWUIFire project during SAJU 6 at Stellenbosch University, South Africa, August, 27-29, 2024. SAJU provides a framework for collaboration between South Africa and Japan, and this forum serve as a showcase for successful collaborations between Africa and Japan. AfriWUIFire was quite honored to be selected to present the ongoing project. After SAJU 6, Prof. Richard Walls had a tour on research facilities for AfriWUIFire project for representative from JST and JICA (Japan International Cooperation Agency).

Signed: Sayaka Suzuki (Science Tokyo) Samuel L. Manzello (Tohoku U.) Natalia Flores-Quiroz (Stellenbosch U.) Richard Walls (Stellenbosch U.), Doug Harebottle (Sol Plaatje U.), and Rejoice Tsheko (BUAN)

Berkeley Fire Research Lab, University of California

The Berkeley Fire Research Lab, run by Prof. Michael Gollner http://firelab.berkeley.edu and Prof. Carlos Fernandez-Pello are working together on a variety of combustion and fire research topics. We are happy to share some exciting recent research updates with the fire research community:

- The Berkeley-led International Space Station (ISS) experiment Material Ignition and Spread Test (MIST) ran its first test points starting in July, 2024. Led by Prof. Fernandez-Pello with Prof. Michael Gollner and supported by NASA, the experiments studied extinction limits of spreading flames in microgravity.



Composite image of a flame spreading in microgravity on the ISS as the oxygen decreases and it moves towards extinction.

- A new Wildland-Urban Interface (WUI) model (WU-E) developed by the Berkeley Fire Lab, University of Maryland, and Cloudfire, Inc has been developed and released. It seamlessly couples an existing landscape scale fire model, ELMFIRE, with spread by embers, radiation, and flame contact in the WUI.
- UC Berkeley has partnered with the Insurance Institute for Business & Home Safety to conduct CAL FIRE funded experiments on structure separation in their large-scale wind tunnel test facility. Experiments will provide urgently needed information on how to separate and protect structures in the Wildland-Urban Interface. A complementary study funded by the California Air Resources Board led by UC Berkeley is also being conducted measuring emissions from houses using drones during these full-scale experiments.

- Joey Dowling, Ph.D. Candidate, and Wuquan Cui, postdoctoral scholar presented UC Berkeley's work on large-scale oil spill cleanup using fire whirls at the 2024 International Oil Spill Conference in New Orleans, Louisiana. (Picture shown at right during demonstration of a fire whirl)
- Five papers from the Berkeley Fire Research Lab were accepted and presented at the 40th International Symposium on Combustion. Papers covered fire emissions, a new WUI model, the blue whirl, firebrand generation, and limits of flame spread and extinction.

Personnel Updates:

- Ethan Levin joined the lab as a PhD student. He formerly worked as a staff member at the USFS Missoula Fire Science Lab and has a PhD in physics and math from Rice University.
- Siyan Wang, Ph.D. candidate in Mechanical Engineering was awarded the SFPE Foundation Student Scholar Award at their annual meeting in October 2024.
- Shaorun Lin, postdoctoral scholar in the Berkeley Fire Research Lab was awarded the Bernard Lewis Fellowship at the 40th International Symposium on Combustion in July 2024.
- Shaorun Lin, former postdoctoral scholar completed his position this summer and moved to The Hong Kong Polytechnic University as a Research Assistant Professor.
- Xiaoyu Ju, former postdoctoral scholar completed his position earlier this year and moved to the State Key Laboratory of Fire Science, University of Science and Technology of China as a Professor.
- Former undergraduate researcher Lilly Etzenbach was named a University Medal finalist and received the Department Citation from Mechanical Engineering. She recently started as a PhD student at MIT in the Department of Aeronautics and Astronautics.
- Former postdoctoral scholar Dr. Mohammadhadi Hajilou left the lab to start a new position as an Assistant Professor of Mechanical Engineering at the University of Portland.

- Former postdoctoral scholar Dr. Luca Carmignani started a new position as an assistant professor at San Diego State University. He was previously a Faire Advisor with the University of California Cooperative Extension
- Former postdoctoral scholar Dr. Ali Tohidi will start a new position at the University of Maryland as an Assistant Professor of Fire Protection Engineering. He was previously an Assistant Professor at San Jose State University.

Signed Micheal Gollner

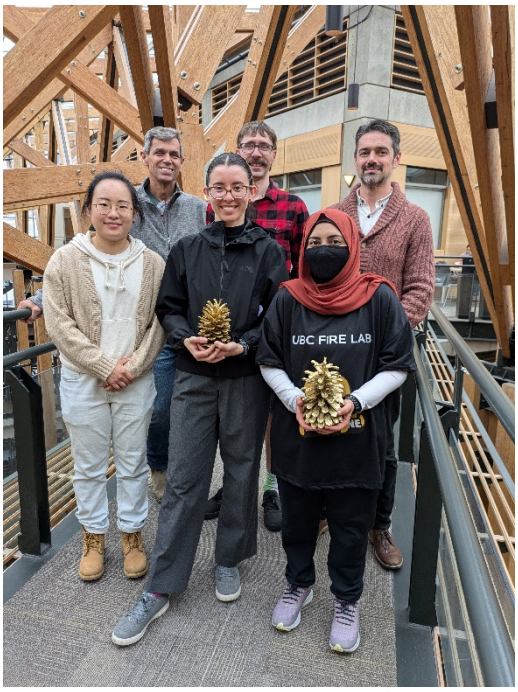
University of British Columbia

It has been some time since the latest news from the fire safety engineering research group at the University of British Columbia, as we missed the previous newsletter. Thus, we have a year's worth of progress, but we will focus on the essentials.

Conferences, symposiums and summer schools.
In October 2023, Dr. Wiesner attended the IAFSS symposium in Tsukuba and greatly enjoyed catching up with the IAFSS membership and learning about recent advances in our field. Dr. Wiesner also travelled to Okayama in Japan to establish collaborations with Meiken, Daiken, and Okayama University to learn about the Japanese state of the art in timber design and fire safety. More recently, Ms. Arwa Abougharib attended the IAFSS summer school at ITB in Poland to learn with and from the global fire safety community.

To further the Canadian collaboration of our growing group, Dr. Wiesner also attended the Nextgen Wood Conference in Edmonton in Spring 2024 – this led to him joining the Next-Generation Wood Construction NSERC Alliance. Watch this space for some more exciting cross-Canadian wood fire safety research.

In some delayed news, but in time to remind everyone of the fast-approaching winter season (in the northern hemisphere): We were able to defend the Golden Pinecone by winning the 2023 Christmas Tree Fire Heat Release Rate Prediction Competition, organized by the National Institute of Standards and Technology, for a second year in a row. Our team consisted of Greg Smith, Delia Murguia, Arwa Abougharib, Felix Wiesner, Alan Verona Jr., Yue (Rachel) Diao and Hamish van der Ven. The team was carried by Mr. Alan Verona Jr., who had years of wildfire fighting knowledge from the US. We are looking forward to competing again in the 2024 edition.



The UBC team with their golden pine cones from 2022 and 2023. The image with Mr. Verona had to be taken separately (right) as he graduated and was busy fighting fires in BC's northern interior during the group picture (left).

Visitors
In 2024, Mr. Cheng Chen from the Polytechnic University visited the Faculty of Forestry at UBC to refine his modelling work on flame spread in timber compartments and learn more about wood science and forestry in BC.

Later, during the summer, Ms. Antonela Čolić from the University of Edinburgh joined us at UBC for a short-term scientific mission as part of the Holistic design of taller timber buildings (HELEN) Cost action. During her stay, Antonela looked specifically at anticipated loads and utilization levels in mass timber buildings and the potential variations between jurisdictions.

Currently, we have the pleasure of hosting Mr. Josh Madden from the University of Queensland (UQ), as part of our ongoing collaboration with the ARC Advance Timber Hub. Josh is working on analyzing data and developing further testing for his research on ignition and flame spread on exposed timber ceilings in open-plan compartments.

Fire lab and funding success
Construction on a fire safety laboratory has commenced within the Faculty of Forestry at UBC, and it is anticipated to be completed in Spring 2025. This will be a relatively small facility, but in the end, it is not the size of the lab that matters but how it will be utilized. To this end, Dr. Wiesner was recently granted NSERC Discovery funding to hire students to grow the UBC fire safety research group and to utilize the new fire lab.

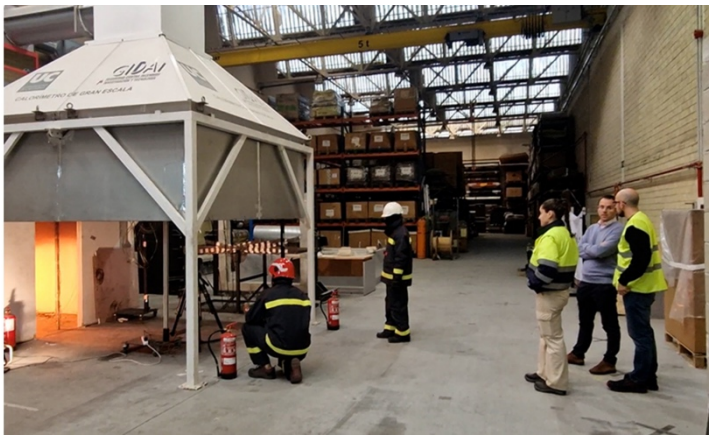
In addition, Dr. Wiesner secured strategic research funding from the John R. Evans Leaders Fund through the Canada Foundation of Innovation, and the B.C. Knowledge Development Fund to purchase equipment. The new fire lab will focus on fire safety research towards the safe implementation of mass timber buildings made from wood resources in Canada. But it will also be utilized to enable laboratory-scale research on wildfire spread as well as wildland-urban interface (WUI) hardening, as well as emissions from WUI fires.

Signed: Felix Wiesner

University of Cantabria

New Collaborative Project between UC and the Nuclear Safety Council
The University of Cantabria (UC) and the Nuclear Safety Council (CSN) have formalized a new agreement that extends the collaborative relationship between both entities. This agreement will enable the development of a joint research project over the next four years titled, "Analysis of Numerical and Experimental Models for Fire Investigation in Nuclear Power Plants," with a total budget exceeding €500,000, 58% of which will be provided by the CSN.

The project will allow UC to support the Spanish participation, led by CSN, in the international research program “Fire Risk Assessment through Innovative Research (FAIR),” promoted by the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD). This program represents the largest campaign to date on experimental characterization of typical fire scenarios within specific areas of nuclear power plants and the validation of computational fire simulation techniques. CSN actively participates within the partner group of countries involved in this program. This project builds on initiatives from previous programs due to the growing importance of new approaches to Fire Safety design in these facilities, where fire modeling and computational simulation tools play a prominent role.



Within this research framework, various tasks will be undertaken, including small- and large-scale experimental tests related to flame propagation in cable trays, combustion in stale atmospheres, and the behavior of materials following aging periods. Additionally, activities will focus on understanding, validating, and improving computational simulation tools for fire scenarios typical of nuclear power plants.

PROBIDE Receives Funding from the Government of Cantabria
The PROBIDE project – PROBABILISTIC MODELS OF EVACUATION BEHAVIOR IN DISASTERS (Reference PID2022-141865NB-I00) – was one of the proposals submitted last year under the national “Knowledge Generation” call from the Ministry of Science, Innovation, and Universities. Although it was evaluated positively, it did not receive funding. To maintain the Group’s competitiveness and facilitate possible funding in a future call, it has now received support under the “2023 Bridge Projects” initiative, funded through the Program Contract between the Government of Cantabria and UC.

PROBIDE aims to develop and validate models to predict evacuation behavior during disasters. These models will be grounded in a comprehensive theory and empirical data and will be integrated into a real-time emergency management tool. This transformation will improve how authorities and emergency managers handle disasters, helping to reduce potential injuries or fatalities. The project addresses a high-priority safety issue for civil society, focusing on protecting citizens and fostering a more disaster-resilient society. It also aligns with the resilience requirements in the Sendai Framework for Disaster Risk Reduction and the Sustainable Development Goals. This project incorporates multidisciplinary and interdisciplinary approaches, including machine learning, predictive modeling, modeling and simulation, virtual reality, human behavior, decision-making, and psychometrics to increase knowledge of human behavior and improve disaster management.

PROBIDE includes four main tasks: (1) Project management and dissemination, (2) Study of human behavior in disasters, (3) Development of behavioral models (choice and traffic), and (4) Integration of behavioral models into the EMS and validation.

With this funding, we will be able to carry out an extensive study of human behavior in disaster situations, a fundamental part of the project that will enable continued progress in emergency management research.

New Project Funded by SODERCAN of the Government of Cantabria

Recently, the GIDAI Group, together with the company INGECID, obtained a grant to carry out the project "Research on the Application of VR/AR Techniques in Nuclear Environments under Fire Situations." This R&D project aims to advance research into the application of Virtual Reality (VR) and Augmented Reality (AR) techniques within nuclear environments under fire scenarios. In nuclear power plants, fire is a critical component in the risk analysis of severe damage, defined as scenarios affecting the safe shutdown of the reactor. Damage from a potential fire can endanger not only the plant's personnel but also the surrounding population.

Consequently, there has been a coordinated international effort to develop knowledge of fire dynamics specific to these applications, leading to the definition of various models that capture the unique characteristics, limitations, and inherent uncertainties of fire phenomena. This knowledge can be leveraged during the project through VR/AR techniques to enhance design, management, and training activities.

New Doctoral Thesis on Evacuation Decisions

On May 31, our researcher Adriana Balboa defended her doctoral thesis titled “Determinants in Evacuation Decision-Making: Experimental Analysis and Development of Predictive Models,” receiving the highest distinction of cum laude. The primary purpose of this thesis is to understand human behavior in emergency situations, focusing on the influence of threat-related factors on individuals’ self-protective decisions.

The methodology incorporates an innovative approach to data collection through online experiments, the development of predictive models for probable actions using Logistic Regression, exploration of the performance of Machine Learning algorithms, and the validation of behavior in a real environment. The factors studied encompass various emergencies, physical and social settings, and sociodemographic characteristics, analyzed in a sample of 1,807 participants. The results provide theoretical insights and practical implications for enhancing personal safety and risk management strategies. This research lays the groundwork for future studies, underscoring the importance of the human factor in safety analysis.

The GIDAI group congratulates Adriana, who has successfully completed an intensive training period and made numerous contributions through articles in scientific journals and conference presentations. We also extend our gratitude to Professors Eulàlia Planas, Mar Alonso, and Mariano Lázaro for their availability and enriching scientific discussion as members of the Examination Committee.

Research Visit to the Western Norway University of Applied Sciences

Last week, members of the GIDAI Group, Javier Gonzalez Villa and David Lázaro Urrutia, conducted a research stay at the Department of Safety, Chemistry and Biomedical Laboratory Sciences at the Western Norway University of Applied Sciences. During the week-long visit, they observed propagation tests, presented advancements within the GAIA project – Integrated Management for Prevention, Extinction, and Reforestation due to Forest Fires (PLEC2023-010303 - MICIU/AEI/10.13039/501100011033), attended talks on forest fires and modeling techniques such as cellular automata, and held meetings to explore synergies and potential collaborative lines between both universities.

The GIDAI group extends its gratitude to Prof. Bjarne Christian Hagen, Prof. Nieves Fernández Anez, and the other members of the Western Norway University of Applied Sciences for their warm welcome.

Visit from Professors of Foreign Universities

The GIDAI Group maintains close ties with other research groups internationally. One such collaboration is with GICOS (Sustainable Construction Research Group) at the Bragança Polytechnic Institute (IPB, Portugal). GICOS consists of 17 researchers dedicated to R&D in Sustainable Construction, focusing on three main research lines: Structural Engineering, Materials, Products and Eco-Construction, and Energy, Environment, and Management. A few months ago, we welcomed Prof. Paulo Piloto, a prominent researcher from GICOS, with the objective of exploring various areas of mutual interest and laying the groundwork for future collaborations in research and development. During his stay, a primary focus was the formalization of collaboration through a framework agreement between the two institutions to expand the existing collaboration between UC and IPB, establishing a foundation for joint research projects, researcher exchanges, co-authored publications, and the organization of academic and scientific events.

We also received a visit from Prof. Nouredine Zekri from the University of Science and Technology of Oran (Algeria). During his visit, both institutions presented their activities to explore potential synergies and collaborative opportunities. Additionally, Prof. Zekri gave a lecture demonstrating the application of general physics concepts to fields such as electricity, combustion, and fire behavior of materials, introducing concepts such as relaxation, fractal analysis, and probabilistic effects.

In Grateful Memory of Orlando Abreu

A few months ago, our colleague Orlando V. Abreu Menéndez passed away, and on behalf of everyone in the GIDAI research group, we wish to express our gratitude for his work, his human values, and the way he connected with all of us.

Orlando joined GIDAI in early 2006, and since then, he worked closely with each member of the team until illness prevented him from continuing his passion for research. Orlando was not only an extraordinarily brilliant person but also embodied all the qualities of a great researcher, especially an immense curiosity. Through reading and critical thinking, he continuously reflected on questions that led to knowledge aimed at improving people's safety.

Collaboration with him was always easy because of his constructive approach and strong sense of belonging; he fully committed himself to the research growth of the rest of the team, especially the young researchers in training. Without a doubt, many of our doctoral theses carry a significant part of Orlando's know-how. Thanks to his contributions, many ideas became real research projects, and some of GIDAI's most relevant scientific contributions bear his presence and leadership, such as stochastic approaches to evacuation process modeling and real-time numerical calculations supporting decision-making systems in emergencies.

Although he was a dedicated researcher, his deepest legacy is as a person and for his human values. And, of course, what we miss the most is his warmth and sense of humor, which remained a part of him until the very end. Thank you for everything, Orlando!

Signed: Mariano Lázaro

University of Canterbury

University of Canterbury and Fire Emergency New Zealand

The University of Canterbury is deeply grateful for the ongoing support of Fire Emergency New Zealand (FENZ) for our Fire Engineering Program. Their generous funding extends beyond providing a teaching position to supporting PhD students, advancing research, and offering scholarships for master's studies. Recently, Dr Aatif Khan was appointed as a Senior Lecturer at UC, a position made possible through FENZ's support. We will soon be recruiting students for PhD positions. Keep an eye out for the upcoming announcement from the University of Canterbury.

Course on Forensic Fire Engineering

This year, UC is offering a course on Forensic Fire Engineering. The aim of this course is that: students shall be able to understand and apply common methods used in forensic fire engineering. Student shall also understand the strengths and weaknesses of these methods, as well as their limitations. In addition, students shall have a basic understanding of common methods used for cause and origin fire investigation. Finally, the aim is that students shall understand the ethical responsibilities that come with being an expert witness and be able to clearly communicate their expert opinion. Lecturers for the course will include Professor Patrick van Hees from Lund University in Sweden, Gregory Kelly previously GKA Investigations/Halliwell, Daniel Nilsson, Aatif Khan, Luke de Schot from the University of Canterbury and other well-known guest lecturers who are active in the expert witness area (to be confirmed).

Erskine Fellow

Prof. Patrick van Hees will be in Christchurch as part of a visiting Erskine Fellowship to be held at the University of Canterbury from 21 October to 22 December 2024. Professor van Hees is currently Head of Department for the Department of Building and Environmental Technology at Lund University. He has past experience in fire research with a PhD degree from the University of Gent on wind-aided flame spread of floor coverings and seven years at SP Fire Technology (now RISE) in Sweden. He has been at Lund since 2007 and is also a guest professor at the University of Gent in Belgium where he is course responsible for the Fire Performance-Based Design course within the International Erasmus Mundus Master of Fire Safety Engineering. Internationally, he is the current chair of ISO TC92 SC1 (Fire Initiation and Growth) and convenor of ISO TC92 SC1 WG 7 (Large and intermediate scale fire test methods). He was previously the chair of ISO TC92 (Fire Safety) and the IAFSS (International Association of Fire Safety Science).

Europe Horizon Project: Minority Report

Dr Andres Valenci and Dr Peter Thompson are working on the Europe Horizon Project: Minority Report. This is the first time for an NZ organization as part of this funding scheme. Barry Evans has joined our fire group as part of the Horizon Project.

Barry was a Senior Research Fellow at the Centre for Water Systems at the University of Exeter in the United Kingdom where over the years he worked on a variety of European research projects on topics including System Dynamic Modelling, Circular Economy, Multi-Hazard Risk Assessments, Impacts of Flooding on Transportation Networks, and Evacuation Modelling. Barry's research interests lie heavily within the fields of risk assessments and evacuation modelling and is very excited to be part of the team here at UC.

In his spare time, Barry practices breakdancing and enjoys badminton, and table tennis, and looking to take up frisbee golf whilst here in New Zealand.

Barry will be working with Dr Andres Valencia and Dr Peter Thompson and the team within the EU-funded "Minority Report" project where his focus will be on "Developing methodologies to model interactions and risks associated with the wildfire urban interface and also on wildfire evacuation modelling."

New PhD Student

Rosie Matthews will join the fire group as a PhD student as part of the MBIE Endeavour project "Extreme wildfire: Our new reality - are we ready?". She will be working on wildfire risk modelling in NZ.

Rosie Matthews is a new PhD student at the University of Canterbury, where she has begun her research on wildfire risk and its impacts on urban areas, particularly in the Wildland-Urban Interface (WUI) of Christchurch, New Zealand. Her work will focus on quantifying both the direct and indirect consequences of wildfires on people, buildings, and critical infrastructure. Rosie's research aims to contribute to more effective wildfire risk mitigation strategies and improve urban resilience. She holds a bachelor's degree with honours in Mathematics from the University of Edinburgh, Scotland

Visiting Scholars

Bronwyn Forrest is visiting UC from October until late December. Bronwyn is a PhD candidate from the University of Waterloo and is the 2024 recipient of the prestigious Dr. Guylène Proulx OC scholarship. Bronwyn is extending her research on Human Neuro-physiological Response in Fire, which you can read more about here https://www.researchgate.net/profile/Bronwyn-Forrest/research.

UC SFPE Student Chapter

The SFPE UC chapter has organized several student events in recent months. With support from the SFPE NZ chapter, two professional seminars were hosted, attracting over 100 online participants for each event. These seminars provided students with valuable exposure to cutting-edge developments in both academic research and engineering practice.

1. Stavros Spyridakis, *"Experimental Fire Studies on the Charring Behaviour of Timber Protected with Thin Intumescent Coatings*," 4th September 2024
2. Jermey Chang and Steph Miller, "*Structural Fire Engineering and Carbon Reduction*," 2nd October 2024

A joint webinar with the four SFPE student chapters was held around the same time. It marked the first collaboration between the UC chapter and the other SFPE student chapters. The event was primarily aimed at young researchers, where valuable insights and common challenges in the research journey were discussed and shared by students from different parts of the world.

This webinar was titled, "*SFPE Asia Oceania Fireside Talks: Learning from successful graduates and peers*," 2nd August 2024

Fire Yarn

Meanwhile, the SFPE UC chapter is organizing a talk series called 'Fire Yarn.' The program is designed to foster active discussions between students and experienced scholars or engineers. Unlike traditional presentations, this event promotes open dialogue, allowing students to freely ask questions and seek advice from senior experts.

In the first episode, we were honoured to have Professor Andy Buchanan share his precious life and research experiences. You can listen to Andy's amazing talk by clicking the Spotify logo or scanning the barcode.

University of Edinburgh

Celebrating 50 Years of Fire Engineering at The University of Edinburgh

In 2024, we are celebrating 50 years of Fire Engineering at The University of Edinburgh. The department was initatiated by Professor David Rasbash who was appointed as the UK's first Chair in Fire Engineering in May 1973, with the first engineering diplomas available in 1974/75, and the fist MSc program starting in 1977/78.

A 50th Anniversary celebration event was held in May 2024, bringing together alumni, group members past and present, and a number of distinguished speakers who joined us to share their insights and perspective by reflecting on 50 years of progress in a number of areas from flame spread to fire education. These talks were curated to reflect the program title "New Variations on an Old Theme", as an homage to the Inaugural Lecture of Professor Rasbash.

50 years later and the School of Engineering continues to offer both BEng and Meng degrees combining innovative research with practical learning opportunities in world-class facilities, alongside our recently introduced MSc in Fire Engineering Science. We are delighted to share in this newsletter the continuing work of our group members and the latest milestones including the graduation of our 100th PhD student (and counting…) and a number of new arrivals to the group.

Our recent social media celebrations can be found on the School of Engineering's LinkedIn, Instagram, X/Twitter, Facebook and YouTube, including some of our favourite lab demonstrations from fire tornadoes to rocket engines.

New Group Members

Han Shun Hsu joins us as a new PhD student, focusing on the study of flashover under extreme conditions. Before coming to Edinburgh, Han completed the International Master of Science in Fire Safety Engineering (IMFSE) in 2023. He has also served for over ten years with the National Fire Agency, Ministry of the Interior (R.O.C.), where he currently holds the rank of Inspector. In his spare time, Han enjoys playing badminton, watching movies, and engaging in photographic hikes.

Drew Epp joins the team as a PhD student. Her journey in fire research began during graduate studies as the student of Professor David Torvi at the University of Saskatchewan in Canada. Drew's research focused on investigating high-performance textiles using non-destructive techniques and thermal aging models. She now joins the team as a Ph.D. student exploring wildfires through live fuel experimentation, specifically exploring flame spread on drought stressed plants. Her investigation spans from benchtop to field scales, examining empirical interactions within a living fuel bed. Drew eagerly anticipates contributing to the field of wildfire science at the University of Edinburgh.

Dr Si Shi has joined the Edinburgh Fire Research Centre as a Postdoctoral Research Associate. Prior to joining Edinburgh, her PhD journey focused on the combustion characteristics of kerosene-based mixtures with the use of laser diagnostics. She is currently working on the firebrand generation, with a particular interest in measuring the surface temperature of the burning particles temporally and spatially.

Dr William Jarrett is a Research Associate in Fire Science and Composites at the University of Edinburgh. His current research focuses on the modelling and fabrication of large-scale testing solutions for composite structures under in-situ fire conditions. With over six and a half years of experience optimizing FRP composites, including the use of graphene nanoparticle additives and the characterization of their failure mechanisms, William previously collaborated with Rolls Royce plc to develop novel accelerated testing methods for hybrid composite-metallic gas turbine components exposed to extreme, end-of-life conditions. Outside of academia, he enjoys hiking and, now living in Scotland, is exploring the stunning landscapes of the Scottish Highlands.

Dr Swagata Dutta is currently working as a Post- Doctoral Research Associate in Fire Safety Engineering at the Rushbrook Fire Laboratory, The University of Edinburgh, UK since July 2024. He is also working as an Associate Professor (on leave) at the Bangladesh University of Engineering and Technology (BUET). Swagata Dutta has particular interests in computational fluid dynamics (CFD), computational modelling of flame spread in compartments, composite material fire properties, flammability, intelligent and smart fire detection and prediction systems, fire risk assessment. At the University of Edinburgh, he will be looking at timber ceiling fire, particularly based on small and medium scale experiments to predict the ignition and spread of fire across exposed timber ceilings

100 PhD Graduates & Counting

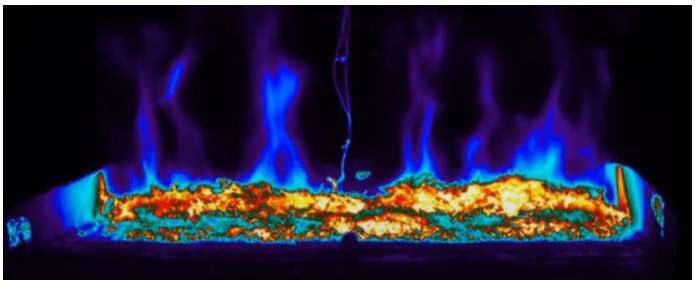
Since our previous newsletter update, three of our PhD students have successfully defended their PhD thesis. This also marks a symbolic milestone, as these graduates represent our 99th, 100th and 101st PhD graduates from Edinburgh fire group.

Congratulations to Dr's Norlizan Wahid, David Morrisset, and Cameron Macleod who successfully defended their thesis:

The fire hazard of layered metal composites by Norlizan Wahid
Quantifying the mechanisms of opposed flow flame spread by David Morrisset
Finite element analysis of flat slab behaviour at elevated temperatures by Cameron Macleod

Future PhD Opportunities

We regularly advertise new PhD opportunities and Post-Doctoral Researcher positions across a variety of fire science and engineering topics. Current openings include a PhD vacancy for a student interested in applying a variety of experimental instrumentation to improve understanding and modelling of combustion in wildland fuel beds.



PhD opportunities are shared via the website https://www.eng.ed.ac.uk/studying/degrees/postgraduate-research/phd which is regularly updated.

Fire Engineering Science MSc

We recently welcomed the second cohort of students on our recently introduced Fire Engineering Science MSc. This programme helps students to develop a greater understanding of the key physical phenomena of fire behaviour and their application in engineering. Further information can be found in a short video shared by the School of Engineering and featuring staff and students from the MSc Program.

Drysdale Scholarships

The University of Edinburgh has created The Drysdale Scholarship to support the study of Fire Engineering Science. Seven scholarships are available each year, covering the tuition fees of successful applicants. Further information, including detailed eligibility requirements, can be found at The University of Edinburgh registry webpage.

For all the latest news from the Centre for Fire Safety Engineering at the University of Edinburgh follow us on Twitter @edinburghfire or on facebook.com/EdinburghFire

Signed: Zakary Campbell-Lochrie

Fire Testing and Research Center of Hubei Province

1. Prof. Jose Torero delivered Luojia Lecture at Wuhan University

Prof. Jose Torero of University College London delivered Luojia Lecture at Wuhan University on October 9, 2024. Professor Jose Torero works in the fields of fire safety, combustion, environmental remediation and sanitation where he specializes in complex environments such as developing nations, complex urban environments, novel architectures, critical infrastructure, aircraft and spacecraft. Jose is a Chartered Engineer (UK), a Registered Professional Engineer in Queensland, a fellow of the Australian Academy of Technological Sciences and Engineering, the Royal Academy of Engineering (UK), the Royal Society of Edinburgh (UK), the Queensland Academy of Arts and Sciences (Australia), the Institution of Civil Engineers (UK), the Institution of Fire Engineers (UK), the Society of Fire Protection Engineers (USA), the Combustion Institute (USA) and the Royal Society of New South Wales (Australia).

Luojia Lecture, established in 2008 for the celebration of the 115th anniversary of Wuhan University, is the highest honor offered by the university to top best scholars in all academic disciplines. Invited scholars deliver lectures to undergraduate students to promote and encourage students' learning through edification. Prof. Torero delivered his lecture on "Architecture, Technology and Competence in Fire Safe Design" at the Library, the most famous building of Wuhan University. Undergraduate and graduate students from School of Civil Engineering, School of Urban Design, School of Computer Science of Wuhan University, fire investigators from the Fire and Rescue Department of Hubei Province, and researchers from other universities in Wuhan attend the lecture. Prof. Ziyuan Li, vice president of Wuhan University, delivered Luojia Lecture Memorial Plaque to Prof. Torero.

Jose joined the "E-Scooter Campus Tour" program initiated by Prof. Chao Zhang of Wuhan University.

2. The center hosted Intl_Fire_Lab Workshop on "Structural Fire Testing"

On October 10, 2024, the Intl_Fire_Lab Workshop on "Structural Fire Testing" was held at the Library of Wuhan University. This workshop was initiated by Prof. Chao Zhang to celebrate the 40th anniversary of the School of Civil Engineering at Wuhan University. Distinguished attendees included Prof. Venkatesh Kodur (Chairman of the Steering Committee for SiF conferences), Prof. Jose Torero, Dr. Emanuele Gissi (Professional Fire Chief of the Italian Fire and Rescue Service and developer of BlenderFDS), Prof. Guo-Qiang Li, Prof. Naian Liu (President of IAFSS), Prof. Bo Wu (Vice President of South China University of Technology), Prof. Jihong Ye (Vice President of China University of Mining and Technology), along with other leading domestic researchers and engineers. Prof. Yufeng Yuan, Vice President of Wuhan University, and Mr. Huijun Zhu, Deputy Head of the Department of Fire and Rescue of Hubei Province, also attended and delivered speeches at the workshop's ceremony.

In response to the global threat posed by fire to engineering structures, Tongji University, led by Prof. Guo-Qiang Li, established the International Joint Research Laboratory (Intl_Fire_Lab) on Smart Fire Safety Engineering. This initiative was in collaboration with two founding institutes, Hong Kong Polytechnic University and Wuhan University (coordinated by Prof. Chao Zhang), along with four international partners: the University of Manchester, Nanyang Technological University, the University of Queensland, and Johns Hopkins University. The lab aims to provide a platform for international research collaboration on structural fire testing. This workshop marks the inaugural event of the lab following its formal announcement at the 13th International Conference on Structures in Fire (SiF2024, Portugal) in June 2024.

Signed: Chao Zhang, Professor, School of Civil Engineering, Wuhan University and Director, Fire Testing and Research Center of Hubei Province

Fire Protection Research Foundation

Fire Protection Research Foundation (FPRF) receives grant funding for two new projects - The Fire Protection Research Foundation, the research affiliate of the National Fire Protection Association® (NFPA®), has received funding for two new projects: (1) Three-year project to investigate firefighter personal protective equipment (PPE) contamination, cleaning efficacy and exposures from Lithium-ion battery fires through a US DHS FEMA Assistance to Firefighters Grant. FPRF will partner with North Carolina State University, Illinois Fire Service Institute and Command and Control, LLC for this project which will kick-off in fall 2024. (2) One-year National Institute of Standards and Technology (NIST) fire grant to conduct full-scale testing to characterize electric vehicle hazards in parking structures to inform fire safety design guidance.

2024 Suppression, Detection and Signaling Research and Applications Conference (SUPDET® 2024)– FPRF's SUPDET® conference was held in tandem with the International Conference on Automatic Fire Detection (AUBE'24) in Duisburg, Germany September 24-26th. This conference brought together leading experts in the field of fire protection for the purpose of sharing recent R & D on techniques used for fire suppression, detection, and signaling. Conference presentations will be available soon here.

Notice of recent FPRF research reports

- Mass timber structures postfire: A gap analysis, April 2024.
- Modern Vehicle Hazards in Parking Structures and Vehicle Carriers Phase II, May 2024.
- Sprinkler Protection for Multiple-Row Rack Storage Systems Phase I, May 2024.
- Stakeholder Perceptions of Wildfire Mitigations for Homes Multi-Audience Survey Research, May 2024.
- Digitized Fuel Load Survey Methodology: Data Collection and Statistical Analysis, July 2024.
- Marine Transport of Energy Storage Systems: Hazard Assessment and Regulatory Analysis, September 2024.

Notice of recent FPRF webinars and workshop

- Webinar: Marine Transportation of Energy Storage Systems: Hazard Assessment and Regulatory Analysis, April 2024.
- Webinar: Current State of Smoking-Related Fires in the United States, July 2024.
- Webinar Series: FPRF conducted a series of webinars in March, April, May and June 2024, on several topics addressing fire service guidance while transitioning to fluorine-free firefighting foams as part of the ongoing project: Firefighting Foams: Implementation of Fire Service Roadmap. All webinar recordings and fire service foam newsletters from this project can be accessed from the project website: www.nfpa.org/foamroadmap.

For more information, visit: www.nfpa.org/foundation

Signed: Sreenivasan Ranganathan

Fire Safety Research Institute

New Research Projects

- Examining Post-Fire Water Contamination in the Wildland Urban Interface
- Exploring the Benefits and Limitations of PPE Technology Advancements
- Fire Modeling Development and Validation
- Fire Safety of Batteries and Electric Vehicles
- Fire Safety in Informal and Humanitarian Settlements
- Maui Wildfires Analysis
- Fire Dynamics and Firefighting Tactics in Multi-Story Residential Structures

2024 FSRI Research Reports

- **Study of the Lahaina Fire Incident**
  - Click here to read our "Lahaina Fire Comprehensive Timeline Report Released by the Attorney General of Hawai'i"
  - Click here to read our "Lahaina Fire Incident Analysis Report Released by the Attorney General of Hawai'i"
- **Study of Heat Transfer Through Walls**
  - Click here to read our "Technical Report on Heat Transfer and Fire Damage Patterns on Walls Released by FSRI"

2024 FSRI Peer-Reviewed Journal Articles

- Click here to read "Fire Safety Research Institute Materials and Products database—A resource to support fire modeling" published in the *Journal of Fire Sciences*
- Click here to read "Thermal degradation of self-contained breathing apparatus facepiece lenses under radiant thermal loads" published in the *Journal of Fire Sciences*
- Click here to read "Fire Dynamics Simulator Modeling of a Line-of-Duty Death" published in the *Journal of Fire Sciences*
- Click here to read "Materials and Products Database that Helps Fire Modelers Predict Material Performance" published in the *Journal of Fire Sciences*
- Click here to read "Evaluation of self-contained breathing apparatus (SCBA) weight on firefighter stamina, comfort, and postural stability" in the journal *Ergonomics*
- Click here to read "Measurement of thermal conductivity of thermally reactive materials for use in pyrolysis models" published in the international journal *Fire and Materials*
- Click here to read "Ignition and combustion behavior of pressure treated wood and wood-plastic composite exposed to glowing firebrand piles: Impact of air flow velocity, firebrand coverage density and pile orientation" published in the *Fire Safety Journal*
- Click here to read "Fire dynamics simulator modeling of a line-of-duty death in a firefighting training facility using recent research on materials and firefighter safety" published in the *Journal of Fire Sciences*
- Click here to read "Experimental investigation of explosion hazard from lithium-ion battery thermal runaway effluent gas" in the journal *Fuel*
- Click here to read "A fire safety engineering approach to improving community resilience to the impacts of wildfire" published in the international journal *Fire and Materials*
- Click here to read "Improvements in Urban Resilience to Wildfires" published in the journal *Fire and Materials*

2024 Online Training Courses

- Prerequisites for Live Fire Training Participants| FSRI Safety Academy

FSRI Welcomes X Research Fellows

Olivita Hunt is a research fellow with the Fire Safety Research Institute (FSRI), part of UL Research Institutes, and is currently a student at the University of Maryland, College Park. She holds a Bachelor's of Science in fire protection engineering and is working towards her master's degree in fire protection engineering, which she anticipates to earn in December 2025. As a fellow, Olivita's research will focus on lithium-ion battery powered e-mobility. Prior to joining FSRI, Olivita was an intern for Jensen Hughes, where she had the opportunity to conduct lab work to construct and test a 3/8 scale railcar.

FSRI Welcomes X Post-Doctoral Researchers

Chandler Probert is a Post-Doctoral Researcher with the Fire Safety Research Institute (FSRI), part of UL Research Institutes. He has earned his Bachelor of Science in Polymer and Color Chemistry, Master of Science in Textiles Engineering, and his Ph.D. in Fiber and Polymer Science, all from North Carolina State University. As a Post-Doctoral Researcher, Chandler is responsible for assisting in initiating the design, development, execution, and implementation of research projects, along with conducting experiments, modeling, and analysis to provide accurate data and information.

Nate Sauer

Nate Sauer is a Postdoctoral Researcher for the Fire Safety Research Institute (FSRI), part of UL Research Institutes. Prior to joining the team in September 2023. Nate holds a BS in mechanical engineering, and MS and PhD in Fire Protection Engineering from Worcester Polytechnic Institute. Nate started his PhD in January 2019, joining an effort to further research oil spill cleanup techniques on the ocean. Graduating in 2023 his research furthered the understanding of this problem by investigating the burning behavior of liquid fuels on wavy water.

Signed: Jennifer Williams

FM Global

FM Fire Modeling Workshop

We are excited to announce that the next FM Fire Modeling Workshop will be held from 13th-14th May 2025 at the Four Points by Sheraton in Norwood, MA, USA. Topics will include experimental, numerical and machine-learning research related to modeling fire and its suppression of solid and liquid fuels, including battery energy storage system. Prospective participants are invited to register and submit abstracts for oral or poster presentation. The abstracts will be evaluated based on their quality and suitability for the objectives of the workshop. An optional session dedicated to the use of FireFOAM is planned for the afternoon of Monday 12th May. Please visit the workshop website for further details: https://fmglobal.github.io/firemodelingworkshop/

New Staff

We warmly welcome a new member of fire dynamics group, Tony Xiao, who joins FM as a post-doctoral researcher. Tony received his PhD from The University of Sydney on the topic of water-mist suppression of buoyant turbulent fires. He will be joining FM's ongoing efforts in the flammability and fire dynamics research.

Open Positions

The fire dynamics group is seeking qualified applicants for a research scientist position. The principal responsibilities are to carry out research projects in the areas of flammability, fire spread, and heat transfer in fires from solid/liquid combustible as well as Lithium-ion batteries. Key areas of research include understanding of fire behavior at the medium and large scales via bench-scale experiments and theoretical models on material flammability and flame heat transfer. Projects can also involve advanced flame diagnostic of buoyant turbulent sooty flames and wall fires. The experimental and theoretical studies will be closely integrated with Computational Fluid Dynamic (CFD) model development and validation within the work group. Interested candidates please contact Dr. Yi Wang, yi.wang@fmglobal.com

The fire and explosion protection group is seeking strong candidates for both a senior scientist and a post-doc position. The senior scientist has principal responsibilities to carry out internally funded research projects in the areas of explosion and blast. This position requires a Ph.D. degree with a strong fundamental background in combustion, fluid mechanics, heat transfer, and applied mathematics, and excellent written and verbal communication skills, as well as demonstrated expertise in developing solutions to challenging technical problems. Extensive experience in explosion research is preferred. The post-doc will work with scientists in the explosion team closely to investigate fundamental problems associated with emerging risks such as explosions due to lithium-ion battery gas emission and H_2-blended fuels. Interested candidates please contact Dr. Yibing Xin (yibing.xin@fmglobal.com).

Summer Internship Program

The 2024 summer intern program concluded successfully due to the outstanding efforts of all involved. Leidong Xu (UCONN), Anran Jiao (Yale), Shaoxuan Chen (UMASS), Aleksei Sorokin (IIT), worked on a wide range of topics from lithium-ion battery fire safety to the development of AI applications to fire modeling. We congratulate the interns on their achievements and wish them success in all future endeavors. Please stay posted for future announcements on the 2025 program.

Signed: Alex Krisman

The Hong Kong Polytechnic University

PolyU Fire Lab organized SureFire Workshop

Dr Xinyan Huang and thePolyU SureFire team hosted the 2nd International Smart Firefighting Workshop (SureFire 2024) in PolyU on 9 July, which aims to tackle future urban fire threats and enhance smart firefighting capabilities. Over 70 international research experts and scholars presented emerging topics in fire safety, covering areas in fire safety design, thermal safety management for battery systems and AI fire forecasting.

Dr Liming Jiang co-organized Workshop of International Joint Lab on Fire Safety Engineering

Dr Liming Jiang has co-organized the 1st in-person workshop of International Joint Resarch Laboratory on Fire Safety Engineering at Wuhan University, and Prof Chao Zhang is the local organizer. The international joint lab was initiated by Tongji University, PolyU and Wuhan University, which has been supported by University of Queensland, Manchester Unviersity, Johns-Hopkins University, and Nanyang Technological University. The lab, with enoumours support from the member institutes and international advisory committee, aiming to creat collaborative platform for large-scale fire testing and joint research.

Dr Anthony Chun Yin Yuen co-organized the BS One Day Seminar 2024 with HKIE at PolyU

Dr Anthony Chun Yin Yuen has co-organized and hosted a full-day seminar at the Chiang Chen Studio, PolyU campus, Hong Kong, in partnership with the Hong Kong Institute of Engineers (HKIE). The seminar was entitled "The Endless Journey in Exploring Building Services Development and Sustainability", with a total amount of around 90 participants. To highlight the importance of improving the structure fire resilience of increasing amounts of timber structure buildings, Dr Timothy Bo Yuan Chen from the City University of Hong Kong has demonstrated the modelling fire behaviour of mass timber structures.

Prof Asif Usmani organized CONFAB 2024

Prof. Asif Usmani as initiating chair has successfully held the 4th International Conference on Structural Safety under Fire&Blast Loading in London. The CONFAB conferences were previously held in 2015, 2017, and 2019, which were aimed at provoding a forum for researchers and engineers to come together and learn best practice from each other. A total of five researchers from the PolyU Fire Lab attended the conference and gave the oral presentations.

Dr Liming Jiang received new GRF funding

Dr Liming Jiang's research project entitled "*Hybrid fire testing with two-way synchronization between e-controlled radiant panel and a full-scale CFD fire model to enable in-laboratory testing equivalent to large fire tests*" was awarded General Research Fund (GRF) from the Hong Kong Research Council.

This project is based on the radiant panel system (H-Tris) built by Dr Jiang and will be extended for hybrid fire simulation.

Dr Congliang Ye received NSFC Fund

Dr Ye received the prestigious Young Scientists Fund from the National Natural Science Foundation of China (NSFC) for this research on fire explosion dynamics. Congliang received his PhD in Safety Science and Engineering from Beijing Institute of Technology and joined PolyU Fire Group in early 2023. His research focuses on the explosion hazard in battery energy systems. The success rate of this funding scheme is about 15%, and this is Congliang's 1st time to apply.

NSFC
National Natural Science Foundation of China

Dr Shaorun Lin won the Bernard Lewis Fellowship

Congratulations to **Dr Shaorun Lin** on his 2024 Bernard Lewis Fellowship from the Combustion Institute. This prestigious recognition is assessed biennially and rewards young scholars who obtained a PhD degree within three years, have contributed high-level research, and have outstanding academic potential. Shaorun currently serves as a Research Assistant Professor in PolyU, and his primary research areas are combustion science and fire safety engineering, specifically smoldering combustion and wildfire dynamics.

PolyU Fire Lab joined Fire Asia 2024

The three-day international conference of Fire Asia 2024 was held at the Hong Kong Convention and Exhibition Centre in July. This conference is held by HK Fire Services Department that is the largest event on Fire Safety organised in HK every three years.

A big team from PolyU Fire Lab attended the Fire Asia 2024 conference. A total of seven posters were presented to guests from all around the world, featuring our latest research outcomes in smart firefighting, battery fire safety, firefighting robots, and AI-driven fire safety design.

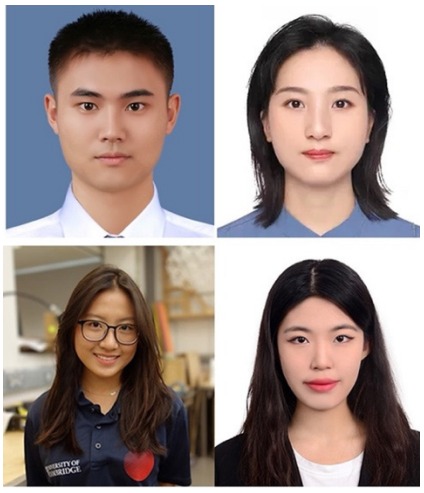
PolyU Fire Lab attended the 3rd National Symposium on Thermal Safety Science and Technology

The 3rd National Symposium on Thermal Safety Science and Technology is held in Hefei. This symposium aims to promote the development of thermal safety science and technology, and provide the platform for scholars to exchange the achievements in the field of thermal safety. Seven members from PolyU Fire Lab attended this event. Xinyan gave a keynote talk on AI-driven Smart Firefighting. Xiaoning and Yifei also shared their latest research on smart tunnel digital twins and automatic fuel load assessment.

New PhD Graduates

Dr Yanfu Zeng defended his PhD Thesis in Aug 2024 with the titled "**Intelligent Building Fire Safety Design Driven by Deep Learning Methods**", and his thesis was rated as excellent. Supervised by Dr Xinyan Huang, Yanfu's research marks the beginning of exploring AI implementation in building fire safety design, which will lead to a better, smarter, and more automated future!

Visiting Students to PolyU Fire Group



Jiekai XIE has finished his 6-month academic visit in Oct 2024 with the PolyU Fire Lab under the Guangdong Provincial funding scheme. He is the PhD student from Guangdong University of Technology, supervised by Prof. Guoqing Zhang. Jiekai currently focuses on the battery thermal management and thermal runaway. **Diane Luan** is the PhD student in Central South University, supervised by Prof. Chuangang Fan. As the exchange student funded by Joint Supervision Scheme, Diane visited the PolyU Fire Lab for one year (2023-2024). Her main research areas are smoke flow characteristics and smoke prevention and control in tunnel fires. **Janice Hiu Ching Ma** is the the undergraduate students from the University of Cambridge. She finished her summer internship in PolyU Fire Lab and worked on the robotic firefighting project. **Xiaoyu Sun** is the undergraduate students from the Glasgow University. When she was working on the summer internship in PolyU Fire Lab, she studied the impact of major fire incidents on social media. PolyU welcomes visiting students and professors all year round.

Smart Firefighting Robot Winning Gold Award

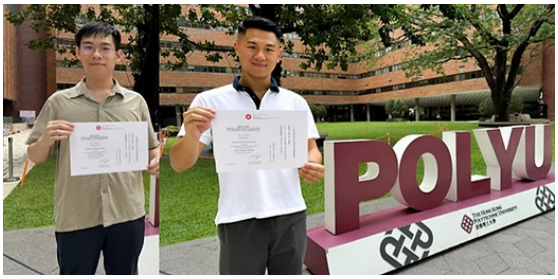
The paper "Use of Unmanned Aerial Systems in Outdoor Firefighting", co-authored by **Dr Xinyan Huang** and overseas collaborators, won 2024 Jack Bono Award for Engineering Communication from SFPE. This award is endowed by UL Research Institutes and each year recognises authors who have most contributed to the advancement and application of professional fire protection engineering. This is the 2nd time of winning this award, since the 2021 award paper "A Review of Battery Fires in Electric Vehicles."

Yichao got Best Presentation Award

Yichao Zhang and Dr. Xinyan Huang attended the 17th International Peatland Congress in Taizhou, China. The proposed theme of the Congress is "Peatlands in a Changing World", with the aim to recognise the multiple functions of peatlands and biodiversity conservation from a global perspective. **Yichao** gave a presentation of his latest research on "Impact of Underground Wildfire on Plant Roots in Peat Soil" and won the Best Student Oral Presentation Award. Yichao was a visiting student in Fire Lab back in 2022 and now joins us as a PhD student.

Wilson & Ho Yin got Government Scholarship

Wai Kit (Wilson) Cheung and **Ho Yin Wong** are the PhD student in PolyU Fire Lab, and they received the 2024 Talent Development Scholarship from HKSAR Government. Established in 2008, this scholarship aims to recognize students not only for their outstanding academic performance but also for their achievements and talents in non-academic areas and provide support for these students to further develop their talent and potential.



Fire Technology SI on Tunnel Fire

The enclosed nature of tunnel spaces, combined with the high density of users and complex environments, makes them particularly vulnerable to fire incidents. This special issue will focus on novel concepts, applications, and perspectives of fire modelling and firefighting technologies in underground space. The Guest Editors include two PolyU Fire Lab members (Tianhang ZHANG and Yuxin ZHANG) and Dr. Ricky Carvel from the University of Edinburgh.

Signed: Dr Xinyan Huang, The Hong Kong Polytechnic University, China

Imperial College London

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.

Graduating and arriving students

We are very excited to welcome **Hanna Berry** as a new PhD student in our team. She starts her work on battery fires between Hazelab and the battery research group of Imperial College London under the supervision of both Guillermo and Dr Huizhi Wang. Welcome to Hazelab!

Dimitra Tarasi from the Technical University of Crete has joined Hazelab again for an extended visit to work with us on our smouldering peat experiments – we are very happy to host you again, Dimitra!

We also hosted three undergraduate students and one postgraduate for the summer to work on research projects. **Yingfan Deng** used AI to study firebrands from timber compartments. **Frixos Papachristodoulou** reviewed firebrands (aka ejecta) from Li-ion batteries. **Siheng Xin** developed wildfire smoke models. Two students recently finished their masters' projects with Hazelab – **Jeff Gwee** developed models of firebrand transport from timber buildings, and **Kristen Chan** developed statistical models of firebrand generation from timber buildings.

Two MSc students from the master in Sustainable Energy Futures joined us for their thesis. **Panagiotis (Takis) Adamopoulos** worked on powerline network design optimisation, while **Auriane Javaloyes** modelled wildfire ignition from powerlines.

We are also thrilled that two of our members have graduated – congratulations, **Dr. Edmund Ang and Dr. Harry Mitchell**! Ed's PhD developed CFD models of tunnel fires, whereas Harry conducted large mass timber compartment fire experiments. Ed is continuing his amazing career as a Director at AECOM in Australia. Harry is continuing with Hazelab as a postdoctoral researcher but moving to a completely new topic – smouldering of Arctic peatlands! We are also proud to share that **Rikesh Amin** has submitted his PhD thesis on Mass timber and AI! Congratulations, Rikesh, and good luck for your upcoming viva.

Carlos Walker-Ravena is taking up a new postdoctoral position at the Universidad Católica de Chile on battery fires. Congratulations Carlos and best of luck!

Visitors

It has been an extremely busy summer for Hazelab for visitors! We feel very fortunate that so many have been able to visit our labs and chat with us about all things fire. We had visits from:

- Carlos Fernandez-Pello from University of California, Berkley
- Charles Betts and fire engineers from Hydrock, now Stantec
- Craig Weinschenk from UL
- Fernando Perez from ETH Zurich
- Augustin Guibaud's research group from University College London
- James Quintere from University of Maryland
- Sara McAllister from Missoula Fire Sciences Laboratory, USDA
- Carmen Gorska and fire engineers from OFR Consultants
- John Gale's research group at York University, Canada
- Richard Yuen from City University of Hong Kong and Anthony Yuen from Hong Kong Polytechnic
- Lukas Arnold's research group from Forschungszentrum Jülich
- Iza Vermesi from Bureau Veritas
- Candice Charlton from University of the West Indies

Conferences and Outreach

Alexander and **Nikolaos Kalogeropoulos** attended the 4th summer school on fire dynamics modelling at the Forschungszentrum Jülich in Germany. There, Alexander and Nick had the opportunity to learn about the physics and chemistry models embedded in FDS, and to meet and exchange ideas with the FDS developers.

Guillermo Rein went to China to visit the University of Science and Technology of China (USTC) and Hong Kong, where he presented at the Fire Asia conference. While he was in China, he also attended the First Hazelab Reunion (China Edition) to meet with some of Hazelab's alumni.

Harry and **Alexander** attended the 4th European Symposium on Fire Safety Science, hosted by the Universitat Politècnica de Catalunya in Barcelona, Spain. Hazelab had a fantastic time with a lot of collaborators and friends from across the world!

Harry, **Carlos**, **Afi Mulyasih**, **Nick**, and **Alexander** went to Edinburgh to attend Fired-Up. It was a great opportunity to meet with colleagues and friends from the fire science community from the UK and abroad!

Nick, Harry, and Guillermo had a great time on the Fire Science Show podcast, hosted by the famed Wojciech Wegrzynski. Nick and Harry presented their research on wildfire evacuation trigger modelling, and Guillermo presented on wind turbine fires.

The BBC published an article on the study conducted by **Jamie John** and **Guillermo** on the 'firewaves' that hit London in 2022. Carlos and Guillermo were also part of the BBC podcast on the Grenfell enquiry, discussing why combustible cladding was allowed on the market.

Nick, supported by student travel grants, attended and presented at the Annual SFPE conference and Expo in Kentucky and the 18th Plinius Conference on Mediterranean Risks in Greece.

Alexander Castagna and **Harry Mitchell** recently attended the European Fire Safety Symposium in Barcelona, Spain. Here, Harry presented his PhD research on firebrands from mass timber compartments. In addition to great tapas and sangria, the conference was a brilliant opportunity to meet our field's best and brightest and see some excellent research. Thank you to the lead organisers and hosts, Elsa Pastor, Eulàlia Planas, and the rest of the Universitat Politècnica de Catalunya team for a wonderful conference!

Signed Alexander Castagna, Harry Mitchell, and Guillermo Rein

International Master of Science in Fire Safety Engineering and Ghent University

Celebration Day

On the 20th of June, the Management Board of the International Master of science in Fire Safety Engineering organized the annual Celebration Day. This time we congratulated the students from cohort 2022-2024. The event was held at the beautiful Aula Campus in Ghent. Our congratulations to all graduating students!

Online Thesis Event

On the 19th of September, the IMFSE consortium organized an online thesis meeting with all IMFSE students who graduated in 2024. Each of them presented their thesis through a 2-minute video, after which questions could be asked. Besides the students, all IMFSE lecturers, alumni and contributors were invited to join the event. Over 100 attendees signed in that day and partook in the discussions.

IMFSE Hits the 30 Student Mark!
For the first time since the founding of the programme, the International Master of science in Fire Safety Engineering programme has 30 new students enrolling in the first year. Students come from all over the world to study this Erasmus Mundus Joint Master at the Universities of Ghent, Lund, Edinburgh and Barcelona. Proof of the quality and value of our Fire Engineering courses!

The Ragnar Wighus Award for IMFSE alumnus Cédric van de Vondel
Yet again, one of our alumni wins the IWMA Ragnar Wighus Award. This time it was Cédric van de Vondel who won the prestigious prize award, which made it possible for him to present his master thesis at the annual international Water Mist Conference (#IWMC2024 - Antwerp, Belgium).

Cédric van de Vondel says: "Winning this award for my thesis on numerical modelling of water mist is a tremendous honour. I'm grateful to my supervisor, Prof. Dr. Tarek Beji, and the IMFSE institute for their invaluable knowledge and support. I am excited to share my research and its potential impact on the water mist field."

The sponsor of the award is the International Water Mist Association (IWMA). In 2023, the award was renamed "Ragnar Wighus Award" in memory of the former and late president. Prior to that, the prize was called "IWMA Young Talent Award".

Read more?
Check our web site (http://imfse.be), where you will also see that the application forms are online for incoming students in 2025. There are a good number of scholarships to apply for! Dead-line is 31 January 2025.
News from Ghent University – Fire Safety Science and Engineering (FSSE)

MFSE Welcome Back Event
On the 27th of September we organized the first *Welcome Back* event for the local MSc programme, as well as the Postgraduate programme, in Fire Safety Engineering. The event was held at the Plateau building in Ghent. Students, alumni, lecturers and industry who were or are involved were invited to attend a welcome speech with more info about the programme by Professor Ruben Van Coile, followed by several thesis presentations by our graduating students and closed by a keynote speech by MFSE alumnus Florian Put. Afterwards, there was ample opportunity to catch up during a networking reception.

PhD Defense Ming-cian Hong
On 23 April 2024 Ming-cian Hong defended his PhD titled 'Numerical Modelling of Combustion Instabilities Induced by a Liquid Pool Fire in a Well-confined and Mechanically Ventilated Compartment'. The supervisors are professors Tarek Beji and Bart Merci. The thesis uses Fire Dynamics Simulator to explore the fire characteristics in an airtight and mechanically-ventilated enclosure. The goal is to enhance the understanding of liquid pool fire modelling in a forced-ventilated enclosure under various ventilation scenarios. More info can be found here.

In Memoriam Xavier Deckers
With deep sadness we share the news of the passing of Xavier Deckers on 17th of June 2024.

Xavier Deckers studied Electro-Mechanical Engineering as well as a Fire Safety Engineering at Ghent University, where he also joined the research team of professor Bart Merci in 2007. In 2009 he created the consultancy company Fire Engineered Solutions Ghent (FESG) as a spin-off from the Ghent University. FESG (now part of Jensen Hughes) has been important for the IMFSE programme as an early member of the Sponsorship Consortium. On a personal level Xavier Dedecker stayed involved with the IMFSE programme by enthusiastically partaking in in the assessment of master's dissertations, offering internships and project assignments as well as guiding many IMFSE alumni to FESG.

Xavier Deckers will never be forgotten and IMFSE will remain grateful forever. Our thoughts are with his family and friends.

Signed: Natalie Veranneman

King's College

New arrivals

We are extremely happy to welcome two new members to the group, Elena Funk and Abdullah Rehman, who joined us in October. Elena will be working on a PhD project on battery fires which is born through a collaboration between King's College and Danish Building Institute (DBI) funded by the Danish Innovation Fund. She comes with a wealth of industrial experience having worked at DBI for two years on projects related to the safety of li-ion batteries. Abdullah joins our group as a PhD student on Wildland Urban Interface fire modelling and is part of the Leverhulme Centre for Wildfires. He is a graduate from Imperial College London and has worked as a software engineer before joining us.

During the summer we were joined by Anton Pustygin, who worked on a research project on battery fire modelling. Anton is a Chemistry undergraduate at Imperial College London and took part in the FUSE internship sponsored by the UK Faraday Institution.

Events

In July, Imogen Richards and Francesca Lugaresi presented at the Fired Up conference hosted by the University of Edinburgh. The student led conference was a great opportunity for them to share ongoing research work with a friendly audience.

Part of our team also attended the ESFSS2024 conference in Barcelona in October. Immy and Ally presented their work during the poster session. Francesco chaired a session, and Elena joined us from DBI.

The ERC Starting Grant

Best news of the year - Francesco was awarded a European Research Council starting grant. The project, FIREMOD, aims to provide a fundamental physical model of wildfires that takes all the accuracy of fire prediction in the lab and applies it to the real world. This 5-year funding will allow our group to grow so watch this space as there will be some openings for PhD students and postdocs coming out in the following year.

Signed: Francesca Lugaresi

Linnaeus University

Revision of the European standard on Durability of reaction to fire performance EN 16755

The European standard EN 16755 to classify the long-term performance of fire-retardant treated wood was established in 2017. It is based on the American standards ASTM D2898 and ASTM D3201 and defines the use classes for fire-retardant wood for indoor and outdoor use in buildings and thus complements the fire classification. The method is a powerful tool both for manufacturers to document the durability of their products and for users to be able to set relevant requirements.

EN 16755 began to be revised after five years, i.e. 2022. Around 240 proposals for changes were received from fourteen organizations in eight countries. These proposals have been reviewed by a European committee with the Swedish presidency and are now being introduced in a revised version that will be sent out for European consultation in 2025.

The main changes in the proposed revised standard are:

- The title and scope have been clarified
- The standard also applies to wood-based boards
- Only one method for accelerated aging is included, the one that also includes UV exposure
- Fire testing according to the small-scale cone calorimeter ISO 5660 has been removed

- The number of test samples according to the SBI, Single Burning Item EN 13823, the medium scale method, to be at least two
- The use classes are based on classes 1, 2 and 3 according to EN 335 Wood protection – Definitions and use classes
- References to service life have been removed

Wooden facades in taller buildings are often requested by architects. Fire requirements can be met with fire-retardant wood in Use class EXT. Strandparken residential building in the Stockholm area, Sweden. Photo Birgit Östman

Signed Birgit Östman Birgit.Ostman@lnu.se, Linnaeus University, Växjö, Sweden

University of Liverpool

The fire safety engineering research group of the University of Liverpool (UK) is composed of academics and PhD students involved in research projects related to fire risk, structural fire engineering, international fire incidents, fire financial evaluations, simulations, fire resilience and sustainability, EV and car park fires.

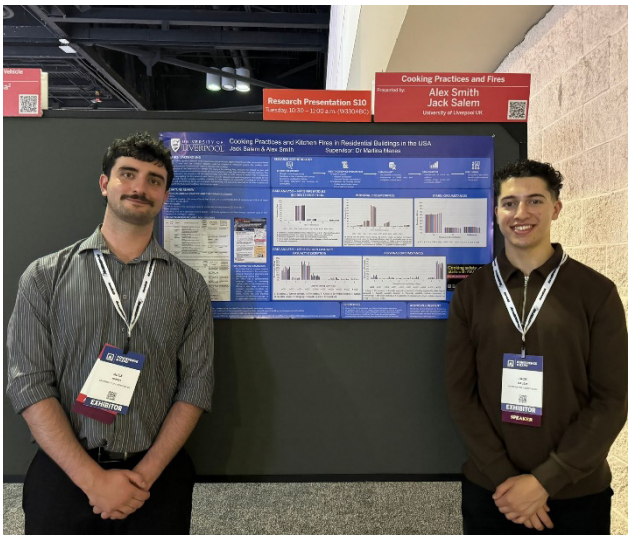
New PhD Student

Richard Clark will start his PhD at the University of Liverpool at the beginning of 2025 under the supervision of Dr Martina Manes and Dr Xu Dai. Richard, who works for the National Fire Chiefs Council will focus his research on the role of fire statistics in the assessment and improvement of fire safety regulations in the UK. The research aims to provide an understanding of 'proportionality' and acceptable risk that can be used by regulators to enforce standards more effectively and by the Fire and Rescue Services to optimize firefighting strategies.

Conferences and Outreach Activities

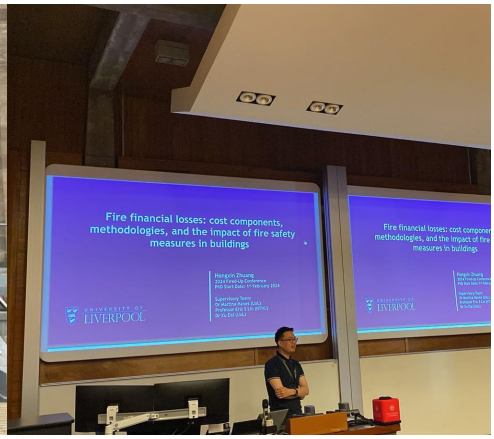
2024 NFPA Conference & Expo (Orlando, Florida, USA)

Jack Salem and Alex Smith (MEng students in Civil Engineering) under the supervision of Dr Martina Manes worked on the NFPA Student Project Initiative in the Summer of 2023 on research focused on "Cooking Practices and Fires in the USA". As part of this initiative, students were accepted for the presentation and poster session at the 2024 NFPA Conference & Expo (Orlando, Florida, USA) on 17-19th June 2024 and the final report of the project was published on the NFPA website. A special thank you to the NFPA for this unique opportunity and to Jacqueline Wilmot, Birgitte Messerschmidt and all the NFPA panel members for the support and feedback provided during the project.



2024 Fired-Up Conference (Edinburgh, UK)

PhD Student Yam (Hongxin) Zhuang currently enrolled in a Dual PhD Scholarship between the University of Liverpool and NTHU in Taiwan under the supervision of Dr Martina Manes, Prof Eric S. Lin, and Dr Xu Dai, attended the Fired-Up Conference (Edinburgh, UK) on 11-12th July 2024. He presented his research on "Fire financial losses: cost components, methodologies, and the impact of fire safety measures".



2024 Structures in Fire Forum (London, UK)

Rachel Foster (MEng student in Civil Engineering) under the supervision of Dr Martina Manes presented her 3rd year final dissertation on the "Investigation of pre- and post-fire conditions in residential buildings during COVID-19 Based on English Fire Statistics" during the Structures in Fire Forum on 27th September 2024. This investigation provided an alternative perspective to the statistical analysis of fires in Houses in Multiple Occupancy properties identifying trends experienced during the COVID-19 pandemic in relation to the recorded fire incidents, and how our social lives and the subsequent fire risks were impacted.

2024 Summer School on Fire Fundamentals for Performance-Based Fire Safety Design

Over 50 international researchers and professionals attended the Summer School on Fire Fundamentals for Performance-Based Fire Safety Design organised by ITB and Frissbe on 1-6th September with lectures by Prof Jose Torero, Prof Bart Merci, Dr Michael Woodrow, Dr Michael Spearpoint, Dr Andrea Lucherini, Dr Ruben Van Coile, and Dr Martina Manes. As part of the Summer School, the participants visited the ITB and Baltic Fire Laboratory. PhD Student Yam (Hongxin) Zhuang presented his research in the poster session. Thank you also to the participants for creating a community of professionals and researchers in fire safety engaged in discussion on several topics, challenges and possible solutions.

Research visits

2024 Universidad de Navarra (Pamplona, Spain)

Dr Martina Manes was hosted by Prof César Martín-Gómez from 18th to 28th September 2024 at the Universidad de Navarra (Pamplona, Spain) as a visiting academic. She was able to engage in discussions with professionals and researchers in the Escuela Técnica Superior de Arquitectura who provided a different view on the fire safety issues affecting our communities. Finally, she attended the EVRisk workshop on EV fires organized by Dr Mohd Zahirasri Mohd Tohir and Prof César Martín-Gómez on 26th September 2024 with relevant stakeholders from academia, industry and local authorities. The discussions created relevant bases for future collaborations addressing fire risk in car parks.

2024 Dual PhD Scholarship University of Liverpool and NTHU

PhD Student Yam (Hongxin) Zhuang is currently enrolled in a Dual PhD Scholarship between the University of Liverpool and NTHU in Taiwan under the supervision of Dr Martina Manes, Prof Eric S. Lin and Dr Xu Dai. He recently visited Prof Eric S. Lin at NTHU to present his ongoing research evaluating the costs of fire incidents in buildings.

Summer project

2024 EPSRC Vacation Bursary

Rachel Foster (MEng student in Civil Engineering) under the supervision of Dr Martina Manes worked on the EPSRC Vacation Bursary in the Summer of 2024 on research focused on "Learnings from DBI fire investigation reports to identify common trends and propose fire mitigation strategies in buildings" in collaboration with DBI.

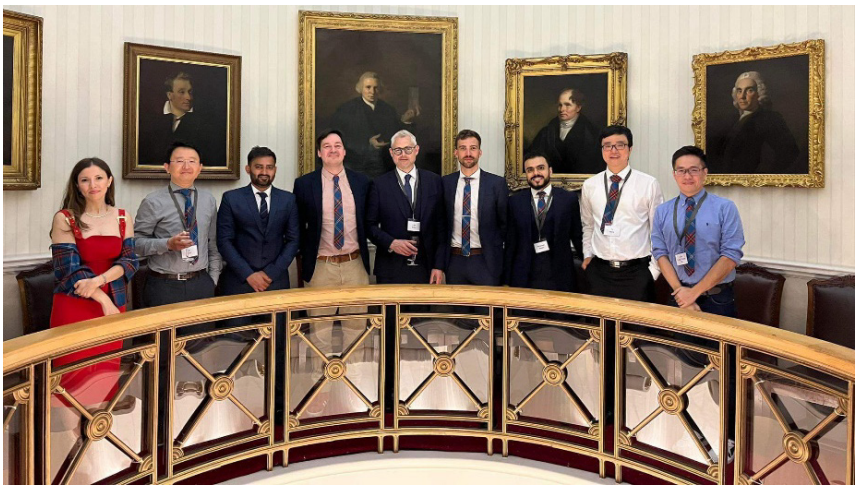
Events

2024 Structures in Fire Forum

On 10th May 2024, the University of Liverpool hosted the Structures in Fire Forum. 56 participants including professionals, firefighters, academics, and researchers in fire safety engineering from 31 companies, 12 universities, and 3 Fire and Rescue Services attended the event. Several presentations and research discussions covering structural fire safety, risk assessment, fire modelling and simulations, and large-scale fire experiments were discussed during the forum. A campus tour concluded the day with a visit to the flight simulator and the Virtual Engineering Centre.

Thank you very much to the presenters and participants for contributing to an engaging and constructive forum. Finally, thank you to Efectis UK/Ireland, Trigon Fire Safety, OFR Consultants, AkzoNobel, The Concrete Centre, and University of Liverpool, sponsors of this forum (Video of the Event).

The University of Edinburgh Fire Research Centre 50th Anniversary
Dr Martina Manes and Dr Xu Dai attended the one-day conference on 23rd May 2024 organised by the University of Edinburgh Fire Research Centre to celebrate their 50th anniversary with presentations from experts and professionals in the fire safety engineering field.



Award
2024/25 RAEng/Leverhulme Trust Research Fellowship
Dr Xu Dai has received a prestigious award from the Royal Academy of Engineering (RAEng), as one of the seven RAEng/Leverhulme Trust Research Fellowships for 2024/25, starting from September 2024. This research project focuses on better characterising travelling fires and evaluating the corresponding critical failure of steel-concrete composite floor structures at the system level. This project has three external collaborators: Dr Stephen Welch from the University of Edinburgh, Prof. Ian Burgess from the University of Sheffield, and Dr Simon Santamaria from Hydrock.

Signed: Martina Manes

University of Lorraine

Work in progress. The group is involved in several major projects. The FIREWALL+ project on fire façade is ongoing, close to the end now. Simulations and experimentations have been conducted at small, medium and large scale in collaboration with the CETHIL laboratory in Lyon and the CSTB. Progresses have been achieved in the way this can be simulated with FDS and FireFOAM (with connexion with Arnaud Trouvé from UMD for FireFOAM). A synthesis was recently presented at 4th *International Symposium on Fire Safety of Façades* in Lund in June. The group recently obtained two other important fundings from the French research agency (ANR). One is for the RAGNAROCH project focused on radiative transfer in oven, with for us, an expected progress in the characterization and modeling of radiation from gases and potential adaption to flames later on. The second project is called PAF and is dedicated to Protection Against Fires. It will address the protection of structures with water spraying in case of fire. EFECTIS and the Corsican laboratory SPE are our partners in this project. Beside these good news for our group, our main works in progress still concern under-oxygenated fires in compartment, use of water mist for fire mitigation, thermal degradation and char production of wood.

Highlights:
Study of compartment fire. Rabah Mehaddi gave an invited lecture at the 4th ESFSS symposium in Barcelona on October 11th. His talk entiltled "Numerical and experimental investigation of compartment fires" was dedicated to our recent experiments and simulations on compartment fires. Both well-ventilated and under-ventilated conditions have been studied on a classical compartment with a door of varying open surface. Usual models derived from pioneering works by Kawagoe or Quintiere et al. have been challenged and our current ability to simulated this kind of fire has been also evaluated. If well-ventilated cases can be correctly simulated, complex phenomena encountered in under-ventilated conditions are still challenging. Recent experiments with innovative measurement of the heat released inside and outside the compartment will help to improve our understanding of the phenomena. Rabah presented our methods, results and open questions.

A new model of tunnel (1/20th scale) has been built in our experimental facilities, within the frame of a cooperation with the SGP company in France, with the aim to help SGP to improve fire safety on this major project to extend the Paris metro network. The so-called « Line 19 » (the name of Côme Leclerc's model, our PhD student in charge of the research project) will allow to study smoke propagation in a gallery, either closed or open, with varying slope and HRR. A huge effort has been done on a fine instrumentation in order to get a clear characterization of temperature and velocity distributions. Next step will be a more challenging model addressing the specific problem of connection between galleries and stations, still with the specificities of the construction step (no available ventilation dedicated to smoke management in particular).

Focus on a nice recent paper : Effect of the wood species on the fire behavior in vertical orientation, by L. Terrei, H. Flity, O. Ikhou, G. Trohel, J. L. Torero, Z. Acem, G. Parent, Fire Safety Journal (2024)148(1):104234

The objective of this study was to investigate the parameters controlling auto-ignition, degradation and auto-extinction of wood in vertical orientation. For this purpose an extensive set of 600 experiments was conducted varying extrinsic parameters such as external heat-flux and the wood samples. The experimental setup was based on a double-cone calorimeter, which allowed to accurately change the imposed heat flux at a predefined moment. For each test, mass loss, surface temperature and in-depth temperature of the samples were measured. The auto-ignition study showed that the time to auto-ignition increases linearly with density. Despite a wide range of times to ignition, the surface temperatures at ignition were in the same order of magnitude for all species: between 450 and 700 °C for auto-ignition before 2 min and between 700 and 800 °C for auto-ignition after 2 min. The onset of char oxidation was observed at low heat fluxes. It occurs at different times depending on the wood species, but at similar surface temperatures, around 390 °C. The sliding double heating cone made it possible to identify the criteria for auto-extinction: the heat flux for auto-extinction can vary from 40 to 55 $kW.m^{-2}$ depending on the wood species. The study highlights the dominant role of density for auto-ignition and auto-extinction.

The French researchers on fire safety sciences gathered at the 34th RésoFeux meeting in Vernon on 12-13 september. French researchers in engineers meet twice a year, to present some of their ongoing work and have exchanges about fire safety problems. Last session in Vernon was organized under the hospices of CNPP, with the participation of a delegation from our group. About 60 participants attended to the sessions, with more than 20 presentations about miscellaneous topics including fire modelling, underground structure fires, suppression, WUI, façade fires, pyrolysis,… A specific round table was dedicated to on new energies and fire safety related-problems.

Arrival:
Modibo Dembele has joined our team and that of LNE. The aim of his thesis work is to characterize and understand the fire behaviour of electrical cables in an oxygen-deficient environment. More specifically, the study will focus on flame propagation and extinction mechanisms for this type of product.

Safir Haddad joined the team in October 2024 to work on the numerical modelling of wood in domestic stoves. The first aim of his work is to implement and validate a new wood degradation model in the FDS code, based on medium- and large-scale experimental results. Then, he will work on the coupling of pyrolysis and solid combustion processes in under-ventilated environment. This post-doc is jointly funded by the laboratories LERMAB and LEMTA with the participation of the GRAND EST region. This new model will subsequently be used to refine other important simulation parameters such as flame, extinction and thermal radiation.

Twitter: LEMTA (@Labo_Lemta) / LEMTA-OS Feux (@FeuxOs)
Web site: https://lemta.univ-lorraine.fr

Signed Pascal Boulet, at LEMTA laboratory, University of Lorraine and CNRS.

Lund University

Education

In August the second cohort of our new local 5-year program in Fire Safety Engineering arrived in Lund. The students that start the second year will have fundamental engineering courses in maths, programming, structural engineering etc as well as fire engineering courses such as Fire Physics, Fire Chemistry and Fire Dynamics

Research

Decision Support Framework for Sustainable and Fire Resilient Built Environments (SAFR-BE)

The Lund University (LU) Division of Fire Safety Engineering (FSE) is pleased to announce a research award of just over US$1M from the UL Research Institutes to advance the concepts and framework for Sustainable and Fire Resilient Built Environments (SAFR-BE). The project is a joint effort between LU FSE, Prof. Margaret McNamee and Dr. Håkan Frantzich, the LU Division of Energy and Building Design (EBD), Prof. Ricardo Bernardo and Prof. Pieter de Wilde, and Crux Consulting, Dr. Brian Meacham. A key objective of the 3-year research project is to advance the concepts developed by McNamee, Frantzich, Meacham and Kimblad in the SFPE Foundation supported research project, Risk and Performance Assessment Framework for a Sustainable and Fire Resilient Building Environment (SAFR-BE). This new, 3-year effort supports two Ph.D. students, one in FSE, Cecilia Wetterqvist, and one in EBD (tbd). The dual doctoral student approach aims to facilitate the convergence of architectural and fire engineering perspectives, theories and approaches around sustainable and fire resilient design, creating the opportunity to broaden interdisciplinary learning and enhance the multisector applicability of the framework. Watch for updates and research outcomes in the coming years!

Positions and personnel

From October 15th to December 21st this year, Patrick Van Hees will be a visiting Erskine fellow at the UC Civil and Natural Resources Engineering at the University of Canterbury. Patrick will be delivering lectures in their new course ENFE675 Forensic Fire Engineering, in close collaboration with Aatif Ali Khan and Daniel Nilsson. Patrick has also received a small project from Lund University to enhance cooperation with the University of Canterbury both within research and education. This grant is part of Lund University´s global engagement activities

Lotta Vylund defended her licentiate thesis “Solving complex problems in emergencies: A Fire and Rescue Service perspective“ on August 15. The full thesis can be accessed here: https://lup.lub.lu.se/search/files/190478504/Lotta_Vylund-_WEBB.pdf

More information

More information about the Division, are available on https://se.linkedin.com/company/fire-safety-engineering-lund. Our LinkedIn page is continuously updated with news.

Signed: Nils Johansson

University of Maryland

Ali Tohidi To Join UMD as Assistant Professor

The UMD FPE Department welcomes Ali Tohidi, a fire and fluid dynamicist, to lead research efforts in wildfire modeling, high-performance scientific computing, and machine learning beginning in 2025.

“I am thrilled to join and contribute to the continued success of the program through collaboration with my colleagues and bringing my expertise in fluid and fire dynamics,” said Tohidi. “I am also looking forward to connecting with other programs across the campus to establish a high-impact research and teaching program in the department.”

Tohidi joins from San Jose State University’s Department of Mechanical Engineering, where he holds appointments as assistant professor and co-principal investigator of the Wildfire Interdisciplinary Research Center, a National Science Foundation Industry-University Cooperative Research Center.

He combines his expertise in mathematical models for large-scale systems to study fluid dynamics phenomena, with the goal of developing next-generation wildfire behavior models and characterization of near-term risk to communities and infrastructure.

Recently, he developed a predictive model for pyro-aerobiology, the transport of bacteria and fungi through wildfire smoke plumes, a damaging effect that extends beyond the wildfire's spatial "burn scars." His technology can help simulate the transport of bioaerosols via smoke plumes—which can affect a region's wildlife and vegetation—through vast time and spatial scales of wildfires.

"We are thrilled at the prospect of Dr. Tohidi joining FPE. He will help us strengthen our teaching and research activities in the areas of wildland fires and wildland-urban-interface (WUI) fires," said department chair Arnaud Trouvé. "He will also help us grow our expertise and capabilities in computational modeling, data science and machine learning."

Tohidi holds a doctorate degree in civil engineering focused on applied fluid dynamics from Clemson University, as well as a master of science in hydraulic structures from Sharif University of Technology, and a bachelor of science in civil engineering from Islamic Azad University Central Tehran Branch.

William Koffel Returns to FPE as Director of Online Courses

The FPE Department welcomes William "Bill" Koffel '79 as a new professional instructor and the new online course director. Koffel was appointed as a visiting senior faculty specialist.

"We are thrilled that Bill has accepted our offer to join FPE. He is bringing a wealth of experience to the department and will help us both as an instructor and as the director of the online under graduate program," said department Chair Arnaud Trouvé. "He will also help us maintain a balance between the practice and the research that is the dual legacy of the department."

Koffel, who obtained his bachelor's degree in FPE from UMD in 1979, is the founder and president of engineering and code-consulting firm Koffel Associates Inc. His passion for education dates back to his time as a UMD senior, when he started teaching at a community college in Pennsylvania. He later became an adjunct faculty for UMD and other colleges. He is a Registered Professional Engineer in seven states and in Washington, D.C., and is set to obtain a master's degree in education with a focus on instructional design for online learning from Capella University in December.

"I am very excited about returning to the Department. I have always enjoyed teaching and I hope to enhance the education of both online and on-campus students based upon my experience as a practicing fire protection engineer. I can't imagine a better way to eventually finish my career," said Koffel.

Two DOE Grants Awarded for Eco-Friendly Heat Pump Research

The U.S. Department of Energy's Buildings Energy Efficiency Frontiers and Innovation Technologies (BENEFIT) program, has awarded $2.5 million to UMD and collaborators to implement technology that addresses safety and performance concerns for secondary-loop heat pumps using refrigerants that are environmentally friendly, but flammable. It also funded UMD with a $2.3 million award to develop cold-climate heat pumps using refrigerants with low Global Warming Potential. Both projects aim to decarbonize buildings, reduce peak demand on the electric grid and lower energy costs by supporting new innovations and making existing technologies more accessible.

The UMD research team is a collaboration between the Center for Environmental Energy Engineering (CEEE) and the FPE Department. CEEE Director Reinhard Radermacher, Co-Directors Yunho Hwang and Vikrant Aute and FPE Professor Peter B. Sunderland will lead the UMD portion of the projects. Both projects will tap into the expertise of researchers in CEEE's Consortium for Energy Efficiency and Heat Pumps.

"Most of the working fluids currently in use for HVAC systems have a high GWP," says Sunderland. "The next generation of working fluids addresses this, but are flammable. These fluids cannot be used safely with current HVAC systems because the working fluid flows between the outdoor and indoor units, whereby the working fluid can leak indoors and ignite." This hazard can be reduced by keeping the flammable working fluid outdoors, with a secondary loop of water transferring heat between the indoor and outdoor units. Such systems are called Air-to-Water Heat Pumps.

For the cold-climate heat pump project, UMD researchers in collaboration with the National Renewable Energy Laboratory will design, develop, fabricate and test a smart rooftop cold-climate heat pump system using a low-GWP refrigerant. Industry partners Rheem Manufacturing Company and Copeland will provide equipment and parts. Electric heat pump sales have surged in recent years, partly due to a global push toward electrification. But the current technology struggles to perform in cold climates.

University of Maryland Team Advances to Semifinals in XPRIZE Wildfire Competition
A multidisciplinary research team led by the FPE Department has been selected as a semifinalist of the international XPRIZE Wildfire competition. Team "Crossfire," led by FPE Chair Arnaud Trouvé, is one of 29 global teams invited to participate in the semifinals taking place in March and October 2025. The group brings together strong expertise in fire protection engineering, robotics, autonomous systems, and vertical flight systems.

"This is exciting news," says Trouvé, "The XPRIZE Wildfire competition pushes the department into the space of technological innovation with great benefits for students and faculty, and if we are successful, with great benefits to society as well!"

Crossfire has moved a step forward in a challenge that involves the development of a system that locates and suppresses a wildfire in an area spanning a thousand square kilometers with challenging wind and terrain conditions in just under 10 minutes.

The team's solution is based on multiple drones, including a large, long-endurance Unmanned Aerial Vehicle (UAV) as well as small, multicopter UAVs, standard communication and navigation technologies, dual fire detection technologies (thermal and optical cameras), enhanced water-based fire suppression (water containers featuring an innovative rupture and dispersion mechanism), all integrated into a System of Systems using optimization methods, Artificial Intelligence (AI) and machine learning algorithms.

Crossfire department members include master of science student Lindon Luu, Professor Stanislav Stoliarov and Assistant Professor Fernando Raffan-Montoya. Other researchers involved are affiliated with the Maryland Robotics Center, the Alfred Gessow Rotorcraft Center, the UAS Research and Operations Center (UROC), the Maryland Autonomous Technologies Research Innovation and eXploration (MATRIX) Laboratory and the xFoundry@UMD.

FPE Department To Offer Online Undergraduate Courses
The FPE Department will offer online undergraduate courses beginning in 2025. Only the required coursework for the B.S. in FPE will be available online.

The content and rigor of online courses will be equivalent to the department's on-campus courses, and program requirements will remain the same. Online courses will primarily be held in an asynchronous format, making coursework accessible to students in all time zones with varying work schedules.

"The objective of the new undergraduate online courses is to produce the high number of graduates that the fire engineering profession needs," says Arnaud Trouvé, chair of the department. "The objective is also to provide FPE with the international footprint that its unique position in the educational landscape should provide."

The close-knit atmosphere of the department is a key differentiator that current students and alums value. Online students can expect to receive the same support that their on-campus counterparts benefit from.

"Our advising will continue to be student-centered. Our two dedicated advisors are here to help students complete a degree, no matter their location or in what modality (on-campus or online). We're excited to meet even more people who want to protect life from fire!," said Nicole Hollywood, associate director of programs.

The Director of the Undergraduate Online Program, William Koffel, shares that "online students expect an experience similar to that which on-campus students receive. The online courses will provide experiential learning opportunities similar to those available to on-campus students. In addition, technology will be used to create an engaging relationship between students and the faculty."

Four Fire Protection Engineers Among Clark School's Distinguished Alums
The A. James Clark School of Engineering inducted the Early Career Distinguished Alumni (ECDA) Society, Class of 2024—four of which were fire protection engineers.

The society, which recognizes individuals for their innovations, leadership, and impact made in their respective fields of engineering, brought Christine Chatfield '08, Isaac Leventon '10 M.S.'11 Ph.D.'16, Adam Levine '06 and Rachel Lilienfeld '16 back to their alma mater for a celebration in their honor.

"The ECDA Society recognizes young individuals who are high achieving alumni from the Clark School," said Arnaud Trouvé, chair of the Department of Fire Protection Engineering (FPE). "We are delighted to count four graduates of FPE among the 2024 inductees of the ECDA Society. They make us proud!"

Firefighter Exoskeleton Wins Second Place at ASTM International Games
A team of students at the UMD Honors College won second place at this year's ASTM International Exo Games, boasting an exoskeleton design for firefighter use at a Philadelphia competition.

Team EXO, which secured an additional first place accolade in the design category, aims to create a device that reduces the physical burden of firefighters during emergency response, as research suggests that a leading cause of injuries for firefighters in the United States is the bodily strain and exertion from their equipment.

Team EXO, part of the university's Gemstone Program, rose in a competition where the task was to design exoskeleton technologies with applications to emergency response and unstructured environments, including law enforcement, firefighting, bomb squads, urban search and rescue, and Emergency Medical Technicians (EMTs). Their prototype, which aids firefighters by distributing weight more evenly, provides mechanical assistance to reduce physical burden for wearers. Their work was a collaboration with FPE Department Professor Peter Sunderland, who mentored the group through design challenges.

"This student team identified an excellent solution to the persistent problem of firefighter fatigue and injury. They have worked tirelessly for three years to design and build several prototypes. They work incredibly well together," said Sunderland.

The team includes FPE senior Liam Smith, as well as mechanical engineering senior Connor Bosco, bioengineering senior Jess Mense, aerospace engineering senior Tom Bigot, geology senior Nick Salanitri, electrical engineering senior Donald Spriggs, and mechanical engineering senior Brett Ingram.

Jensen Hughes Awards $5,000 To Undergraduates in Entrepreneurship Course
Jensen Hughes, a global fire safety consulting firm, awarded $5,000 to three undergraduate students based on their product pitches presented in the FPE Department's "Think Thank" course earlier this Spring. The first place award went to Adam Brodsky '26, winning $3,000 in cash, with a second place tie between Elliot Pasiner '25 and Samantha Farren '25, who both won a $1,000 award.

Throughout the semester, students work on a business proposal for a product that advances the FPE field alongside a Jensen Hughes mentor, who provides insight on the product or business' practical application, market competency, suggested price point and technical advice on product design.

"I always enjoy teaching this class! It's the only course in the FPE curriculum that combines the financial aspects of the business community with the technical aspects of engineering and product development," said Clinical Professor Ken Isman. "I'm also very grateful for the dedication of Jensen Hughes to this class. Their commitment to providing guest lecturers, mentors, and a panel of experts for the final pitch session is invaluable. We couldn't do this without their sponsorship."

"The Think Tank experience gave me the opportunity to think about innovations within the FPE field. Having the guidance of knowledgeable professionals and the open-end format of the class really allowed me to explore my interests," said Brodsky. "Presenting at Jensen Hughes to respected individuals in the field made me feel very valued within the fire protection community, and I am excited to see the future of the class!"

Signed: Peter Sunderland

OFR Consultants

OFR continues to support students and research dissemination through its sponsorship activities. We maintain our relationship with the International Masters in Fire Safety Engineering (IMFSE) and are also a supporter of the University of Edinburgh SFPE chapter. We remain a sponsor of the Structures in Fire Forum (STiFF) group organized by David Rush at the University of Edinburgh. This year OFR were also sponsors of the 4th ESFSS conference in Barcelona and also the Summer School on performance based fire engineering in Warsaw that was organised by Grunde Jomaas, Andrea Lucherini through FRISSBE, and Wojciech Węgrzyński at ITB. Finally, OFR are delighted to continue our partnership with Wojciech in supporting his very successful Fire Science Show podcast.

Speaking of the Fire Science Show, Danny Hopkin was a recent guest talking about 'Lessons from mass timber experiments' which follows on from his earlier episode on 'Engineered timber'. Izzy Inerhunwa has spoken at STiFF on his work on light gauge steel walls in which OFR worked with Wojciech and his colleagues at ITB to carry out the furnace tests. Izzy also had a paper on this work at the Structures in Fire (SiF) conference.

In addition to being a sponsor, Mike Spearpoint was one of the lecturers at the summer school in Warsaw and he was also invited by Michael Klippel at ETH to deliver a course on fire safety systems as part of its masters programme in fire engineering. In terms of OFR sponsored PhD students, Antonela Čolić is close to finishing her thesis examining the performance of adhesives used in the manufacture of CLT panels, supervised by Luke Bisby at the University of Edinburgh. We also have our on-going support of Aatish Jeebodh supervised by Shan-Shan Huang at the University of Sheffield on their work on sustainable steel-timber hybrid structures in fire. OFR are also partnering with Peter Lawrence and Asim Siddiqui at the University of Greenwich to support Chan Sorayudh Chanthan on his research on BIM standards within fire engineering.

OFR in collaboration with Steve Gwynne and Hui Xie from GHD/Movement Strategies, and Anne Templeton at the University of Edinburgh completed the work on evacuation from high-rise residential buildings on behalf of the Building Safety Regulator at the Health and Safety Executive. Along with a paper published in Safety Science, Mike Spearpoint presented aspects of this work at ESFSS and also at a fire evacuation workshop organised during the Council on Tall Buildings and Urban Habitat (CTBUH) congress in London. Mike has also given several presentations this year including a talk on data collection at the 9th IMFSE Fire Safety Engineering Day, and seminars for the Swedish and Swiss SFPE chapters. Finally, Mike was also recently made a Fellow of the SFPE.
Michael Spearpoint
OFR Consultants

Signed Michael Spearpoint

Université de Poitiers

New PhD student – Mohameth DIA
My name is Mohameth DIA. After obtaining a Bachelor's degree in Physics and Chemistry, I completed a Master's degree in Renewable Energies. Currently, I am a PhD student in the Fire research group of Pprime Institute – Université de Poitiers, under the supervision of Thomas Rogaume. My thesis focuses on improving the numerical modeling of the fire reaction of solid materials. This work is part of the LabCom (joint laboratory) project on Performance in Fire Safety Engineering (Perf-ISI), a collaboration between the Pprime Institute and Efectis France, funded by the French National Research Agency (ANR).

Fires are complex phenomena involving numerous physical and chemical processes, making them particularly difficult to study. Among these processes, the thermal decomposition of materials plays a crucial role. One of the major scientific challenges today is accurately modeling this decomposition by developing reliable pyrolysis models. The Fire Dynamics Simulator (FDS) is a widely used computational tool in this field, as it can simulate various physical phenomena associated with fires. However, the simulation of chemical kinetics remains a point that can be improved. It may be positive in order to represent the fire behavior of certain specific materials, such as thermal decomposition kinetics, flame propagation and gaseous emissions. Therefore, a key scientific challenge is the accurate description of solid-phase and gas-phase processes and their interactions and interfacial phenomena. In this context, my research project aims to improve the FDS code to represent these fire reaction processes better, from specific experimental investigations.

New Post-doctorate

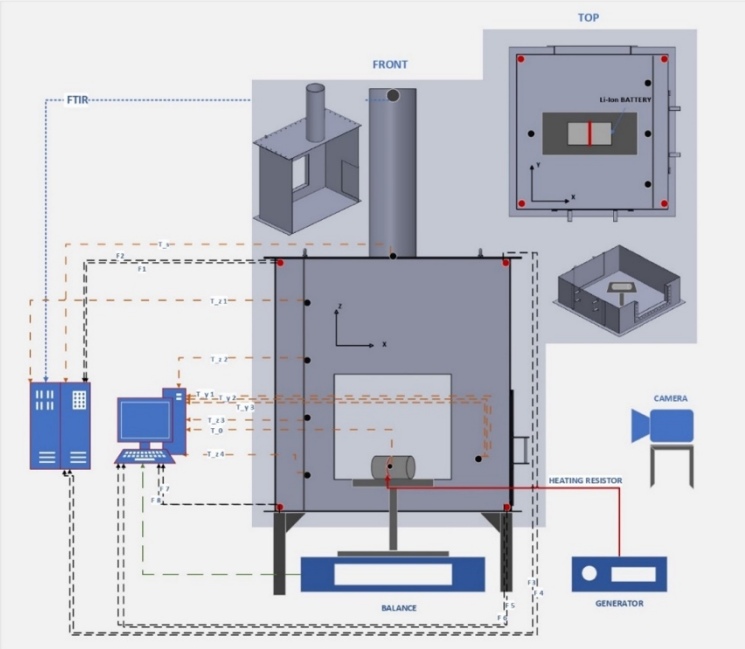
Amine TERZI, specialized in fluid mechanics and heat transfer, just joined the team in Pprime – Université de Poitiers. He had the opportunity to participate in several research projects throughout his academic and professional career. His integration into the TEMPO research team at the LAMIH laboratory of the University of Polytechnique Hauts-de-France allowed him to conduct numerical and experimental studies on the cooling of a heated surface as part of the ATAC-ALSTOM project.

Amine also worked on the thermal study of rotating machines as part of the RENAULT-COCTEL project. Subsequently, he held the position of project manager in various renowned companies in the energy sector, which allowed him to improve my skills in project financial management. In his pursuit of further expertise in fluid mechanics and heat transfer, he decided in 2018 to pursue a doctorate, working on a thesis titled "Dynamic and thermal study of a heated liquid film flowing down an inclined wall."

More recently, he joined the Pprime laboratory at the University of Poitiers to contribute to the setup of a new subsonic high-speed combustion bench (CHV). He later joined the Fire team of Pprime Institute to participate in a project for the study of lithium-ion battery fires.

Investigation of the fire behaviour of batteries

Pprime Institute is now equipped in order to study the fire behavior of batteries, notably the Li-Ion ones. The team is involved in two new research's projects which aim to characterize the the ignition, the flame development and characteristics as well as the extinction of Li-Ion batteries classically found in the domestic life. Thus, phone, PC, tools and e-bike batteries fire behavior is studied.



The first project, named "Batterie LI-ION, prevention and protection" is found by Fondation MAIF, while the second one is supported by Region Nouvelle Aquitaine. Are partners of the projects Efectis France, Duorisk, Calyxis and the SDIS49.

The research projects aim to evaluate the risks associated with the use of rechargeable lithium-ion (Li-Ion) batteries. It will focus on the various applications of these batteries, as well as the conditions for storage and recharging, while examining the potential fire hazards they may pose to their environment. This includes analyzing the propagation of fire to nearby elements and structures, taking into account different building configurations, with: risk of fire spread to adjacent elements, domino effects, risks to structures and premises...

In order to meet its challenges (prevention and protection of Li-ion battery fires), the project aims to characterize, for fires involving batteries:

- Their combustion, in terms of the temperature fields and heat flux emitted.
- Toxic and dangerous gaseous species discarded.
- The risk of thermal runaway or even explosion.
- The various techniques of extinction, as well as to study their effectiveness.

Based on this work, the members of the consortium will prescribe safe conditions of use and measures to be applied to prevent and react to fires, including:

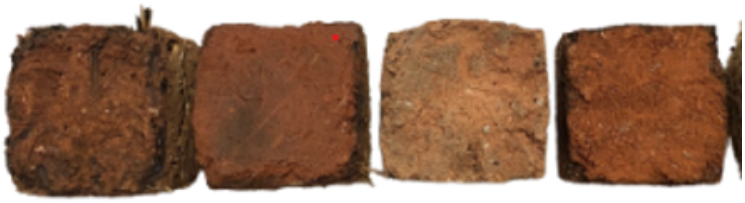
- Behaviour to be observed by users in order to prevent the risk of accidents, and lines to be observed in case of fire.
- Extinguishing techniques and operational modes.
- Safety measures to be adopted by battery manufacturers.

More specifically, we will study the impact of the following factors on the batteries fire:

- Charge and discharge cycles,
- Improper charging,
- Overcharging,
- Mechanical shocks,
- Unfavorable environmental conditions (temperature, humidity),
- External heat sources.

Fire performance of the earth elements for buildings

Pprime is partner of the project MURTERFEU found by the ADEME in France. The other partners are Université de Pau et Pays de l'Adour, Cergy Université, IMT Alés, CSTB, ASTERRE and Efectis France.



The raw earth is currently experiencing a revival of interest as a constructive technique because of its very low environmental impact. However, there is currently no regulatory document describing these constructive techniques. There are now guides to good practices published in 2018 and developed by the professional actors of the field. In terms of fire behaviour of raw earth structures, for certain applications such as establishments receiving the public, the elements must be tested in a laboratory approved at scale 1. This situation complicates and increases the use of raw earth and makes these materials very efficient from an environmental point of view, not competitive economically.

The objective of the MURTERFEU project is to facilitate the use of raw earth in the case of works requiring an assessment of fire behaviour. For this, laboratory assessments will be established to characterize the fire behavior of the most common raw earth structures. If a work perfectly corresponds to the field of tests carried out, the validation of the behaviour under fire will be direct. If a work is close to the field of laboratory assessments, the assessment will be simplified.

Will be studied land with a reduced weight and its protection by earth or earth-based coating, land mixed with fibres (adobe in particular), compressed land. The materials studied will not involve stabilization. laboratories, evaluation will be simplified.Will be studied Land with a reduced weight and its protection by earth or earth-based coating, land mixed with fibres (adobe in particular), compressed land. The materials studied will not involve stabilization. laboratories, evaluation will be simplified.

Materials and products will be characterized in the laboratory and the evolution of thermo-mechanical properties will be characterized. Tests with rapid heating approaching a fire heating will be carried out at different scales: laboratory scale (decimeter order of magnitude), intermediate scale (meter order of magnitude) and scale 1 (walls of 3 x 3 m 2). The 1-scale tests will be conducted at an accredited facility.

In this project is particularly in charge of the tests in order to determine the fire behaviour tests of light-weight land and the understanding of the phenomena of burning fires
To respond to this challenge, the post-doctorate student will used the cone calorimeter as well as different radiant panels, and will be characterize: the conditions of ignition is this one occurs, the mass loss, the mass loss rate, the heat release rate in case of combustion, and the temperature distribution into the materials as well as it mechanical degradation.

Duorisk partnership
Former PhD students from the University of Poitiers and Pprime Institute, Simon Roblin and Fabien Hermouet, are contributing through their company DuoRisk to a project focused on battery fires (in everyday products, from individual cells to battery packs used in light mobility). This project is part of a call for proposals by the MAIF Foundation (a French insurer) and will involve several partners and stages. In addition to DuoRisk, the consortium includes the University of Poitiers, Efectis, Calyxis, and the Maine-et-Loire Fire Service. The project's phases include a literature review of the phenomenology and accidentology of battery fires, experimental tests, and numerical simulations of the conditions under which these fires occur. The ultimate goal is to provide best practices for battery use to individuals and fire departments, as well as to contribute to the global fire community's databases on this emerging risk. The literature review phase was completed in September with the submission of the first report to the MAIF Foundation, and the next phase (experimental) has already begun.

Signed: Thomas Rogaume

University of Queensland

UQFire welcomes new academic
David Morrisset completed a Masters in Fire Protection engineering at Cal Poly San Luis Obispo in 2020 and a PhD in fire safety engineering from the University of Edinburgh in 2024. David's research focuses primarily on material flammability including ignition and flame spread for solid fuels, but he also has experimental experience across a range of scales and applications (e.g., mass timber, cladding, upholstered furniture).

He plans to continue exploring aspects of material flammability at UQ and hopes to use optical measurement techniques such as laser diagnostics to develop high fidelity measurements for a range of fire science topics.

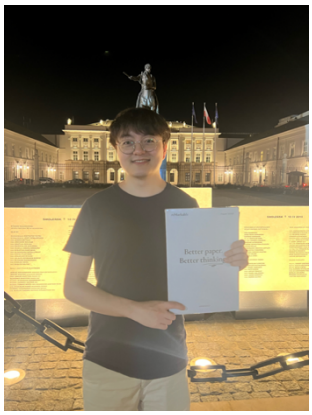
And a new visiting PhD Student

Yukito Nakayama is a PhD student at Chiba University in Japan, under the supervision of Professor Takeo Hirashima. He is currently visiting UQFire where he is focused on the fire performance of timber-steel connections. His PhD project, funded by JSPS Grants-in-Aid for Scientific Research, endeavours to understand the influence of moment-resisting timber-steel joints on the overall response of timber structures in case of a fire. He has conducted full-scale fire experiments on timber frames with such connections, focusing on the impact of moment redistribution among connected members on the fire resistance of a timber frame. In Australia, Yukito is working on the development of a numerical model for timber structures with timber-steel joints subjected to realistic fire scenarios, which enables parametric fire response simulation of high-rise timber buildings. Outside of research, Yukito is an avid basketball player and also enjoys architecture, exploring different cultures, and eating new foods.

Recent Graduates

One outstanding PhD student specialised in fire research graduated from the joint PhD programme between UQ and IITD in 2024. UQFire extends their warmest congratulations to Dr Akshay Baheti.

Akshay's doctoral thesis introduces a design framework for assessing life-cycle risk, offering a stepping stone for determining the need for structural strengthening to promote sustainable use of construction materials. The framework is illustrated for reinforced concrete (RC) structures subjected to multi-hazard action of earthquake and fire while accounting for continuous structural deterioration on account of chloride- and carbonation-induced corrosion over the structure's service life. This research also discusses a seminal contribution to the field of structural fire engineering through the development of semiempirical equations for predicting maximum deflection in RC beams and columns under uniform fire exposure. These equations use the most appropriate fire intensity measure derived from a novel framework developed in-house.



UQFire around the world

UQ Student Wins Best Poster Award

UQ PhD student Wenxuan Wu attended the Fire Performance-based Design Summer School in Poland, organised by Instytut Techniki Budowlanej and FRISSBE. He was honoured to receive the Best Poster Award from the lecturers' commission!

PROTECT 2024

UQ Research Associate Dravesh Yadav presented his work titled "Numerical Prediction of Fire Resistance of Concrete-Filled Steel Tubular (CFST) Columns Protected by Intumescent Fire Coating."

UQ Students Present in SiF 2024 in Coimbra, Portugal

UQFire PhD students Stavros Spyridakis, Zhiruoyu Wang, Askhay Baheti, and Joshua Madden presented at the Structures in Fire Conference held in Coimbra, Portugal.

Stavros presented some novel and practically valuable insights on the performance of timber coated with different types of intumescent paint, and how these coated timber systems perform when compared to traditional encapsulation with plasterboard. This was informed by hundreds of experiments he had performed at UQ over the last three years. You can find Stavros' results in the conference proceedings, and in the upcoming special issue on Structures in Fire in *Fire and Materials*.

Zhiruoyu presented his work on high-rise the effect of topology of diagrid structures on their fire response. This work showed that under fire, the thermomechanical response of the floor system can change dramatically due to the change in diagrid system topography. Read more about this work in the upcoming special issue in Fire and Materials.

Joshua presented his work titled: 'Burning Behaviour of a Timber Ceiling: A Bench-Scale Investigation'. The focus of this study was to determine the impact that changing the orientation from a conventional horizontal orientation to a ceiling orientation has on the ignition delay time and subsequent burning behaviour of CLT at a bench-scale using the FPA. More recently, Joshua also presented this novel methodology and the future work required to understand the ignition phenomena at this orientation at the European Symposium of Fire Safety Science (ESFSS 2024), held in Barcelona in October.

UQFire Turns Ten
This year marks the 10th anniversary of UQFire. Over the last ten years, UQFire has consistently strived and succeeded in making meaningful contributions to the fire safety engineering field. This is in great thanks to the many dedicated, motivated, and technically capable students, researchers, and academics many of whom continue to dedicate their life to this field.

Signed: Anwar Orabi

SFPE Foundation

Events
In partnership with the NFPA Fire Protection Research Foundation, UC Berkeley Engineering, and the Pacific Earthquake Engineering Research Center, the SFPE Foundation will host the 2025 AI in Fire Engineering Summit. The event will take place at the University of California, Berkeley (USA) May 28 to May 30, 2025. Registration opens in January 2025, and the conference program will be announced at that time. For more information, please visit https://www.sfpe.org/2025aisummit/home

Research Projects
The SFPE Foundation is funding research into Energy Storage System Hazards in alignment with its commitment to the Grand Challenges Initiative (GCI) research agenda, specifically the priorities outlined in the GCI Energy & Infrastructure white paper. Funding was made possible through the Grand Challenges Initiative and GCI Partner organizations. This project, in particular, benefits from support provided by Code Red Consultants, Fisher Engineering, LMDG, Sparc Fire Protection Engineering, and UL Research Institutes' Electrochemical Safety Research Institute.

The project team for *Energy Storage System (ESS) Hazards* includes Noah L. Ryder, PhD, PE (Fire & Risk Alliance, LLC), Prof. Grunde Jomaas (ERA Chair Holder and Head of Department for Fire-safe Sustainable Built Environment at ZAG), Jim Milke, PhD, PE, FSFPE (Fire & Risk Alliance, LLC), Bishoy N. Awad, PhD, PMSFPE, PMP®, ITC, BCIN (Fire & Risk Alliance, LLC), Karli Steranka, PE (Fire & Risk Alliance, LLC), Lauren Gagnon, PhD (Fire & Risk Alliance, LLC), and Ulises Rojas-Alva, PhD (Department for Fire-safe Sustainable Built Environment at ZAG).

After this work is completed, we expect to have a deeper understanding of how ESS fires and related hazards compare to other industrial and storage fires. The results are expected to be published in late 2025. Learn more at https://www.sfpe.org/foundation/foundationresearch/foundationresearch-ongoing

Additionally, the SFPE Foundation received a FEMA (USA) Fire Prevention & Safety Grant to create an advanced training in Wildland Urban Interface (WUI) fire risk assessment and mitigation for the fire service. With WUI fires on the rise, more fire departments are called to engage in WUI fire prevention and protection strategies, but most have significant unmet training needs in this area. While training on the basic principles of individual asset protection – such as structural hardening, defensible space, and vegetation management – has increased among

fire service personnel in the last few years, access to training on advanced topics remains lacking. Fire protection engineers can offer educational tools and resources regarding advanced topics like WUI fire dynamics, WUI fire modeling, and human behavior in WUI fires (e.g., notification and evacuation strategies). This project will assess advanced training needs that can be addressed with engineering-based resources and guidance, document best practices, develop three modular courses on these topics, and illustrate how these courses can reduce risk by addressing unmet training needs for departments across the U.S. We recently announced an RFP for a WUI Curriculum Consultant team for this project (75,000 USD); proposals are due November 4, 2024.

Grants & Awards
Twice a year, the SFPE Foundation awards four student research grants of 5,000 USD. The most recent recipients (from the March 2024 round of submissions) are Darko Glujić, PhD student, University of Rijeka (Croatia), Rajeendra Lakmina Pilana Godakandage, PhD student, University of Moratuwa (Sri Lanka) and RMIT University (Australia), Kunal Mallick, PhD student, Presidency University (India), and Wenxuan Wu, PhD student, The University of Queensland (Australia). To learn more about their projects and our student research grant program please visit https://www.sfpe.org/foundation/funding-opportunities/student-research-grants

The SFPE Foundation also bestows research awards every year. Our 2024 recipients are:

- **The Arthur B. Guise Medal:** Margaret McNamee, PhD, Lund University (Sweden)
- **Dr. Guylène Proulx, OC Scholarship:** Bronwyn Forrest, PhD Student, University of Waterloo (Canada)
- **Jack Bono Award for Engineering Communication:** Brian Y. Lattimer, PhD (Virginia Tech), Xinyan Huang, PhD (The Hong Kong Polytechnic University), Michael A. Delichatsios, PhD (Northeastern University), Yiannis A. Levendis, PhD (Northeastern University), Kevin Kochersberger. PhD (Virginia Tech), Samuel Manzello, PhD (Tohoku University), Peter Frank (Evans Consulting), Tombo Jones (Virginia Tech - FAA Designated UAS Test Site), Jordi Salvador (BCN Drone Center), Conrad Delgado (BCN Drone Center), Eduard Angelats (Centre Tecnològic de Telecomunicacions de Catalunya/CTTC), M. Eulàlia Parés (Centre Tecnològic de Telecomunicacions de Catalunya/CTTC), David Martín (Pau Costa Foundation), Sara McAllister, PhD (Missoula Fire Sciences Laboratory), & Sayaka Suzuki, PhD (Tokyo Institute of Technology)
- **Student Scholar Awards:** Samuel Lovett, Master's Student, Carleton University (Canada), and Siyan Wang, PhD Candidate, University of California, Berkley (USA)
- **Frederick W. Mowrer Global Scholar Award:** Ting Xia, PhD Student, University of Science and Technology of China (China)

In 2024, we were also able to award Student Travel Grant funding to nine students to attend the SFPE 2024 Annual Conference & Expo in Louisville, KY, USA. All nine of them were past Student Research Grant or 2024 Foundation Award Winners, and they either gave a talk or presented a poster. Below, from left to right, they are Amy Kurr, Syan Wang, Yohannes Shewalul, Jacob Derrick, Nikolaos Kalogeropoulos, Samuel Lovett, Jingwen Weng, Ting Xia. Not pictured: Tanmay Vora.

Do you have students in search of research funding? We can virtually speak to your students about SFPE funding opportunities for students. To arrange a presentation, please contact Amanda Tarbet at atarbet@sfpefoundation.org

Signed: Amanda Tarbet

University of Sheffield

New arrivals

In October 2024, **Alan Winterburn**, from Leeds England, started his PhD entitled "*Fire dynamics in cross laminated timber structures*" under the supervision of Dr Martyn S McLaggan and Dr Shan-Shan Huang. Alan's project is focused on the behaviour of fire in relation to cross laminated timber structures analysis, with the aim to develop a better understanding of the fire performance of such systems. He received distinction with an MEng Fire Engineering from the University of Central Lancashire. Alan is also a Registered Professional Fire Engineer with the Engineering Council and a Fellow of the Institute of Fire Engineers. Alan is currently an Associate Director of Fire Engineering with WSP where he has acquired experience working as a Fire Engineer in multi-disciplinary environments, although Alan has previously work for pure fire engineering consultancy and delivered on projects. Alan currently manages a team of fire engineers out of the London office and works with and alongside stakeholders to achieve project deliverables and safe buildings.

Other news

We held our annual fire engineering CPD course earlier this year. 48 participants from 9 countries attended the course. The 2025 course is still under construction, but the timing will be similar (Spring time). Please keep an eye out!

Signed: Martyn McLaggan, University of Sheffield.

The Slovenian National Building and Civil Engineering Institute

Summer School arranged by ITB and FRISSBE-ZAG

The 2024 Summer School entitled *Fire Fundamentals for Performance-Based Fire Safety Design* took place from the 1st to the 8th of September in Warsaw and Gdansk, Poland. Organised by researchers from ZAG (Slovenian National Building and Civil Engineering Institute) and ITB (Instytut Techniki Budowlanej), the event provided fire professionals and early-career researchers with science-based insights into performance-based design for building fire safety.

The summer school featured an international panel of lecturers, who actively engaged with participants throughout the week. This close interaction fostered a dynamic learning environment, ensuring in-depth discussions.

Prof Grunde Jomaas and Dr Andrea Lucherini served as lecturers and organisational committee members, while our PhD students Martin Veit and Nik Rus were attendees.

The lecturers were Prof José Torero and Dr Michael Woodrow (University College London), Dr Michael Spearpoint (OFR Consultants), Prof Bart Merci and Dr Ruben van Coile (Ghent University), Dr Martina Manes (University of Liverpool), and Dr Wojciech Węgrzyński (ITB). A poster session was also held, with participants competing for the best poster awards.

The participants also had the opportunity to visit two fire labs in Poland, namely the ITB Fire Testing Laboratory in Pionki and the Baltic Fire Laboratory in Gdansk. These visits featured practical demonstrations, including fire resistance testing, façade testing with IR technology, and live sprinkler and water-mist demonstrations, as well as vehicle fire test.

If there is interest for a second edition of the Summer School for 2025, it will most likely be organized. If you would the summer school to become a reality in 2025, then you should complete the following survey https://forms.office.com/e/uzY151UinJ.

Summer internships

Over the (extended) summer, the FRISSBE department at ZAG welcomed a diverse group of summer interns, including three students from France (ISAE-SUPMECA, ENSIACET and Polytech Angers) and five from the International Master of Science in Fire Safety Engineering (IMFSE) program. The interns gained hands-on experience in fire safety research, contributing significantly to our projects and engaging in various laboratory experiments.

The French interns, Julian Cappeau, Ayad Abdou, and Antoine Couelier, focused on data analysis and automation, customer process optimisation, and various fire safety projects. Their work ranged from calculating carbon footprint to improving business models and collaborating with industries in research and development.

The IMFSE interns (El Ghalia Serghini, Rauan Adikey, Liliana Martínez, Sameed Ahmed Khan, and Akash Jyothivas) focused on fire testing, façade fire safety, battery testing, flammability assessment of biobased materials and photovoltaic fire risks. Several of them also contributed to the Burning Matters newsletter.

Overall, the summer interns demonstrated outstanding commitment to research, furthering our understanding of fire safety challenges while gaining professional experience. We thank them for their dedication and wish them all the best for their current academic year.

5th European Symposium on Fire Safety Science (ESFSS 2025) to be held in Ljubljana, Slovenia

We are excited to announce that we will be hosting the 5th European Symposium on Fire Safety Science (ESFSS) from the 3rd to the 5th of September 2025 in Ljubljana, Slovenia. The event will bring together fire safety science experts and researchers so that they can share and discuss their latest research results.

The Local Organizing Committee includes Prof Grunde Jomaas, Dr Andrea Lucherini, Dr Aleš Jug, Dr Ulises Rojas-Alva, Dr Laetitia Marrot and Dr Urška Blumauer.

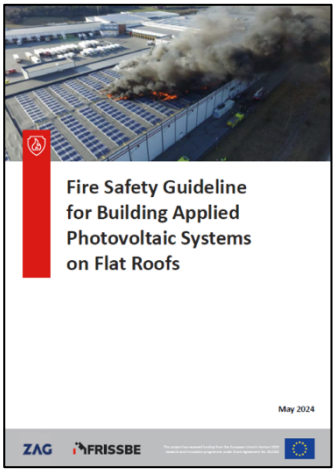
Dr Andrea Lucherini receives the 2024 SFPE 5 Under 35 Award

Senior researcher Andrea Lucherini was recently awarded the 2024 SFPE 5 Under 35 Award (as one of five recipients). This recognition highlights Andrea's ongoing contributions to fire protection engineering and his commitment to the development of the field.

The SFPE 5 Under 35 Award also acknowledges Andrea's leadership and professional growth, as well as his work in fire dynamics and structural fire engineering. His research, including studies on intumescent coatings and post-flashover fires, has contributed to deeper insights into fire safety.
Andrea's engagement with the fire safety community continues to make a valuable impact on the profession. Congratulations!

Publication of Building Applied Photovoltaics (BAPV) Fire Safety Guideline

The *Fire Safety Guideline for Building Applied Photovoltaic (BAPV) Systems on Flat Roofs* was developed to contribute towards fire safety for the increasing number of installations of photovoltaic (PV) systems across Europe. The recommendations in the guideline are based on scientific experiments and reliable data. It highlights critical concerns like increased fire risk (both fire frequency and consequence), changes in the fire development, as well as challenges for firefighters.



In addition to the publication of this guideline, Prof Grunde Jomaas, discussed the key elements of the guideline with Wojciech Węgrzyński in a recent episode of the *Fire Science Show* podcast (Episode 155).

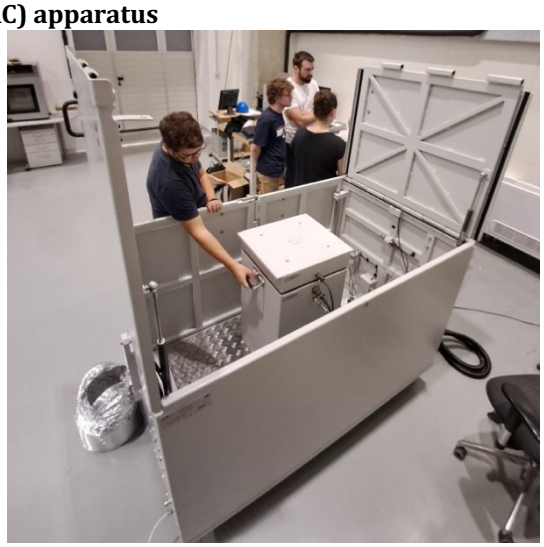
The concise, accessible nature of the guideline aims to be of relevance to a wide range of professionals, including fire engineers, firefighters, and building designers. It is currently available in English and Slovene, with editions in several other languages being prepared. Spanish, French and Chinese translations are welcomed – contact us!

Magazine Požar

Požar is a Slovenian professional magazine in the field of fire engineering, fire safety and fire prevention and it has 30 years of existence. ZAG's fire laboratory is deeply involved with the magazine for years. Since July new editor in chief is Dr Urška Blumauer – congratulations! We foresee that this opens for further communication routes towards the industry.

New Testing Capabilities: Acceleratory Rate Calorimetry (ARC) apparatus

The FRISSBE department at ZAG has just unboxed a new apparatus in the ZAG Fire laboratory in Logatec, namely the Acceleratory Rate Calorimetry (ARC EVx) apparatus from Thermal Hazard Technology. This equipment has been acquired together with the L18 Laboratory for Modern Battery Systems from the National Institute of Chemistry, with partial funding from ARIS (Slovenian Research and Innovation Agency). We extend our gratitude to ARIS for their support in enabling this significant upgrade to our testing capabilities.



The ARC EVx will enable us to deepen our research into the safety and performance of battery cells. This advanced apparatus allows to perform thermal degradation studies under various conditions, which is crucial in identifying the onset of thermal runaway and quantifying the energy released during such events. We can also conduct abuse testing, performance testing, and gas collection. The ability to collect and analyse exhaust fumes during thermal runaway is particularly valuable, as it can be combined with other methods like GC-MS or FTIR for further characterisation and quantification. These enhanced capabilities will significantly contribute to our ongoing battery safety and performance research. For any inquiry, please feel free to contact Dr Ulises Rojas (ZAG) or Dr Sara Drvarič Talian (National Institute of Chemistry).

Global Engagement

This summer has been a remarkable period of travel, knowledge-sharing, and collaboration for the FRISSBE department at ZAG. The diverse engagements demonstrate our active involvement in advancing fire safety science globally. Our team remains committed to building collaborations and contributing creating safer, more sustainable built environments.

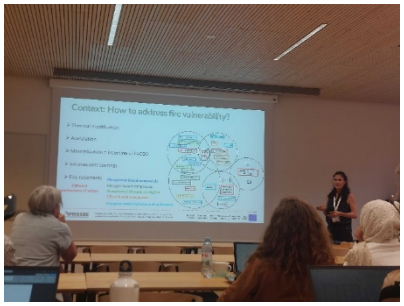
Prof Grunde Jomaas started the season as an invited speaker at the **Chief Fire Officers Association Annual Conference 2024** in Ireland, where he discussed the challenges of balancing sustainability and fire safety. His insights emphasised the growing importance of integrating fire safety with sustainable design principles, especially as we move toward more eco-friendly buildings.

Prof Grunde Jomaas and Dr Andrea Lucherini were excited to be invited to take part in the **Exchange of Experts (EoE)** and the **16th International Congress on Fire Safety & Science (FSS)** by NIPV in Arnhem, Netherlands (photos). These events allowed them to engage with fire safety experts, share their research, and explore new collaborations in the field. Andrea also contributed to the **International Master of Science in Fire Safety Engineering (IMFSE) webinar**, where he and Antonela Čolić (University of Edinburgh) provided mentorship and guidance to the next generation of fire safety engineers. He also presented key findings from his research on structural fire engineering at the **13th International Conference on Structures in Fire (SiF)** in Portugal.

At the same conference Dr Urška Blumauer presented interesting research of spatial steel joints outside the fire compartment. The experimental work was carried out in collaboration with the University of Ljubljana, Faculty for Civil and Geodetic Engineering. The results are showing some rather interesting behaviour of heated steel elements when they come in contact with cold steel elements outside of the fire compartment.

In May, Dr Aleš Jug and Nik Rus presented their work at the **4th EU Fire Safety Day International Conference** in Zagreb, Croatia focusing on fire safety concerns related to photovoltaic (PV) systems. Aleš also presented work on **Firefighting in Photovoltaic Power Plants** at a meeting in Split, Croatia (photo), where he thus continued to share our work related to the safety of renewable energy systems. Nik also participated in the **40th Symposium on Occupational, Process, and Fire Safety** in Portorož, Slovenia.

Dr Ulises Rojas-Alva was pivotal in organising a meeting for the ExFire Topical Team in Aachen, Germany (photo). This team focuses on the flammability of materials in microgravity environments. Ulises and Grunde were also delighted to participate in the One-day conference: "New variation on an old theme" at the University of Edinburgh, as part of their celebration of 50 years of their Fire Safety Engineering Education. Ulises also attended the IMFSE graduation ceremony in Ghent. ZAG is very proud to have become an affiliated partner of this excellent educational program. Ulises also presented his poster at the 4th European Symposium on Fire Safety Science (ESFSS) in Barcelona, Spain. At the same time, Martin Veit showcased his research paper, "*Predicting the Total Wall-Time of CFD Simulations of Single-Compartment Fires*." The event (ESFSS 2024) is surely well described in other newsletter entries.



Kirils Simakovs contributed by attending the Baltic Fire Safety Technology Forum 2024 in Riga, Latvia, where he presented work on how experiments can be carried out to reduce fire risks in photovoltaic installations.

Dr Laetitia Marrot (photo) presented her research on *biobased flame-retardant coatings for wooden façades* at the InnoRenew CoE International Conference in Slovenia, reflecting ZAG's commitment to sustainable fire safety solutions.

In May 2024, Dr Urška Blumauer and Friderik Knez attended the 7th Consortium meeting of MEZeroE project in Lecco, Italy. As a project partner ZAG is involved in Horizon Europe

MEZeroE project, which aims to support industrial partners' innovative products in the nearly zero energy envelope sector to reach the market by providing specific testing activities. These testing activities are done both in laboratory settings and in different public/private owned buildings throughout Europe.

In October 2024, Dr Matija Uršič and Friderik Knez attended the 5th Consortium meeting of the GREEN-LOOP project in Katowice, Poland. ZAG is a partner of this Horizon Europe project, which aims to design and optimise three innovative bio-based materials and components for industrial sectors. As part of the development of multifunctional rubber panels, based on recycled tyre rubber and bio-based flame retardants, we have created and tested prototype rubber panels which show very promising results compared to established products. The development and testing will continue with full-sized prototypes in the spring of 2025.

Both these projects (MEZeroE and GREEN-LOOP) are examples of integration of fire related topics into otherwise dominant topics such as energy efficiency and circular economy.

Open Positions
We are currently offering opportunities for graduates, postdoctoral researchers and senior researchers to join our team. We seek motivated individuals who are passionate about fire safety engineering and sustainable building research. These positions offer a chance to contribute to projects, collaborate with leading experts in the field, and gain hands-on experience in our fire laboratory. For more information on the open positions, please visit our website or contact us directly (frissbe@zag.si).

Acknowledgements
Several of the researchers in the Department for Fire-safe Sustainable Built Environment are funded by the FRISSBE project, which has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 952395.

Signed: Grunde Jomaas

State Key Laboratory of Fire Science (SKLFS), University of Science and Technology of China

The 3rd National Thermal Safety Science & Technology Symposium and the 2024 National Fire Science Popularization Theory & Technology Symposium successfully held
The 3rd National Thermal Safety Science & Technology Symposium and the 2024 National Fire Science Popularization Theory & Technology Symposium were co-sponsored by the National & Local Joint Engineering Research Centre of Thermal Safety Technology, the State Key Laboratory of Fire Science (SKLFS), and the China Fire Protection Association. Prof. Weiguo Song and Prof. Jie Ji served as the Chairmen of the Local Organizing Committee. This symposium brought together more than 480 attendees to exchange latest research progress.

During the symposium, Prof. Weicheng Fan (Academician of Chinese Academy of Engineering, University of Science and Technology of China), Prof. Laibin Zhang (Academician of Chinese Academy of Engineering, China University of Petroleum (Beijing)), Prof. Liang Yuan (Academician of Chinese Academy of Engineering, Anhui University of Science and Technology), Prof. Juncheng Jiang (President of Nanjing University of Technology), Prof. Chengli Qiu (Science Communication Research Centre of the Chinese Academy of Sciences), and Prof. Lifu Shu (Chinese Academy of Forestry Sciences) were invited to deliver plenary speeches. Eight parallel sessions were set up, with a total of 166 speeches, including, 58 keynote speeches and 108 oral presentations, covering 14 topics including fire dynamics, fire prevention and control of underground spaces and tunnels, personnel evacuation in emergency situations, fire prevention and control of cultural relics buildings and wooden structures, thermal safety issues in energy and chemical industries, fire protection, emergency response technologies and products, academic journals, accident and disaster risk assessment, electrical fire prevention and control, coal thermal power disaster prevention and control, high-rise building fire prevention and control, application of artificial intelligence in the field of fire, and fire science popularization.

2023 Annual Meeting of Academic Committee of the SKLFS held

On March 31, 2024, the Academic Committee of SKLFS held the 2023 Annual Meeting. Academician Weicheng Fan, Academician Yimin Xuan, Academician Xiangsheng Chen, Academician Laibin Zhang, Academician Chuan He, Vice Minister of Emergency Management Tian Zhou, Prof. Xiaofeng Sun, Prof. Fei Qi, Prof. Rui Xiao, Prof. Naian Liu and Prof. Heping Zhang attended the meeting. President of the University of Science and Technology of China (USTC), Academician Xinhe Bao delivered a welcome speech.

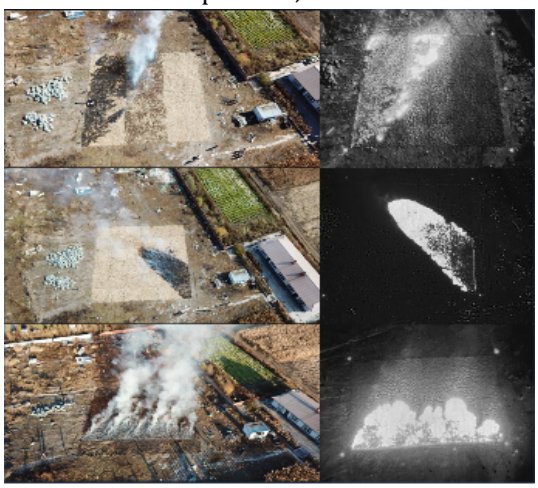
Prof. Naian Liu, the Director of the SKLFS, presented a detailed report on the achievements of the SKLFS in the year from 2022 to 2023 to the Academic Committee, covering aspects such as laboratory reconstruction, team construction, scientific research, discipline construction, cooperation and exchange, social services, etc. In the future, the SKLFS will dedicate efforts to key technologies innovation for fire prevention and control in the face of complex fires and their secondary and derivative accidents. Subsequently, Prof. Huahua Xiao, Assoc. Prof. Jianxin Yi, Assoc. Prof. Qixing Zhang, and Assoc. Prof. Xin Wang successively delivered oral presentations, entitled "Mechanism and prediction models of deflagration-to-detonation transition in gaseous mixtures", "Multi-dimensional gas detection with a chemiresistive-potentiometric multivariable sensor", "Integrating data-driven and physics-informed methods for accurate fire smoke detection", and "Performance regulation and mechanisms of recyclable, self-healing, intrinsically flame retardant bio-based epoxy composites".

Present members congratulated the laboratory for successfully completing its reorganization and highly commended the recent achievements. During discussions on the laboratory's long-term developmental planning, they offered constructive suggestions.

Research group of Prof. Jie Ji conducted manually laid fuel fire spread experiments and prescribed burning experiments

The National Key R&D Program of China "Key Technologies and Equipment for Ground-Air Collaborative Fighting of Forest and Grassland Fires", led by Prof. Jie Ji from SKLFS, has carried out fire spread experiments of manually laid fuel with an area of 900m^2 and prescribed burning experiments with an area up to 100,000m^2.

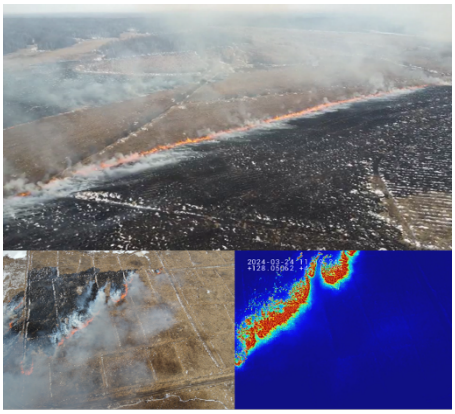
In the manually laid fuel fire spread experiments, the fuel types (corn stalks, walnut leaves, etc), fuel moisture content and ignition modes (single-point ignition, multi-point ignition, linear ignition, etc.) were changed to construct different fire spread scenarios. Multi-terminal equipment, including UAVs and ground video towers, etc., have been used to record fire spread process data, such as meteorological, topographical, and combustible parameters. The prescribed burning experiments were carried out in Lesser Khingan Mountains, China, and included several meadow fire spread scenarios with an area of 40,000m^2 to 100,000m^2. In particular, a fleet of drones was organized to collaboratively collect large-scale fire data.



Manually laid fuel bed fire spread experiments

A series of data-driven prediction methods have been established to solve the problem of defects in actual observation data, such as non-continuous, asynchronous, and unknown observation errors. The purpose of these experiments is to build a sample library of multi-granular spatiotemporal parameters of fires for coordinated monitoring on the ground and in the air, providing real fire environment measurement parameters for the basic theory of fire spread, and to verify the effectiveness of the prediction models established through simulation data before. This work has been published in the International Journal of Wildland Fire. The developed technologies have been applied to analyze the wildfire occurred in Kunming, China, on April 12, 2024, successfully simulating the spread of the fire.

Prof. Longhua Hu was awarded the XPLORER PRIZE



Prescribed burning experiments

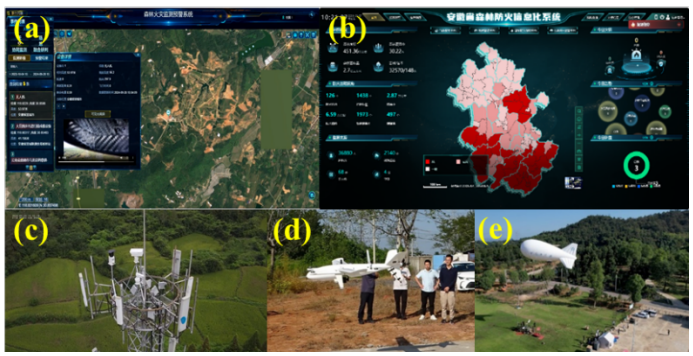
Prof. Longhua Hu from SKLFS, was awarded the ‘‘XPLORER PRIZE’’ of 2024. The XPLORER PRIZE, established in 2018, is a non-governmental and public interest award initiated by the New Cornerstone Science Foundation. The prize, which grants a total of 3 million CNY money award to each winner, aims to support young talents in exploring uncharted scientific territories. It covers ten fields of fundamental science and frontier technology, including Mathematics and Physics, Chemistry and New Materials, Astronomy and Geoscience, Life Sciences, Medical Sciences, Information and Electronics Technologies, Energy and Environmental Sciences, Advanced Manufacturing, Transportation and Architecture, Advanced Interdisciplinary Sciences. Each year, no more than 50 scientists are selected. This year, Prof. Hu is one of the four awardees selected in the field of Energy and Environmental Sciences. He is the first fire scientist that receives this prize.

Prof. Hu is a Fellow of The Combustion Institute, a recipient of the National Science Fund for Distinguished Young Scholars and the National Special Support Program for Science and Technology Innovation Leadership Talent of China. He has been committed to research on fire dynamics under wind, sub-atmospheric pressure and microgravity, with over 200 papers published in respected journals such as Progress in Energy and Combustion Science, Combustion and Flame, Proceedings of the Combustion Institute, Fire Safety Journal. Prof. Hu has held various academic positions, including IAFSS Vice-Chair (2017-2023), member of the Silver Medal Committee of The Combustion Institute, Fire Research Colloquia Co-Chair at 38th Combustion Symposium, Awards Committee Co-Chair at 14th IAFSS Symposium, Program Committee Chair at 13th AOSFST. He also serves as an Associate Editor of Tunnelling and Underground Space Technology, Editorial Board Members of Fire Safety Journal, and Fire Technology.

Under the support from the XPLORER PRIZE, Prof. Hu will explore the new discoveries, knowledge and theories of fire science, including ignition, fire spread and extinction fundamentals under special gravitational environments, providing a scientific foundation for the fire safety of future space exploration missions, and advancing the scope of human knowledge on fire science towards various special gravities in space.

National Key R&D Program of China "Research on all-weather and multi-mode monitoring, prediction and accurate early detection of forest fire" conducted application demonstration

The National Key R&D Program of China "Research on all-weather and multi-mode monitoring, prediction and accurate early detection of forest fire" has completed the application demonstration of the technologies developed by the project on September 28, 2024. This project is hosted by the Sate Key Laboratory of Fire Science (SKLFS) and jointly undertaken by 10 institutions. During the meeting, Prof. Weiguo Song, chief scientist of the project, reported the significant progress of the project, as well as the deployment of application demonstration work in Liaoning, Sichuan, and Anhui provinces in China. Yong Yu, an engineer from China Tower Corporation Limited, presented the application demonstration of the project's technologies in Anhui Province. Ming Xue, a senior engineer from the Ministry of Emergency Management Big Data Center, demonstrated the all-weather forest fire risk monitoring and early warning system developed by the project. The experts tested the operation status and fire detection effectiveness of the system on-site, and affirmed the achievements of the project and the effect of the demonstration. The project may enhance forest fire monitoring and early warning capabilities and comprehensive fire prevention and control level of China.

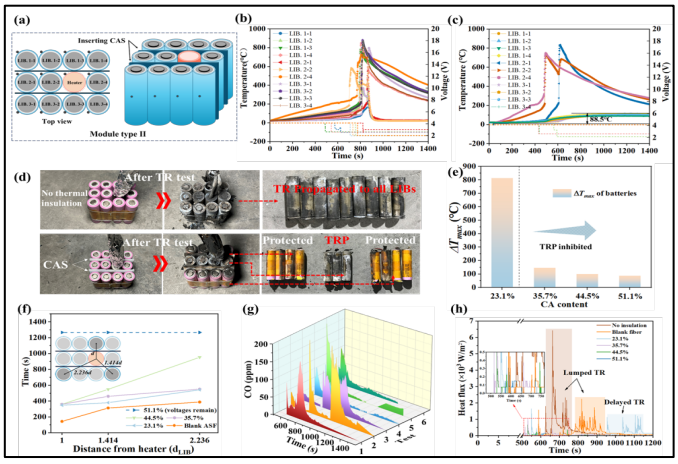


Systems and equipment developed by this project. (a) The forest fire risk monitoring and early warning system. (b) The forest Fire Prevention Information System of Anhui province in which project technology is used. (c) The fire detection equipment, installed on the tower. (d) The fire detection drone. (e) The fire detection airship.

Progress in the mitigation of thermal runaway propagation with high-temperature resistant, aerogel sheet

Due to the severe hazards of thermal runaway propagation (TRP) of lithium-ion batteries, separating the lithium-ion battery modules with a highly efficient insulation layer to effectively prohibit TRP, attracting extensive attention from scholars. Aerogel is considered a low-density material with strong thermal-insulation capacity. Nevertheless, silica aerogels or ready-made aerogel materials are not equipped with high-thermal resistance, and the maximum temperature during the thermal runaway of battery modules can be higher than 850 °C, which will cause structural damage and deterioration of thermal insulation performance. Therefore, developing aerogel sheets with high-temperature resistance and a systematic study of their blocking effects on TRP behaviours are of significant importance for enhancing fire safety of lithium-ion batteries.

Prof. Xudong Cheng, from SKLFS, proposed a type of high-temperature resistant and super elastic aerogel sheet, achieving prevention of thermal runaway propagation in lithium-ion batteries. The thermal runaway blocking effect of the obtained aerogel sheet was experimentally verified. TRP among fully charged LIBs with the highest temperature of up to 836.2 °C was successfully suppressed by a 2mm-thick aerogel sheet, yielding the maximum cell-to-cell temperature gap of 767 °C. The associated work was published in the ***Energy Storage Materials*** (the top journal of Chemistry and Physics).



The performance of aerogel sheets in thermal runaway propagation test. (a) The assembly of the LIB modules. (b-c) The time-dependent temperature profiles of each battery during the TR propagation tests with no insulation and aerogel sheet, respectively. (d) Comparison of the LIB module before and after TRP test. (e) The maximum temperatures rise duration of TRP with different aerogel loading. (f) Delayed effect of aerogel sheets compared with the control blank group. (g-h) The reduced CO concentration and flame radiation flux.

Prof. Yuan Hu from the SKLFS Led a Delegation to Kazakhstan for Exchange and Visits

To promote scientific and technological cooperation and cultural exchanges with countries along "the Belt and Road" and expand the international cooperation network, Prof. Yuan Hu, from SKLFS, led a delegation to visit Kazakhstan in August 2024. The delegation visited two universities (Zhubanov Aktobe Regional State University, Almaty University of Power Engineering and Telecommunications) and three research institutions (Institute of Combustion Problems in Kazakhstan, Sinopec Kazakhstan Branch, and Sinopec-Kazakh Oil Joint Venture), and conducted in-depth discussions on strengthening scientific and technological cooperation and exchanges between the SKLFS and Kazakhstan.

This visit is a continuation of the scientific and technological training course for developing countries along "the Belt and Road" in 2023. From December 3 to 16, 2023, with the support of the Bureau of International Cooperation of the Chinese Academy of Sciences, the SKLFS successfully hosted the scientific and technological training course "Design and Evaluation Methods of Fire Safety Engineering Materials". Since then, Prof. Amirbek BEKESHEV's group from Zhubanov Aktobe Regional State University has established close contact with Prof. Yuan Hu's group. With the support of the Ministry of Education and Technology of Kazakhstan, Prof. BEKESHEV invited Prof. Hu and his delegation to visit Zhubanov Aktobe Regional State University for exchange, to promote the research results of fire safety engineering materials in China, and to build a scientific and technological cooperation platform between the SKLFS and countries along "the Belt and Road".

The 2024 Seminar on Safety Engineering Materials & Technologies alongside "the Belt & Road" successfully held

The 2024 Seminar on Safety Engineering Materials & Technologies alongside "the Belt & Road" was successfully held on October 12-13, 2024, in Hefei, China. The seminar is hosted by SKLFS of the University of Science and Technology of China (USTC). The purpose of this seminar is to promote academic exchanges among researchers engaged in public safety or material science research in developing countries along "the Belt and Road" and to share research results related to safety engineering materials.

During the seminar, Prof. Naian Liu, the director of the SKLFS, delivered welcome speech. Prof. Manfred Döring from Schill+Seilacher GmbH (Germany), Dr. Kelvin Shen from Rio Tinto Minerals (USA), Dr. Trubachev Stanislav from Voevodsky Institute of Chemical Kinetics and Combustion (Russia), Prof. Aravind Dasari from Nanyang Technological University (Singapore), Prof. Rashid Nadirov from Institute of Combustion Problems (Kazakhstan), Prof. Amirbek Bekeshev from Zhubanov Aktobe Regional State University (Kazakhstan), and Prof. Jixin Zhu and Assoc. Prof. Xin Wang from the SKLFS delivered invited keynote speeches then. The attendees lively discussed the opportunities and challenges faced in the field of safety engineering materials and technologies, and expressed a willingness to strengthen the collaboration among countries alongside "the Belt & Road" in the future.

A technical training course "Fire Investigation and Firefighting Products" for Yunnan Province successfully held

To enhance the theoretical knowledge and practical ability of fire rescue personnel, the Yunnan Fire and Rescue Brigade commissioned SKLFS to organize a technical training course on "Fire Investigation and Firefighting Products". The training course was held in Hefei, from July 30 to August 1, 2024. Forty-one fire rescue members from Yunnan Province participated in this training.

This training course has been carefully designed to provide participants with a comprehensive understanding of fire theory, the fundamentals of fire investigation, and the characteristics of fire development. In this training, five professors were invited to deliver courses covering fundamental principles of fire science, fire dynamics, the characteristics of fire development in typical scenarios, analysis of fire traces, and hazardous chemical fires and explosions. The trainees also visited experimental platforms of different types of fires including fire whirls, lightning strike fires, lithium-ion battery fires, and a satellite remote sensing experimental bench for forest fire research.

In recent years, the SKLFS has primarily concentrated on cultivating senior technical and managerial talent from fire safety supervision and management departments, fire investigation teams, and large-scale enterprises and public institutions nationwide. It provides systematic and comprehensive training courses in fire safety technologies and management to enhance trainees' professional skills. Currently, the SKLFS has successfully organized several training programs for National Fire and Rescue Administration, the Fire and Rescue Brigade of Sichuan Province, the Fire and Rescue Brigade of Guangdong Province, and the Public Security Bureau of Shenzhen Municipality.

Professor Guillermo Rein Visited State Key Laboratory of Fire Science

In July 2024, Prof. Guillermo Rein from Imperial College London visited SKLFS. His visit was hosted by the SFPE Hefei Student Chapter and Prof. Yu Wang. The highlight of the visit was an academic presentation titled "Wildfires, Tall Timber, and Battery Fires: Combustion Science at a Crossroads with Climate Change and Safety" which drew significant interest, attracting nearly 4,000 participants worldwide. During an engaging seminar with young scholars, "How to Start Your Career", Prof. Rein shared his personal journey from an academic beginner to an internationally recognized figure. He intertwined his talk with personal stories and practical advice, offering valuable insights. The audience, especially young scholars, eagerly asked questions on topics ranging from securing research funding to maintaining a work-life balance. As the event concluded, attendees left with a renewed sense of direction and an array of actionable advice to guide them in their academic and professional endeavours.

Future Scientists in Fire Safety: International Graduate Research Forum Successfully Held

SKLFS, in partnership with the SFPE Hefei Student Chapter, organized the "Future Scientists" International Graduate Research Forum at the University of Science and Technology of China (USTC) on 28 April 2024, in Hefei, China. The event brought together prominent professors including Xingcai Lv (Shanghai Jiao Tong University), Haiqiao Wei (Shenyang Aerospace University), Hao Zhou (Zhejiang University), Zhuyin Ren (Tsinghua University), and Botao Qin (China University of Mining and Technology). As the Vice Director of SKLFS, Prof. Longhua Hu delivered the opening address, encouraging students to broaden their academic perspectives and to leverage the opportunity for interdisciplinary exchange. Prof. Yu Wang chaired the forum throughout. With over 200 attendees participating both online and in person, the forum underscored its global reach in fire safety research.

The event featured presentations from graduate students from various institutions, including USTC, University of Edinburgh (UK), University of Queensland (Australia), Nanyang Technological University (Singapore), and University of Petroleum and Energy Studies (India). These presentations covered a diverse range of fire safety topics, such as fire detection algorithms, flame retardant materials, combustion dynamics, and fire risk assessment, highlighting the forum's international and cross-disciplinary nature. Keynote addresses by distinguished experts further enriched the event, focusing on cutting-edge topics like zero-carbon fuels, ammonia combustion, hydrogen-fuelled aviation engines, and coal spontaneous combustion. The forum received highly positive feedback, it significantly advanced research innovation and collaboration in fire safety, providing a vital platform for students to showcase their findings and enhance their academic careers.

SFPE Hefei Student Chapter of SKLFS Achieves Gold Award for Chapter Excellence again

In July 2024, the Society of Fire Protection Engineers (SFPE) announced on its official platform that the SFPE Hefei Student Chapter advised by Prof. Yu Wang from SKLFS stood out among 124 chapters around the world and won the 2024 Gold Award for Chapter Excellence. Remarkably, this is the second time the chapter has received this honour, after winning the award for the first time in 2023.

Since its establishment in 2021, the SFPE Hefei Student Chapter has consistently devoted itself to deepening connections and interactions among students from various institutions and colleges. It has meticulously constructed a high-quality platform that allows undergraduate and graduate students in the field of fire safety science to achieve seamless connection and in-depth communication with internationally renowned engineers and scientists. Through close collaboration with various acclaimed organizations, the chapter has not only

significantly broadened the horizons of students and researchers but also markedly enhanced their capacity to collaborate, jointly propelling the advancement of this field to a new level.

The Second Safety Technology Summer Camp successfully held

The Second Safety Technology Summer Camp was successfully held in Hefei from July 13 to 16, 2024. The summer camp was co-hosted by the Graduate School of the University of Science and Technology of China (USTC) and SKLFS. One hundred and nine campers from more than 30 universities across China participated in the event. The summer camp aimed to improve SKLFS graduate enrolment. During the event, participants were allowed to closely learn about the SKLFS. At the same time, the academic ability and comprehensive quality of campers were assessed.

At the opening ceremony, Prof. Naian Liu, director of the SKLFS, expressed a warm welcome to the outstanding campers and shared his experience on how to do scientific research. Subsequently, Prof. Lizhong Yang gave a detailed introduction to the development process and overall situation of the SKLFS from various aspects including laboratory origin, discipline construction, laboratory setting, teaching staff and scientific research strength. Then, the professors from different research divisions of the SKLFS made detailed introductions to the Building Fire Research Division, Industrial Fire Research Division, Forest and Urban Fire Research Division, Fire Risk Assessment Research Division, Computer Simulation Research Division, Fire Chemistry Research Division, Fire Monitoring and Control Research Division, and Clean and High-Efficiency Firefighting Research Division.

During the summer camp, the SKLFS arranged the campers to visit the exhibition hall, the five-story wind tunnel experiment platform, the large-scale space fire experiment hall, as well as other facilities.

Signed Prof. Jie Ji, State Key Laboratory of Fire Science, University of Science and Technology of China.

Toyohashi University of Technology

The fire safety group, ECELAB (Energy Conversion Engineering Laboratory), located at Toyohashi University of Technology (TUT) in Japan, is experiencing continued growth and actively seeks both international and local students, as well as new opportunities for collaboration. The current members of ECELAB include Professor Yuji Nakamura, two Associate Professors -Tsuneyoshi Matsuoka, and Nobumasa Sekishita, Assistant Professor Daiki Matsugi, two postdoctoral researchers, a secretary, and over 20 students, including international visitors.

There have been significant changes and promotions since the last newsletter. We are pleased to announce that **Dr. Daiki Matsugi** was promoted to Assistant Professor on August 1, 2024, and **Dr. Vojtěch Šálek** from Prague, Czech Republic, has recently joined the ECELAB team as a postdoctoral researcher. Meanwhile, **Dr. Peiyi Sun** successfully completed her research at ECELAB and has now continued her career at Hong Kong Polytechnic University. Additionally, **Assistant Professor Takuya Yamazaki,** who spent four years conducting fundamental fire research and mentoring lab members, left at the end of March to take on a new role as Associate Professor at the Graduate School of Science and Technology at Hirosaki University.

ECELAB members have recently received several major awards. **Professor Nakamura** was honored with the *Encouragement Award* from The Japan Society of Microgravity Application and the *Academic Achievement Award* from the JSME Environmental Engineering Division. **Dr. Matsugi** received the *Uchida Encouragement Award* from the Japan Association of Fire Science and Engineering, which is presented to young researchers for their contributions to fire science and their originality and promise. Under the supervision of Prof. Nakamura, Master's students **Taichi Ogawa** and **Goshu Haruhiko** won the *Excellence Award* and the *Fighting Spirit Award*, respectively, at the 36th Annual Conference of the Japan Society of Microgravity Application for their posters on polymer combustion in microgravity conditions. Lastly, **Okada Ryoki** and his colleagues received the *Excellent Presentation Award* at the International Symposium on Fuels and Energy (ISFE2024). Congratulations to everyone!

From left to right: **Prof. Nakamura's** *Academic Achievement Award*, **Taichi Ogawa** receiving *Excellence Award*, **Dr. Matsugi's** *Uchida Encouragement Award*, and **Goshu Haruhiko** receiving *Fighting Spirit Award*.

ECELAB is active in both internal and external communication and in the popularization of science. The lab hosted a joint training session for all new bachelor's students, participated in a softball tournament against other laboratories, and held a traditional BBQ party to welcome new members and celebrate the end of the school year. To show that ECELAB's door are open to everyone, the ongoing research and demonstration experiments were showcased to numerous visitors at various events, including young students and their parents during the Open Campus 2024, as well as students from the University of Nebraska and Toyohashi Higashi High School. Additionally, **Prof. Nakamura** has contributed to the TV Tokyo program Science Now and participated in interviews, such as in Map of Learning, where you can find a detailed introduction to his career, achievements, and advice for the next generation of combustion engineers.

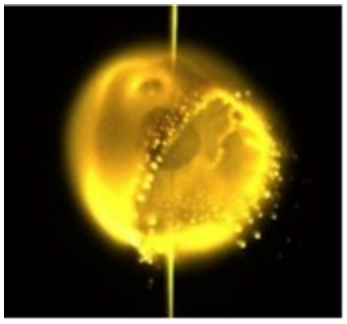
Traditional BBQ party (left). A fire whirlwind experiment demonstrated to visiting students (right).

Laboratory members have actively participated in various conferences, presenting their work through speeches and posters at events such as the 36th Annual Conference of the Japan Society of Microgravity Application, the 8th International Symposium on Fuels and Energy, the Special Effects Symposium at Tokyo Gakugei University, the First Special Effects Symposium, or the Research and Presentation Meeting of the Fire Science Society of Japan. Notably, **Dr. Zhang** and **Dr. Matsugi** presented at The Thermal Engineering Conference 2024 in Yamaguchi City, discussing burning rate constants of polymer materials and combustion control methods for pool fires, respectively. Thank you to everyone for your valuable contributions to the fire safety community!

Beyond these visible contributions, ECELAB, under the leadership of **Prof. Nakamura**, is also engaged in a variety of other important and prestigious initiatives. **Prof. Nakamura** is currently the chair of JAFSE (Japan Association for Fire Safety Engineering) academic committee, and serves in committees for the 4th European Symposium on Fire Safety Science (ESFSS 2024) and the 11th International Seminar on Fire and Explosion Hazards (ISFEH11), and other significant events. Toyohashi University of Technology will also host the annual 2025 JASFE symposium, with **Prof. Nakamura** as executive chair of the conference.

Finally, a noteworthy set of experiments was conducted using the drop tower in Akahira, Japan, to investigate flammability of polymer materials

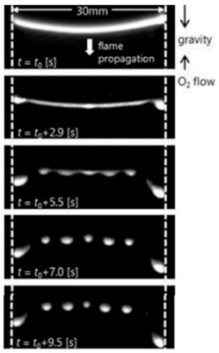
under microgravity. **Mr. Ogawa, Mr. Kawai, Mr. Yamabayashi, Dr. Matsugi, and Prof. Nakamura** successfully modified the apparatus and obtained a very valuable dataset!



The following paragraphs briefly introduce Prof. Nakamura, Assoc. Prof. Tsuneyoshi Matsuoka, and our postdoctoral researchers:

Professor Yuji Nakamura has dedicated himself to scale-modeling-based combustion research, aiming to develop strategies for addressing multi-scale, multi-physics problems and proposing more efficient and safer energy systems. Among others, Professor Nakamura has dedicated the past decade to groundbreaking research on polymer combustion, achieving remarkable results. We are excited to share that he is now planning to write a comprehensive review article, which we eagerly anticipate! In the figure to the right, you can see one of Prof. Nakamura's research concerns - burning of spherical polymer under microgravity environment.

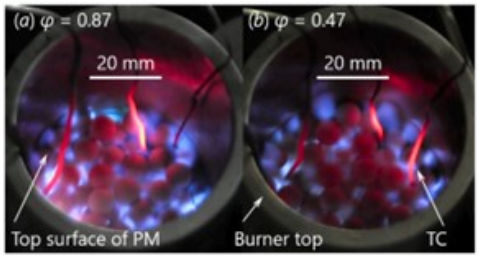
Assoc. Prof. Tsuneyoshi Matsuoka has focused on experimental research into the dynamics of solid combustion.



Using an in-house wind tunnel with precise control over flow velocity and channel height, he successfully observed the formation of fingering patterns within opposed flame spread over a thick solid combustible. As shown in the figure on the right, a continuous flame separates into small flamelets (see "T. Matsuoka et al., Proc. Combust. Inst., Vol. 36, Issue 2 (2017) 3019-3026"). This work has garnered significant attention from researchers in the field.

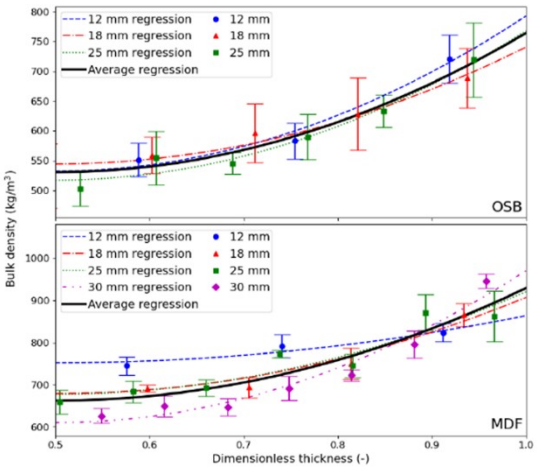
Assoc. Prof. Matsuoka took a sabbatical leave for about 10 months, starting in June 2023. During this period, he stayed at IRPHÉ (Institut de Recherche sur les Phénomènes Hors Équilibre) in Marseille, France, where he initiated research on the dynamics of hydrogen combustion.

Dr. Daiki Matsugi's research centers around fundamental studies on burning characteristics of a porous combustible soaked in a liquid oxidizer and development of liquid-fueled premixed burner system. Also, he conducts in-depth research on combustion in microgravity environments. His research outcomes have already garnered recognition through peer reviews, as evidenced, for example, by the very recent publication dealing with liquid-fueled high-performance burners accepted in Applications in Energy and Combustion Science. In the figure to the right, typical burning behavior observed for different equivalent ratios provided in "D. Matsugi et al., Appl. Energy Combust. Sci., Vol. 20, 100287 (2024)".

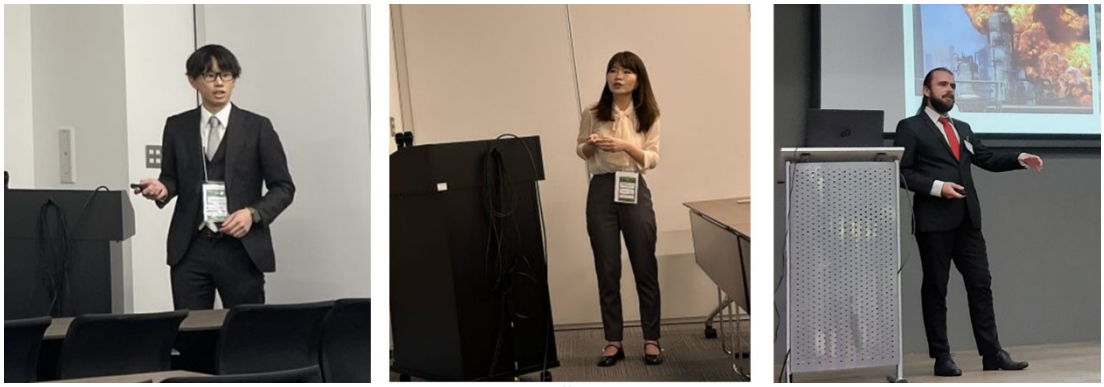


Dr. Yue Zhang was selected as JSPS Foreign Special Researcher. Her research focuses on fire dynamics, with current interests in flame structure and fundamental burning characteristics of polymer. Dr. Zhang's work enriches the foundational knowledge of flame research and will be instrumental in developing more effective firefighting techniques and ensuring the safety of both responders and the public. Recently, research findings related to polymer burning and the measurement of burning rate constant have been presented at various symposiums.

Dr. Vojtěch Šálek expertise lies in fire modeling, with a focus on determining input parameters for complex pyrolysis models. Currently, Vojtěch is expanding on his previous work in FDS by advancing techniques for modeling wood-based materials. He is developing a novel approach to simulate the heating and thermal decomposition of various porous materials, extending the existing capabilities within FDS.



In the figure to the right, often neglected wood-based material bulk density profiles, as one of the important input parameters for pyrolysis models, are shown. Additional frequently overlooked wood properties, procedures to obtain them, and their influence on the model prediction are provided in Vojtěch's latest publication "Šálek, V. et al., Fire Saf. J., Vol. 143, 104055 (2024)".



Dr. Matsugi (left), Dr. Zhang (center), and Dr. Šálek (right) delivering conference speeches.

To summarize, ECELAB offers a unique environment filled with challenges and opportunities, where researchers are given the freedom to explore their ideas while receiving unwavering support. With a diverse range of research interests and a dedicated team, the lab fosters a culture that empowers young researchers to grow and take charge of their career development. We highly value the independence and ambitions of doctoral students and postdocs, ensuring they have the resources and guidance needed to pursue meaningful research in combustion and fire dynamics.

If you are interested in being part of our dynamic lab, please don't hesitate to get in touch. We will be looking for a postdoctoral researcher in the next intake! The contact details, scientific topics, achievements, and news can be found at ECELAB web pages.

Signed: Vojtěch Šálek

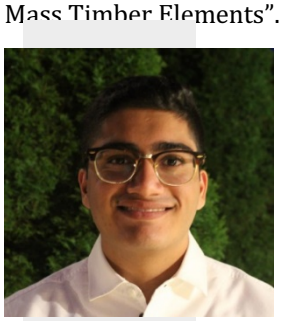
University of Waterloo

We are excited to welcome Dr. Vinny Gupta to the Fire Research Team! Vinny joins the University of Waterloo Department of Mechanical and Mechatronics as an Assistant Professor after three years as a Postdoctoral Research Associate with the Clean Combustion Group at the University of Sydney in Australia. Vinny brings expertise in areas such as Li-ion battery thermal runaway, compartment fires, flame spread, fire suppression, and laser diagnostics in fires He has initiated new projects leveraging our fire facility on Li-ion battery fires & explosions, timber compartment fires, and wildland fire emissions & spread. He will expand optical diagnostic capabilities for detailed characterization of multi-scale fire behavior.

Awards and Conferences

Huge Congratulations to Bronwyn Forrest, PhD student, on being awarded the Michael J. Smith Travel Award (Natural Sciences and Research Council of Canada) and the SFPE Dr. Guylène Proulx, OC Scholarship (presented at the SFPE 2024 Annual conference in USA) to extend her research in Human Response to Fire Exposure. Bronwyn is on an exciting research placement with Dr. Daniel Nilsson at University of Cantebury, NZ. Together they will meld VR studies of the MGM Grand Fire developed at UC with fire gas exposure protocols from UW to further study physiological and cognitive responses to combined visual and gaseous fire signals.

Claire Yuan, recent MASc graduate, also travelled to the SFPE Annual Conference to present her thesis work entitled "A Case Study Approach to Performance-based Design Dilemma in Canada". In her presentation she outlined how the objective based structure of the NBCC, with prescriptive solutions to define performance, does not and cannot envision every single design possibility in practice. Further, slow updates cannot keep pace with technology advances driven by concerns around climate change, energy efficiency, sustainability, new materials, and construction methods. Through consideration of 'History and Scientific Background', 'Reliability', 'Economic Impact', 'Design Practicality' and 'Guidance for Compliance', the associated challenges in application of the NBCC are investigated through three case studies involving "Atrium Design", "Spatial Separation of Buildings" and "Exposed Mass Timber Elements".



Ayaan Lakhani, MASc student, attended the Combustion Institute – Canadian Section conference with Braden Southern, Research Assistant, to present results from their Acetone Pool Fire Analysis outlined in the February newsletter.
Ayaan also travelled to ESFSS 2024 in Barcelona to present his work entitled "Impact of Oxygen Concentrations on the Development of Fires in Ventilation Limited Environments", summarizing another section of the large research project on Characterization of Underventilated Fires underway at the Fire Lab.
Student Updates

We welcome new PhD student, Mayur Patel from PLC Fire Safety Engineering to the UW Fire Safety graduate program. Mayur will be undertaking research into the volatilization and transport of heavy metals due to wildland fire smoke, particularly related to mining operations in remote areas.
We also welcome new MASc students Braden Southern (thermal runaway of Li-ion batteries), Andy Xu (infiltration of wildfire smoke co-supervised with Professor Amy Li), Stefan Mazzadi (data science/decision making in fires co-supervised with Professor Joshua Pulsipher) and Aaron Winter (timber/wildfires) to the UW Fire Safety graduate program.

Congratulations are due to our graduating students:

- Alex DiPaolo, MASc – Thesis: 'Furniture Fire Dynamics and Smoke Flow in a Two-Story House With Mechanical Ventilation" now at Tesla, USA. Access: https://uwspace.uwaterloo.ca/items/275ef5de-fb1d-46a4-98cf-ba4970296666
- Peter Senez, PhD – Thesis: '' An examination of escape times in a mock residential test house by analyzing smoke filling and detection times for couch fires in a living room" with SenezCo Fire Science and Engineering in Vancouver. Access: https://uwspace.uwaterloo.ca/items/3664338f-edda-4e87-b756-52e2639304c8

There are currently 7 MEng, 6 MASc and 5 PhD students in the fire safety program at UWaterloo. We have also hosted 3 high school students and 4 co-op students over the past year as they gained experience in research and fire safety engineering with our Group.

We are looking to recruit PhD and MASc students on exciting experimental projects involving Li-ion batteries, wildfires, and timber. If you're interested to learn more, we'd love to connect—feel free to reach out!

Signed: Beth Weckman

Victoria University

Victoria University's Fire Safety Group (VUFSG) has been active in fire research and education since 1991. The core of the group is formed by Professor Khalid Moinuddin, Professor Maurice Guerrieri and Associate Professor Paul Joseph. There are currently four postdoctoral fellows and about six PhD students conducting research in this group. Wildland fire propagation and liquid pool fire suppression by water mist research are led by Professor Moinuddin, Professor Guerrieri leads concrete behaviour in fire research, and Associate Professor Paul Joseph is in charge of fire safety engineering courses, and active and passive fire protection strategies, the former utilizing environmentally-friendly agents and the latter involving various polymeric materials.

Wildland Fire Research
Wildland fire research at VUFSG focuses on the adaptation and application of advanced physics-based numerical models (Fire Dynamics Simulator, FDS and FIRESTAR3D) to model and simulate firebrand transport, dynamic fire behaviour (both grassfire, and forest fire setting) under diverse atmospheric, terrain and fuel conditions. This

includes studying merging of two fires, transitioning surface fire to grassfire, and developing a statistical for firebrand landing distributions from physics-based models. The latter will be as a function of atmospheric conditions and fire scenarios to be used in any operational model (such as SPARK developed by CSIRO Data61).

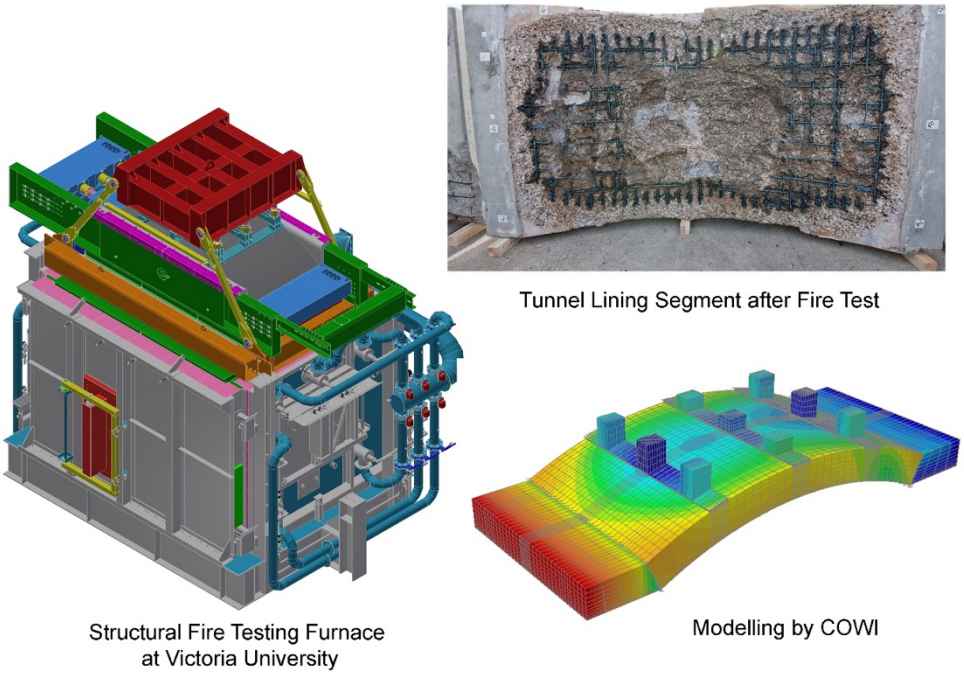
Recently, our team achieved a major milestone by successfully validating the physics-based numerical model, FDS against the experimental burning of a single Australian pine tree under a 1.5MW calorimeter hood. The findings from this pioneering study will serve as a critical foundation for future research using physics-based model FDS, contributing to more accurate fire predictions in wildland. This is the first time such a comprehensive simulation has been conducted for an Australian tree species, and only the second time globally, following similar work on Douglas fir trees found in North America and parts of Europe.

We are going to commence a series of experimental studies involving (1) fundamental aspects of firebrand characteristics (2) modification of our unique a firebrand generator to facilitate release of firebrand shower towards a fuel bed or scaled house.

Fire Suppression by Water-mist Research
Our on-going project, funded by the defense industry, finished in August 2024, and we are currently anticipating funding from our collaborators through an ARC-Linkage funding scheme. The project involves the use of water mist systems to actively suppress fires involving hydrocarbon-based fuels in maritime vessels. This will be a combined study of experimental work and numerical modelling using FDS. The latest version of the FDS model is capable of modelling suppression of liquid fires.

Novel Polymer Electrolyte Membranes with Enhanced Safety and Performance for Hydrogen-based Electrolyzers
Our postdoctoral fellow Dr Malavika Arun has been exploring the formulation of novel polymeric membranes using organo-phosphorus chemistries through polymeric analogous reaction on polyolefins. This project is led by Associate Professor Paul Joseph through a Victoria University/CSIRO research funding.

Concrete Behaviour in Fire Research
Professor Maurice Guerrieri, (2019 Vice Chancellor Engagement Award Recipient) developed and designed a NATA Structural Fire Testing Facility which received AS1530.4 Sections 3 and 4 and Efectsis R0695 accreditation in April 2021. The facility the only one of its kind in Australia with similar facilities involving full scale loading only available in Europe. The facility has been commissioned by Melbourne Metro Tunnel, Westgate Tunnel, Snowy Hydro2.0, Sydney Metro and a vast of other major tunnel infrastructure projects in Australia. The furnace is also equipped with a 4k Nikon based Endoscope system allowing real time video monitoring. The facility also carries out state-of-the-research including full scale research works with COWI UK.



Full scale Tunnel Lining Test Frame (left), Tunnel lining segment after fire test (top) and modelling by COWI (bottom)

Signed Siddharth Gupta

Worcester Polytechnic Institute

Introducing WPI's New Master's Program in Explosion Protection Engineering (XPE)

WPI is proud to announce the launch of the first-ever Master of Science program in Explosion Protection Engineering (XPE) in the United States. This pioneering program is dedicated to the memory of Professor Robert G. Zalosh, a trailblazer in explosion safety who developed some of the earliest graduate courses in this critical field. Designed to meet the growing industry demand for specialized expertise, the XPE program offers in-depth training in explosion protection, risk management, and forensic analysis.

For more information, visit
https://www.wpi.edu/academics/study/master-science-explosion-protection-engineering

New Incoming Members

Samy Rosenberg is currently pursuing her master's degree in Fire Protection Engineering under the guidance of Prof. James Urban at Worcester Polytechnic Institute. Samy is conducting research that focuses on the dynamics of wildland flame spread. She earned her bachelor's degree in mechanical engineering from the same institution.

Olivia Diorio, supported by the U.S. National Science Foundation's Research Experiences for Undergraduates (NSF REU) program, spent her summer conducting experiments on the radiation and convective ignition of vegetation.

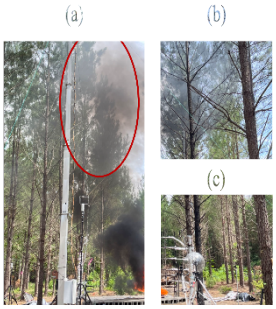
Current Research:

WPI Team: Hurstwic Viking Research Project

[From left to right: Abhinandan Singh, Fernando Ebensperger, Navya Muniraj, Christian Vogt, Rayna Harter, and Jonathan Zimak]

A Group of seven graduate students from the Fire Protection Engineering Department conducted a well-planned and coordinated field experiments in Iceland in July.

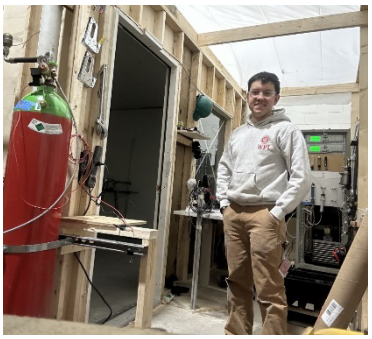
The experiments focused on studying the ignition and combustion properties of Viking-style doors and traditional Viking-style longhouses. The work was conducted in partnership with Hurstwic, an organization that studies Viking life and culture. The experiments were performed during Hurstwic's Fire Festival in an effort to analyze the Viking-age combat tactic of burning longhouses, commonly made of wood and turf. The structures were built specifically for the festival and the WPI team instrumented them to study tenability and fire spread. For more information, visit: https://www.youtube.com/watch?v=DIUQSsrCSdY&list=PLD447mhDkoZrgKbcQyXaTp9apGCBI_840



Convective heating of forest canopy: This work aims to investigate the convective heat transfer between plumes and vegetation through lab-scale and field-scale experiments. During the field-scale experiments, plumes with varying buoyancy are generated by igniting pool fires of different configurations under a forest canopy. The interaction between the vegetation and the ascending plume is captured using video recordings and instruments mounted on selected branches. The local response of the live vegetation is assessed by inserting hypodermic needles into the branches to measure the solid-phase temperature, complemented by a nearby thermocouple to record the gas-phase temperature. This data will be used to measure the convective heat transfer coefficient and improve the sub-models in physics-based solvers. The project is funded by SERDP.

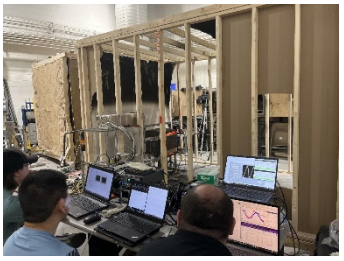
Reliability of fire pattern indicator in forest fire investigation: This research aims to enhance the scientific foundation of fire pattern indicators by conducting controlled burns in a wildland setting. The study evaluates how thermal effects contribute to the formation and reliability of fire pattern indicators under near-ignition conditions. The experimental protocol involved prescribed burns conducted jointly with the US Forest Service at the Silas Little Experimental Forest, in NJ Pine Barrens. Various field sensors, including sonic anemometers and infrared cameras, were employed to monitor fire behavior. The research further incorporates data from post-fire analyses, including LiDAR scans, heat flux sensors, thermocouples, and photographic documentation, to evaluate the reliability of fire direction inferred from the fire pattern indicators. Preliminary results show that while fire pattern indicators are valuable in forensic investigations, their reliability depends on local fire conditions, including fuel load and weather patterns. Further analysis of the results is currently being conducted. This project is funded by the National Institute of Justice (NIJ).

Inert Gas Extinguishing Research: The inert gas extinguishing experiments conducted in a scaled enclosure suggest that the reduced scaling methodology can accurately reproduce the discharge and extinction dynamics of the full-scale test while saving time, space, and resource demand for testing. Most importantly, the reduced-scale has been shown to accurately reproduce the time-resolved oxygen concentrations within the enclosure, something not accomplished by previous scaling methods. The results of the scaling analysis and characterization of reduced scale extinguishing test for inert gasses were presented by Jon Zimak, Ph.D. student working on the project, at the AUBE'24 / SUPDET 2024 hosted by the University of Duisburg-Essen in Germany. This work was awarded the best paper award for the suppression category. The project is funded by Kidde.



Large-scale tree burning (Douglas Fir) experiments were recently conducted in the UL Performance Lab at the Department of Fire Protection Engineering to study the flammability of wildland and WUI (wildland-urban interface) vegetation under varying conditions. The project is funded by the California Department of Forestry and Fire Protection (CALFIRE). These tests provide critical data for fire hazard assessment and contribute to the validation of future physics-based models aimed at enhancing fire prevention strategies in these environments. Undergraduate student Olivia Hollenbeck played a key role in designing an essential burner for these experiments during the summer.

Fire toxicity experiments, performed in the UL Performance Lab, focused on measuring emissions such as HF, HCl, and HBr during fires using advanced laser absorption techniques. The project is funded by the Federal Emergency Management Agency (FEMA). This research, conducted in collaboration with teams from UCLA and UTSA, aims to deepen our understanding of the chemical and transport phenomena in compartment fires, particularly during overhaul conditions. Undergraduate student Joshua Miller assisted in manufacturing fuels and compartments and in conducting the experiments.



Experiments exploring flame spread under unsteady flow conditions over thermally thin materials were conducted under normal gravity. These results will be compared with upcoming microgravity experiments scheduled for launch in late 2024. The experiments are funded by the National Science Foundation (NSF).

Several experiments have been conducted to study flame spread across vegetation and to assess fire impacts on other materials such as electrical wires and panels under various conditions with funding from Wildfire Interdisciplinary Research Center (WIRC) and FM, respectively. These experiments provide critical datasets for model validation and hazard assessment and were used for demonstrations to local high school faculty, students, and the broader community. Undergraduate student Andrew Nobrega contributed significantly to the execution of these experiments.

Lab Class Focus: Fire Protection and Wildland Fires

FP 4000: Fire Laboratory, a course covering experimental methods used in fire research along with other thermal-fluid topics, continues to attract a diverse group of students from mechanical, chemical, and aerospace engineering. This year, new sections featuring lab demonstrations on wildland and WUI fires were introduced for the first time, receiving enthusiastic feedback from students.

Graduated students

Alana Miska has successfully defended her M.S. thesis titled, *Downward Opposed Flame Spread Response to Non-Steady Airflow.* Congratulations, Alana!

International/national conferences

Luqing Zhu, gave a presentation titled, *Analyzing the ignition capabilities of glowing firebrand accumulations*, at the 40th International Symposium on Combustion in Milan, Italy.

Jon Zimak, presented a novel B-Number for the burning rate of wood crib under forced flow and variable oxygen concentration at 40th International Symposium on Combustion in Milan, Italy. The paper explained how a wood crib burning rate changes under the joint effects of flow and reduced oxygen concentration.

Signed: Albert Simeoni

CONFERENCES AND MEETINGS

Upcoming Conferences and Meetings

Interflam

The 16th International Conference on Fire Science and Engineering, Interflam, will be held at Royal Holloway, University of London, UK 30th June to 2nd July 2025.

Interflam has brought together engineers, scientists, practitioners and regulators from around the globe to hear the latest state of the art papers, meet with new colleagues and importantly, to network with their peers in a friendly atmosphere conducive to exchanging ideas. Regularly since 1979. Yes, Interflam will be 46 this year and has grown from a single session 2-day event with 12 countries represented in 1979, to 3 days packed multiple parallel session, truly worldwide event.

Since its start Interflam has aimed to bring together engineers, scientists, practitioners and regulators from around the globe to hear the latest state of the art papers, meet with new colleagues and importantly, to network with their peers in a friendly atmosphere conducive to exchanging ideas and building new ones. Join them!

Please visit: https://www.interflam.co.uk/ for more information!

5th European Symposium on Fire Safety Science (ESFSS 2025) to be held in Ljubljana, Slovenia

We are excited to announce that we will be hosting the 5th European Symposium on Fire Safety Science (ESFSS) from the 3rd to the 5th of September 2025 in Ljubljana, Slovenia. The event will bring together fire safety science experts and researchers so that they can share and discuss their latest research results.

The Local Organizing Committee includes Prof Grunde Jomaas, Dr Andrea Lucherini, Dr Aleš Jug, Dr Ulises Rojas-Alva, Dr Laetitia Marrot and Dr Urška Blumauer.

The symposium will feature oral and poster presentations of fully peer-reviewed papers, (expected submission deadline: early March 2025) and invited talks from leading fire science researchers. Key topics include material behaviour in fire, fire dynamics, wildland fires, fire detection and suppression, and human behaviour during evacuation.

The event is endorsed by the International Association of Fire Safety Science (IAFSS), which will present awards for the best paper, poster, and presentation. Join us in Ljubljana for this event and engage in thought-provoking discussions on the future of fire safety science.

International Symposium on Lithium Battery Fire Safety

The 4th International Symposium on Lithium Battery Fire Safety (ISLBFS 2025) continues its mission to advance research and applications in lithium-ion battery fire safety. Since its inception in 2019 in Hefei, the symposium has become a biennial event that attracts experts, scholars, and professionals worldwide. Following successful editions in Hefei (2019, 2021) and Qingdao (2023), the 4th symposium will be hosted in the vibrant Asia's world city of Hong Kong from 30 Oct to 2 Nov 2025.

The four-day symposium will showcase cutting-edge developments through invited lectures by leading battery fire safety researchers, parallel sessions of peer-reviewed paper presentations, and engaging poster sessions highlighting recent advancements.

In addition to the rich technical program, attendees will enjoy numerous social activities designed to foster informal discussions and networking opportunities, strengthening collaborations among colleagues and friends. Join us in exploring the forefront of battery fire safety science and technology. See official website: https://batteryfire2025.com/

Submission Guidelines: You are invited to submit original abstracts on any scientific topic at the symposium. Each author with an accepted abstract will be invited to submit an extended abstract (no more than three pages) or a full paper.

The extended abstract and full paper will be peer-reviewed. The accepted ones will be included in the Symposium Proceedings and invited to give an oral or poster presentation. Conference participants will receive the proceedings in electronic format, and access to the file on the platform will be granted.

Full papers with good review feedback will be invited for publication in the special issues of **Fire Technology** and **Process Safety and Environmental Protection**. Both journals are indexed in Web of Science.

Please submit via the **EasyChair** System.

Please see the templates for (1) abstract, (2) extended abstract, and (3) full paper.

Submissions are encouraged on, but not limited to, the following topics:

Battery Fire Dynamics

- Heat generation, thermal runaway and propagation of battery system
- Fire and explosive dynamics of Lithium-based battery crossing scales
- Fire in battery energy storage systems, electric vehicles, charring and manufacturing
- Modelling ignition, spread, and extinction of battery fire

Battery Fire Hazards, Regulations, and Environmental Impacts:

- Emission from Lithium-ion battery fire and toxicity of smoke and emissions
- Battery fire safety codes, test standards and engineering of practice
- Fire safety improvement, protection measures and insurance in battery production
- Fire risk assessment of battery transportation, storage, usage, charging and disposal

Advanced Technologies for Battery Fire Safety

- Early warning, detection, prediction and investigation of battery fires
- Advanced materials for improving battery fire safety
- Novel suppression agents and technologies for battery fire incidents
- Smart firefighting of EV and battery energy storage station and emergency response

Prizes & Awards: The **ISLBFS 2025 Technical Program Committee** will select award prizes for the *best papers*, as well as the *best oral* and *poster presentations* at the symposium.

Important Dates

15 Mar 2025	Deadline for abstract
31 Mar 2025	Notification of acceptance
15 Jul 2025	Deadline of full paper and extended abstract submission

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If you have any questions or would like to sponsor the conference, please contact us at polyu.fire@gmail.com

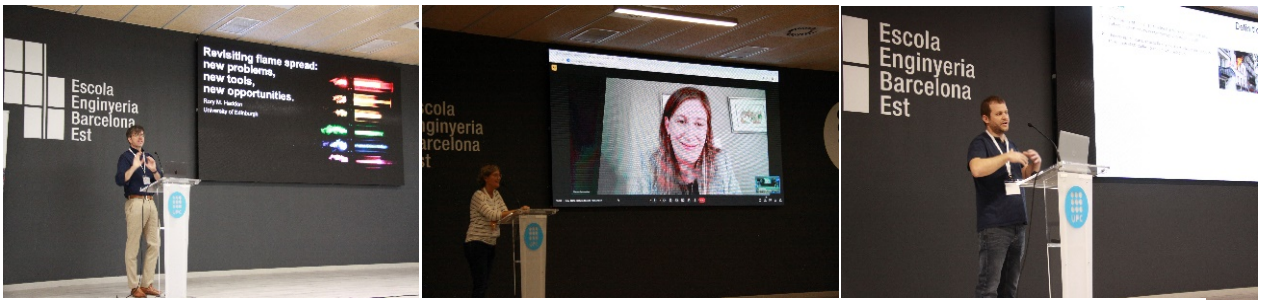
THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學

Reports from Conferences

4th European Symposium on Fire Safety Science
The CERTEC research group, based at Universitat Politécnica de Catalunya, hosted the 4th European Symposium of Fire Safety Science (ESFSS 2024) on October 9th – 11th 2024 in Barcelona. The Symposium welcomed 186 registered participants from 30 countries across the globe. A total of 157 research submissions were received, and after a rigorous review process, 42 papers were accepted for oral presentation and 96 for poster presentation.

ESFSS 2024 Group Photo

The event featured three insightful keynote speeches: "Revisiting flame spread: New problems, new tools, new opportunities" by Dr. Rory Hadden, "Assessing fire and explosion hazards in biomass: insights and emerging challenges" by Prof. Nieves Fernández, and "Numerical and experimental investigation of compartment fires" by Dr. Rabah Mehaddi.



Keynote speeches given at ESFSS 2024. from left to right: Dr. Rory Hadden Prof. Nieves Fernández and Dr. Rabah Mehaddi

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Poster titled "Extinction of gas barrier with minimum water flow rate discharge from a water mist" by Lucie

Lapillonne et al. from Université de Lorraine, was awarded the Best Poster Award. Finally, the Best Presentation Award was won by Florian Put et al. from Ghent University for his presentation entitled “High-Intensity Fast-Response Electric radiant Panel (HIFREP) for increased accuracy on thermal boundary conditions during fire testing.”

The next ESFSS is planned to take place in Slovenia, hosted by the Department for Fire-Safe Sustainable Built Environment (FRISSBE) of the Slovenian Nation gineering Institute (ZAG), in autumn 2025, organisers announced abstract submissions wi rch 2025.

Signed ESFSS Local Organising Committee

CALL FOR CONTRIBUTIONS

To continue succeeding with this newsletter, it is important that we receive contributions from the IAFSS membership at large. Please consider submitting articles, letters to the editor, images, news, announcements or job openings related to fire safety science of IAFSS members. These could be collected from your department, institution, country or region. Please send your contributions to the Co-Editors (Nils Johansson, nils.johansson@brand.lth.se or Xinyan Huang, xy.huang@polyu.edu.hk.

Letters to the Editor are most welcome, anytime, in response to newsletter content or any other topic related to the IAFSS.

Deadline for contributing to the next regular issue (No. 53) will be communicated later.

http://www.iafss.org