International Association for Fire Safety Science
A charity registered in England and Wales no 800306

Fire Safety Science News

http://www.iafss.org

August 2022, Issue No. 48

Photo Credit: Longhua Hu, University of Science and Technology of China

Blooming Fire
Judges' Choice Best Science Image Award
12th IAFSS Symposium

IAFSS was founded in 1988 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

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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 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'd like posted on the website, you can contact the team of webmasters through office@iafss.org and they'll help you out.

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!*

One-Year Membership – 2022 (£25) Three-year membership (2021 – 2023) is £75 (3 x £25)
Student Membership – 2022 (£5*) Lifetime Membership (currently suspended)

BENEFITS OF MEMBERSHIP

- Symposia attendance at special member rates
- Free Digital Access to Elsevier's *Fire Safety Journal*
- Fire Safety Science News (Official Newsletter of the IAFSS)
- A vote in Association affairs**
- Discounted Symposium Proceedings
- Participation in IAFSS committees
- Participation in IAFSS working groups

** IAFSS student members do not have a vote in Association affairs.

* Registered IAFSS academic members can nominate their students for free IAFSS student membership. Check website for details.

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

LETTER FROM THE CHAIR

Having just passed the midpoint of 2022 (and my term as chair), our Association has been engaged in many important activities, including the preparation of a new Constitution and Rules of the Association, the planning of the 14th Symposium, and the launch of our new website. I would like to update you on our progress in these are other areas.

Starting with our governance documents, as you will be aware, the IAFSS is a Registered Charity in England. As such, we are governed under the Charities Act 2011. The Charities Act 2011 consolidated three prior Acts which governed different types of charities. As a result, a new set of legal structures for charities came into force. In reviewing our Rules of the Association (last updated in 2021 for virtual meetings and voting), and in discussions with legal counsel, it became clear that we should be operating under a different legal structure than our current one. In particular, we should be operating under a structure that allows the Association to more appropriately engage in financial contracts (such as for redevelopment of the website) and which affords more legal protection to the Trustees.

After a review of the legal structures that are outlined under the Charities Act 2011, the Governance Committee, in consultation with legal counsel, identified the ***charitable incorporated organisation (CIO)*** as the appropriate model for IAFSS. (For more information about the process of setting up a charity, please see Set up a charity: step by step - GOV.UK (www.gov.uk).) An attribute of the CIO structure is that the governing document is a constitution. As such, using the Charity Commission's model governing document for a CIO Constitution as a template, the Governance Committee transferred the pertinent provisions from our current Rules into a draft IAFSS Constitution. The remaining provisions were then distributed into a new draft Rules document and a new draft Terms of Reference document for Officers, Committee and Working Group members. This was a significant effort and I want to extend a huge thank you to Beth Weckman for leading this effort! In addition, we have drafted several other policies and procedures, including a Member Code of Conduct, a policy on Safeguarding and Protecting People, and more. A big thank you to Jason Floyd and the DEI SC for leading this effort!

The draft IAFSS Constitution, Rules and Terms of Reference documents, as well as the various policies and procedures, have been approved by the Managing Committee (MC) and have the concurrence of legal counsel. Each of these documents (draft governance and approved policies) has been posted to the website. The next step is to submit an application to the Charity Commission to register IAFSS as a CIO. This is planned for September. We have to do this because the Charity Commission is not permitted to simply transfer our existing Association into a new structure, but requires that we apply again, and if approved, we can then transfer our assets to the new CIO and operate under the new structure. This will also require us to 'wind down' our current Association (more on that below).

Since we needed to develop new governance documents, we took advantage of the opportunity to modify our management structure to be more in line with current best practice as suggested by the Charity Commission and by legal counsel. In brief, this includes combining the MC, Executive Committee and Trustees into a single body, the charity Trustees, and creating a new entity, the Membership Advisory Council (MAC). In this structure, the Trustees have fiduciary responsibility for the Association, and will total 10 members: 3 elected from each region and the Past Chair as ex-officio member. The MAC will be comprised of 18 members: 6 elected from each region. The Trustees (EC) will have responsibility for finance and operations of the CIO. The MAC will be responsible for member-focused issues, such as symposium planning, committees (e.g., Early Career, Education, Diversity, Equity and Inclusion), and representation of the membership as a whole.

Of interest to members who wish to serve in leadership roles in the future, this new structure increases the total number leadership positions from 24 to 27 elected positions and will provide those members seeking office a choice of service between 'management' and 'member services' functions. The new governance documents outline the roles and responsibilities of each, election processes, and the like. Please have a look at these, since it is anticipated that elections for IAFSS leadership positions in 2023 will be conducted under the new structure.

In order to close down the current Association and transfer into the new CIO structure, we need to comply with Article 17 of our current Rules, which states that "The Association may be dissolved by a Resolution passed by two-thirds majority of those members present in person at a Special General Meeting convened for that purpose of which 3 months prior written notice shall have been given to the Members…." As such, notice is hereby given that **the IAFSS is planning to hold a Special General Meeting (SGM) on 6 December 2022**. This will be a virtual meeting. We hope you appreciate that it is not possible to find a time that works well for all, but we will look for a time that works for a majority. We expect that it will be possible for members who cannot attend to use the proxy vote option. **Please note that only members in good standing (which means have paid dues for this year) will be able to vote.** If you have not yet renewed your membership for 2022 because of the website problems earlier this year, please do so soon, as you will have to be a paid member by 1 December 2022.

As noted above, we have posted to our website drafts of the new governance documents – Constitution, Rules and Policies, Terms of Reference – so that all members will have a chance to review them and ask questions. We have set up a discussion stream in our new Members Forum on the website to facilitate discussion. Note that at the SGP there will not be a vote on the documents, but only on the 'winding down' of our current Association. However, we do want to provide the opportunity for input and discussion prior to that point. Our new policies and procedures, which do not require approval from the Charity Commission, are posted to the website, and are currently in force. Comments on those documents are also welcome.

On the topic of our new website, what do you think? Our journey for the new website started more than a year ago with a request for proposals, from which the MC selected the firm Gecko Designs to develop for us and to host a state-of-the-art website with expanded operability, functionality and security. Our new website (same URL, https://iafss.org/) includes several new features, such as a member forum (mentioned above), video embedding, and the potential for managing our various content more readily. It will allow for our Committees and Working Groups to communicate more readily with their members, and moving forward will allow us to manage webinar registrations and the like as well. Our new website has a fresher and more modern look, including smartphone compatibility, and much better security than our old website. Development of our new website was overseen by our Outreach and Communications SC, led by Xinyan Huang, and our Secretariat, Barb Waronek. Input was solicited from our SCs and WGs, including the Early Career Researchers and Practitioners SC which provided helpful suggestions on the look and feel of the new website. A big thank you to Xinyan, Barb and all the others who have helped us in this effort! We hope you like the new site!

Lastly, just a brief update on planning for our 14th International Symposium. The plan at this time remains to hold an in-person event in Tsukuba, Japan, from 22-27 October 2023, with workshops and other activities around it, including our General (business) Meeting. Our large team that comprises the Symposium Planning Committee (SPC), under the very capable leadership of Prof. Arnaud Trouvé, Prof. Anna Stec, and Prof. Naian Liu, have things well in hand. The Program Scientific Committee Co-Chairs, Prof. Erica Kuligowski and Dr. Yi Wang, have assembled a very competent group of Track Chairs, and you will see that they have issued the Call for Papers. The Local Organizing Committee Co-Chairs of Prof. Ritsu Dobashi, Prof. Kazunori Kuwana and Prof. Yuji Nakamura have been doing a great job at sorting out the venue and local needs and programmes and have launched the symposium website (https://iafss2023.com/). The dozens of other members of the SPC and its subcommittees have been working hard as well, preparing to deliver another outstanding and informative symposium. You will hear much more about this in the months ahead!

This has been a busy year for IAFSS – and this is just the start! With a new governance structure coming soon, which will involve more members, a new website, which will give an updated face to the world, and our next symposium, which will again bring people together to learn and shar experiences, we look forward to continuing to deliver value to you, our members, and to encourage more researchers and practitioners to join our Association and work with us in advancing fire safety science and engineering around the world.

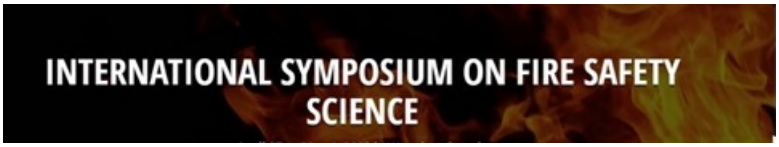
Signed: Brian Meacham, Chair IAFSS, Meacham Associates, USA

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 Editor (Rita Fahy, rfahy2@yahoo.com).

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

For the next issue (No. 49), the deadline for submissions is January 31, 2023



Follow us on social media!

Twitter: #IAFSS2023

LinkedIn: IAFSS2023

14th IAFSS Symposium – Symposium Planning Committee Leadership

The International Association for Fire Safety Science (IAFSS) is delighted to announce that the 14th International Symposium on Fire Safety Science will be held from October 22 – 27, 2023 in Tsukuba, Japan.

The IAFSS Symposium, organized triennially since 1985, is the premier fire safety science meeting attracting researchers, students and fire protection engineers from across the globe. The five-day symposium will feature invited lectures from world leading fire researchers, parallel presentations of peer-reviewed papers, and poster sessions for recent work. Symposium activities will be preceded by a series of weekend workshops. In addition to the technical sessions, numerous social activities are planned to provide informal meeting and net- working opportunities for colleagues and friends.

Symposium Planning Committee Co-Chairs
Prof. Naian Liu
Prof. Anna Stec
Prof. Arnaud Trouvé

Program Scientific Committee Co-Chairs
Prof. Erica Kuligowski
Dr. Yi Wang

Local Organizing (Host) Committee Co-Chairs
Prof. Ritsu Dobashi
Prof. Kazunori Kuwana
Prof. Yuji Nakamura

Program Communication Committee Co-Chairs
Prof. George Boustras
Prof. Brian Lattimer
Prof. Cristian Maluk

Technology Committee Co-Chairs
Prof. Xinyan Huang
Prof. Nils Johansson
Prof. Beth Weckman

Program Proceedings Committee Co-Chairs
Prof. Luke Bisby
Prof. Bart Merci

Poster Committee Co-Chairs
Prof. Nieves Fernandez Anez
Prof. Andres Fuentes

Images Committee Co-Chairs
Prof. Ken Matsuyama
Prof. Pedro Reszka

Workshop Committee Co-Chairs
Prof. David Lange
Dr. Sarah Scott
Prof. Wojciech Węgrzyński

Diversity, Equity and Inclusivity Committee Co-Chairs
Dr. Jason Floyd
Prof. Rosaria Ono
Courtney Devine
Dr. Izabella Vermesi

Early Career Committee Co-Chairs
Ms. Bronwyn Forrest
Prof. Jie Ji
Prof. Francesco Restuccia

English Language Mentoring Chair
Dr. Colleen Wade

Awards Committee Co-Chairs
Dr. Tuula Hakkarainen
Prof. Longhua Hu
Prof. Albert Simeoni
Prof. Stanislav Stoliarov
Prof. Takeyoshi Tanaka
Prof. Jennifer Wen
Prof. Hideki Yoshioka

IAFSS Chair
Dr. Brian Meacham

IAFSS Past Chair
Prof. Patrick van Hees

15th IAFSS Symposium Local Host
Prof. Thomas Rogaume

Program Scientific Committee Members

- Prof S. Bourbigot, University of Lille (France)
- Prof K. Cashell, Brunel University (UK)
- Prof M. Gollner, University of California-Berkeley (USA)
- Prof A. Filkov, University of Melbourne (Australia)
- Prof A. Fuentes, Universidad Técnica Federico Santa María (Chile)
- Dr. R. Hadden, University of Edinburgh (UK)
- Prof S. Hostikka, Aalto University (Finland)
- Prof Y. Hu, University of Science and Technology of China (China)
- Prof X. Huang, The Hong Kong Polytechnic University (Hong Kong)
- Dr. H. Ingason, Research Institute of Sweden (Sweden)
- Professor A. Jeffers, University of Michigan (USA)
- Prof J. Ji, University of Science and Technology of China (China)
- Prof E. Kuligowski, RMIT University (Australia)
- Prof K. Kuwana, Tokoyo University of Science (Japan)
- Prof D. Lange, University of Queensland (Australia)
- Dr. S. McAllister, USDA Forest Service (USA)
- Dr. R. McDermott, National Institute of Standards and Technology (USA)
- Prof K. Moinuddin, Victoria University (Australia)
- Prof R. Ono, Universidade de São Paulo (Brazil)
- Prof P. Reszka, Universidad Adolfo Ibanez (Chile)
- Prof T. Rogaume, University of Poitiers (France)
- Prof E. Ronchi, Lund University (Sweden)
- Prof A. Simeoni, Worcester Polytechnic Institute (USA)
- Prof S. Stoliarov, University of Maryland (USA)
- Prof A. Usmani, The Hong Kong Polytechnic University (Hong Kong)
- Dr. Y. Wang, FM Global (USA)
- Prof E. Weckman, University of Waterloo (Canada)
- Dr. W. Węgrzyński, Building Research Institute (Poland)
- Prof J. Wen, University of Warwick (UK)
- Dr. Y. Xin, FM Global (USA)
- Dr. D. Zeng, FM Global (USA)

14th IAFSS Symposium – Call for Papers

The International Association for Fire Safety Science (IAFSS) is excited to announce the **Call for Papers** for the upcoming **14th International Symposium on Fire Safety Science** to be held in **Tsukuba, Japan on October 22-27, 2023**.

The Call can be downloaded from the IAFSS website and can be found on the EasyChair system at this link: https://easychair.org/cfp/IAFSS2023.

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

- Material Flammability, Toxicity, and Related Testing Methods
- Fire Spread
- Enclosure Fire Dynamics
- Flame Dynamics
- Fire Suppression
- Structures in Fire
- Wildland Fires and Other Large Outdoor Fires
- Evacuation and Human Behavior
- Fire Risk Analysis and Fire Safety Design
- Emerging Issues and Special Applications

Papers up to **16 pages** in length must be **submitted by February 8, 2023** on the EasyChair site at this link https://easychair.org/conferences/?conf=iafss2023 . Papers must be original work that have not been submitted to another forum and formatted using the symposium paper template. Acceptance of papers will be based on 3 independent peer reviews. Accepted papers will be published in the *Fire Safety Journal*.

A Call for Posters and Call for Images will be issued in late 2022. Posters may describe work-in-progress or completed projects. Poster abstracts will be reviewed by the Program Committee.

We look forward to receiving your contribution!

Symposium Timeline	
Full papers	
February 8, 2023	Submission deadline for full papers
March 28, 2023	Reviews and request for rebuttals sent to authors
April 11, 2023	Author rebuttals due
May 8, 2023	Final paper selection decision sent to authors
June 10, 2023	Authors send revised papers to Fire Safety Journal
Posters and images	
June 30, 2023	Submission deadline for poster abstracts and images
July 15, 2023	Authors notified of accept/reject decision for poster abstracts
July 15, 2023	Authors notified of accept/reject decision for images

Signed: George Boustras, Brian Lattimer, and Cristian Maluk, 14th Symposium Communications Committee

Invitation to join the new Publications Task Group of the IAFSS

In response to the rapid and profound changes occurring in the scientific publishing landscape, IAFSS has created a new Publications Task Group (Pub-TG) with a mission to help IAFSS understand current changes and prepare for the future. The Pub-TG is now looking for individuals who may be interested in joining this TG.

At this point, the objectives of the Pub-TG are:

- To review changes in the scientific publishing landscape and to educate the IAFSS community on these changes;
- To develop an informed and independent point of view for future interactions between the IAFSS and the *Fire Safety Journal*/Elsevier (for instance, to examine the possibility of making the Proceedings of the IAFSS Symposia open access);
- To examine the possibility of creating an open access repository of fire science publications (Green open access);
- To examine the possibility of having the IAFSS community launch its own open access journal, independently of any commercial publisher.

If interested, please email the Chair of the Pub-TG.

Arnaud Trouvé
Chair of the Pub-TG
(atrouve@umd.edu)

Updates from IAFSS working groups

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

Updated Objective Statements – Revised Based on Member Survey!
The International Association for Fire Safety Science (IAFSS) established the permanent working group known as LOF&BE (Large Outdoor Fires and the Built Environment), as an outgrowth of the 2017 Lund Workshops held in conjunction with the 12th IAFSS Symposium. LOF&BE aims to bring the community together to tackle large outdoor fire problem such as wildland fires, wildland-urban interface (WUI) fires, urban fires, and informal settlement fires. LOF&BE consists of three subgroups - Ignition Resistant Communities (IRC), Emergency Management and Evacuation (EME), and Large Outdoor Fire Fighting (LOFF). The IRC subgroup is focused on developing the scientific understanding that will lead to new standards, testing methodologies, and mitigation strategies indicative of large outdoor fire exposures, including the ones from wildland to communities and within communities. The EME subgroup is focused on developing the scientific basis for effective emergency management strategies for communities exposed to large outdoor fires. The LOFF subgroup is providing a review of various tactics that are used, as well as the various personal protective equipment (PPE), and suggests pathways for research community engagement, including environmental issues in suppressing these fires.

Please join us: Large Outdoor Fires & the Built Environment Working Group Sign Up Form (google.com)

Migration of LOFF Subgroup Activities to Fire Service Advisory Panel
As part of our continued growth plans in IAFSS LOF&BE, we are establishing a fire service advisory panel to help bridge the gap between fire management and fire research. The fire service panel advisory will be of great help to all three of our subgroups; we expect valuable input to guide our future activities! If interested to join the panel, please send a CV along with relevant experience with the fire services to Sara, Sayaka, and Samuel. *We also thank Xinyan Huang and Brian Lattimer for leading the LOFF subgroup during difficult times in the midst of the pandemic!*

Management Team
IAFSS LOF&BE Co-Leaders -Samuel L. Manzello, Reax Engineering, USA, Japan; Sara McAllister UDSA Forest Service, USA; Sayaka Suzuki, National Research Institute of Fire and Disaster (NRIFD), Japan

Ignition Resistant Communities (IRC) Subgroup Leaders - Alex Filkov, University of Melbourne, Australia; Daniel Gorham, IBHS, USA; David Rush, University of Edinburgh, UK

Emergency Management and Evacuation (EME) Subgroup Leaders - Rahul Wadhwani, Victoria University, Australia; Yu Wang, USTC, China

Large Outdoor Fires & the Built Environment Working Group Webinar Series
The webinars are running monthly and to date, 15 webinars have been delivered, as well as six student webinars. These are listed below. LOF&BE also started its own YouTube channel, so anyone is free to watch any of these interesting webinars. We have moved the IAFSS LOF&BE Channel for public viewing and the reception is very positive! https://www.youtube.com/channel/UCiar3IU5l6YtWC5zTGKYMkg

November 2020 - Samuel L. Manzello (Formerly NIST, now with Reax Engineering) - Welcome to LOF&BE Webinar Series and Snapshot of Recent Research Activities of Interest to Urban and WUI Fires

December 2020 - Sayaka Suzuki (NRIFD, Japan) - Overview of Urban Fire Management in Japan

January 2021 - Amy Christianson (NRC Canada, Canada) - Blazing the Trail: Celebrating Indigenous Fire Stewardship in Canada

February 2021 - Sara S. McAllister (USDA Forest Service, USA) - The Need for Fundamental Wildfire Behavior Research in the Context of the 2020 Fire Season in the Western USA

March 2021 - Raphaele Blanchi (CSIRO, Australia) - Challenges from the 2019-2020 Fire Season in Australia - Role of Science to Improve WUI Fires Understanding and Preparation

April 2021 - Elsa Pastor (UPC, Spain) - WUI Fires in Mediterranean Europe: Current Research and Innovation Actions to Increase Communities' Resilience

May 2021 - Yu Wang (USTC, China) - Overview of Informal Settlement Fires: An Asian View

June 2021 - Ofodike Ezekoye (University of Texas-Austin, USA) - Overview of Large Outdoor Fires in Texas

July 2021 – Off

August 2021 - Stephen Wong (University of Alberta, Canada) - Lessons Learned from Recent Evacuations in California

September 2021 - Emanuele Gissi (CNVVF National Fire and Rescue Service, Italy) - Fighting WUI Fires in Italy: Role of Simulation Tools

October 2021 - Enrico Ronchi (Lund University, Sweden) - Evacuation Modeling for Wildland-Urban Interface (WUI) Fires

November 2021 - Ido Marom (Technion – Israel Institute of Technology, Israel) - Wildland-Urban Interface (WUI) Fires in Israel and the Role of Social Interactions during Evacuation

December 2021 - Jason Sharples (University of New South Wales) - The Role of Local Fire Dynamics in Extreme Wildfire Development

January 2022 Americas Student Webinar Series

- Jacques De Beer (University of Maryland-College Park, USA) - Ignition Quantification of Decking Materials Subject to Firebrand Attack
- Nima Masoudvaziri (University of Buffalo, USA) - Risk Assessment of Wildland-Urban Interface Communities for Wildfires
- Savannah Weisses (University of Texas-Austin, USA) - Firebrand Ignition and Heat Transfer Characterization

February 2022 Africa/Europe Student Webinar Series

- Simona Dossi (Imperial College London, UK) - Statistical Relationships between Wildfire Damage and Building Features in WUI Fires
- Natalia Flores Quiroz (Stellenbosch University, South Africa) - Fire Investigations in Informal Settlements
- Ruben Dobler Strand (Western Norway University of Applied Sciences, Norway) - Improved Home Fire Risk Warnings using Cloud-Based Weather Data Services

March 2022 - Canceled

April 2022 - Russell Parsons (USDA Forest Service, USA) - Prototype 3D Fuel Modeling System Supporting Physics-Based Fire Modeling, Prescribed Fire and Fuel Treatment Analysis

May 2022 - Pedro Reszka, Universidad Adolfo Ibáñez (UAI), Chile - From Risk Mapping to Flammability Testing: Recent Wildfire Research in Chile

June 2022 - Chris Lautenberger (Reax Engineering, USA) - Automated Wildland Fire Forecasting in the Continental USA

July 2022 - Guillermo Rein (Imperial College London, UK) - Smoldering and Wildfires: The Beginning and the End of Flames

More to come including Asia/Oceania Student Webinar Series!

Large Outdoor Fires & the Built Environment Working Group Publications

Y. Wang, R. Wadhwani, S. Suzuki, M. Theodori, E. Asimakopoulou, J. De Beer, N. Flores, M. A. Ibrahim, H. Johanna, H. Mitchell, S. L. Manzello, A. Wickramasinghe, C. L. (Farian) Wu, and T. Xia, Case Studies of Large Outdoor Fires Involving Evacuations, *Emergency Management & Evacuation (EME) Subgroup, Large Outdoor Fires & the Built Environment (LOF&BE) Working Group of the International Association for Fire Safety Science*, 2022 May. https://doi.org/10.5281/zenodo.6544760

E. Ronchi, S. Wong, S. Suzuki, M. Theodori, R. Wadhwani, S. Vaiciulyte, S. Gwynne, G. Rein, M. Kristoffersen, R. Lovreglio, I. Marom, C. Ma, D. Antonellis, X. Zhang, Z. Wang, and N. Masoudvaziri, 'Case Studies of Large Outdoor Fires Involving Evacuations', *Emergency Management & Evacuation (EME) Subgroup, Large Outdoor Fires & the Built Environment (LOF&BE) Working Group of the International Association for Fire Safety Science,* 2021 February. https://doi.org/10.5281/zenodo.4504853

S. Suzuki, S. McAllister, S.L. Manzello, A. Filkov, D. Gorham, X. Huang, B. Lattimer, and M. Theodori, Large Outdoor Fires and the Built Environment (LOF&BE): Summary of Virtual Workshop, *NIST SP 1263,* 2020. https://doi.org/10.6028/NIST.SP.1263

S.L. Manzello, S. McAllister, S. Suzuki, R. Blanchi, E. Pastor, and E. Ronchi, Large Outdoor Fires and the Built Environment (LOF&BE): Summary of Workshop at Interflam, *NIST SP 1241*, 2019. https://doi.org/10.6028/NIST.SP.1241

S.L. Manzello, S. McAllister, S. Suzuki, R. Blanchi, E. Pastor, and E. Ronchi, Large Outdoor Fires and the Built Environment: Summary of Kick-Off Workshop*, NIST SP 1236*, 2019. https://doi.org/10.6028/NIST.SP.1236

S.L. Manzello, S. McAllister, and S. Suzuki, Large Outdoor Fires and the Built Environment: Objectives and Goals of Permanent IAFSS Working Group. *Fire Technol* **54,** 579–581 (2018). https://doi.org/10.1007/s10694-018-0717-z

S.L. Manzello, S. McAllister, and S. Suzuki, Large Outdoor Fires and the Built Environment: Objectives and Goals of Permanent IAFSS Working Group *Fire Safety Journal* **98**, 1-2 (2018). https://doi.org/10.1016/j.firesaf.2018.03.003

S.L. Manzello, R. Blanchi, M. Gollner, D. Gorham, S. McAllister, E. Planas, E. Pastor, P. Reszka, and S. Suzuki, Summary of Workshop Large Outdoor Fires and the Built Environment, *Fire Safety Journal*, 100: 76-92, 2018. https://doi.org/10.1016/j.firesaf.2018.07.002

S.L. Manzello, R. Blanchi, M. Gollner, S. McAllister, E. Planas, G. Rein, P. Reszka, P., and S. Suzuki, Summary of Workshop Large Outdoor Fires and the Built Environment, *NIST SP 1213*, 2017. https://doi.org/10.6028/NIST.SP.1213

Signed Samuel L. Manzello, Sara McAllister, and Sayaka Suzuki (IAFSS LOF&BE Co-Leaders)

IAFSS Working Group on Human Behaviour in Fires (HBiF)

The IAFSS Human Behaviour in Fires permanent working group started its activities during the last 2021 IAFSS conference and will serve as a coordinating body that monitors, develops and guides research on all aspects of the broad discipline of human behaviour in fire. The primary aim of the group is to achieve measurable, positive impacts on life safety of people in building and outdoor fires, avoid duplication in research efforts across the world and present a unified representative voice for researchers in the field.

The IAFSS HBiF permanent working group is currently engaged in our first priority: the development of a research roadmap for the field. The following tasks are in progress to reach this goal:

Task 1: Document research needs for applied research and possibilities for fundamental research in HBiF - Led by Natalie van der Wal (Delft University, The Netherlands)

Task 2: Map out existing research in HBiF through a bibliometric analysis and identify gaps - Led by Milad Haghani (UNSW, Australia) and Mary Button (Design Fire Consultants, UK)

Task 3: Assess the motivations/reasons behind the research gaps identified in Tasks 1 and 2 - Led by Kate Kapalo (University of Nebraska, USA) and Enrico Ronchi (Lund University, Sweden)

Task 4: Develop a research roadmap for Human Behaviour in Fires - Led by Erica Kuligowski (RMIT University, Australia) and Stephen Wong (University of Alberta, Canada)

The IAFSS HBiF working group is also engaged in a webinar series. Recordings of our webinar events are available on the working group's YouTube channel. You can subscribe to our YouTube channel here: https://www.youtube.com/channel/UCSqMIEaZ08r5BrtOb5q2d0Q

So far, we have held five webinars:

Webinar 1 - Why is my paper getting rejected? – by Enrico Ronchi, Bart Merci, Guillermo Rein, Karen Boyce - Recordings: https://www.youtube.com/watch?v=q-hydfXmL9w

Webinar 2 - How to write a good peer review for HBiF papers – by Erica Kuligowski and Peter Lawrence - Recordings: https://www.youtube.com/watch?v=YqXFT0TAR8U

Webinar 3 - The (mis)use of controversial terminologies in evacuation research – by Anne Templeton and Milad Haghani – Recordings: https://www.youtube.com/watch?v=757LZYBQcXU

Webinar 4 - Webinar 4 - Machine learning in evacuation research - What can/can't we do? by Gerta Köster and Xilei Zhao - Recordings: https://www.youtube.com/watch?v=pZ0idOp64rQ

Webinar 5 – Webinar 5 - Virtual reality for evacuation research - Opportunities and Challenges – by Yan Feng and Ruggiero Lovreglio – Recordings: https://www.youtube.com/watch?v=9Gy67_iDVLY

Follow us: Twitter: @HBinFire and at LinkedIn: https://www.linkedin.com/groups/14004136/

The HBiF working group currently includes about 220 members. Join the HBIF permanent group of IAFSS to contribute or to remain updated (it is free!) by signing up at the following link: https://forms.office.com/r/878uNLnYKf

Signed: Erica Kuligowski (RMIT University, Australia) - erica.kuligowski@rmit.edu.au
Enrico Ronchi (Lund University, Sweden) - enrico.ronchi@brand.lth.se

Updates from IAFSS sub-committees

IAFSS Sub-committee for Research (SC Research)

A research sub-committee was launched in 2021. It current consists of 12 core members from different regions and organisations from the IAFSS community.

The SC Research aims to help shape research directions in fire safety science by identifying gaps between the state-of-the-art knowledge and practical engineering needs, opportunities associated with the emerging technologies, as well as fire safety challenges brought by climate change and sustainability.

SC Research intends to engage with the broader IAFSS community through various activities. Currently, work is undergoing to identify associated research topics which calls for the attention and presents opportunities. The findings will be disseminated through IAFSS publications. This work is organized through the following task forces, each led by a SC Research member with participations from both within the SC and the wide IAFSS community. Experimental and modelling aspects are embedded in the relevant topics and hence not listed separately.

If you are interested to contribute to any of the specific topics, please get in touch directly with the task force leader by 30 September 2022.

- Fundamental abilities to predict the physical and chemical processes underpinning fire growth (pyrolysis, heat transfer, flame dynamics, …)
  Led by: Stanislav I. Stoliarov stolia@umd.edu
- Fire safety of batteries
  Led by: John Hewson jchewso@sandia.gov
- Structure fire research in the context of different building construction techniques
  Led by: Thomas Gernay tgernay@jhu.edu
- Wildland-urban fire interface challenges
  Led by: Sara McAllister sara.mcallister@usda.gov
- Opportunities associated with the emergence of data science and AI
  Led by: Wojciech Węgrzyński w.wegrzynski@itb.pl
- Associated challenges with human behaviour
  Led by: Enrico Ronchi enrico.ronchi@brand.lth.se
- Fire safety of hydrogen
  Led by: Jennifer Wen Jennifer.Wen@warwick.ac.uk
- Improving codes and standards through research
  Led by: Yi Wang yi.wang@fmglobal.com

SC Research will also support the work of the IAFSS Symposium Sub-committee, especially to help facilitate and support the working groups and workshops. Some members of SC Research also directly participate in IAFSS endorsed working groups. Two members of the SC Research are also Workshop Committee Co-Chairs for the next symposium.

Signed: Professor Jennifer Wen, Chair, IAFSS Research Sub-Committee

IAFSS Education Committee Report - January 2022

Education Committee held their first meeting of 2021 on 14 December 2021 via zoom. Ten of the 15 committee members were in attendance. The committee discussed the committee's purpose and scope and approved the following:

Purpose of Committee:

The Education Committee (EC) provides support, guidance, and leadership in education and academic issues to support the IAFSS educational activities and the international fire safety science community at large.

Scope:

The committee is responsible for providing leadership and implementing the educational aspirations of the IAFSS committee.

The education committee will not have any formal responsibilities for the Symposium except where requested by the Symposium committee

The committee is currently prioritizing the tasks we will focus on before the 14th Symposium.

Next meeting planned for early February 2022.

Signed: Charles Fleischmann, Co-Chair

NEWS FROM MEMBERS

News from the International Master of Science in Fire Safety Engineering (IMFSE)

IMFSE FSE Day 2022

On Monday 11 April 2022 the IMFSE FSE day was organized. The central theme for this year was "Large outdoor fires". The first part consisted of two interesting presentations presentations, titled "Buildings as fuel in Wildland Urban Interface fires" and "Modelling of Large Outdoor Fires". In the second part students and alumni were able

to have a meet and greet with five of our IMFSE contributors. This event was held online for one last time hopefully: we wish to organize the next one in real life again!

IMFSE Virtual Tour
Every year the IMFSE team organizes a virtual tour for everyone who is interested to find out more about the program. It's a great way to get to know the IMFSE program and the different universities involved, as well as meet the IMFSE staff and ask questions on the spot. The latest edition in December 2021 was again a success, with almost 70 attendees.

New IMFSE Contributor: Astute Fire
The IMFSE consortium wants to give a warm welcome to Astute Fire as our newest IMFSE contributor. Astute Fire is a fire engineering company based in the United Kingdom. IMFSE keeps on growing thanks to our group of IMFSE Contributors, who make it possible to grant IMFSE scholarships and tuition fee waivers to promising applicants.

IFSC project on improving understanding of wildfires and fire modeling
IMFSE program director Prof Bart Merci and IMFSE lecturer dr. Giorgos Maragkos are involved in the International Fire Safety Consortium (IFSC) project, funded by Underwriter Laboratories and led by Prof Arnaud Trouvé (UMD), on fire modelling. University of Melbourne is also a partner in the project. Our task concerns performing and analysing advanced CFD simulations for a range of compartment fires.

SFPE student chapter - IMFSE
The members of the IMFSE student chapter (SFPE) organized two meetings for the IMFSE students to discuss their experience and path during and after IMFSE into the industry/different PhD programs and arrangements. This kind of event was greatly appreciated per the feedback of the students. Besides that they are exploring ideas together with the IMFSE students for future events.

Signed: Silke Van Parys, Fire Safety Engineering Administrator

News from Ghent University

PhD defense Xiepeng Sun
On Monday 13 December Xiepeng Sun defended his joint PhD (USTC - UGent), on 'Experimental and Theoretical Study on the Ejected Facade Flame Behavior from Compartment Fires under Different Ventilation Conditions'. In his doctorate, Xiepeng Sun investigated the mechanisms behind fires with spreading flames in high-rise buildings. So that in the future, safety measures can be taken and fires in high-rise buildings are less likely to spread (https://www.ugent.be/ea/en/news-events/news/understanding-large-fires-in-urban-high-rise-buildings).

Master of Science in Fire Safety Engineering
In the past MFSE students who graduated were invited for a MFSE dinner at the end of June to celebrate this. We wanted to keep this tradition of course, so now that the government rules allowed it again, we invited the classes of 2020 and 2021 on 9 May 2022. It was the perfect occasion for the alumni that are still in Belgium to see each other again and it was nice to hear how their professional careers evolved after their MFSE studies.

Silver pinecone for the UGent team in the 2021 Christmas Tree Fire HRR Prediction Competition

In December 2021, the Department of Fire Protection Engineering at the University of Maryland hosted the 8th annual competition to predict the burning behaviour (Heat Release Rate - HRR) of a Fraser Fir Christmas tree (https://fpe.umd.edu/burn-competition). This is a friendly competition designed to bring together students, researchers and engineers of the fire science community around the world to share the positive fire safety message "If you have a natural Christmas Tree this season, please keep it well-watered". The video of the 2020 Christmas Tree Burn can be viewed here: https://youtu.be/Flujblo8pZ0 For the 2021 competition, 92 individual predictions from 37 unique institutions located in 15 countries were submitted. Dr Andrea Lucherini, Mr Jovanovic, Mr Hong, Mr Thielens, Mr At Thabari, and Mr Hong represented Ghent University. The team obtained the second best team score (only 0.2% away from the winner, Korea University) and they received the prestigious "Silver Pinecone" trophy. Congratulations to the UGent team!

Signed: Prof. Bart Merci, Ghent University

News from Stellenbosch University

Stellenbosch University is seeking applicants for The Almand Masters Scholarship in Fire Engineering
This scholarship seeks to advance fire safety engineering in the developing world. An ideal candidate is (a) a candidate with a strong academic background, (b) who will be able to have an impact in their country / region / institution through being supported by this scholarship, (c) desires to advance the fire engineering profession, and (d) would not have been able to obtain the masters degree without the financial support provided by this bursary. The masters in engineering (MEng) degree is a research-based degree which also requires the completion of various courses.

Start date:	February 2023
Length:	2 years full-time
Location:	Stellenbosch University
Apply by:	16 September 2022

The applicant should indicate his/her preferred thesis topic(s) of those listed below:

1. Development of fire detectors for low-income communities;
2. Fire safety for construction systems incorporating waste and biomass products;
3. Development of a fire danger index for refugee camps.

Pre-requisites include a Bachelors degree in Fire / Structural / Civil / Mechanical / Chemical / Electrical engineering with an average above 65%. (Masters degree required if applying for PhD support.)

The following aspects are highly beneficial for applicants:

(a) Potential to make an impact in your country / region / institution through being awarded this scholarship
(b) Good academic record
(c) Fire engineering / thermodynamics knowledge
(d) Laboratory and experimental experience and
(e) Good writing and communication skills

Scholarship Description:
Funding and details: The masters degree is a full-time research position for 2 years, with a bursary of R80,000 per year (tax free). No teaching or admin responsibilities are associated with the bursary. Additional opportunities to earn an income are provided by the research group / department / faculty in teaching assistant, consulting or lab assistance roles. Students may apply for this bursary to support a PhD degree instead, but the funded amount will remain the same. For details about costs of degrees and living in Stellenbosch: https://web-apps.sun.ac.za/student-fees-estimate/#/home.

To apply, submit a CV, list of references, research topic choice(s), explanation why you should be awarded the scholarship (<1 page) and university transcript of degrees to fire@sun.ac.za.

News from the Hong Kong Polytechnic University

12th Int Conference on Structures in Fire SiF 2022 @ PolyU Call for Papers

The 12th International Conference on Structures in Fire (SiF 2022) will be hosted by PolyU in Hong Kong at 30 Nov - 2 Dec 2022. The conference is organised by the fire group (Prof. Asif Usmani and Dr Liming Jiang) at the Dept of Building Environment and Energy Engineering.

- Abstract Submission: 27 May 2022
- Abstract Results Announcement: 15 July 2022
- Full Paper Submission: 16 Oct 2022

PolyU fire research group holds Christmas & New Year Party

The Christmas-New Year Party 2021 was successfully held on 20 December 2021 at PolyU Block Z. Over 25 members of the Fire Lab gathered together to celebrate Christmas and the new year. With delicious food and drinks, the SFPE Hong Kong Student Chapter prepared mini-games and gifts for everybody. All participants had a wonderful experience and immensely enjoyed the event.

New Exchange PhD Student from Malaysia

Ms Dayang Musa, a PhD Student from Universiti Putra Malaysia, will exchange in PolyU Fire Lab for 6 months. She is an ecologist and a junior lecturer at Universiti Malaysia Sabah. Her current PhD research focuses on smouldering peatland and the suppression of peat fire. Dayang is supervised by Dr Zahirasri Mohd Tohir and Dr Xinyan Huang.

Xiqiang acquired a grant from the the National Natural Science Foundation of China

Dr Xiqiang Wu's project titled "Failure mechanism and intelligent early warning of reinforced concrete slab-column connections under fire scenarios" has been awarded by the National Natural Science Foundation of China (NSFC) Youth Program. This project aims to make real-time early warnings for the slab-column connections under real fire scenarios, which has great practical significance in reducing the casualties caused by building fires.

Recent Graduates

Dr. Mohamed Anwar Orabi was awarded a PhD with a thesis titled "State of the Art Large Scale Simulation of Buildings in Fire: The Case of WTC7". His thesis extends the simulation tools of the research group to connect with CAD models, link with CFD tools, and perform nonlinear thermomechanical analysis of building structures. He also uses the tools he developed to perform a case study on the collapse of world trade center building 7. His work has been published in Engineering Structures and Fire Technology.

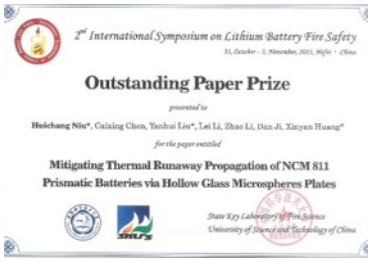
Dr. Aatif Ali Khan was awarded his PhD with a thesis titled "Reconstriction for tall building fires for thermal response analysis" from the Hong Kong Polytechnic. During his PhD, he developed the first and only free integrated simulation tool (OpenFIRE) for evaluating structural fire response using CFD results in his thesis. The middleware for coupling CFD-FEM can be downloaded from his GitHub page (OpenFIRE). He also proposed a framework for carrying out fire investigation of a structural fire accident. Using the framework, the fire spread history of the Plasco Building fire incident was estimated and further verified by calibrating the CFD models. This year, Aatif also became a Chartered Engineer (CEng) from the *Institution of Fire Engineers* (UK).

Xinyan is elected to the IAWF board of director

Dr Xinyan Huang is elected to be a new member of the Board of Directors by the International Association on Wildland Fire (IAWF). His official Board term will start from January 2022. Xinyan is also the only board member from Asia.

From this year, Xinyan also serves as the associate editor for the International Journal of Wildland Fire, the official Journal of IAWF.

Outstanding Paper Prize from the International Battery Fire Symposium



The paper "*Mitigating Thermal Runaway Propagation of NCM 811 Prismatic Batteries via Hollow Glass Microspheres Plates*", co-authored by Xinyan and Yanhui, won the Outstanding Paper Prize at the 2nd International Symposium on Lithium Battery Fire Safety (ISLBFS). The paper is now published in Process Safety and Environmental Protection with the collaboration with Guangzhou Institute of Industrial Technology https://doi.org/10.1016/j.psep.2022.04.049.

Ho Yin won HK$600K from PolyU Maker Fund Programme 2021

Ho Yin's project titled "Smart Building Emergency System" was selected ultimately to enjoy a 24-month incubation and funding support of HK$600,000 in PolyU Maker Fund Programme 2021. Under the supervision of Dr Xinyan Huang, the proposed Smart Building Emergency System will apply artificial intelligence (AI) and Internet of Things (IoT) technologies into a smart signage network that can guide residences towards the shortest and safest evacuation paths in a fire event. This system will be a core component of the novel smart firefighting technology developed in PolyU (SureFire Project).

Yuying joins in joint PhD programme with UTS

Yuying Chen was successfully enrolled in the Joint PhD programme with the University of Technology Sydney (UTS) and awarded the UTS President's Scholarship. This program will lead to a Dual PhD Degree from PolyU and UTS. Yuying will spend her half of PhD study in UTC and co-supervised by **Dr Nic Surawski** to conduct research on wildland emissions on the earth scale.

Full-scale slab fire test at SLDRCE in Tongji University

From Jan. 2022 to Feb. 2022, **Jin Qiu**, a PhD student in the PolyU fire group carried out four full-scale precast concrete slab fire tests in the State Key Laboratory of Disaster Reduction in Civil Engineering (SLDRCE) in Tongji University. This collaborative project aims to study the fire behaviour of precast concrete slabs subjected to the real residential fire scenario which was extracted from the previous studies. The test results enrich the dataset for the calibration of reasonable numerical model.

Tianhang elected as SFPE GCI Student Fellow

Zhang Tianhang was elected as one of four Global Student Research Fellows of the Society of Fire Protection Engineers (SFPE) Grand Challenges Initiative. SFPE Grand Challenges Initiative aims to identify how fire safety science and engineering can contribute to addressing pressing challenges. Tianhang will be awarded USD 5,000 to conduct independent research in the area of Digitalization, Artificial Intelligence, & Cybersecurity.

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

Asia-Oceania Association for Fire Science and Technology (AOAFST) Activities

- The 12th Asia-Oceania Symposium on Fire Science and Technology (AOSFST) organized by the University of Queensland, Australia was held virtually from 7-9 December 2021, and will be reported separately by the organizer.
- Following symposium traditions, AOAFST President (in Hong Kong) called upon a regular meeting with experts from different parts in the Asia-Oceania regions attended. The AOAFST meeting was held with draft minutes shown in website [1].
- AOAFST Lifetime Contribution Awards 2021 to Professor Jinhua Sun, Professor Charles Fleischmann and Professor Makoto Tsujimoto, Congratulations!
- The 13th AOSFST will be held in Daegu, Korea in 2024.

Fires to Watch in this Reporting Period

- **Vehicular tunnel fire F1**
  A car caught fire in a vehicular tunnel in the evening on 14 December 2021 [2]. The fire was put out by firemen arriving at the scene. The tunnel was closed for about an hour and many cars were jammed inside the tunnel. Passengers inside the tunnel had to walk all the way out.

- **Tall commercial complex fire F2**
  Fire broke out at around 12:30 pm on 15 December 2021 in a 39-storey commercial complex [3]. The fire was originated from an electrical switch room and spreading to scaffolding. As the building was under major renovation on some floors, the fire alarm systems and sprinklers were suspected to be shut down.

  Customers and staff in the restaurant did not even know there was a fire. Occupants had great difficulty in escaping from the building due to smoke spread. More than 1200 people were evacuated from the building slowly. Some went to the rooftop of the building which functioned as a refuge floor. At least 13 were injured, with one in critical condition.

  The fire incident exposed a serious loophole in fire safety provisions that require a serious follow-up in regulations.

- **Fire under a bridge F3**
  An Alarm 3 big fire [4] occurred on 28 April 2022 with a temporary accommodation unit [5] burning under a vehicle bridge as in Fig. 1. Fire safety provision in vehicular bridge has to watch, particularly with combustibles below as in this case.

- **UAV fire F4**
  A self-ignited unmanned aerial vehicle (UAV) dropped on 13 April 2022 as a burning source to downtown areas [6] to watch.

  Counterfeit electronics parts and batteries fires [7] to watch. There is no quality control on counterfeit products, including batteries and refrigerants. The fire is under investigation with the instrument manufacturer. Similar tests will be suspended until the results of the investigation are available.

  That is the reason why UAV fire protection research was halted at PolyU over 10 years ago, because of the potential hazards of dropping in deluxe houses.

- **Arson fires**
  There were several suspected arson fires on burning trucks and residential buildings [8,9]. Protection against arson fires has to be reviewed. There are deep concerns on railway system and research undergoing on subway stations at the moment [7,10].

- **Testing fires**
  Smoke emitted from full-scale burning tests at downtown areas [11] to watch. Some residents had already noticed several testing fires occurred near to their buildings. Legal consequences can be very serious under this tight atmosphere.

Fire Safety Management

- Fires F1, F2 [2,3] alerted the importance of fire safety management (FSM) in dense urban areas in a single week in mid-December 2021. The fire F1 has good fire safety management with minimum protection, but not F2. A question raised is:

  When the normal fire services installed including alarm system is shut down due to renovation or other permitted work, what temporary backup and particular measure should be imposed?

- All these problems have to be addressed by ensuring appropriate FSM. However, resources required to implement appropriate FSM substantially, to ensure hardware technology working properly by software management. Budget on safety might be cut if no accidents happened, nor due to other reasons such as economic depression.

Safety Culture

- The proposal of introducing safety culture in handling public safety by Professor Weicheng Fan [12] at University of Science and Technology of China as in Fig. 2, on top of safety technology and safety management should be considered.
- The concept of safety culture might be different [13] in the Asia-Oceania areas, but useful in monitoring implementation of FSM on controlling fire service installations.

Fig. 1: Burning under a vehicle bridge

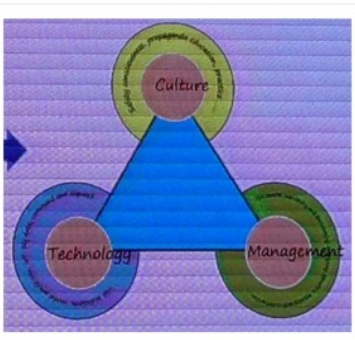


Fig. 2: Safety culture (Fan 2019) to give a tripod

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Signed: W.K. Chow, Emeritus Professor

News from Lund University

Education

The first part of the spring semester was partly online and partly at campus, but from March 21 all education was back on campus. After two years it is really satisfying to give teaching and labs in-person again, even though the students have seen some benefits with increased availability of digital material (recorded lectures, labs etc) the great majority of our students are very happy to be back on campus. As an example, we have once again been able to perform our full-scale three-room apartment fire lab that we normally do every spring in one of our fire dynamics courses.

There will be great changes to our local educational program. Our current education is a 3.5-year program that results in a B.Sc. exam in Fire Protection Engineering. However, during the last three years there has been intense work to expand this education and in March 2022, the board for undergraduate education at Lund University granted a new program in fire safety engineering. The new program, which will replace the old B.Sc. program, will be a full 5-year MSc program in Fire Safety Engineering. The first three years will hold fundamental courses in math, physics, building materials, structural engineering, and basic courses in fire science (fire dynamics, human behaviour, passive systems, active systems, risk analysis, etc.). In the last two years the students can choose from two different specializations (fire safety analysis and accident management). If you would like to learn more about the new program, please contact nils.johansson@brand.lth.se

Research

The four-year project Extreme Index is now more than halfway through, and the first work packages are completed, and several publications are in the pipeline. The project aims to develop a multi-hazard risk index to assist prediction of emerging risks on a local, regional, and national level to support various stakeholders for strategic training and resource planning. Partners in the project are Swedish Meteorological and Hydrological Institute and the National Research Council of Canada.

During 2021, Dr Enrico Ronchi and Dr Nils Johansson have been running a project on the benchmarking of a multi-zone fire model for tunnel fire dynamics assessments. This work has been funded by the Italian company Cantene srl. The final report presenting the model and the benchmarking is available online; the work will also be presented in an upcoming scientific article.

The construction of our 70 m medium-scale tunnel for fire tests is soon completed. Some initial calibration tests will be performed after the summer/beginning of the autumn 2022. Once calibrated there will be possibilities for the division to use the tunnel in both different research projects and in our education (thesis projects and course labs).

Research on wildland-fire evacuation modelling is ongoing within the WUI-NITY 3 project funded by NIST in which, among other activities, traffic evacuation data has been collected. In the meanwhile, Dr Enrico Ronchi has led the development of a protocol for V&V of WUI fire evacuation models, together with an international team

including the Fire Protection Research Foundation at NFPA, Imperial College London, NRC Canada, Movement Strategies and RMIT in Australia. This work has been published in the WUI-NITY 2 report.

Erik Smedberg and Dr Enrico Ronchi along with Victoria Hutchison from the Fire Protection Research Foundation at NFPA have recently published a paper concerning their recently finished project on alarm technology for people who are deaf or hard of hearing.

There are several more on-going research projects and some of the are found at www.brand.lth.se/research. Results from many of them are reported in open access Lund University reports. You can access our publications through our webpage: www.brand.lth.se/publications.

Positions and personnel
Dr. Marcus Runefors has won the 2022 Jack Watts Award for Outstanding Reviewer. This award celebrates the highest quality and most helpful reviewers, an essential part of the journal. It is presented annually to those peers whose reviews were most valuable in terms of quality, in-depth, number and timeliness.

Events
Axel Mossberg successfully defended his PhD thesis "Elevator evacuation – Exploring the human behaviour aspects" on June 17.

On June the 16th, Erik Smedberg successfully defended his Licentiate thesis "Egressibility – Applying the concept of accessibility to the self-evacuation of people with functional limitations".

More information about the Division, are available on www.brand.lth.se. Our website is continuously updated with news.

Signed: Nils Johansson, Lund University

News from State Key Laboratory of Fire Science, University of Science and Technology of China

Prof. Jinhua Sun the recipient of the AOAFST 2021 Lifetime Contribution Award
Prof. Jinhua Sun from the State Key Laboratory of Fire Science, University of Science and Technology of China, was awarded the AOAFST 2021 Lifetime Contribution Award at the 12th Asia-Oceania Symposium on Fire Science and Technology which was held during Dec. 7-9, 2021.

Prof. Jinhua Sun was awarded his Bachelor's and Master's degrees from Nanjing University of Science and Technology in 1983 and 1989, respectively. He was subsequently awarded a PhD degree in Japan under the supervision of Prof. Toshisuke Hirano. After graduating from the University of Tokyo in 1999, Prof. Sun worked at the National Fire Research Institute of Japan for 3 years, thereafter he was selected into "Hundred Talents Program" of the Chinese Academy of Sciences (CAS) and returned to the University of Science and Technology of China (USTC) in 2002.

Prof. Sun has been engaged in fire safety science education and research for over 30 years. He has occupied important positions in USTC including the Vice Director of State Key Laboratory of Fire Science (2004-2019), Director of the Academic Subcommittee of the USTC (2019~), Director of Industrial Fire Section (2004~2014) and Director of Institute of Energy Fire Safety of SKLFS (2014~). Concurrent with his roles within USTC, internationally he served as the Vice-Chairman of AOAFST (2007-2021) and a Committee Member of the IAFSS (2008-2018). Prof. Sun was elected as a Fellow of the EU Academy of Science in 2018.

As the Chief Scientist or Principle Investigator, Prof. Sun has led more than 20 projects including the National Key Basic Research Program of China (highest level project in China's Ministry of Science and Technology), and the National Key Natural Science Foundation of China. He has developed the theoretical model to predict the internal-external flame spread for super high-rise building façade fires, revealed the mechanism of lithium-ion battery thermal runaway, and invented high-efficiency fire extinguishing and anti-resurgence technologies for lithium-ion battery fires. To date, Prof. Sun has published 7 academic books, 21 invention patents, and more than 340 SCI journal papers in the fields of combustion and fire safety which have been cited more than 10,000 times. In recognition of his great contributions to scientific research and international cooperation in fire safety science and engineering, Prof. Sun won the First-class and Second-class Prizes of National Science and Technology Progress Award, the Outstanding Contribution Award of Chinese Government, and 12 provincial or national society awards. In 2021, Prof. Sun was awarded the Lifetime Contribution Award of AOAFST.

Prof. Sun created the Curriculum System and Cultivating model of New Energy Fire Safety for undergraduate and graduate students. He has written 8 distinguished academic monographs (in Chinese) such as "Thermal Risk and Safety Countermeasures of the Lithium-ion Battery" and "Methodology of Fire Risk Assessment", which are very widely read by fire researchers in China. To date, Prof. Sun has supervised a total of 51 PhD's and 70 Master's students in fire safety engineering, among which, one student won the IAFSS Best Thesis Award "Excellence in

Research", and two students won the Top 100 Excellent Ph.D Thesis Award of the Chinese Academy of Sciences (CAS), and eight students won the CAS Presidential Awards (Top scholarship available to PhD students in CAS). Because of his outstanding achievements in teaching and talent training, he has been awarded the CAS Excellent Supervisor Award 4 times, the Ethical-Teacher Model of Anhui Province 1 time, and has been awarded the USTC Education Award many times.

Prof. Sun has organized more than 10 international academic conferences, serving as the chairman, vice-chairman or executive member of the organizing committee. In addition, Prof Sun has been invited to deliver more than 30 plenary or keynote lectures including at the IAFSS symposium, AOAFST symposium and the International Symposium on Hazards Prevention and Mitigation of Industrial Explosions (ISHPMIE). Prof. Sun cooperated with Prof. Toshisuke Hirano who is the former Chairman of the IAFSS, and won the China International Science and Technology Cooperation Award in 2003. Dr. Zihe Gao, who was co-supervised by Prof. Jinhua Sun, Prof. Jie Ji and Prof. Bart Merci at Ghent University, won the IAFSS Best Thesis Award "Excellence in Research".

Prof. Jie Ji was elected as a Fellow of the Combustion Institute

The Combustion Institute has announced the 2022 class of Fellows of The Combustion Institute, 23 scholars around the world were elected. Among them, there are two Chinese scholars, including Prof. Jie Ji from the State Key Laboratory of Fire Science (SKLFS), University of Science and Technology of China (USTC).

Prof. Jie Ji was admitted to USTC in 1997. After obtaining the doctoral degree in Safety Technology and Engineering from USTC in 2008, he has worked at USTC until now. He is currently the deputy director, professor and doctoral supervisor of SKLFS. In 2015, he was elected as a top-notch young talent in the "National High-level Talents Special Support Plan" of China. In 2017, he was supported by the National Natural Science Foundation of China for outstanding young scientists. Later, in 2018, he was elected as young and middle-aged scientific and technological innovation leading talent in the "Innovative talents Promotion Plan" of the Ministry of Science and Technology. Besides, he was elected as the leading talent of scientific and technological innovation in the "National High-level Talents Special Support Plan" of China in the same year. In 2020, he was elected as a "Highly Cited Chinese Researcher" by Elsevier. He is the editorial board member of Fire Safety Journal (Journal of the International Association for Fire Safety Science), Fire Technology (Journal of the National Fire Protection Association and the Society of Fire Protection Engineers), Building Simulation, and Journal of University of Science and Technology of China, member of Combustion Branch of Chinese Society of Engineering Thermophysics, co-chair of the Program Committee of the China National Symposium On Combustion in 2018 and 2019, member of China Fire Protection Standardization Committee, deputy director and secretary general of Popular Science & Public Education Committee of China Fire Protection Association, chair of the Early Career Committee and the topic of Enclosure Fire Dynamics of the 14th International Symposium on Fire Safety Science. Prof. Jie Ji has long been committed to research on fire plume behavior, building fires, etc. So far, he has published more than 130 journal papers. In recent years, as the project principal, he has undertaken the National Key Research and Development Program, key projects of the National Natural Science Foundation of China, etc. He has won the China Advanced Worker in Science Popularization (Ministry of Science and Technology of the People's Republic of China, Publicity Department of the Central Committee of the Communist Party of China, China Association for Science and Technology, 2020), Excellence Instructor Award in Chinese Academy of Sciences (2020), outstanding award of Teaching Achievement Award of Anhui Province (2019), first prize of scientific and technological innovation award of China Fire Protection Association (2019), The 12th Wu Zhonghua Outstanding Young Scholar Award (2019), Outstanding Member Support Program of the Youth Innovation Promotion Association of the Chinese Academy of Sciences (2019), advanced individual of "Outstanding Contribution Award" of China Fire Science Popularization (2019), Lu Jiaxi young talent award of Chinese Academy of Sciences (2014) and the 2nd USTC-Tang Lixin Outstanding Scholar Award (2019).

The commendation given to Prof. Jie Ji by The Combustion Institute is "for outstanding contributions to the fundamental fire research on combustion and flame dynamics under restricted air entrainment".

The Combustion Institute, which was founded in 1954, is the most authoritative international academic organization in the field of combustion. The fellow of The Combustion Institute is a lifetime honorific title established by the Combustion Institute to recognize outstanding scientists who have made outstanding contributions to the field of combustion around the world. So far, a total of 245 scientists around the world have won this honor, including 14 scholars from mainland China.

Announcement of the 2022 class of Fellows of The Combustion Institute:
https://www.combustioninstitute.org/news/the-combustion-institute-fellows-class-of-2022-elected/

Project of detection and prediction on forest fire risk launched

With the warming of climate and the increase in extreme weather, the world has entered a high incidence period of forest fires. At present, there are no effective response methods for forest fires in the world, especially for catastrophic forest fires. China will be in the prone and high-risk period of forest fire for a long time. The situation of forest fire prevention is extremely difficult, and fire monitoring and early warning are facing great challenges. Recently, the Ministry of Science and Technology of China launched a project "Research on full-time and multi-mode monitoring and prediction on forest fire risk and accurate detection on early fire", with total funding of 29.65 million RMB.

Figure 1. (a) the forest fire in Xichang city in Sichuan province 2020. (b) "Tianyan" satellite monitoring system from the Ministry of Emergency Management.

Facing the goal of monitoring and early warning on forest fire, the project studies two key scientific problems: the fire risk prediction mechanism based on three-dimensional structure information of forest fuel and meteorological factors, and the coupling evolution mechanism and pyrotechnic radiation characteristics of forest fire. It covers many research subjects, which include (1) New inversion method of key fire risk factors, collaborative monitoring and fusion technology with multi-source remote sensing data, satellite remote sensing monitoring and fine prediction technology on forest fire with multi temporal and spatial granularity; (2) Forest fire monitoring device based on near-space platform station, forest spatial-temporal spectrum information fusion processing method, fire analysis and early warning technology; 3) Large scale forest fire monitoring and early warning technology combining fire accurate positioning and situation sharing technology, fixed point inspection and close-in reconnaissance with UAV; 4) ground-based multi-dimensional information sensor array and control technology for forest environment; 5) Fusion technology of multi-source monitoring information, characteristics and decision-making, "space-near space-air-ground" forest fire collaborative monitoring system.

The project is led by the State Key Laboratory of Fire Science (SKLFS), University of Science and Technology of China, and the project leader is Professor Weiguo Song. The partners include the Shenyang Fire Science and Technology Research Institute of MEM, The Aerospace Information Research Institute in the Chinese Academy of Sciences, National Satellite Meteorological Centre, China Tower Corporation Limited, Tianjin Fire Science and Technology Research Institute of MEM, and etc.. The project is expected to provide basic theories, methods, models, analysis software, technologies and platforms for monitoring and prediction of forest fire risk and accurate detection of fire early. The technologies are expected to be applied at the three forests in Northeast, Southeast, and Middle China.

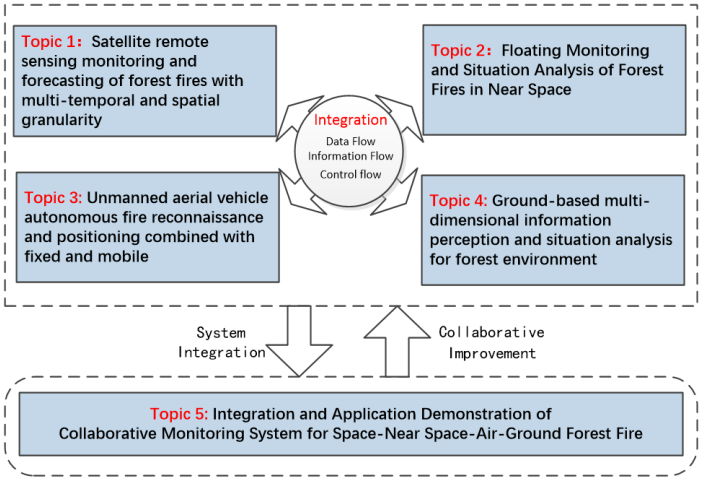
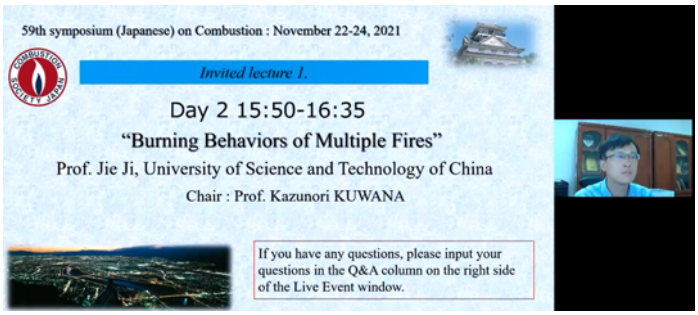


Figure 2. Project research content and supporting relationship

Prof. Jie Ji delivered an invited lecture at the 59th Symposium (Japanese) on Combustion

From November 22 - 24, 2021, The 59th Symposium (Japanese) on Combustion was held online. Prof. Jie Ji gave an invited lecture titled Burning Behaviors of Multiple Fires.

The lecture was divided into three parts: research background, research status, application and future challenges. In the research background section, the burning phenomenon of multiple fires in industrial fires and forest fires, the complex combustion behavior caused by the competition mechanism of the limited air entrainment and radiant heat feedback enhancement were introduced. Moreover, the hazards caused by flame merging and external radiation enhancement were mentioned. The research status section summarized the latest research results of scholars, and focused on the multiple fires research results of his research group in recent years in four aspects: limited air entrainment, enhanced radiative heat feedback, external thermal radiation and environmental wind effects. In the application and future challenges section, application examples and possible application directions of these research results were introduced, as well as some current challenges and possible future hot issues. These researches were carried out in recent years under the support of the key project of National Natural Science Foundation of China and the Excellent Young Scientists Fund Project. The results were published in journals such as Combustion and Flame, Proceedings of the combustion institute, Energy, Fuel, etc.



After the lecture, Dr. Toshiro FUJIMORI, president of the Combustion Institute of Japan, presented a certificate of appreciation to Prof. Jie Ji.

Besides, this Symposium on Combustion invited Prof. Guillermo Rein (editor of Fire Technology, Professor at Imperial College London) and other scholars to give lectures. The conference set up 18 topics (including more than 160 oral presentations and more than 40 posters), as well as a series of activities such as the Carbon Neutrality Forum, Young Scholars Forum, Flame Photography Contest, Women's Luncheon, etc. The Symposium (Japanese) on Combustion has been held for 59 sessions so far. In previous symposiums, Chinese scholars including Prof. Qiang Yao (Tsinghua University), Prof. Fei Qi (Shanghai Jiao Tong University) and Prof. Hong Yao (Huazhong University of Science and Technology) have given invited lectures at the 56th, 57th and 58th Symposium (Japanese) on Combustion respectively.

Summary of the 2nd International Symposium on Lithium Battery Fire Safety

The State Key Laboratory of Fire Science (SKLFS) at the University of Science and Technology of China (USTC) hosted the 2nd International Symposium on Lithium Battery Fire Safety (ISLBFS) on Oct. 31 to Nov. 3 in 2021.

The Chemical Safety Committee, Chemical Industry and Engineering Society of China (CIESC), and China Energy Storage Alliance (CNESA) co-hosted this symposium. Nearly 300 representatives from 6 countries and more than 80 research institutes gathered together online and offline to discuss the fire safety and prospects of lithium battery.

Before this symposium on Oct. 31, a salon on Energy storage accident analysis and safety countermeasures was made. At the symposium, Professor Partha P. Mukherjee of Purdue University, Professor Guillermo Rein of the Imperial College London, Professor Hong Li of Institute of Physics, Chinese Academy of Sciences, Professor Rui Xiong of Beijing Institute of Technology, and Professor Chi-Min Shu of National Yunlin University of Science and Technology made plenary reports online. These reports focused on the thermal runaway mechanism and fire safety prevention and control technology of lithium-ion battery, and comprehensively explained from the aspects of lithium plating safety, fire mechanism, prevention and control, material modification to improve the intrinsic safety of battery, intelligent operation and life prediction of electrochemical energy storage system, and electrolyte additives.

In total, 56 oral presentations and 28 posters were presented in the following six streams in the field of lithium battery safety: Thermal runaway and propagation, Heat generation and numerical modeling, Abuse condition and

venting, Capacity fading and life prediction, Thermal management, Fire extinguishing and safer materials It covers almost the research hotspots of lithium battery fire safety. All participants actively discussed during and after the symposium.

Updates from SFPE Hefei Student Chapter

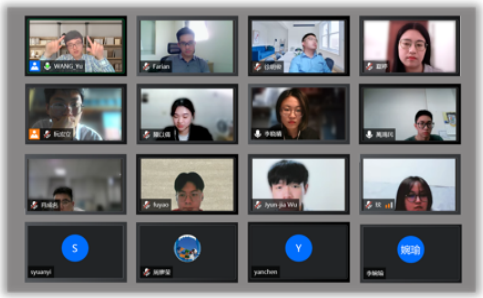
In the past half year after the establishment of SFPE Hefei Student Chapter, we have held international and domestic academic activities, such as presentation from Prof Luke Bisby at University of Edinburgh about *Playing with Fire; Unplanned Adventures in Fire Science, Engineering, and Sociology* and presentation from Prof Jinhua Sun at USTC about *Some thoughts and experience on research "hotspot" and "cold bench",* which attracted more than 200 audiences in each activity.

On 23rd April 2022, a joint workshop between SFPE Hefei Student Chapter and SFPE Taiwan Student Chapter was held with 4 students' and 1 staff's presentations, chaired by Profs Yu Wang and Chia Lung (Farian) Wu. The diverse student audience respectively came from Chang Jung Christian University, USTC, Anhui University of Science and Technology, China Mining University, China University of Geosciences etc., significantly enhancing the communications across both sides of the Taiwan Straits in our fire safety community.

Miss Ting Xia (Vice Chair of the chapter) and Mr Hongli Ruan (Chair) worked together to make a video called *An introduction to Chinese informal settlement fires*, which was awarded the Excellent Popular Science Work Award at the China National Symposium on Combustion. Our faculty advisor, Prof Yu Wang, delivered a presentation about glass thermal breakage at 12th AOSFST and got the Best Presentation Award. More interesting activities are coming in the near future!

Luke answering a question from our Afghanistan student

Prof Sun delivering the presentation online



Joint workshop between SFPE Hefei and Taiwan Student Chapter

Signed: Prof. Naian Liu, at the State Key Laboratory of Fire Science, University of Science and Technology of China

Seminar on Theory and Disruptive Frontier Technology of Fire Protection held

The State Key Laboratory of Fire Science (SKLFS) at the University of Science and Technology of China (USTC) and the Tianjin Fire Research Institute (TFRI) co-hosted the "Theory and Disruptive Frontier Technology of Fire Protection" on April 15. Nearly 200 experts and scholars from universities, research institutes and fire technology enterprises attended the seminar. The seminar was held online, co-chaired by Prof. Lizhong Yang and Mr. Jin Li.

During the seminar, Prof. Jie Ji, Prof. Lizhong Yang and Prof. Xishi Wang gave reports on "Real-time Dynamic Prediction Method of Large-scale Forest Fire Development", "Thinking on Fire Prevention and Control of Photovoltaic Power Generation", and "Discussion on Development Trend of Fire Extinguishing Technology" respectively; Mr. Xuanya Liu and Dr. Qinpei Chen (TFRI) gave reports on "Discussion on Disruptive Technology and Frontier Technology of Fire Fighting and Rescue" and "Strategic Research and Planning of Fire Protection Technology" respectively; Senior Engineer Zhaoyong Lu (Guangdong Ruilin Special Equipment Manufacturing Co., Ltd.), professor-level senior engineer Mingjun Wu (Vitalong Fire Safety Group Co., Ltd.), and Senior Engineer Jihong Xu (Beijing Xuanbang Digital Technology Co., Ltd.) shared the development and application progress of micro-structure foam CAFS fire extinguishing system, supercritical CO_2 fire extinguishing technology, and pulse pressure spray integration technology.

This seminar focused on the international frontier direction, discussed the development hotspots and frontier trends in fire protection, and provided ideas for grasping the evolution law and frontier layout of disruptive technological innovation under the new situation. This seminar had positive significance for improving the original innovation ability of fire prevention and control, effectively solving the pain points in fire protection, and deepening the collaborative innovation of production, education, research and application in the field of fire protection technology.

Signed: Prof. Jie Ji and Prof. Naian Liu, at the State Key Laboratory of Fire Science, University of Science and Technology of China

Case Western Reserve University

Recent Research Activities

Battery fire experiments

For the first time, battery fire experiments were carried out in our lab at Case Western Reserve University (CWRU) in collaboration with and sponsored by the Underwriters Laboratories (UL). The objective of this work is to investigate the unique chemistry of fires associated with lithium-ion battery (LIB) thermal-runaway and its scalability. Experiments are conducted to collect data on the gas compositions and fire characteristics during and post-thermal runaway of LIB cells. The data will be ultimately used to develop a robust numerical model for the LIB fires.

Picture on the top right: PhD candidate Byoungchul Kwon and the combustion chamber for the LIB fire test. Pictures on the bottom, left to right: cell venting, thermal runaway, and fire of a18650 cylindrical cell

Wildland–urban interface (WUI) fires

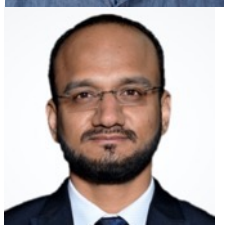
Byoungchul Kwon, PhD Candidate in Liao's group published an experimental paper on the effects of spacing on the burning characteristics of flaming and smoldering firebrands. (You can access the paper at: https://doi.org/10.1177%2F07349041221081998.) Flaming and smoldering processes of a group of firebrands were studied through a series of burning experiments using a 3 × 3 square array of birch wood cube samples. Burning intensity was observed to have a non-monotonic dependency on the gap spacing between the samples. This suggests that the distribution of firebrands can affect the ignition propensity of materials after landing.

Fire resistance natural fibers

Prof. Ya-Ting Liao and her former Ph.D. student Dr. Yanjun Li published a new paper on strategies to grow fungi fiber with improved thermal stability and fire resistance. (You can access the paper at: https://doi.org/10.1016/j.jclepro.2021.128729.) For this work, Liao and Li collaborated with Prof. Bill Yu in the Department of Civil and Environmental Engineering and Prof. Gary Wnek in the Department of Macromolecular Science and Engineering at CWRU. A second paper on this work (titled "Development and characterization of novelly grown fire-resistant fungal fibers") is accepted for publication in Scientific Report.

Recent Recruits

Dr. Chengyao Li, joined Prof. James S. T'ien's research group as a Research Assistant Professor in March 2022. T'ien and Li are serving as the PI and the co-I of the project GEL (Growth and Extinction Limit). GEL is one of the five experiments of the NASA's SoFIE (Solid Fuel Ignition and Extinction) project, led by Dr. Paul Ferkul from NASA/USRA. GEL is the first experiment of SoFIE and is scheduled to take place in summer 2022 aboard the International Space Station. https://www.nasa.gov/feature/glenn/2022/fighting-fire-with-fire-new-space-station-experiments-study-flames-in-space. The SoFIE investigations will explore how flames spread in space and will help NASA select materials and designs for spacesuits, cabins, and habitats. Prior to this position, Li was a Post-Doc in T'ien's group at CWRU.



Dr Ankit Sharma joined Liao's group as a Post-Doctoral researcher, supporting NASA's Saffire (Spacecraft Fire Safety) project. Dr. Sharma conducts ground experiments and numerical studies complementary to NASA's microgravity experiments. He also participates and provides inputs during the development of future Saffire experiments. Dr. Sharma holds a Ph.D. degree in Mechanical Engineering from Indian Institute of Technology (IIT), Roorkee (India), with specialization in High-rise building fires and storage tank fires.

Recent Graduates

Two lab members from Liao's group, Eli Healey and Enna Van Den Akker, successfully defended their MS projects in April 2022. Eli's thesis is titled "A Numerical Study of Concurrent-Flow Flame Spread over Ultra-Thin Solid Samples in Microgravity" and Enna's thesis is titled "Numerical Study of fire Spread between Thin Parallel Samples in Microgravity".

Left picture: Eli and their committee members. Right picture: Enna and her committee members.

Honors and Awards

Dr. Ankit Sharma is recently chosen as one of four early career researchers selected worldwide for the Society of Fire Protection Engineers (SFPE) Foundation Grand Challenges Initiatives. He will be supporting the climate change working group to develop a 10-year strategic engagement plan for identifying how fire safety science and engineering can contribute to addressing pressing challenges in climate change https://www.sfpe.org/foundation/grandchallenges/gci-student-research-fellows.

Recent Events

Prof. Ya-Ting Liao co-planned a poster competition in the American Astronautical Society John Glenn Memorial Symposium held on July 18-20, 2022 at Case Western Reserve University. High school, undergraduate, and graduate students world-wide (especially in the US) were encouraged to participate in the competition https://astronautical.org/2022/04/28/announcing-the-aas-glenn-symposium-student-poster-contest/.

Prof. Fumiaki Takahashi, Prof. James T'ien, and Prof. Ya-Ting Liao are serving as editor and co-editors of a special issue of Frontiers of Mechanical Engineering: Protection of Life and Property from Wildland Fires https://www.frontiersin.org/research-topics/32514/protection-of-life-and-property-from-wildland-fires. Submission is open until September 2, 2022.

Signed: Ya-Ting T. Liao, Assistant Professor

News from Linnaeus University

Fire Safe Use of Wood in Buildings – Global Design Guide 2022

An international guideline for the fire safe use of wood products and timber structures in a wide range of buildings will be published in autumn 2022 [1]. It aims to provide state-of-the-art scientific knowledge on a global level for practical applications. The guideline includes extended use of design codes and standards, practical guidance and examples of fire-safe design and principles of performance-based design.

The guideline is based on the 2010 European guideline, Fire Safety in Timber Buildings [2], enhanced with the latest outcomes from the recently completed COST Action FP1404 - Fire Safe Use of Bio-Based Building Products [3], to which many of the authors have actively contributed. It is also inspired by recent code changes to allow taller and larger timber buildings in Australia, Canada, Europe and the US.

Many well-known fire scientists and engineers from practice worldwide have written the different chapters to guarantee its quality and relevance for use in all countries, see table below. More than additionally 20 experts are co-authors of the different chapters.

Technical content

The guideline consists of 14 chapters, starting with a description of the various wood products, types of structures and their use in buildings, to a more in-depth chapter dealing with performance-based fire design.

The guideline not only addresses structural fire engineering by providing the latest detailed guidance on structural design of separating and load-bearing elements of timber structures, it also contains guidance on design for surface flammability and prevention of fire spread. The importance of proper detailing in building design is stressed with examples of practical solutions to prevent the spread of fire or smoke. Active fire protection and building execution and control are presented as important means of fulfilling fire safety objectives.

Chapters	Lead author
1. Timber structures and wood products	Christian Dagenais, FPInnovations, Canada
2. Fire safety in timber buildings	Andrew Buchanan, University of Canterbury, New Zealand
3. Fire dynamics	Colleen Wade, Fire Research Group, New Zealand
4. Fire safety in different regions	Birgit Östman, Linnaeus University, Sweden
5. Reaction to fire performance	Marc Janssens, Southwest Research Institute, USA
6. Fire separating assemblies	Norman Werther, Technical University of Munich, Germany
7. Load bearing timber	Alar Just, TalTech, Estonia
8. Timber connections	David Barber, Arup Fire, Australia
9. Prevention of fire spread	Esko Mikkola, KK-Fireconsult, Finland
10. Active fire protection by sprinklers	Birgit Östman, Linnaeus University, Sweden
11. Performance-based design	Paul England, EFT Consulting, Australia
12. Robustness in fire	Michael Klippel, ETH Zürich, Switzerland
13. Building execution and control	Andrew Dunn, Timber Development Association, Australia
14. Firefighting considerations	Ed Claridge, Auckland Council, New Zealand

National and international building codes in different regions of the world are compared, but not explained in detail. The guideline is of benefit to design engineers in any country, and will be of special interest to code writers in countries where timber buildings are not yet widely used.

The technical content has been peer-reviewed by fire engineers, scientists and experts from various countries, providing additional international credibility and applicability.

The release of the guidelines is planned for autumn 2022. It will be published both as a hard-bound book, and as an open access version available for free PDF download via the Fire Safe Use of Wood website (www.fsuw.com). It is expected to be of use to a wide range of stakeholders involved in designing and realising timber buildings, including architects, engineers, educators, regulatory authorities and building industry personnel.

Acknowledgements
The authors wish to thank all their co-authors and a large number of colleagues and reviewers in many countries who provided much assistance. Melody Callahan did the line drawings and managed the delivery of text and images to the publisher. We also acknowledge the large number of consulting firms, research institutions, universities and professional organisations around the world who supported this project through in-kind support of authors and reviewers.

References
[1] Fire Safe Use of Wood in Buildings - Global Design Guide - in preparation. Andrew Buchanan and Birgit Östman, Editors. CRC Press, 2022.
[2] Fire Safety in Timber Buildings - Technical Guidelines for Europe, Stockholm (Sweden), SP Technical Research Institute of Sweden, 2010.
[3] COST Action FP 1404, Documents available at: https://costfp1404.ethz.ch/ and www.fsuw.com.

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

News from the University of Canterbury

Achievements
Dr. Dennis Pau was involved in the supervision of a collaborative project with UC School of Product Design to develop a sustainable and viable seaweed plasterboard that achieve suitable fire safety performance for building application. The project won the UC Innovation Jumpstart Greatest Commercial Potential Award in 2021, and accompanying $20,000 prize, https://www.canterbury.ac.nz/news/2022/new-seaweed-plasterboard-design-provides-safer-more-sustainable-building-option.html

PhD students and Postdocs
Dr. Humayun Khan has recently joined the fire group. His research involves studying human behaviour during disaster evacuation (fire and tsunami) using virtual reality (VR) as a tool to understand individual decision-making and pedestrian dynamics. His research also explores multisensory elements (visual, audio, wind, heat, and smell) in VR and sees their effect on the perception of disaster events. Prior to this role, Humayun briefly worked at HITLab NZ as a research associate where he built a portable multisensory system for VR, simulating wind and smell sensory inputs. For his PhD at HITLab NZ, he developed a novel indoor localisation system for first responders using visual and inertial sensors. His localisation solution can determine pedestrian position within a metre level of accuracy in large-scale indoor space.

Conferences
Andres Valencia presented his work in the 14th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods, which consisted of a framework for building fire design in the Wildland Urban Interface. Additionally, he will present his works in the upcoming IX International Conference on Forest Fire Research, in the areas of wildland fire behaviour.

Scholarships
Fire Engineering Group at the University of Canterbury (UC), Christchurch, New Zealand (NZ), is seeking a few PhD. students, who are interested in one of the following areas:

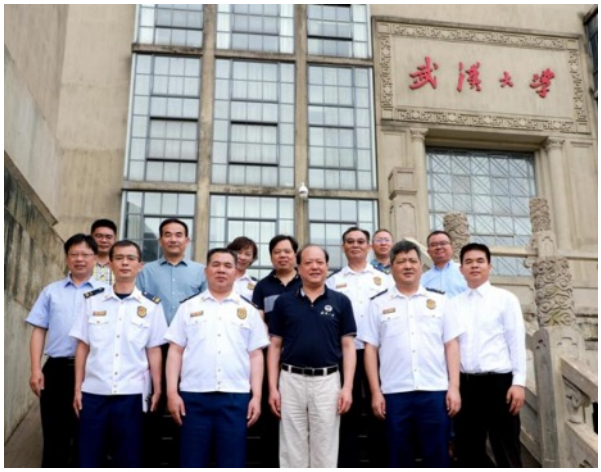
- Fire safety of mass timber buildings (compartment fire dynamics and structural fire design)
- Fire safety of sustainable tall buildings
- Fire safety of renewable energy systems in built environment
- Automated fire safety design of built environment
- Wildland Urban Interface fire design and modelling
- Wildfire evacuation; Tsunami evacuation
- Dynamic way-finding systems and people localisation in smart buildings

Applicants are required to identify the topic of interest for their study (visit UC Fire Engineering Group website https://www.canterbury.ac.nz/engineering/schools/cnre/research/fire/), and provide relevant credentials for review, (1) CV maximum 3 pages showing research experience and academic referees, (2) 1-page motivation letter explaining research interest, (3) proof of graduation e.g. transcripts from Bachelor/Masters degrees, (4) evidence of the English Language proficiency, and (5) draft research proposal if available, optional. Application should be addressed to Dr. Dennis Pau, dennis.pau@canterbury.ac.nz.

Signed: Dr Andres Valencia-Correa, University of Canterbury

Establishment of the Fire Testing and Research Center of Hubei Province

On July 5, 2022, the ceremony for the establishment of the Fire Testing and Research Center of Hubei Province was held at the administration building of Wuhan University, China. The center is established to solve the challenging problems in fire protection, fire investigation and firefighting through carrying out real and simulated fire tests. The idea of establishing such center was originally proposed in 2017. In May 2022, the Department of Fire and Rescue of Hubei Province and Wuhan University signed the agreement to jointly establish the center. The center is the first provincial level center for fire in the province. The chief of the department and a vice-president of the university attended the ceremony.



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

News from the Victoria University Fire Safety Group

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 Prof Khalid Moinuddin, Prof Vasily Novozhilov, Associate Professor Paul Joseph and Associate Professor Maurice Guerrieri. There are currently two postdoctoral fellows and six PhD students conducting research in this group. Wildland fire and fire suppression by water mist research are led by Prof Moinuddin, Associate Professor Guerrieri leads concrete behaviour in fire research and Associate Professor Paul Joseph is in charge of fire safety engineering courses and environment-friendly foam research.

Wildland Fire Research
Wildland fire research within the VUFSG involves modifying and applying WFDS to simulate firebrand transport, grassfire and forest fire propagations under various atmospheric and fuel conditions as well as over slope and the effect of firebreaks and fuel inhomogeneity on fire propagations.

We have made two changes to FDS/WFDS in relation to firebrands by implementing: (1) Haider and Levenspiel (1989) drag model to account for the sphericity of the firebrands and (2) a firebrand generation model (number of particles as a function of fuel mass loss) based on the experimental studies conducted at Oregon State University, USA. We are conducting simulations of firebrand transport with a view to develop operational models of ember attack for quantification in Australian Building Standard in wildfire-prone areas, AS3959. We are also

endeavouring to determine firebrands' landing distributions as a function of atmospheric conditions and fire scenarios to develop a statistical model for an operational model, Spark (developed by CSIRO Data61).

We are currently studying junction fire behaviour using FIRESTAR3D model (developed by Aix-Marseille University and Lebanese University, Lebanon). We aim to extend our studies to other dynamic fire behaviours such as vorticity driven lateral spread, different mode of fire propagations etc.

Fire Suppression by Water-mist Research
Recently, we have secured a funding from the Australian defence industries to use 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. Dr. Iqbal Mahmud who completed his PhD at Victoria University a few years ago on a similar topic, will work on this project as a postdoctoral fellow.

Fire Suppression by Environment-friendly Foam
Our postdoctoral fellow Dr. Malavika Arun has been exploring the efficacies of water foams obtained through the use of environmentally-benign and electrically neutral surfactant formulations. Associate Professor Joseph is leading this project and this work has been funded by a defence science institute.

Concrete Behaviour in Fire Research
Dr 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.

Signed: Professor Khalid Moinuddin , Victoria University

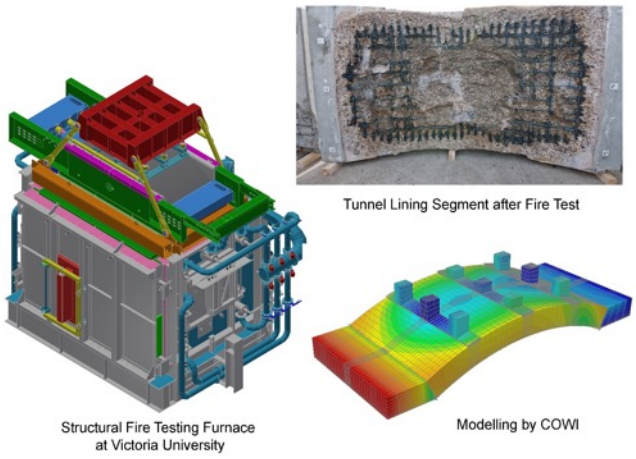


Figure 1.0: Full scale Tunnel Lining Test Frame (left), Tunnel lining segment after fire test (top) and modelling by COWI (bottom)

News from Imperial College London

Hello friends of Hazelab! Welcome to another update from Hazelab at Imperial College London.

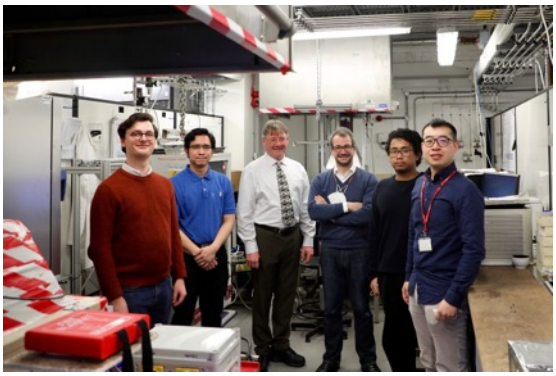
For more news follow us on twitter @ImperialHazelab, visit our website or watch our video.

Graduating Students
This has been a dramatic year for people graduating from Hazelab – we have had four members submit their theses and pass their vivas! We would like to *proudly* congratulate **Dr Dwi Purnomo** (Peat fires) for passing his viva, as he will now be moving to UC Berkley along with **Wuquan Cui** to continue his stellar career in fire science! His viva was examined by Prof J. Michael Waddington in Canada, and Dr Monica Marinescu and Dr Salvador Martinez-Navarro from Imperial College London. Congratulations, Dwi!

Matt Bonner also departed from Hazelab this year, starting his new position as research lead at Trigon fire in London.

We would also like to say goodbye to **Hafizha (Afi) Mulyasih**, a visiting PhD student from Universitas Indonesia who we greatly enjoyed hosting! We had an intense experimentalist versus modellers bowling evening to celebrate her departure, which the experimentalists won by a few points.

After the pandemic causing delays for the past two years, **Eirik Christensen, Matt, Han Yuan, and Mohammad Heidari** had their PhD graduations at the Royal Albert Hall – congratulations all!



To celebrate graduations over the past two years (**Eirik, Matt, Han, Mohammad,** and **Dwi**), Hazelab members past and present had a celebratory dinner.

Conferences and Outreach

This academic year has been an exceptional time for in-person conferences and outreach from Hazelab to the fire science community and beyond!

Dwi and **Wuquan** presented their individual work at the 13th Asia-Pacific Conference on Combustion 2021 in Abu Dhabi.

Harry Mitchell, **Rikesh Amin**, and **Simona Dossi** attended another mass timber compartment fire experiment in France, collaborating with Arup and CERIB.

Nikolaos Kalogeropoulos and **Simona** presented their work on wildfire evacuation triggers and wildfire statistics at the London Leverhulme Centre for Wildfires early career researchers conference! They also attended Pyrolife training in Cyprus, and the European Geosciences Union 2022 conference (EGU22) in Vienna – congratulations Nik and Simona!

Dwi, **Simona**, and **Nikolaos** also attended the International Congress on Fire in the Earth System in Valencia, where they enjoyed some delicious paellas and excellent speakers!

Francesca Lugaresci and **Rikesh** attended and participated in an evacuation training drill in a London high-rise building, hosted by the London Fire Brigade and UCLan Fire.

Francesco and **Guillermo Rein** were also special guest speakers on battery fires (episode #049), travelling fires (episode #027) and peatland fires (episode #002) for the new and rapidly growing Fire Science Show podcast, run and hosted by Wojciech Węgrzyński! In a surprise twist, for the 50th episode **Guillermo** became the host, interviewing Wojciech on the challenges of modelling the impact of wind and fire in the built environment.

Guillermo presented in person for the first time in three years at the 7th International Tall Building Fire Safety Conference on the flammability of facades, at which **Rikesh** and **Francesca** were also in attendance.

Visitors

We also hosted Brian Meacham and Scott Stephens for our first in-person seminars in the last two years, on "*A Sociotechnical Systems Framework for Performance-Based Design for Fire Safety"* and *"What's Next? Forest Fires in California's New Climate Reality"* respectively. Thank you both for visiting Hazelab and sharing your knowledge and experience!

Awards

Xinyan Huang (alumni) and **Guillermo** received the 2021 IOP Ricardo Award for best UK paper contributing to the understanding of combustion at a fundamental level awarded by the Institute of Physics (IOP). The paper in the international journal of wildland fire is an experimental and computational study of how peatfires spread.

SFPE Greater London Student Chapter

After receiving 12 incredible video submissions, the student chapter announced that **Dwi** won first place in the Flash Points competition with an informative and stunning video on peatland fires – congratulations Dwi!! To view the rest of the excellent videos click here.

We also had a handover meeting to say goodbye to old members of our chapter committee, and elect new members! We would like to say thanks to **Matt, Ben Khoo**, and **Dwi** our treasurer, events officer and website manager who are all leaving us following their graduation from student life. We would now like to welcome **Harry, Francesca,** and **Nikolaos**, our new President, secretary, and Treasurer!

As in-person events are more possible now, our chapter is looking forward to an upcoming year of in-person and hybrid events for the London fire safety student community and beyond!

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

Follow this link to Hazefiles, our repository of papers and reports!

Signed: Harry Mitchell and Nikolaos Kalogeropoulos, Imperial College

News from the University of Maryland (USA)

FPE Welcomes Two New Faculty Members

The UMD FPE Department is pleased to announce the arrival of two new Assistant Professors who joined the faculty starting in August, 2022: Shuna Ni and Fernando Raffan-Montoya.

Ni received a Ph.D. degree in civil engineering from Texas A&M University, College Station, in 2018, with an emphasis in structural engineering. She is currently an Assistant Professor in the Department of Civil and Environmental Engineering at Utah State University (USU), focusing on structural fire engineering and risk engineering. Her current research interests include probabilistic structural fire engineering, fire safety of tall mass-timber buildings, impacts of fire on civil infrastructure, fire-related multiple hazards, smart firefighting, and fire forensics. Her research vision is to increase built environments' resistance and resilience to fires and fire-related multiple hazards, at both the single-structure and community levels.

Raffan-Montoya earned his Ph.D. degree in Aerospace Engineering at UMD, where he worked on the experimental characterization of slot film cooling flows for propulsion applications. He is currently a Faculty Specialist in the UMD FPE Department, with roles as laboratory manager, lead engineer for the Fire Testing and Evaluation Center (FireTEC), and department instructor. His current research interests are in the areas of minimally intrusive diagnostics, test standards, fire toxicity, fire suppression and wildland fire early detection. His research vision is to explore problems through careful experiments, the design of new testing instruments and methods, and close collaboration with modelers to advance the field of fire science.

IFSC and UL Collaborate on Wildland Fires and Fire Modeling

The International Fire Safety Consortium (IFSC) and Underwriters Laboratories (UL) have announced a collaboration on two new worldwide research initiatives designed to create new knowledge and understanding of wildland fires and fire modeling. The projects will involve researchers from across the IFSC and the UL Fire Safety Research Institute (FSRI).

The first project, led by Stanislav Stoliarov, will improve understanding of the ignition of wildfire fuels by firebrands. This project will explore the ignition of building materials by firebrands, and relate the ignition propensity to material properties, characterizing the associated thermal and gaseous environments, wind speeds, external radiative heat fluxes, and exposure times. Structural materials will be installed in a bench-scale wind tunnel and subjected to piles of smoldering wood dowels. Gas analyzers will measure the heat release rates and advanced visible and infrared pyrometry will measure the ember and building material temperatures and the heat flux distributions. These processes and findings will be incorporated into new computational models. The project will lead to the improved resilience of structures in wildland fires and new standard test methods.

The second project, led by Arnaud Trouvé, will improve models for compartment fires. While the fire modeling community has made significant progress in recent years with fire models in free-burn configurations, there is an unmet need to extend this work to compartment fires. This research project aims to address this unmet need, focusing on CFD-based modeling. The project will lead to significant steps forward in understanding complex coupled phenomena, including flow fields, combustion, and heat transfer, as they occur in compartment fires. The project will also evaluate the performance of current fire modeling capabilities in the simulation of compartment fires with a particular focus on FDS. The IFSC research team will seek to identify the best modeling options to simulate radiation heat transfer, flame extinction, soot production, and fuel production due to pyrolysis taking place inside solid flammable objects.

Additional collaborators include Alex Filkov (Univ. Melbourne), Michael Gollner (UC-Berkeley), Steve Kerber (UL), Bart Merci (Ghent Univ.), and Peter Sunderland (UMD).

FPE Awards Three UL Fellowships

Grayson Bellamy, Thomas DiPietro and Rebekah Schrader are the 2022/2023 recipients of the UL Fellowship with UL's Fire Safety Research Institute (FSRI). The trio will contribute to research at UL FSRI, while pursuing their degrees at the University of Maryland. UL's FSRI researches fire dynamics in contemporary environments to ensure victim and firefighter survival and safety.

Thomas Roche Receives 2022 Bryan GRA Award

Thomas Roche, a senior in the UMD FPE B.S. program, is the recipient of the John L. Bryan Graduate Research Assistantship (GRA) Award for the 2022/23 academic year. Roche is the current president of the Salamander Honor Society and the treasurer for the Society of Fire Protection Engineers UMD student chapter. He will begin his master's program in the fall of 2022, and will be advised by Fernando Raffan-Montoya.

Sunderland Selected for National Academies Decadal Survey
Peter Sunderland has been selected to serve as a member of the U.S. National Academies of Sciences, Engineering and Medicine's 2023-32 Decadal Survey on Biological and Physical Sciences Research in Space – a NASA-sponsored guide for the next 10 years' worth of scientific study priorities. The study will review current theories and understanding of emerging areas of space-related sciences and generate recommendations on vision and strategy for next decade. It will also help NASA identify research goals applicable to robotic exploration needs and provide terrestrial benefits.

Signed: Peter Sunderland, University of Maryland

News from Pprime Institute – Poitiers – France

DINH Duy Cuong - "Development of a detailed approach to model the solid pyrolysis with the coupling between solid and gases intra-pores phenomena"

In October 2021, DINH Duy Cuong started as a PhD student with Combustion Hétérogène et Milieux poreux (CH) team under the supervision of Prof. Thomas ROGAUME, Dr. Franck RICHARD and Dr. Benjamin BATIOT. He graduated in the Aerospace Engineering, Excellent Engineer Training Program at Hanoi University of Science and Technology. He works with thesis called " Development of a detailed approach to model the solid pyrolysis with the coupling between solid and gases intra-pores phenomena ".

The team focuses on studying the comprehension of different fundamental factors influencing the fire dynamics (ignition, propagation and extinction) by developing innovative tools to characterize the fire experimentally and numerically. The developed models allow describing the fire behavior of solid material when these materials are exposed to thermal stress. Furthermore, the interface interaction between condensed and gas phases are researched to be integrated in numerical modelling because of its necessity in describing phenomena during combustion. Besides, the coupling phenomena between chemical reactions and heat and mass transfers is also carefully studied. They all aim to describe the combustion of a type of material that can be considered the most common in nature as well as in life, Porous Material. From there, Cuong's thesis was proposed to further develop and synthesize the above factors.

This thesis will focus on the following content:

- Describing the chemical process occurring under the thermal decomposition of cellulosic materials such as wood by a multi-step reaction approach coupling concurrent and competitive reactions. (The presence of intermediate phases would be a notable factor and need to be addressed)
- Considering the pyrolysis gases such as reactive and constituted by a melting of hydrocarbons (CH4, H2, C2H2, C2H4…) which can be transported through the solid pores and react with the ambient oxygen which diffuses inside the solid.
- Integrating the exchange between gas and solid phase in the model.

The model will be developed based on the PATO code (Porous Analysis Toolbox based on OpenFoam) developed by NASA.

New Benchscale of the "Fire REsistaNce of External Thermal Insulation Composite Systems - FRENETICS" Project

In the last recent years, thermal insulating from the outside has developed strongly. That's why, it's necessary to know the reaction of the insulating system to be able to predict the resistance of the façade. It is the aim of the project FRENETICS with Efectis, Centrale Lille and INSA Rouen. Different type of insulating system can be used: the ETICS (External Thermal Insulation Composite System) and ventilated cladding, that are the most common. Four samples were chosen: two ETICS and two ventilated cladding for this study.

Different scenarios will be studied: the inflammation of the front side, the stack effect on back face and inert wall too. In order to realize this study, a specific bench has been developed. It is composed of a radiant panel and a burner powered by propane (depending on the configuration) on one part and a sample holder on another part. It is equipped to measure the mass low rate, the temperature at different depths and heat flux in solid and gaseous phase both, the toxicity of gazes using a multiply gas analyser. All the beachscape is located under a large Heat Release Rate hood. Different sizes of panels will be used: a 50*50 cm^2 panels and 100*100 cm^2 panels. The first will contribute to study and characterize the decomposition of the system and the second to study the influence of the flame in the upper part of the sample.

The project approach being multi-scale, the results will be used to designed the test on the higher scale (LEPIR 2) and to validate numerical model.

Our new ISO 5660 Cone calorimeter is in use
The lab has bought its third cone calorimeter. This time a Netzsch TCC 918 has been choice and installed by their technician, our users formed. The first experimental campaigns have begun.

New large-scale tests in collaboration with the fire rescue – Experimental fires in a real building
In collaboration with the Fire Rescue of the department of Maine et Loire (SDIS49), a new real scale week of tests has been performed in March 2022. Indeed, we have the opportunities to realize tests in an old Hospital, the CEZAME.

Three identical fire tests have been done into three identical rooms. During each one, an initial and well calibrated wood cribs fire has been ignited and four targets constitutes from PMMA plates located respectively at 50cm, 100cm, 150cm and 250 cm from the wood crib fire. Each PPMA plate was equipped with 10 Thermocouples, at different places and thickness into the plate as well as two total heat fluxmeters. The main objective was to capture in real scale conditions the conditions of ignition of the PMMA targets as a function of their distance.

Signed: Thomas Rogaume, University of Poitiers

News from ZAG – The Slovenian National Building and Civil Engineering Institute

FRISSBE project
The FRISSBE project (Fire-safe Sustainable Built Environment, www.frissbe.eu) is hosted by ZAG, the Slovenian National Building and Civil Engineering Institute (www.zag.si/en). The project aims at having regional impacts in terms of research, education, and engineering practice in the field of fire safety science. The team will build a strong interactive ecosystem with the InnoRenew CoE and the University of Primorska, as well as with other supporters of the project.

Establishment of the FRISSBE team
After Prof Grunde Jomaas was appointed as the ERA Chair holder in October 2021, Dr Andrea Lucherini and Dr Ulises Rojas Alva joined the FRISSBE project as senior researchers at the beginning of 2022.

Dr Andrea Lucherini completed his BSc and MSc in Structural Civil Engineering in a joint programme between the University of Bologna (Italy) and the Technical University of Denmark (Denmark). In 2020, he obtained his PhD in Structural and Fire Safety Engineering at the University of Queensland (Australia). Between 2020 and 2022, he has been working as a Postdoctoral Research Fellow at Ghent University (Belgium). His field of expertise is construction materials engineering, with a specialization in fire safety science and engineering. To date, Andrea's research interests primarily focus on the performance of advanced construction materials and systems during and after a fire, material behaviour at ambient and elevated temperatures (heat transfer and structural mechanics), advanced experimental fire methodologies, fire protection (intumescent coatings), and fire dynamics for performance-based design of fire-safe structures, including computational fluid-dynamics (CFD) modelling. Andrea is thus acquainted with different research cultures and has a proven record of innovative experimental research, as well as experience with both numerical and theoretical research.

Dr Ulises Rojas-Alva recently graduated with a PhD from the University of Edinburgh, where he also was a post-doctoral researcher for the last 5 months of 2021. He obtained his MSc in Civil Engineering from the Technical University of Denmark (DTU) in 2013, and his Architectural Technologist BSc from the Polytechnic University of Madrid (UPM). After finishing his MSc at DTU, he worked there as a Research Scientist for 2 years. During his PhD studies, research assistant position at DTU and his MSc thesis project, he worked on a range of research topics, including fire safety on spacecraft, flame spread and ignition of solid materials, in-situ burning of crude oils (ISB), and smoke management in tunnel infrastructures. Dr Rojas-Alva has collaborated with a broad range of other research institutes and universities (NASA, ZARM, Bremen University, Worcester Polytechnic Institute, Sorbonne Université, Aarhus University, NOFO, International Association of Oil & Gas Producers, S.L. Ross Environmental Research Ltd., and the Cold Regions Research and Engineering Laboratory) and brings very strong experience in planning, design and execution of experimental research of high fidelity and complexity.

Opportunities within FRISSBE

An important long-term goal of the FRISSBE project is to establish and maintain an internationally recognized research team in the field of fire-safe sustainable built environment and to establish effective and efficient support services within ZAG with the overall aim of supporting research activities and lead ZAG towards scientific excellence in the international sphere, also after the successful completion of the FRISSBE project.

The FRISSBE team is planned to consist of the ERA Chair holder, 2 senior researchers, 6 postdoctoral researchers and 3 PhD students. In Spring 2022, the following positions were open:

- 2 postdoctoral researchers (application deadline closed June 2nd 2022)
- 2 PhD students (application deadline closed May 17th 2022)

In addition, the FRISSBE team will hire more researchers soon, with the following positions being the minimum:

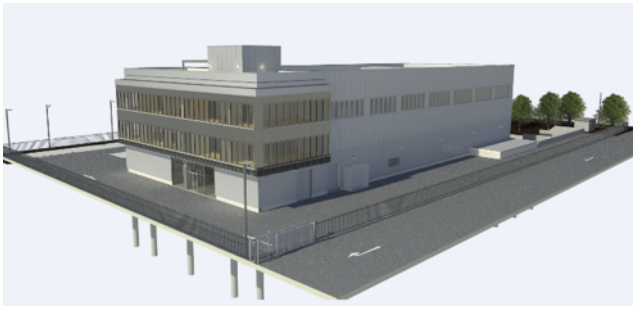
- 2 postdoctoral researchers (Q1 2023)
- 2 postdoctoral researchers (Q1 2024)
- 1 PhD student (Q3 2023)

The most updated information about open positions within the FRISSBE project can be always found on the project website. We also encourage you to follow us on LinkedIn for updates about the team activities and research outputs.

New research facilities in Logatec

The new state-of-the-art fire laboratory in Logatec is the main workplace for the FRISSBE team. The laboratory is being completed these days and the FRISSBE team moved in to their offices in May 2022. The laboratory will offer the FRISSBE team brand new research equipment for fire testing at various scales.

In the new building (see picture), one entire office floor will host the FRISSBE team, while the other one will be for the fire testing and research team from the Department of Building Physics under the direction of Friderik Knez.



Skilled to be a Fire Expert – Erasmus+ project

At the end of March 2022, our ERA chair holder Grunde Jomaas visited Zagreb, Croatia's capital city, where he participated in the 3rd transnational meeting and workshop of the Skilled to be a Fire Expert project (www.skilledfe.eu) led by University of Ljubljana. He gave a short presentation about Fire Risk Analysis and had good discussions with the project partners from Croatia, the Czech Republic and Slovenia (team photo to the right). The second day of the meeting proceeded with presentations for a solid group of stakeholders from Croatia. Questionnaires and discussions provided valuable input for the progress of the project. A similar meeting was held in Ljubljana at the end of April, and the next meeting was in Prague in June 2022.

Signed: Dr Andrea Lucherini, Slovenian National Building and Civil Engineering Institute (ZAG)

News from University of California, Berkeley

The Berkeley Fire Research Lab, run by Prof. Michael Gollner http://firelab.berkeley.edu and working together with Prof. Carlos Fernandez-Pello, who runs the adjacent Combustion and Fire Processes Lab, are working on a variety of combustion and fire research topics. Some recent updates to the group include:

- Postdoctoral scholar Dr. Mohammadhadi Hajilou is leaving the lab to start a new position as an Assistant Professor of Mechanical Engineering at the University of Portland.

- Postdoctoral scholar Dr. Luca Carmignani started a new position as a Wildland-Urban Interface Fire Advisor with the University of California Cooperative Extension
- Incoming PhD student Bryce Bathras was awarded a Berkeley Chancellor's Fellowship and the NSF Graduate Research Fellowship and current PhD student Kelly Clevenson was awarded an honorable mention by the NSF Graduate Research Fellowship program.
- Undergraduate research assistant Ingrid Shan was awarded the Steidel Prize by the Department of Mechanical Engineering at the University of California, Berkeley for excellence in undergraduate research.

Professor Gollner was invited to testify to the United States House of Representatives Oversight Committee on March 16, 2022 addressing federal wildland fire policy and mitigation.

https://firelab.berkeley.edu/2022/03/professor-gollner-testifies-to-congress/

Christina Liveretou, Priya Garg and Joey Dowling presented at the Spring meeting of the Western States Section of the Combustion Institute March 21-22. Postdoctoral scholar Hadi Hajilou also came to support the group. Jeanette Cobian, former postdoctoral scholar and now UC Merced faculty, also presented a paper on work performed at UC Berkeley. Finally, Professor Gollner presented the plenary lecture on the Role of Combustion in Wildland Fire Science. It was a great meeting across the bay on the beautiful Stanford Campus.

https://firelab.berkeley.edu/2022/03/students-present-at-stanford-combustion-conference/

The Berkeley Fire Research Lab was recently awarded several exciting new projects we'll be working on over the next few years. These include:

- A collaborative project with Northeastern University on Cardiopulmonary Risk-Assessment from Smoke Exposure at the Wildland Urban Interface funded by the National Institutes of Health
- Quantifying Structural Ignition Risk in the Wildland-Urban Interface from CAL FIRE as part of the Forest Health Program
- Development and Implementation of a Model for WUI Fire Spread funded by the Moore Foundation in collaboration with Dr. Chris Lautenberger of Reax Engineering, Inc.

Signed: Prof Michael J. Gollner, University of California, Berkeley

News from Luleå University of Technology

Experimental and numerical student laborations in structural fire safety engineering

As a part of the Fire protection engineering curriculum at LTU, there is a focus on understanding and numerical ability of structural fire safety engineering. As a part of this, the students are required to do a fire lab with a steel stub under compression. The lab, developed and supervised by Joakim Sandström, is performed during the undergraduate part of the studies evaluated with diagrams and hand calculation tools. For student who continue to the master program, the same fire test (the data is saved) is evaluated using the finite element software SAFIR. This progression is appreciated by the students who can already as undergraduates make basic predictions of the structural performance while it also motivates student to continue to the master program for a deeper understanding of the design process.

Figure 1 Test of fire exposed steel stub during undergraduate course.

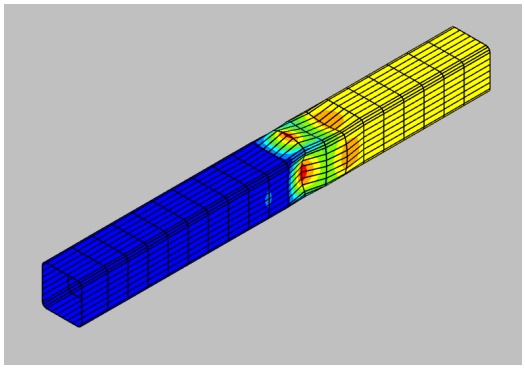


Figure 2 Numerical evaluation of the fire exposed steel stub in one of the masters courses.

Signed: Michael Försth, Luleå University of Technology

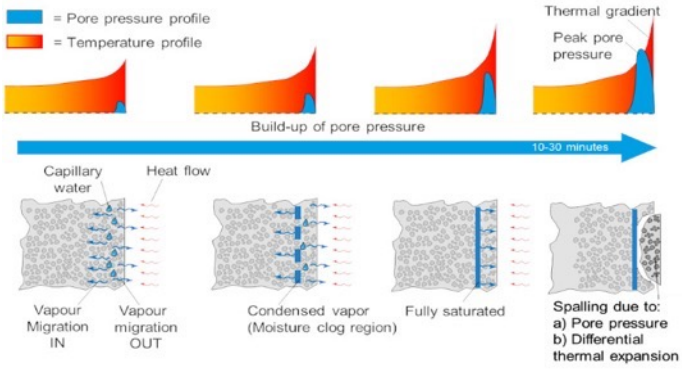
News from University of Sheffield

Updates

- Both **Dr Shan-Shan Huang** and **Dr Giacomo Torelli** have joined the new *RILEM TC (Technical Committee) CFR: Concrete during Fire – Reassessment of the framework*.
- Our annual course Structural Analysis and Design for Fire, led by **Dr Shan-Shan Huang**, **Prof. Ian Burgess** and **Dr Danny Hopkin** (OFR Consultants & Visiting Prof at Sheffield University), has started. This year, we developed the course into both face-to-face and online versions, which have been well received. The class has 46 students at Masters level, plus 15 CPD (Continuing Professional Development) participants from industry.
- **Dr Martyn S. McLaggan** has taken home the highest individual result in the NIST's prestigious 2021 Annual Christmas Tree Heat Release Rate (HRR) prediction competition. This comes after winning Best Team in 2017 (DBI), 2018 (UQ), 2019 (UQ), 2020 (UQ) and also being around (but not contributing much) for the 2016 (DBI) win. Unfortunately, it turns out that achieving the highest individual result does not award a pinecone, so the streak of 5 winning pinecones is over. Congratulations to Korea University for taking home the prize this year and, as always, thanks to Isaac Leventon for arranging the competition and reminding everyone to water their Christmas tree!

Projects

Dr Maurizio Guadagnini, **Dr Giacomo Torelli** and **Dr Shan-Shan Huang** have been awarded a Game Changers grant, funded by Sellafield Ltd and Dounreay Restoration Site Ltd, to develop a proof-of-concept technology to effectively remove concrete layers from contaminated nuclear structures. The project proposes a novel approach to remove layers of contaminated concrete, using heated-induced spalling of concrete as the driving mechanism. The novelty of this work lies in the use of heated-induced spalling constructively, as it is commonly seen as deleterious, e.g. in the context of fire engineering where efforts are made to prevent it. In this project spalling will be controlled, rather than prevented, and used to achieve the desired removal of concrete layers.



Recent Publications

- Amran, M., Huang, S. -S., Debbarma, S., & Rashid, R. S. M. (2022). Fire resistance of geopolymer concrete: a critical review. *Construction and Building Materials*, *324*. doi:10.1016/j.conbuildmat.2022.126722
- Cadena, J. E., McLaggan, M., Osorio, A. F., Torero, J. L., & Lange, D. (2022). 'Maximum allowable damage approach to fire safety performance quantification.' *Fire Safety Journal*, 103537. doi:10.1016/j.firesaf.2022.103537
- Chen, L., Hassan, H., Tallman, T. N., Huang, S. -S., & Smyl, D. J. (2022). Predicting strain and stress fields in self-sensing nanocomposites using deep learned electrical tomography. *Smart Materials and Structures*. doi:10.1088/1361-665x/ac585f
- Liu ,Y., Huang, S-S. & Burgess, I. W. (2022). 'Three-dimensional modelling of composite frames with ductile connections in fire'. *Structures*, 36, pp. 666-677. doi:10.1016/j.istruc.2021.12.033
- Liu, Y, Huang, S-S. & Burgess, I. W. (2022). 'Ductile connection to improve the fire performance of bare-steel and composite frames', *Journal of Structural Fire Engineering*, 13 (2), pp. 249-266. doi:10.1108/JSFE-06-2021-0041
- McLaggan, M. S., Gupta, V., Hidalgo, J. P., & Torero, J. L. (2021). 'Upward Flame Spread for Fire Risk Classification of High-Rise Buildings.' *International Journal of High-Rise Buildings*, 10(4), 299-310. doi:10.21022/IJHRB.2021.10.4.299
- Nothard, S., Lange, D., Hidalgo, J. P., Gupta, V., McLaggan, M. S., Wiesner, F., & Torero, J. L. (2022). 'Factors influencing the fire dynamics in open-plan compartments with an exposed timber ceiling.' *Fire Safety Journal*, 129, 103564. doi:10.1016/j.firesaf.2022.103564
- Xu, H., Pope, I., Gupta, V., Cadena, J., Carrascal, J., Lange, D., McLaggan, M. S., Mendez, J., Osorio, A., Solarte, A., Soriguer, D., Torero, J. L., Wiesner, F., Zaben, A. & Hidalgo, J. P. (2022). 'Large-scale compartment fires to develop a self-extinction design framework for mass timber—Part 1: Literature review and methodology.' *Fire Safety Journal*, 103523. doi:10.1016/j.firesaf.2022.103523

Signed: Martyn McLaggan, Shan-Shan Huang, Giacomo Torelli & Maurizio Guadagnini, University of Sheffield.

News from the Fire Protection Research Foundation (FPRF)

Fire Protection Research Foundation Celebrates 40 Years of Research to Advance Safety

FPRF reflects upon the progress of the past four decades of research with celebrations, a webinar series, and articles and blogs. Read more here.

Suppression, Detection and Signaling Research and Applications conference (SUPDET® 2022) – 13-16 September 2022, Atlanta GA (USA)

SUPDET is an annual symposium hosted by the Fire Protection Research Foundation that brings 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. The conference will be held September 13-16, 2022, in Atlanta, Georgia (USA). Conference program and registration information can be found here.

Notice of New (2022) Fire Protection Research Foundation Reports

- ***Performance criteria for aircraft hangar fire protection systems*** **–** This study reviewed alternative fire protection solutions for aircraft hangar facilities and establishes an evaluation method for assess their performance. Download report here.

- ***Electric Circuit Data Collection: An Analysis of Health Care Facilities*** **–** This report studied electrical demands in hospital patient care areas during COVID-19 surge, finding electrical systems to be sized between 100 and 700% larger than the measured loads. Download report here.
- ***Public Safety Small Unmanned Aerial Systems (sUAS) Compliance Training: Literature Review & Use Case Study*** **-** Report provides a snapshot of the current technology, including use cases, barriers to success, job performance requirements, best practices, and the current regulatory framework for sUAS applications for public safety. Download report here.
- ***Evaluating Data and Voice Signals in Pathway Survivable Cables for Life Safety Systems*** **–** Report assimilated existing literature to determine if temperature impacts the transmission and the functional and operational quality of alarm/data signals and voice messages in a fire rated and non-fire rated environment. Download report here.
- ***Influence of gap sizes around swinging fire doors: Experimental testing*** **–** The report presents the experimental testing results to study the effect that door clearances might have on the performance of a fire door assembly. Download report here.
- ***Environmental Impact of Fires in the Built Environment: Emission Factors*** **-** This report and associated database contains information on emission factors for a range of fire conditions as well as building materials. The database is available so that it can be built upon with future research on this topic. Download report here.
- ***Firefighting Foams: Fire Service Roadmap*** **–** This report aims to assist the fire service while transitioning to fluorine free foam technology by summarizing currently available information on firefighting foam operations and handling, including all types of applications of foams that provide possible exposure pathways to firefighters and others. Download report and associated workshop proceedings here.
- ***Light gas (Hydrogen) dispersion screening model tool*** **–** This project developed a simple open domain hydrogen dispersion screening model tool along with a basic user documentation that will predict the unintended releases of hydrogen gas. Such a tool will be used to predict the concentration of gas releases in various hazard scenarios. Download report and tool here.
- ***Fires in animal housing facilities*** **–** This report presents the information on cause of fires, fire loss summaries, and fire protection features of animal housing facilities through a comprehensive review of published literature, U.S. new media report (2020-21) and information collected from animal housing facilities through a project questionnaire survey. Download report here.

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

Fire Protection Research Foundation issues new report on environmental impact of fires
FPRF has issued the report, The Environmental Impact of Fires in the Built Environment: Emission Factors. This report and associated database contains information on emission factors for a range of fire conditions as well as building materials. The database is available so that it can be built upon with future research on this topic. To download the report, please visit: https://www.nfpa.org/News-and-Research/Data-research-and-tools/US-Fire-Problem/The-environmental-impact-of-fire.

Fire Protection Research Foundation Celebrates 40 Years of Research to Advance Safety
FPRF reflects upon the progress of the past four decades of research with celebrations, a webinar series, and articles and blogs. More information can be found at: https://www.nfpa.org/fprf40.

Signed: Amanda Kimball and Sreeni Ranganathan, PhD, Fire Protection Research Foundation

RISE Research Institutes of Sweden

RISE will host FIVE (Fires in Vehicles) and ISTSS (International Symposium on tunnel safety and Security) conferences after each other during the same week 24 - 28 April 2023 in Stavanger, Norway. This allows you a great possibility to attend both conferences at a reduced fee! For links to the two conferences, see the Upcoming Events section below.

International Water Mist Association (IWMA)

The International Water Mist Association (IWMA) and the Fire Research and Innovation Centre (FRIC) in Norway planned to start a collaborative research project aiming to gather information on the performance of sprinklers in order to quantify the consistency of their extinguishing performance. IWMA general manager Bettina McDowell explains: “For this purpose, IWMA will collect data which will then be made available to FRIC. FRIC will then organize, process, and analyse the data and publish an open report.” As far as the schedule is concerned, IWMA and FRIC are looking at a one-year project. The collection of the data commenced during the second quarter of 2022. The report will be published during the first or second quarter of 2023.

For information on the project, see https://iwma.net/project/the-fric-project.

PUBLICATION NEWS FROM MEMBERS

News from ISO TC92/WG14 (Large Outdoor Fires and the Built Environment Working Group)

ISO TC92/WG14 has developed ISO TR24188: Large Outdoor Fires and the Built Environment – Global Overview of Different Approaches to Standardization. The document provides a review of global testing methodologies related to the vulnerabilities of buildings from large outdoor fire exposures.

For preview (no-cost) access to some of the content, please see the ISO website:

ISO/TR 24188:2022(en), Large outdoor fires and the built environment — Global overview of different approaches to standardization

The full document may be accessed here (for a fee):

ISO - ISO/TR 24188:2022 - Large outdoor fires and the built environment — Global overview of different approaches to standardization

For the additional questions about current activities in progress at ISO TC92/WG14, please contact the convener of ISO TC92/WG14, Dr. Samuel L. Manzello, at manzello@reaxengineering.com

Signed Samuel L. Manzello, Reax Engineering

NEW POSITIONS

Dr. Samuel L. Manzello is pleased to join the team at Reax Engineering and is based in Tokyo, Japan. Over the span of his two decades career at the National Institute of Standards and Technology, part of the US Department of Commerce, Samuel's expertise may be best described as bringing fundamental combustion knowledge to practical problems. His research in droplet-surface interaction was featured in the journal Nature and his firebrand research was featured in the journal Science. Samuel has received many awards including a NASA Graduate Student Researcher Fellowship (NASA-GSRP), a National Research Council Post-Doctoral Fellowship (NRC), a fellowship from the Japan Society for the Promotion of Science (JSPS), a NIST Individual Bronze Medal, NIST Engineering Laboratory (EL) Awards for best paper and Outstanding Communicator, the 2015 Harry C. Biggelstone Award from NFPA, the 2016 Tibor Z. Harmathy Award from Springer Nature, the 2016 and 2020 Best Journal Paper Award from the Combustion Society of Japan, and the 2017 Samuel Wesley Stratton Award as an individual from NIST, NIST's highest award for fundamental research. Samuel's research is published in more than 90 journal articles, across some 25 different journals focused on heat and mass transfer, combustion, and fluid dynamics. As a world renown expert in wildland-urban interface (WUI) fires, he was an invited speaker and panelist at The Chemistry of Urban Wildfires - A Virtual Information-Gathering Workshop hosted by National Academies of Science, Engineering, and Medicine in 2021, the 11th International Association for Fire Safety Science Symposium in 2014, and the 9th Asia-Oceania Symposium on Fire Science and Technology Symposium in 2012.

He has served as Guest Editor for *Fire Technology*, *Fire Safety Journal*, *Combustion Science and Technology*, *Frontiers in Mechanical Engineering*, and is currently Associate Editor of *Fire Technology*. Additional service includes colloquium co-chair for Fire Research at the 37th, 38th, and 39th International Combustion Symposium, convener of ISO TC92/WG14 (Large Outdoor Fires and the Built Environment), and co-leader of the IAFSS permanent working group LOF&BE (Large Outdoor Fires and the Built Environment). At the invitation of Springer Nature, he served as Editor in Chief on the first comprehensive encyclopedia on wildland fires and wildland-urban interface (WUI) fires. He obtained his PhD in Mechanical Engineering from the University of Illinois-Chicago in microgravity droplet combustion.

Please have a look at my journal publications and feel free to reach out for collaborative opportunities! https://orcid.org/0000-0002-3171-7333

UPCOMING CONFERENCES

Suppression, Detection and Signalling Research and Applications conference (SUPDET® 2022) – 13-16 September 2022, Atlanta GA (USA)

SUPDET is an annual symposium hosted by the Fire Protection Research Foundation that brings together leading experts in the field of fire protection for the purpose of sharing recent research and development on techniques used for fire suppression, detection, and signaling. These events are generally attended by a variety of fire protection professionals, such as engineers, researchers, insurers, designers, manufacturers, installers, and AHJs. The conference will be held September 13-16, 2022 in Atlanta, Georgia (USA).

Links to the conference program and registration information can be found at:
https://www.nfpa.org/News-and-Research/Resources/Fire-Protection-Research-Foundation/SUPDET

2nd Asia-Pacific Combustion Institute Summer School — Fundamental Combustion Problems in Outdoor Fires (APCISS-2) – 4-9 December, 2022, Valparaíso and Viña del Mar (Chile)

The main goal of the **2nd Asia-Pacific Combustion Institute Summer School — Fundamental Combustion Problems in Outdoor Fires (APCISS-2)** is to introduce the AP combustion and fire safety community to fundamental combustion problems, focusing particularly in the application of combustion and fire science to outdoor fires. Throughout the planning and development of the school special emphasis will be given to outdoor fires, connecting combustion theory with real fire scenarios and applications. APCISS-2 will bring together graduate students, post-doctoral fellows, early-career researchers, academics and practicing engineers working in fire science.

We expect this school will provide an instance for participants to build and reinforce collaboration networks between different academic and non-academic institutions of international renown along the Asia-Pacific Rim. Following its predecessor, APCISS-2 will have a theoretical track and a practical track.

The theoretical track will consist of an introduction to fundamental combustion aspects, focusing particularly in theoretical aspects relevant to fire science. The practical track will have a more specific focus on applications of fire science to outdoor fires, considering a broad range of lectures related to fire safety topics. Some of the participating scientists and lecturers involved in APCISS-2 include Prof. Katharina Kohse-Höinghaus, Prof. Carlos Fernandez-Pello, Prof. Elsa Pastor, Prof. Arnaud Trouvé, Dr. Franco Tamanini, Dr. Fengshan Liu, and Prof. Albert Simeoni.

APCISS-2 is scheduled for December 4 - 9, 2022 in the coastal cities of Valparaíso and Viña del Mar, Chile. Workshops will be held at Universidad Técnica Federico Santa María.

For more information, please see the preliminary program at https://apciss.cl/2022/.

CALLS FOR PAPERS/ABSTRACTS/POSTERS

International Conference on Fires in Vehicles (FIVE 2023)

The International Conference on Fires in Vehicles (FIVE 2023) will be held April 24 - 25, 2023 in Stavanger, Norway. The Call for Posters will be open until December 15, 2022. (The Call for Papers closed at the end of August.)

One author per accepted full paper or poster can register at a reduced fee as 'Speaker' delegate. A discount applies for persons attending both ISTSS 2023 and FIVE.

Conference topics include but are not limited to:

- Regulations and standards
- Fire statistics
- Insurance issues
- Fire development in vehicles
- Fire detection in vehicles
- Fire suppression in vehicles
- Fire mitigation strategies in vehicles
- Case studies
- First responder strategies
- Fire risks in vehicles with alternative fuels or alternative drives
- New materials in vehicles

For information on the conference and instructions on how to submit an abstract, see https://www.ri.se/en/five/call-for-papers.

10th International Symposium on Tunnel Safety and Security (ISTSS 2023)

The 10th International Symposium on Tunnel Safety and Security will take place April 26 - 28, 2023 in Stavanger, Norway. The Call for Posters will be open until December 15, 2022. (The Call for Papers closed at the end of August.) One author per accepted full paper or poster can register at a reduced fee as 'Speaker' delegate.

The extended abstract should deal with issues related to tunnel safety and security and belong to either research work or engineering applications or others (e.g., case studies, safety design concepts).

For information on the conference and instructions on how to submit an abstract, see https://www.ri.se/en/istss/call-for-papers.

UPCOMING EVENTS – 2022/2023

2022

Sep 5-7	8th International Conference on Structural Engineering, Mechanics and Computation (SEMC 2022) – Cape Town (South Africa) - http://www.semc.uct.ac.za/
Oct 12-14	SFPE Annual Conference (SFPE22) – Detroit, Michigan (USA) - https://www.sfpe.org/annual22/home
Nov 9-10	The 21st International Water Mist Conference – Madrid (Spain) - https://iwma.net/events/detail/iwmc-return-to-spain
Nov 11-18	IX International Conference on Forest Fire Research & 17th International Wildland Fire Safety Summit – Coimbra (Portugal) - https://www.adai.pt/newevent/event/home/index.php?target=home&defLang=2&event=4
Nov 30 – Dec 2	12th International Conference on Structures in Fire (SiF 2022) – Hong Kong (Hong Kong) - https://www.sif2022.org/
Dec 4-9	2nd Asia-Pacific Combustion Institute Summer School - Fundamental Combustion Problems in Outdoor Fires (APCISS-2) – Valparaíso - Viña del Mar (Chile) - https://apciss.cl/2022/

2023

Mar 29 - 30	SFPE European Conference on Fire Safety Engineering – Berlin (Germany) - https://www.sfpe.org/europe23/home
Apr 24-25	International Conference on Fires in Vehicles (FIVE 2023) – Stavanger (Norway) - https://www.ri.se/en/five/about-five
Apr 26-28	10th International Symposium on Tunnel Safety and Security (ISTSS 2023) – Stavanger (Norway) - https://www.ri.se/en/istss/about-istss/
Oct 22-27	14th International Symposium on Fire Safety Science – Tsukuba (Japan) - https://iafss2023.com/

JOB POSTINGS

The **Imperial College London (UK)** is inviting applications for a Research Associate to study experimentally smouldering Artic fires and join Imperial Hazelab which is the multidisciplinary research group led by Prof. Guillermo Rein based the Department of Mechanical Engineering. The closing date for applications is 31 August 2022. For details, see https://www.imperial.ac.uk/jobs/description/ENG02239/research-assistant-associate-artic-fires-emphasis-smoldering-combustion-and-fire-spread.

The **Danish Institute of Fire and Security Technology (DBI)** is looking for a highly qualified candidate for an Industrial Postdoc position in a project on experimental and modelling investigations of hybrid steel-timber construction details in fire. The project is a collaboration between DBI and the University of Sheffield, Dept. of Civil & Structural Eng., UK. The closing date for applications is 31 August 2022. Read more here.

The **NIST Engineering Laboratory (USA)** has opened a search to fill the Division Chief position for the Fire Research Division. The position is described here, and information about the position is also available online at https://www.nist.gov/el/about-el/careers. As noted in the announcement, interested candidates should send resumes to ELHQjobs@nist.gov by September 2, 2022. Please note that only U.S. citizens can be considered for this position.

The **Department of Mechanical and Mechatronics Engineering at the University of Waterloo (Canada)** invites applications from exceptional scholars and researchers for two tenure track positions at the *Assistant Professor* level with a focus on *Fire Research* with an anticipated start date in May 2023. In the case of an exceptional candidate, an appointment at the rank of Associate or Full Professor will be considered. Applications will be accepted until September 30, 2022. The successful applicants are expected to have an engineering license for practice in Canada, or to apply for a Canadian engineering license within the first year of joining the university, and must be registered as a Professional Engineer within 5 years from the start of their appointment. Click here to learn more.

You can always find current job postings on the IAFSS website – www.iafss.org.

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 Editor (Rita Fahy, rfahy2@yahoo.com).

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

For the next issue (No. 49), the deadline for submissions is January 31, 2023.

http://www.iafss.org

2021-2023
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