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Fire Safety Science News

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Rita Fahy, Editor

Associate Editors: Michael Gollner (USA), Nils Johansson (Sweden), Naian Liu (China), Ai Sekizawa (Japan), and Michael Spearpoint (UK).



The burning of two informal dwellings, UL Chicago



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

TABLE OF CONTENTS

- Page 3 Letter from the Chair
- 4 2021-2023 IAFSS Management Committee Elections
- 4 News on the 13th IAFSS Symposium
- 5 Updates from IAFSS Working Groups
- 7 2020-2023 IAFSS Management Committee Nominations Update
- 8 An Update from *Fire Safety Journal* the Official Journal of IAFSS
- 8 News from Members
- 32 Upcoming Conferences
- 34 Calls for Papers/Abstracts
- 35 Upcoming Events
- 34 Job Postings
- 36 Call for Contributions

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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 <u>online</u>.

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, contact the team of webmasters at webmaster@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 – 2020 (£25) Lifetime Membership (£300) Student Membership – 2019 (£5*)

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

* 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



Keep safe!

When I was writing my previous introduction for this newsletter half a year ago, it was meant to be the last one as acting chair. However, the COVID19 pandemic changed a lot in a few weeks' time. Before continuing, however, I really hope that all of you have been able **to stay healthy and well** and that you also will stay healthy. Follow the instructions from your local health authorities. Also, take care and keep up the good mood as we experience a very special situation which requires a lot of courage to keep up this good mood. In these difficult times, we should not forget that we have many good friends in our fire community and that we can keep contact by many ways. Zoom, Teams, Meet, etc. can be used for many things and certainly also for keeping contact and just ask "How are you? Everything well, can we have a short chat?". We need to realise that the crisis will not yet be been over so quickly. My thoughts are with you all!

As I said, the COVID19 pandemic resulted in a lot of consequences. From running at full speed with the preparation of the conference we needed **to cancel the conference in 2020 and delay it** for a year. This affected a lot of people both from the organisation but also those who had started to plan their trip to Canada. This was extremely sad and frustrating and had a lot of consequences for us all. But I feel that we made the right decision at the right time too and did not gamble. I would like hereby to thank all of you for your understanding. Special thanks also for everybody in the local organising committee and in the symposium committee. They did a fantastic job to accommodate the new situation. When we delayed the conference by a year, we thought everything would go back to normal and that we could meet all our colleagues and friends in April 2021. But we all now know that this is not the case. The COVID19 pandemic is still not over and in many countries the second wave is now ongoing. Many countries have extended therefore their measures already far into 2021.

As such, we were again obliged to take again a decision which we rather not have done but both the symposium committee and the management committee felt it was necessary to move from an on-sight hybrid event to **a fully virtual event**. This will create a lot of extra work and effort from all involved but also from the association. However, all involved felt that we need to make the best of the situation and are very positive that this event will be a new landmark for our association. The future will never be the same to my opinion and we have to adapt ourselves. It might be so that we need a lot more help. I hope we can account on you in one way or another.

At the same time, we needed also to take decisions for the management committee and decided earlier this year to extend the period for the officers by one year. This is the reason that I write even this introduction, my term and all the officers' term were extended by a year. Nevertheless, with the fact that we have now a virtual symposium, we need to organise a member meeting and will discuss this situation soon and come back to you. As preparation for this general member meeting, we launched **the vote for the new management committee**. As a member you should have received an email with a link to the vote. Please vote to influence the way our association is led in the future!

Last but not least I would like to inform you again that we are standing for the challenge of bringing our organisation in a new structure e.g. with a new secretariat but now also with the new conditions created by the COVID19 pandemic. More information will follow on this but this becomes a much bigger challenge than we expected in the beginning. The major hurdle will be an adaption of our bylaws and the way we work. They need to be able to change more easily and more often instead of every three years. I hope we can get **your support for changing to a modern IAFSS**.

I will close by wishing you all the best and courage and hope you will attend our virtual event and follow the information on our different media. You are all welcome! I also would like to **thank you for the trust** you had in me during all my years as chair. It was a pleasure for me to serve the association even now in this extra year! Our association is based on voluntary actions and we can be proud of IAFSS that we have this type of association.

Signed: Patrick Van Hees, Chair IAFSS, Lund University, Sweden

2021-2023 IAFSS MANAGEMENT COMMITTEE ELECTIONS

The election period for the 2021-2023 IAFSS Management Committee will be open from **1 October – 30 November 2020**. Each member (paid as of 31 March 2020) will be eligible to vote. The voting will be conducted using SurveyMonkey, not IAFSS, so please check your 'junk' fold if you do not see the email which will come from <u>webmaster@iafss.org</u> via SurveyMonkey (<u>member@surveymonkeyuser.com</u>). We have 27 candidates for 24 open positions, so please review the candidate statements and vote for up to 24 persons. If you have any questions, please feel free to contact the IAFSS Secretariat at <u>office@iafss.org</u>.

INTERNATIONAL SYMPOSIUM ON FIRE SAFETY SCIENCE

13TH INTERNATIONAL SYMPOSIUM ON FIRE SAFETY SCIENCE

13th IAFSS Symposium Moving On-Line!

As you are aware, we took the difficult decision back in March to postpone the 13th IAFSS Symposium until April 2021. While the new dates of the 13th Symposium are still some six months away, the situation in Canada, and in much of the world, is such that a change in the approach to the Symposium is warranted. Based on ongoing COVID-19 related travel restrictions, quarantine requirements and related issues, it will not be possible to hold an inperson symposium at the University of Waterloo in April of 2021. As such, the 13th Symposium will be moving to an on-line event. The Symposium Committee is currently evaluating options with the aim to make this a successful event for all. Please be aware that the symposium structure and the registration fees will be changed, but that details have not yet been finalized. We thank you in advance for your patience and ask that you please watch for updates over the coming weeks.

13th Symposium Committees

IAFSS Chair Prof P van Hees, Lund University, Sweden

Local Host Co-Chairs

Prof E Weckman, Chair, U of Waterloo, Canada Prof C Devaud, U of Waterloo, Canada

Symposium Co-Chairs

Prof M McNamee, Lund University, Sweden Prof A Trouvé, U of Maryland, USA

Program Scientific Committee Co-Chairs Prof N Liu, U of Science and Technology of China Dr S McAllister, USDA Forest Service, USA

Program Communication Committee Co-Chairs

Dr K Boyce, Ulster University, UK Dr Y Wang, FM Global, USA

Symposium Poster and Image Co-Chairs Dr T Hakkarainen, VTT Technical Research Center, Finland Dr J Floyd, Jensen Hughes, USA

English Language Mentoring Chair Dr C Wade, Building Research Assoc, New Zealand

Awards Committee

Prof C Fleischmann, U of Canterbury, New Zealand Prof M Gollner, U of California, Berkeley, USA Prof J Wen, U of Warwick, UK

Symposium Proceedings Co-Chairs

Prof L Bisby, U of Edinburgh, UK Prof B Merci, Ghent University, Belgium

Symposium Workshop Co-Chairs

Dr A Hamins, National Institute of Standards and Technology, USA Prof G Rein, Imperial College, UK

Diversity Group Co-Chairs

Dr A Steen-Hansen, RISE Fire Research, Norway Dr S Suzuki, National Research Institute of Fire and Disaster, Japan Dr I Vermesi, Bureau Veritas, UK Prof E Weckman, U of Waterloo, Canada

IAFSS Working Groups

MaCFP , Prof A. Trouvé, U of Maryland, USA LOF&BE, Dr S. Manzello, NIST, USA

UPDATES FROM IAFSS WORKING GROUPS

Measurement and Computation of Fire Phenomena (MaCFP) Working Group

DELAYED – Second MaCFP Workshop (April 2021)

UPDATE – Because of concerns and travel restrictions associated with the Coronavirus (COVID-19) pandemic, the second MaCFP workshop has been postponed to April 24-25, 2021, and will take place as a pre-event to the 13th IAFSS Symposium (http://iafss2020.ca). The workshop will feature activities organized by both the Gas Phase Phenomena and Condensed Phase Phenomena subgroups. The organizing committee of the Gas Phase Phenomena Subgroup for the second MaCFP workshop is composed of:

Alexander Brown (Sandia National Laboratories, USA)	China, China)
Andres Fuentes (Universidad Técnica Federico Santa	Andre Marshall (University of Maryland, USA)
María, Chile)	Randy McDermott (National Institute of Standards
Michael Gollner (University of California, Berkeley,	and Technology, USA)
USA)	Bart Merci (Co-Chair) (Ghent University, Belgium)
Anthony Hamins (National Institute of Standards and	Arnaud Trouvé (Co-Chair) (University of Maryland,
Technology, USA)	USA)
John Hewson (Sandia National Laboratories, USA)	Yi Wang (FM Global, USA)
Naian Liu (University of Science and Technology of	Beth Weckman (University of Waterloo, Canada)
The organizing committee of the Condensed Phase Phenomena subgroup is composed of	

The organizing committee of the Condensed Phase Phenomena subgroup is composed of:

Benjamin Batiot (University of Poitiers, France) Morgan Bruns (Virginia Military Institute, USA) Simo Hostikka (Aalto University, Finland) Isaac Leventon (National Institute of Standards and Technology, USA)

Yuji Nakamura (Toyohashi University of Technology, Japan) Pedro Reszka (Universidad Adolfo Ibáñez, Chile) Thomas Rogaume (University of Poitiers, France) Stanislav Stoliarov (University of Maryland, USA)

The target audience is the experimental and computational fire research community. The workshops will be open and participation will be encouraged by proper advertisement, for instance by publishing (beginning of 2019) a Letter to the Editor in reputable outlets like the IAFSS Newsletter, *Fire Safety Journal* and *Fire Technology*.

Call for Participation

The MaCFP Working Group is inviting the members of the entire fire research community to participate in the second workshop, see the calls published published in Fire Safety Journal (Click Here) and Fire Technology (Click <u>Here</u>). While the workshop topic is of direct interest to experimental and computational fire researchers, the workshop should also be of broad interest to the community at large. Registration to the April 2021 workshop will be fully open.

Members of the fire research community can participate in one or both of the following ways:

- From now until April 2021: participate in the planning of the workshop by interacting with the organizing committee, making suggestions and generating/contributing simulation results to be discussed at the workshop;
- April 24-25, 2021: attend and participate in the discussions at the workshop. •

Important issues like membership to the organizing committee of the MaCFP Working Group and the selection of new target experiments for the third MaCFP workshop will also be discussed at the second workshop. Suggestions on these topics are also welcome anytime.

Format of the Second MaCFP Workshop (April 2021)

The Gas Phase Phenomena subgroup is planning to hold discussions corresponding to the following target experiments:

- Category 1 (Turbulent buoyant plumes): the helium plume experiment studied at Sandia National Laboratories;
- Category 3 (Turbulent pool fires with liquid fuel): the methanol pool fire experiments previously studied at the University of Waterloo and also currently studied at the National Institute of Standards and Technology (NIST):
- Category 5 (Flame extinction): the controlled co-flow round diffusion flame experiment currently studied at FM Global.

The MaCFP repository hosted on GitHub (https://github.com/MaCFP) has been updated and now contains new data for:

- Category 3 (Turbulent pool fires with liquid fuel): new data in /Liquid Pool Fires/NIST Pool Fires/ corresponding to a 30-cm-diameter methanol pool fire (a configuration that is similar to that previously studied by Beth Weckman at the University of Waterloo and a database that includes heat flux measurements), a 100-cm-diameter methanol pool fire, and also a 30-cm-diameter acetone pool fire, a 30-cm-diameter ethanol pool fire, and a 37-cm diameter methane fire, all studied at NIST. Groups interested in simulating Category 3 cases are invited to focus on the 30-cm and 100-cm methanol cases first and also to focus first on simulations with a prescribed liquid evaporation rate. Questions on the NIST database should be directed to Anthony Hamins (ahamins@gmail.com).

- Category 5 (Flame extinction): new data in /Extinction/FM_Burner/ corresponding to a 13.7-cm-diameter controlled co-flow (a mixture of air and nitrogen) round diffusion flame experiment currently studied at FM Global. Groups interested in simulating Category 5 cases are invited to consider all 3 reported cases (corresponding to a coflow oxygen mole fraction equal to 20.9%, 16.8% and 15.2%). Questions on the FM Global database should be directed to Yi Wang (<u>yi.wang@fmglobal.com</u>).

Also an important new feature in the second MaCFP workshop is the following series of requirements in the submission of computational results:

- We ask that for each simulated target experiment, the submission includes a grid convergence study in which the effect of changing spatial resolution in the flow and combustion solver is quantified;
- Similarly, we ask that for each simulated target experiment, the submission includes an angular convergence study in which the effect of changing angular resolution in the radiation solver is quantified;
- We ask that modeling groups explain their modeling choices for the treatment of the turbulent flow, combustion and radiation transport; we encourage modeling groups to define a baseline model and apply that model to all simulated cases considered by the group; we ask that variations in modeling choices be justified;
- In the case of the methanol pool fire experiments, we ask that the modeling groups first perform baseline simulations in which the liquid fuel evaporation rate is prescribed as equal to the measured values; more advanced simulations using an evaporation model are welcome but should be presented as a variation from the baseline simulations.

We feel that these requirements will improve the quality and depth of the comparisons between results obtained by different modeling groups.

Furthermore, we encourage modeling groups to consider performing fine-grained simulations under the highresolution conditions that are often the preferred choice made by CFD researchers, and also consider performing coarse-grained simulations under the moderate-to-marginal resolution conditions (sometimes called VLES) that are more representative of the choices made by CFD practitioners.

All results will be uploaded on the MaCFP GitHub repository and detailed comparisons will be made. An example of the spirit in which these comparisons will be made can be found in the <u>proceedings of the first MaCFP workshop</u>.

The exact format of the second MaCFP workshop is yet to be determined but is likely to be a mix of invited oral presentations and group/panel discussions, guided by plenary introductions and concluded by reports of main outcomes. Proceedings will be produced after the workshop and submitted for publication in Fire Safety Journal. The proceedings are intended to review progress, summarize accomplishments of the workshop and provide guidance with clear objectives for the next workshop.

Contact Information

For more information and/or to take a first step to get involved, please contact one of the organizing committee Co-Chairs: Bart Merci (<u>bart.merci@ugent.be</u>) and Arnaud Trouvé (<u>atrouve@umd.edu</u>)

Additional Information

- Initial MaCFP white paper (August 2014): click here
- Call for Participation in the second MaCFP workshop, published in *Fire Safety Journal* (<u>Click Here</u>) and *Fire Technology* (<u>Click Here</u>).
- MaCFP repository on GitHub: <u>https://github.com/MaCFP</u>
- Information on first MaCFP workshop: <u>Program; Presentations; Proceedings</u>

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

Two virtual workshops of the permanent working group, sponsored by the International Association for Fire Safety Science (IAFSS), entitled *Large Outdoor Fires and the Built Environment* (LOF&BE), were held this past August (2020). The first session was held on August 4, 2020 with times selected to suit those in Africa, Europe, and Asia/Oceania. The second session was held on August 6, 2020 with times to suit those in North and South America.

The Ignition Resistant Communities (IRC) subgroup is focused on developing the scientific basis for new standard testing methodologies indicative of large outdoor fire exposures, including the development of necessary testing

methodologies to characterize wildland fuel treatments adjacent to communities. IRC subgroup progress was presented by Alex Filkov (U Melbourne) and Daniel Gorham (IBHS).

The Emergency Management and Evacuation (EME) subgroup is focused on developing the scientific basis for effective emergency management strategies for communities exposed to large outdoor fires. EME subgroup progress was presented by Maria Theodori (Reax Engineering) and Sayaka Suzuki (NRIFD).

The Large Outdoor Fire Fighting (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. LOFF subgroup progress was presented by Xinyan Huang (Hong Kong Poly U) and Brian Lattimer (Va Tech).

An extended session was held for open discussion so that participants could provide feedback on current progress and offer suggestions for the upcoming LOF&BE workshop being organized as part of 13th IAFSS, now being held in April (2021).

A total of 60 participants joined from Australia, Brazil, Canada, China, India, Israel, Italy, Japan, Malaysia, Nigeria, Norway, Russia, South Africa, Zambia, UK, USA. All the presentations and discussions will be documented in upcoming report. Please stay tuned!

LOF&BE is always welcoming new members. Please sign up here: https://forms.gle/GHP81WSkrR3zHNC1A

LOF&BE provides updates on our activities on a regular basis; please check the following: https://iafss.org/committees/large-outdoor-fires-the-built-environment-working-group/

IAFSS Large Outdoor Fires and the Built Environment (LOF&BE) Webinar Series

Welcome to LOF&BE Webinar Series and Snapshot of Recent Research Activities of Interest to Urban and WUI fires - Nov. 10, 2020 8 am Tokyo (Nov. 9, 6 pm US East Coast: 11 pm London) Register here: <u>https://forms.gle/bDcHsbCV1RZ1Srz28</u>

Large outdoor fires have the potential to negatively impact the built environment. Wildland fires that spread into communities, known as wildland-urban interface (WUI) fires, have become a global problem. Significant WUI fires occurred in Australia and the USA in 2020, South Korea in 2019, and again in USA in 2018. Once a WUI fire reaches a community, a large urban fire may develop. A recent addition to the large outdoor fire problem is the rise of informal settlement fires, which are being seen in many countries.

To begin to address these needs, the International Association for Fire Safety Science (IAFSS) initiated the permanent working group known as Large Outdoor Fires and the Built Environment (LOF&BE). In the first part of the webinar, the genesis of LOF&BE will be discussed, a brief overview of current working groups and their activities, how you may become active! (all are welcome to become members – we need your help!), as well as an introduction to our new exciting webinar series will be provided. In the second part of the webinar, a snapshot of recent research focused on firebrand generation and ignition processes in large outdoor fires will be discussed.

Of particular focus will be simple laboratory experiments on firebrand generation from building materials, coupled influences of firebrand showers and radiant heat flux on fuel bed ignition, and firebrand deposition and accumulation studies using the Dragon. The webinar will close with a discussion on progress in ISO TC92/WG14 to develop harmonized test standards to begin to address this growing global problem.

Signed: LOF&BE Co-leaders - Sayaka Suzuki (NRIFD), Sara McAllister (USDA Forest Service) and Samuel Manzello (NIST)

2020-2023 IAFSS MANAGEMENT COMMITTEE NOMINATIONS - UPDATE

As you are aware, in early March, 2020, the Executive Committee, in concert with the Symposium Committee, took the decision to postpone the 13th IAFSS Symposium until April 2021 due to the COVID-19 pandemic. We did not take this decision lightly, but believed it was in the best interest of the Association. We took this decision, without consultation of the membership at large, as the Rules of the Association allow for the EC and Committee to "deal with all matters concerning the management of the Association and not expressly provided for by the rules". We trust you will agree that the need to make a rather quick decision to shift the dates of the 13th Symposium due to the COVID-19 pandemic meets these criteria.

As you might expect, this decision has other impacts, including shifting the dates of the General Meeting until April 2021 as well. This in turn has implications for the current Committee, the election of a new Committee, and the election process itself.

- First, the decision has been made to extend the term of the current Committee until the next General Meeting, scheduled to be held in April 2021. This was determined to be the most practical way to continue operations, including Symposium planning, and transition of activities to the next Committee, with the least disruption. This decision complies with the Rules of the Association, which allows for Committee terms to be between 2 years and 4 years in length.
- Second, the decision has been made to carry on with elections of the new Committee this calendar year, but to delay the voting until after August. The nominations period has closed, and candidate information for the ballot is being gathered. Anyone who is recorded as being current with dues payment as of 31 March 2020 will be eligible to vote.
- Third, the decision was made to carry forward with plans to hold the 14th Symposium in 2023, since planning is well underway.

If you have any questions, please feel to contact Brian Meacham.

Signed: Brian J. Meacham, IAFSS Honorary Secretary

AN UPDATE FROM FIRE SAFETY JOURNAL: THE OFFICIAL JOURNAL OF IAFSS

Profs Bart Merci & Luke Bisby

The editorial team of *Fire Safety Journal*, the official journal of the IAFSS, would like to update the IAFSS community on ongoing administrative processes for the Journal.

In recent years, submissions to *Fire Safety Journal*, and reviews undertaken by many colleagues from within the IAFSS community, have been managed through Elsevier's EVISE online management system. A massive recent effort, almost certainly involving yourself, concerns the successful and timely publication process of the 13th IAFSS Symposium proceedings. As such, you are probably now familiar with EVISE.

However, Elsevier have recently acquired Aries Systems, and with it the Editorial Manager (EM) journal management system. Editorial Manager is considered a best-in-class manuscript submission and peer-review platform. Since the completion of the acquisition, Elsevier have been gradually migrating all of their journals to Editorial Manager.

We can now confirm that *Fire Safety Journal* plans to migrate from EVISE to EM in October 2020. Many IAFSS colleagues are likely to already be familiar with EM as authors, reviewers, or editors. Similarly, if IAFSS colleagues have experience of the EES system, the look and feel of EM will be familiar as EES was based on an early version of EM.

We hope that the transition to the new system will be as painless, and with as few technical frustrations, as possible. During the transition we would like to highlight that here is nothing that we value more than our reviewers and authors. Needless to say, you are what determines the quality and success of the journal. Therefore, should you experience any frustrations at all with the new system, please do get in touch to let us know.

We cannot stress enough that we recognise how valuable your time is, and we remain very grateful, in particular, for the time that you and your colleagues volunteer to assist in providing thoughtful and constructive reviews; we would hate to waste it through frustration on journal management systems.

We look forward to a smooth migration of *Fire Safety Journal* from EVISE to EM.

NEWS FROM MEMBERS

News from the Hong Kong Polytechnic University

Surviving the Pandemic

The Covid19 pandemic has altered the landscape of the world considerably with many educational institutions railing from the fallback. Over the last few months, Hong Kong has been fortunate to have largely avoided first and second waves with case number just above 1,000 before July. Masks have been mandatory on campus for a few months now, but the PolyU and Hong Kong communities had been wearing them since the first few cases in January and long before they were required. Naturally, online teaching continues for the rest of 2020.

The PolyU team feels very privileged for the support offered by the university for performing all teaching duties, and for the team members who, despite maintaining strict social distancing and working from home when possible, continued with their studies and research. Online meetings replaced face to face meetings, and personal contact largely replaced by WeChat, WhatsApp, and Zoom. The extent of the third wave in Hong Kong is still unclear, but the PolyU Fire group will adapt, grow, and overcome. Recently, HK PolyU and Macau University of Science and Technology successfully developed "recombinant RDB" vaccine for COVID-19, and 8 million vaccines are reserved for Hongkongers.



Fire research projects cooperated with FASA

PolyU fire group has extensive cooperation research projects with other academics and governmental associations. At the end of May, our fire group had a successful visit to the Fire and Ambulance Services Academy (FASA). FASA has professional and comprehensive firefighting training scenarios. All simulate fire situations are aiming to help firefighters to adapt a real fire site. One mission of our fire researchers is assisting the firefighter in scientifically handling the fire. During the visit, full-scale compartment fire tests were conducted with our preliminary AI fire prediction technology. With the collaboration of FASA, it is more likely to get significant progress on the advanced development of AI fire technology.



Updates in Group Members

The current PolyU Fire Research Group includes 5 professors, 3 postdoctoral fellows, 2 research assistants, and 15 research students. Prof. Asif Usmani is the group lead and the head of the Dept. of Building Services Engineering. More talented researches are welcomed to join this big family. We are now welcoming a Professor of Practice, a Research Assistant Professor, and five new Ph.D. students.

Professor of Practice Ir Dr. Mingchun Luo has been in industry for over 30 years in which he was responsible for the fire safety review of various public house blocks and the development of the fire safety strategy for fire safety design for the Mass Transit Railway of Hong Kong, airport terminals, super high-rise buildings, casinos, and Beijing's Olympic projects amongst other professional achievements. He is currently a Professor of Practice at the Building Services Department and the Project Manager of the SureFIRE project where he works with students and researchers to ensure high quality and efficient achievement of project goals.



Research Assistant Professor Dr. Xiqiang Wu first joined the PolyU team as postdoctoral fellow working on SureFIRE. He was promoted to the post of Research Assistant Professor in August 2020, where he will continue his work on SureFIRE and perform additional teaching and academic duties. Dr. Wu obtained his Ph.D. from the University of Hong Kong, where he had worked on the structural fire performance of concrete bridges. Over the years of his academic career, he established a strong foundation in fire simulation, structural modeling, and AI applications to structural and fire engineering.



SureFire Smart Firefighting Research

Work on SureFIRE continues its progress despite the pandemic. Researchers at PolyU have made progress with setting up Digital Twin by setting up and conducting small-scale tunnel fire tests with real-time sensing and AI-assisted forecasting. Progress has also been made towards the data collection framework, data analysis, and visualization. Recent breakthroughs can be read in the team's recently published Fire Technology <u>article</u> on a new AI-based detection and prediction method for smart detection of fire sources in tunnel fires. More information on progress and open positions are available on the <u>new project website</u>.

Building Safety and Reliability Mini Symposium

The 13th International Conference on Structural Safety & Reliability will take place at Tongji University in Shanghai, China, in June of 2021. Prof. Usmani and Dr. Jiang from the PolyU team will chair a special session there on <u>Building Safety and Reliability in Fire and Development of Smart Fire Safety Engineering</u>. The mini-symposium and the conference will serve as a great platform for exchange of ideas and cross-fertilization of research by experts in different fields. The call for abstracts is finished, and currently, all are under review. Five selected papers will be presented during the symposium, and discussion will ensue over this topic, which is critical for safety of all modern infrastructure.

PolyU organizes the OpenSEES for Fire Workshop at SiF 2020

The PolyU structural fire group will hold a <u>one-day workshop</u> at the University of Queensland on the 3rd of December 2020 to train students, researchers, and engineers on the OpenSEES for Fire framework. OpenSEES for Fire is a free and opensource finite element platform for analysis of structures in fire that was extended by the PolyU team and previously by the UoE team from the original earthquake version developed at UC Berkeley. The workshop will cover a range of topics including getting started for new users, running fire models, coupling FDS with OpenSEES, performing heat transfer analysis, and finally adding your own code. Kindly note that registration is restricted to attendees of the 11th International Conference on Structures in Fire (SiF 2020).

Join our SFPE Hong Kong Chapter Monthly Webinars

All are invited to attend our monthly MS Teams broadcasted webinars. The lockdown around the world has forced many to adapt to new platforms. At PolyU, we utilized this time to produce online webinars that anyone can watch and either gain skills or learn about a niche research topic. Our speakers include people from our own team, as well as distinguished individuals from industry and academia. <u>Follow us on Twitter</u> to hear about our new webinars or through our <u>website</u>. If you would like to join us as a speaker, do <u>get in touch</u>. Four webinars have been held since March 2020:

- 1. A global safety threat faced by 1 billion people: Informal settlement fire Dr. Yu Wang
- 2. A tutorial on UML: Standard ways to describe Software Dr. Qixin Wang
- 3. Tunnel Fire Safety System & Risk Assessment Dr. Mingchun Luo
- 4. Framework for Forensic Investigation of Fire-Induced Collapse Mhd Anwar Orabi

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

News from Lund University

Education

The University is open for students during the autumn semester but teaching takes place partly as distance teaching and partly with activities at campus. As an example, we are holding laboratory sessions and seminars in smaller groups of students, while lectures are online. Even so, we have welcomed as new class of 54 students to our fire protection-engineering program. The first week involved team building activities (in smaller groups than normal), like the very appreciated visit to the training field of the local fire and rescue service, RSYD.

Research

The division is involved in a new 2-year project called "Perceived threats and 'stampedes': a relational model of collective fear responses "funded by the Economic and Social Science Research Council in the UK. The project addresses the question of how people respond collectively to acute states of



Car fire demonstration for first year fire engineering students at Lund University

perceived emergency. This project provides the first systematic evidence on the nature and dynamics of human 'stampedes' in response to perceived hostile threats. Dr Enrico Ronchi is co-PI of the project, that is led by Prof John Drury from University of Sussex and involves world-leader crowd psychologists based in the UK.

During the early autumn a project on European fire statistics was started. The project is led by Efectis and the division of fire safety engineering at Lund University is one of several international partners. The project aims at mapping the existing data and developing a proposal on how the lack of common data can be remedied to provide meaningful data sets to allow legislative decisions on fire safety at Member States and at EU level. The research group from Sweden is primary involved in cost-benefit analyses that will be performed in the project.

In a new project funded by Nordforsk a consortium of researchers from the Nordic countries will look at improving problem-solving throughout the whole emergency management cycle (including prevention, preparedness, response and recovery). This will be done through understanding the underlying problem-solving networks in emergency management and establishing strategies for their development in support of societal change. The project is led by Prof. Margaret McNamee.

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

Positions and personnel

We are very happy to welcome Steve Gwynne and Petra Anderson as new adjunct Professors at the division. Prof. Gwynne will work with evacuation and pedestrian dynamics at 20% at the division aside of his ordinary work as Research Lead at Movement Strategies (UK), and Prof. Andersson will work with fire science and fire statistics at the division. The professorship of Prof. Andersson is financed through the Lise Meitner Professorship at the faculty of engineering, Lund University.

Announcements

Stephen Kerber successfully defended his PhD thesis "Utilizing Research to Enhance Fire Service Knowledge" on September 15. The faculty opponent was Professor Charley Fleischmann, New Zealand.

On September 9 Magnus Arvidson defended his licentiate thesis: "Water mist fire protection systems - the development of testing procedures for marine and heritage applications" the opponent was Dr. Jukka Varri, VTT Finland, and the examiner was Dr. Bjarne Hustedt.

The theses and more information about the Division, are available on <u>www.brand.lth.se.</u> Our website is continuously updated with news.

Signed: Nils Johansson, Lund University

News from Linnaeus University

Expert course on Fire safety in timber buildings

An expert course on Fire safety in timber buildings has been organized at Linnaeus University in Växjö Sweden since 2014 and the interest is increasing. The fourth course was held in the spring 2020 and the fifth one will be organized during the autumn 2020. It consists of three two-day meetings and own studies with tasks to be solved in between. During the present pandemics parts of the meetings have been web based.

About 20-25 persons, mainly professionals from industry, have participated each time. The topics cover all aspects that are needed to design fire safe timber buildings, i.e. from basic knowledge on fire physics and principles to design tools and detailing. Structural fire design according to Eurocode 5 Structural fire design including the present revision is an essential part.

Main teachers are Dr. Birgit Östman LNU and Prof. Alar Just RISE.

Signed: Birgit Östman <u>Birgit.Ostman@lnu.se.</u> Linnaeus University, Växjö, Sweden

News from Aalto University

People and projects

The Fire Safety Engineering team has currently 10 members: *Simo Hostikka* continues as the team leader as a tenured associate professor. Staff scientist *Hadi Bordbar* coordinates the projects on thermal radiation and cosupervises two of the new doctoral candidates. His research on the spectrally resolved radiation calculations is contributing to the new generation of fire radiation analyses. Post-doc *Michalina Makowska* has asphalt as her main research field, but she contributes to the experimental fire research with her chemistry skills. Doctoral candidate *Deepak Paudel* is targeting to defend his thesis in the fall 2020. Together with Simo, he received the <u>2020 Harmathy award</u> for the best student-led paper in Fire Technology -journal in 2019. *Rahul Janardhan Kallada, Aleksi Rinta-Paavola* and *Tito Adibaskoro* continue their thesis projects on travelling fire simulations, wood pyrolysis, and Material Point Method -simulation of wood cracking, respectively. Their research projects were funded by the Academy of Finland.

Four new doctoral candidates have started since our last contribution to the newsletter: *Morteza Gholami Haghighi Fard* models the 3D effects of electrical cables burning using FDS, with the funding from nuclear safety research programme. *Hosein Sadeghi*'s research mainly focuses on the thermal radiation in fuel gases based on WSGG model. *Farid Alinejad* is modeling radiation transfer within the liquid and solid materials. He has already developed a full spectrum correlated-k (FSCK) method for modeling the radiation penetration within the liquid fuels. Hosein's and Farid's projects are funded by the Finnish Fire Protection Fund. Finally, *Christian Riitamaa* started his doctoral project in June 2020, focusing on numerical modelling of concrete behavior in tunnel fires, as part of the Nordic Five-Tech collaboration with DTU.

Ada Malagnino visited us for few months. She was studying the generation of fire and evacuation risk analysis

from BIM. She defended her thesis at the University of Salento, Italy, in August 2020. Congratulations Ada! Visiting doctoral student *Zhi Wang* from USTC has been modelling the PVC cable pyrolysis reactions with FDS during the last year.

Facilities

We received our custom-made cone calorimeter in fall 2019. The cone has a relatively large vitiated atmosphere chamber around the cone heater and the sample holder, with accessibility from three directions for additional measurements. The commissioning process was successfully led by Aleksi. We expect to utilize the new facility in many of the coming projects and explore the new ways of analyzing materials fire behavior.





Students and teachers present at the course in spring 2020.



COVID-19

During the COVID-19 lockdown, Simo and Hadi participated in a Finnish, ad hoc consortium that was built to support the COVID-19 decision making by the Finnish health authorities. The consortium collected background information and performed CFD analyses to investigate the importance of the airborne spread route of COVID-19. Hadi reviewed literature about respiratory droplet and aerosol properties, and Simo made simulations of different ventilation scenarios in a supermarket environment using FDS. The results highlighted the importance of ventilation, and the complexity of the social distancing in anisotropic air flow fields. The work was published in <u>Safety Science, vol 120</u>, and the input files are available from <u>GitHub</u>.



Signed: Prof. Simo Hostikka, Aalto University

News from the University of Edinburgh

Education:

Since the previous update from the University of Edinburgh, a number of PhD students have graduated. Some have continued working with the team, while others have joined external research teams or industry.

- Martina Manes recently defended her thesis entitled "Resilience evaluation of structures when exposed to fire based on UK and USA fire statistics", where she investigated statistics from more than half a million fires across the United Kingdom and the United States. The outcomes of her research are included in the updated British Standard PD 7974-7:2019, and Martina will continue as a postdoctoral researcher within the group.
- As mentioned by the University of Queensland in IAFSS Fire Safety Science News #44, Felix Wiesner has joined their team as a lecturer in timber engineering after he finished his PhD studies at the University of Edinburgh. His thesis was entitled "Structural behaviour of cross-laminated timber elements in fires".
- Ieuan Rickard defended his thesis entitled "Explosive spalling of concrete in fire: Novel experiments under controlled thermal and mechanical conditions" and have joined OFR Consultants.
- Finally, two former PhD students have joined Foster + Partners as, respectively, Head of Fire Safety and as a Fire Engineer. Ben Ralph graduated with his thesis "Coupled hybrid modelling for fire engineering" and Nikolai Gerasimov recently defended his thesis entitled "The behaviour of intumescent coatings under non-standard heating conditions".

New Group members:



Sam Stevens started as a PhD student in the middle of 2019. Sam is primarily studying fire spread in informal settlements. He graduated from the MEng Structural and Fire Safety Engineering programme at the University of Edinburgh in 2019. His work aims to understand and model fire risk and fire spread in the Mukuru slums of Nairobi, Kenya. He is under the supervision of Dr David Rush and Dr Stephen Welch.

In September 2020, David Morrisset will start as a PhD student. David graduated from the California Polytechnic State University (Cal Poly) - San Luis Obispo with a Master's in Fire Protection Engineering in June 2020. He has worked with the University of Edinburgh fire group as a visiting researcher in the winters of 2019 and 2020. His work focuses on bench-scale flammability

assessment, with a particular emphasis on solid flame spread mechanics. He will be supervised by Dr Angus Law and Dr Rory Hadden.





Vaish has an MEng in Civil Engineering from the University of Aberdeen. Following that, she worked in the defence industry for Thales in project management and then moved into the role of a research engineer where she worked in algorithm development for GOT (Generic Object Tracking). She is supervised by Dr Ricky Carvel, and Dr Rory Hadden is her second supervisor.



News about other group members:

Dr Xu Dai started working at NIST, National Fire Research Laboratory Group in October 2019 as a foreign guest researcher. He is currently involved in the research project on "Steel-Concrete Composite Floor Systems Subject to Fire – Phase 2". At the same time, he is still part-time contributing to the Edinburgh team on the research project "TRAFIR (Characterization of TRAvelling FIRes in large compartments)," which will finish at the end of 2020.

Dr Lesley Gibson worked with the IRIS-Fire team for two and half years. She introduced the team to GIS and remote sensing and how it can be used to help map and understand informal settlement fire risk. As of August 2020 she will be assisting the UoE School of Engineering with their digital teaching offering.

Awards/Prizes:

Together with Dr Alastair Bartlett, Dr Rory Hadden and Prof Luke Bisby won the Jack Bono Award from SFPE for their paper entitled "A Review of Factors Affecting the Burning Behaviour of Wood for Application to Tall Timber Construction". Dr Alastair Bartlett, now working for AECOM, was at the time of publication a postdoctoral researcher at the BRE Centre for Fire Safety Engineering.

Dr Angus Law won the Health and Safety Award at the ICE Publishing Awards 2020. The award was given for the paper "Prescription in English fire regulation: treatment, cure or placebo?", written in cooperation with Neal Butterworth.

Dr Angus Law also won the Oscar Faber Medal Award for his presentation "Fire safety design: we need to talk about timber" given to the Institution of Structural Engineers. The presentation can be found online at: <u>https://youtu.be/rND9M-kmVX8</u>.

The University of Edinburgh Student Chapter of the Society of Fire Protection Engineers (SFPE) is very honoured to announce that for 2020 it has received a Bronze Award for Chapter Excellence by the SFPE Board of Directors. This is a wonderful recognition of the reinvigorating attempts which initiated in 2019 in the Edinburgh area, mainly through three evening seminars with Prof Luke Bisby, Prof Jose Torero, and Prof Grunde Jomaas, which engaged the local fire safety/protection community. The chapter appreciates this development and looks forward to more planned events once that is safe for everyone. Future events will be announced at the twitter account @SfpeUoe.

New project and project updates:

Closing data gaps and paving the way for pan-European fire safety efforts

Thanks to the valuable cooperation of a consortium composed of the University of Edinburgh and other nine fire safety institutions around the world, Dr Martina Manes is now a Research Associate working with Prof Grunde Jomaas and Dr David Rush on the pilot project "Closing data gaps and paving the way for pan-European fire safety efforts" funded by the European Commission. The study, which is led by Efectis, aims to map the terminology used and the data collected by the EU Member States related to fire incidents and their consequences proposing a shared terminology and a methodology to collect data amongst the EU Member States. Further information about the project and the project partners can be found here: https://efectis.com/en/project-to-boost-pan-european-fire-safety-efforts/

Improving the Resilience of Informal Settlements to Fire (IRIS-Fire)

The project is close to the end, and all the results are being organized and published. The technical report is being drafted, and it is expected that it will become the reference for solving this global fire safety issue.

The combustible materials of informal settlement were studied based on nearly 400 cone calorimeter tests to develop a database of the reaction-to-fire responses of some of the typical combustible materials found in widespread use in informal settlements, initially those of the Western Cape in South Africa. The database is open access (https://doi.org/10.7488/ds/2599) and includes all the original combustion data, such as critical heat flux, HRR, and ignition time. The paper for this database is published as well.

obtained

from

full-scale

The

data



The burning of two informal dwellings, UL Chicago

experiments conducted at UL has been published or are under revision. The boundary condition, opening factors and fire spread mechanism has been successfully addressed from these experiments. All the data will be open access once the relevant work is published. The numerical modelling of these full-scale experiments have been

modelled focusing on validating the FDS model using the experimental results with different boundary conditions. The modelling work is done with good progress and the data is being analysed/ The main objective of the modelling is to provide a validated FDS model for each case with low computational power, efficiency and consistency.

With the help of summer intern students Arthur Morvan and Paul Menou from University of Angers, the data analysis of survey, which includes the construction materials, ventilation condition, dwelling dimension, furniture type and fire protection conditions of informal settlement in real life, has been finished. On the other hand, GIS is

found an effective tool to undertake community-level fire spread hazard analysis. Recent research has shown that it is possible to map historic informal settlement fires based on the changes in reflectance in the Blue Band of Sentinel-2 satellite imagery, and that this can aid in fire spread risk assessments of informal settlements. More work will come out in the following months.

The brilliant work and contribution by Post-Doctoral Research Associates Dr Lesley Gibson and Dr Yu Wang to IRIS-Fire are sincerely appreciated.



Dr Lesley Gibson and Dr Yu Wang, in South Africa.

Signed: Prof Grunde Jomaas, University of Edinburgh

News from the University of California, Berkeley

Prof. Michael Gollner recently moved from the University of Marvland to the University of California, Berkeley, where he has formed the Berkeley Fire Lab. The new website for the group is http://firelab.berkeley.edu. Together with Prof. Carlos Fernandez-Pello, who runs the adjacent Combustion and Fire Processes Lab, they are working on a variety of combustion and fire research topics. Among them, Dr. Maria Thomsen, Dr. Luca Carmignani, and Prof. Fernandez-Pello participated in supporting the NASA Spacecraft Fire Safety Experiment - IV (Saffire-IV), that flew on May 11th for about 3 weeks, onboard the resupply vehicle Cygnus. The objective of the experiments are to understand the fire behavior of large scale fires in microgravity and provide better insight for



spacecraft fire safety. Dr. Franz Richter also prepared a new guide for interested students to learn about fire science and fire protection engineering on the website: <u>http://bit.ly/fpelearn</u>.

Prof. Gollner was recently awarded the 2020 Hiroshi Tsuji Early Career Researcher Award from the Combustion Institute.

Drs. Franz Richter (Formely Imperial Hazelab), Charles Scudiere (formerly UC Berkeley), and Luca Carmignani (formerly SDSU/UCSD) recently joined the lab as postdoctoral scholars working on firebrand combustion, robotic brazing, and microgravity fire spread, respectively.

Christina Liveretou (BS, UC Berkeley), Joseph Dowling (BS/MS, U. Maryland) and Maria Theodori (BS/MS, U. Maryland) have joined the lab as doctoral students working on smoldering combustion, fire whirls, and wildlandurban interface fire risk, respectively.

Congratulations to our recent cohort of graduates and alumni from the group:

• Dr. Mohammadhadi Hajilou, who was a postdoctoral scholar with Prof. Gollner at the University of Maryland recently accepted a position as a Senior Engineer at Gexcon US.

- Prof. Jeanette Cobian was a postdoctoral scholar with Prof. Fernandez Pello at the University of California, Berkeley and recently started as an Assistant Professor at the University of California, Merced in the Department of Mechanical Engineering
- Dr. Sriram Bharath Hariharan recently defended his Ph.D. on fire whirls at the University of Maryland and will start soon as a postdoctoral scholar at the University of California, Berkeley
- Michael Heck successfully defended his MS thesis in FPE at the University of Maryland on the combined effects of wind and slope on wildfire spread.
- Michael Jones successfully defended his MS thesis in FPE at the University of Maryland on microgravity fire whirl formation.
- Ashlynne Orcurto successfully defended her MS thesis in FPE at the University of Maryland on intermittent heating of fine wildland fuels
- Joseph Dowling successfully defended his MS thesis in FPE at the University of Maryland on the effects of wall height on fire whirl formation

Signed: Prof Michael Gollner, University of California, Berkeley

News from California Polytechnic State University (Cal Poly)

The Fire Protection Engineering Program at Cal Poly (fpe.calpoly.edu) is celebrating its 10th year of offering Master of Science (MS) degree and Graduate Certificate Programs. In June of this year, 14 MS degree students presented their culminating projects and 1 student defended his MS thesis. While these presentations are normally presented on campus at the annual FPE Student Symposium, this year the presentations were made remotely via Zoom as a concession to the COVID-19 pandemic. Over its 10-year history, the FPE program at Cal Poly has awarded more than 110 MS degrees and numerous Graduate Certificates. The Cal Poly FPE program has always offered its courses both on-campus and online, so the pandemic has had little impact on program delivery.

The FPE program was also part of a university-wide multi-disciplinary proposal that was awarded funding from the Cal Poly Strategic Initiatives Program. The proposal entitled "Establishment of the Cal Poly WUI FIRE Institute" aims to create a university wide institute that is a leading source on fire science and engineering, information and intelligence, research, and education all pertaining to wildland-urban interface (WUI) fires. Uniquely situated in California and positioned at a university with a wide array of campus programs, an institute such as this at Cal Poly has enormous potential at reducing the impacts from WUI fires.

Signed: Richard L. Emberley, Cal Poly

News from the University of Queensland

New arrivals

We're delighted to welcome Nages Karuppiah to the group. Nages has started an MPhil degree studying the role of the fire services in the fire safety engineering process. She is a part-time student who also works for the Fire Service in South Australia. Nages is supervised by Dr David Lange, Dr Juan Hidalgo and Dr Cristian Maluk.

Recent graduates

Doctor of Philosophy

- Dr Aaron Bolanos was awarded a PhD with a thesis entitled *"Fire and structural performance of Structural Insulated Panels"* supervised by Dr Cristian Maluk, Dr Juan Hidalgo, and Prof. Jose Torero (now at UCL, UK). https://doi.org/10.14264/uql.2020.733
- Dr Carmen Gorska was awarded a PhD with a thesis entitled *"Fire dynamics in multi-scale timber compartments"* supervised by Dr Juan Hidalgo, Prof. Jose Torero (now at UCL, UK), and Dr Cristian Maluk. <u>https://doi.org/10.14264/uql.2020.795</u>
- Dr Quang Le was awarded a PhD with a thesis entitled "Understanding the performance of structural elements at elevated temperatures: a case study of profiled composite walls" supervised by Dr Vinh Dao and Prof. Jose Torero. <u>https://doi.org/10.14264/uql.2020.935</u>

Master of Engineering Science in Fire Safety Engineering

- Sai Murugan Pandit was awarded a MEngSc with a thesis entitled *"A novel methodology for the analysis of fire spread modes in open-plan compartments"* supervised by Dr Juan Hidalgo.
- Wenxuan Wu was awarded a MEngSc with a thesis entitled *"Exploring the Advantages and Disadvantages to using a new "Rules of Thumb" method in Structural Fire Engineering"* supervised by Dr Cristian Maluk.

Graduate Certificate in Fire Safety

- Gary Hall
- Darren Herden

- Scott Munro
- Christopher Ryan
- Anthony SchofieldStephen Thuell
- Mark Vaughan

SiF 2020

The Structures in Fire International Conference will now be hosted online between 30th November and 2nd December 2020, having been postponed due to Covid-19. We look forward to taking these unfortunate circumstances to be create a unique online conference experience and reach a much wider audience. The committee is still finalising the details at the time of writing this contribution to the newsletter, but up-to-date details can always be found on the website, <u>https://sif2020.com/</u>

IAFSS

UQ Fire has had a number of papers accepted for IAFSS across a wide range of subjects, and are published in Fire Safety Journal as listed below:

- 1. Cuevas J, Torero JL, and Maluk C (2020) *Flame extinction and burning behaviour of timber under varied oxygen concentrations*. <u>10.1016/j.firesaf.2020.103087</u>
- 2. Gorska C, Hidalgo JP, and Torero JL (2020) *Fire dynamics in mass timber compartments*. <u>10.1016/j.firesaf.2020.103098</u>
- 3. Gupta V, Hidalgo JP, Cowlard A, Abecassis-Empis C, Majdalani AH, Maluk C, and Torero JL (2020) *Ventilation effects on the thermal characteristics of fire spread modes in open-plan compartment fires*. 10.1016/j.firesaf.2020.103072
- 4. Le QX, Torero JL, Dao VTN (2020) *Stress–strain–temperature relationship for concrete*. <u>10.1016/j.firesaf.2020.103126</u>
- 5. Lucherini, Hidalgo JP, Torero JL, and Maluk C (2020) *Influence of heating conditions and initial thickness on the effectiveness of thin intumescent coatings*. <u>10.1016/j.firesaf.2020.103078</u>
- 6. Maluk C, Tignard J, Ridout A, Clarke T, and Winterberg R (2020) *Experimental study on the fire behaviour of fibre reinforced concrete used in tunnel applications*. (in press)
- 7. McLaggan MS, Hidalgo JP, Carrascal J, Heitzmann MT, Osorio AF, and Torero JL (2020) Flammability trends for a comprehensive array of cladding materials. <u>10.1016/j.firesaf.2020.103133</u>
- 8. Pope I, Hidalgo JP, and Torero JL (2020) *A correction method for thermal disturbances induced by thermocouples in a low-conductivity charring material*. <u>10.1016/j.firesaf.2020.103077</u>
- 9. Ramadhan ML, Zarate S, Carrascal J, Osorio AF, and Hidalgo JP (2020) *Effect of fuel bed size and moisture on the flammability of Eucalyptus saligna leaves in cone calorimeter testing*. <u>10.1016/j.firesaf.2020.103016</u>
- 10. Solarte A, Numapo J, Do T, Bolanos A, Hidalgo JP, and Torero JL (2020) Understanding fire growth for performance based design of bamboo structures. <u>10.1016/j.firesaf.2020.103057</u>
- 11. Wiesner F, Deeny S, and Bisby LA (2020) *Influence of ply configuration and adhesive type on cross-laminated timber in flexure at elevated temperatures*. <u>10.1016/j.firesaf.2020.103073</u>

Large-scale engineering timber compartment experiments

We have completed the 5th test of the series of seven large-scale tests for the ARC Future Timber Hub project <u>"Exploring the self-extinguishment mechanism of engineered timber in full-scale compartment fires</u>". This project is led by Dr Juan Hidalgo (Senior Lecturer at UQ) and Hangyu Xu (PhD student), and developed with the full support of The University of Queensland (UQ) Fire Safety Engineering Research Group. The project investigates the self-extinguishment mechanism of Cross-Laminated Timber (CLT) at a large-scale in order to establish design criteria for the safe use of CLT in buildings. Partners of the project include Hyne Timber, XLam, QFES, Lendlease, Knauf and Rockwool International.

The project consists of $3.4 \text{ m} \times 3.4 \text{ m} \times 3.125 \text{ m}$ rooms made of XLam-supplied CL3/125 CLT (45-35-45 mm thick lamellae). The fuel load corresponds to a $1 \text{ m} \times 1 \text{ m}$ pool of kerosene fuel to generate a fully-developed compartment fire reaching gas-phase temperatures above 1,000 °C. To date, we have tested two compartments with the CLT fully-encapsulated, two tests with two exposed CLT surfaces (ceiling and lateral wall) and a test with three exposed CLT surfaces (ceiling and two lateral walls).

In the project, we aim to demonstrate and validate a framework for self-extinction using multi-scale experimentation and numerical studies. For more information about the large-scale tests of the project, you can visit <u>https://sites.google.com/view/arc-future-timber-hub-pr14</u>.

Cladding Materials Library update

In the previous newsletter, we announced the publication of the Cladding Materials Library (<u>https://claddingmaterialslibrary.com</u>) which is a publicly available flammability database containing a detailed quantified data on cladding materials. Since then, we have received additional contributions from the private sector who have agreed to test materials and to make the data publicly available. On top of the 20 original materials with detailed data (and 1,100 screened samples), there are now a further five materials (having screened a further 200 samples). This data is of benefit to engineers and researchers alike, and the free and

transparent process enables the whole fire safety engineering community to benefit. We thank everyone who has supported it.

The five new materials are: two further different types of Mg-based fire retarded aluminium composite panels (ACPs), one glass fibre reinforced polymer (GFRP) panel, a wood polymer composite (WPC), and another new polyurethane (PUR) foam. These are ACP22 and ACP34, OTH23, OTH24 and INS12 respectively in the library.

Signed Martyn McLaggan, Juan Hidalgo, David Lange, Cristian Maluk, Felix Wiesner and the rest of the Fire Safety Engineering group at The University of Queensland

News from Imperial College London

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

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

New arrivals

In PhD student arrivals, we would like to welcome Simona Dossi, who has started researching how to protect rural houses in rural communities from wildfire! Simona is part of PyroLife, an international program targeted at training wildfire PhD students over a wide range of disciplines.

Also joining us soon is Tatenda Nyazika, who will be coming on as a Postdoctoral student researching façade fires!

Over the summer, Hazelab is also excited to be taking on three undergraduate UROP students: Yaxin, Kseniia, and Christos. Yaxin will be developing a database of timber behavior in fire for application in machine learning and AI; Kseniia will be modelling the fire behavior of curtain walls in buildings, and Christos will be continuing the work to develop an updateable database on façade fire incidents.

Welcome to Hazelab, Simona, Tatenda, Yaxin, Kseniia, and Christos!

Graduating Students

Shu Min, Poppy and Alexandra graduated from their master's degree in mechanical engineering and completed their final year thesis with us. Poppy worked on modelling the combustion of timber facades, Alexandra on ACP

panels and Shui Min studied the flammability of strong composites for aerospace applications. The research was well received and was presented to the department also as posters and webinars. We wish them all luck with all their future endeavours!

Departures

We would like to say goodbye to Erika (bottom left of photo!), an undergraduate student from Toyohashi University of Technology in Japan, who was with Hazelab on academic placement studying façade fire safety with Francesca. Safe travels, Erika!

Conferences



Guillermo, Matt and Franz presented their work at the Imperial Forum for policy makers. The Forum is part of Imperial's policy engagement programme, aiming to connect Imperial researchers with policy-makers to discover new thinking on global challenges.



In February, Harry presented his master thesis on wildland fire evacuation trigger modelling at the London Office of Movement Strategies. Simona helped organize and host a seminar of the Pyro-life symposium streaming every Wednesday during the summer months.

Awards

Matt won the SFPE Student Scholar Award, which recognizes excellent students across the world who are conducting research to advance the science and practice of fire protection engineering. Well deserved, Matt!

Guillermo received The Research Excellence Award from The Combustion Institute for publishing research papers that have had a major impact on the field of combustion science. We are very proud! He has also been nominated for the student choice award at Imperial College.

Life during the pandemic

During these unprecedented times, Hazelab has had to adapt to working outside the office, with most of us working remotely in London and beyond! We have weekly virtual group meetings to keep everyone updated on work and current events in the field, and we run frequent drop-in virtual coffee meetings where we chat about the wonders of now being able to wear pyjamas to the office.

Wuquan and Agung are part of the few students that were granted access to Imperial College campus to continue to carry out their experiments on smouldering peat. The rest of the group has been working from remote.

SFPE Greater London Student Chapter

The SFPE Greater London student chapter has launched <u>Flash Points</u>, a competition to encourage communication for young researchers in the discipline of fire safety across the UK. The competition is open to undergraduate, postgraduate students and who are yet to or have recently graduated. To apply for the competition, students are required to submit a brief 3-minute original video describing research related to fire safety science that they have done, explaining its importance and impact in society. The prize for the best video decided by our panel of judges from industry and academia will consist of a £350 cash prize! Watch out for the winning video announced towards the end of summer.

The chapter has also established monthly publicly available fire science webinars. Carmen Gorska from University of Queensland was our first speaker on this new platform her talk on timber compartment fires is available on our YouTube channel. More amazing speakers are comping in August, September and October, so sign up to our mailing list on our website for further updates.

The chapter has also been awarded a silver award for chapter excellence, which recognises chapters that demonstrate significant contributions to the needs of chapter members and the society. We would like to thank members and friends of the chapter for making this possible, and SFPE for recognising the strides the chapter has made!

Outreach

We were interviewed for an <u>article</u> which featured in the national geographic on wildland fires.

Matt participated in a communication competition challenge open to all phd students at Imperial College and made this amazing <u>video</u> for the competition.

The Combustion Institute has featured a range of photos taken by multiple Hazelab members on their Instagram account. Phenomena including Fire tornadoes (left, by Francesco), Peat micro-haze (top, by Eirik), and smouldering Biomass (bottom, by Francesco)



Finally, we would like to send a huge thanks all of the academics and engineers who were kind enough to visit us – when this was still possible - and share their expertise and diverse experiences with the group. Thank you to Dr Nieves Fernandez-Anez (Western Norway University of Applied Sciences), Dr Eleni Asimakopoulou (UCLan), Carmen Gorska (University Queensland) & Dr Wojciech Węgrzyński.

Signed: Francesca Lugares and Harry Mitcheli, Imperial College

News from Pprime Institute – Poitiers – France

Project OPTIFUM and its state of advance - PhD of Safae KELLALI

Friday, January 10, 2020, the University of Poitiers and the CNRS inaugurated a joint laboratory with the company Poujoulat. This laboratory has been established to combine both the human and the experimental skills and expertise of Pprime institute and the CERIC laboratory of Poujoulat. The purpose of this laboratory is to resolve the problematic of chimney fires.

Chimney fires can have many causes. The following cases present one of the worst possible scenarios. In the first scenario, a fire can occur in a room where the chimney duct is located. The chimney duct should not engender the transmission of fire. In the second scenario, a fire can take place in the chimney duct itself. In this case, the fire can be caused by the buildup and the inflammation of the deposits within the flue. The Fire should not spread outside the chimney duct.

The first scenario has been studied during the PhD of Dr. Pierre CREMONA (2017), supervised by Prof. Thomas ROGAUME, Dr. Franck RICHARD, Dr. Jocelyn LUCHE and Mr. Lionel Druette. During this work, in order to respond to the problem linked to the first scenario, a fire resistance furnace has been developed at the CERIC laboratory, a corresponding model has been proposed and simulations were carried out using Fluent software. The model allows the prediction of contact temperature of the chimney duct's external wall. During this work the second scenario has also been studied by the characterization of the real deposits which are findable in the chimney ducts and that are flammable and could ignite once the necessary ingredients for fire are present (fire triangle). Those first experiments characterized the creosote coming from different sources: pellet stoves and fireplaces.

The experimental campaigns showed significant heterogeneity between the different types of deposits. Depending on their source and their generation conditions, the deposits differ in terms of structure, porosity, composition and thermo-physical parameters (such as density, thermal conductivity, thermal capacity and calorific value). These elements imply differences in the thermal decomposition of these residues and their ignition. For this reason, it seems difficult to predict one single model of ignition and combustion that can be suitable for all the types of deposits.

Therefore, the team of Prof. Thomas ROGAUME is currently still working on the project OPTIFUM (LabCom ANR). A PhD student, Safae KELLALI, joined the team on November 2019 under the supervision of Prof. Thomas ROGAUME, Dr. Franck RICHARD, Dr. Pierre CREMONA, and Dr. Benjamin BATIOT. Its scientific aim concerns the modeling of pyrolysis in a porous medium, and its industrial objective is to study the inflammation of the deposits in chimney flues. After noticing the heterogeneity of the real deposits. For the current research, we have chosen to accomplish the study using one kind of material. The coal chosen to replace the real creosote is lignite. This choice has been decided firstly after an initial observation that showed similarities between the two materials. This first observation has then been experimentally validated. At first, the behavior of lignite and creosote was compared at the material scale through TGA experiments. After that, cone calorimeter tests were carried out in order to compare the behavior of the two materials at the small scale.

Tests were performed under different heat fluxes, under both auto ignition and piloted ignition configurations. After the validation of the material choice, to discern the phenomenon of pyrolysis of lignite under Nitrogen, the thermal decomposition of lignite has been studied through TGA experiments. First, the drying behavior of lignite has been analyzed through different thermogravimetric experiments. During those experiments, the influence of some parameters on the drying behavior has been studied (heating rate, final temperature, maintain of final temperature and particles size). Those studies showed that the mass losses of the lignite samples (losses of moisture) increase with decreasing heating rate. However, it is difficult to eliminate moisture completely even with the use of a small heating rate and a relatively high final temperature and duration of its maintain. Once the best protocol to eliminate moisture has been chosen, samples of lignite (with different particle size) were tested using TGA under Nitrogen. Pyrolysis of lignite was studied under different heating conditions.

The results of those tests were exploited to validate the two mechanisms of pyrolysis of lignite under Nitrogen that we have proposed during this work. The use of two different optimization programs (DAKOTA and another program that has been coded by Dr. Benjamin BATIOT) allowed us to find the kinetic parameters for the different pyrolysis reactions. The optimization with DAKOTA has been performed by the coupling of this optimization software with OpenFOAM. Moreover, the thermal decomposition of lignite has been modelled using PATO (an Open Source software implemented in OpenFOAM and distributed by NASA). The first mechanism proposed is

parallel, while the second one is competitive. Once both mechanisms have been validated under each heating rate separately. A comparison was necessary to assess the ability of the two mechanisms to model the mass loss at a large range of heating rates.

In addition to this first pyrolysis kinetic study and the numerical modelling of the phenomenon at the material scale (TGA test), and besides the classical thermal experiments that have been performed at PPRIME lab using TGA and cone calorimeter. A new experimental bench at semi-real scale has been developed at the CERIC Laboratory (Poujoulat).

The bench is equipped with a tube with 80 mm inner diameter, a heat gun under the tube, a sample holder (a grid with 4,5mm² mesh size), three thermocouples, pressure sensor, a gas analyzer and a data acquisition system. The heat gun has been adjusted to airflow generate an with different temperatures for the tests. Thermocouples have been placed on three different positions: at the bottom of the duct, at the middle (before the sample holder) and at the top of the duct. In order to visualize the inflammation beside the sample, a viewing window has been placed at the level of the sample holder. Using this bench, tests were performed at different air temperatures and airflows. The aim was to have a first idea about the conditions that could cause the occurrence of an inflammation. In addition,



tests were carried out using different samples of lignite to observe the influence of the size and the shape of lignite particles on the delay and the type of inflammation. For the next studies, the developed bench will allow us to study the pyrolysis of lignite in a porous medium, while remaining under conditions that are similar to the realistic ones (temperature of smoke and airflow within the chimney duct). Then those experiments will be modelled using PATO and at final experimental and numerical results will be compared in order to validate the models.

Collaboration with the Fire defense Service of Charente (SDIS 16) – Official of the Fire Platform of Alcohol

Last 15th of February the French firemen service of Charente (SDIS 16) inaugurate its teaching technical platform. This one is equipped of different specific facilities in order to study and to train its agent.

Notably, this platform, unique in Europe permits to simulate different typologies of liquid Fire, representative of the one met notably in the cellars for the manufacturing and the storage of Cognac. This platform has been developed in collaboration with the SDIS16 and researchers of the Pprime Institute (UPR3346 CNRS) – University of Poitiers.

A first campaign of measurement has been conjointly realized in order to characterize the flame structures met during alcohol combustion. An IR thermal camera as well as a high speed camera. The results obtained are very promising and new experimental campaigns are already planned.



The objective of this collaboration is to complete the scientific knowledge of the specific characteristics of the alcohol fires: ignition process, fire propagation, flame structure and characteristics, thermal exchange, flame extinction, etc. As well as to improve the training of the firemen.

Van Minh LE's post-doc is finished...

His post-doc lasts totally 6 months from January 2020 to June 2020 and aims to finish the last researching part on the project "Modeling of finite rate chemistry effects in the combustion of solid fuel relevant to fire safety problems". More specifically, the post-doc focuses on validating the nongray radiation model with turbulence-radiations interactions (TRI) coupled with the flamelet combustion model; on developing the flamelet combustion model, which is capable of describing the extinction/reignition phenomenon due to the oxygen dilution. During 6 months, new understandings and interesting results are discovered and the project is still going on. The project is a collaboration between University of Poitiers and University of Maryland and began from October 2016 until now.



After finishing his studies as a PhD student and his research works as a junior post-doc researcher in France and the USA, Minh will come back to Vietnam and search a job as a CFD researcher.

He thanks and wishes all the best to everyone working in the fire safety domain!

DuoRisk is still alongside the Pprime Institute and the University of Poitiers!

For almost 3 years, two PhD from the Pprime Institute have taken the path of entrepreneurship by creating a company called *DuoRisk*. Fabien Hermouet and Simon Roblin, former students of Professor Thomas Rogaume, are still maintaining a strong link with the academic world, which has seen them grow in their expertise: the industrial and environmental risk assessment, with a strong specificity in of fire safety engineering acquired during their PhD.

During this year, and despite the upheavals that the world has known, the company continued to support various structures and in particular the Pprime Institute as part of a project jointly carried out between the Institute and the national technologic institute of wood (FCBA). The objective of this project is to carry out a multi-scale study on different types of wood which are constituting facade elements in the context of new constructions or renovation of buildings. Starting from the TGA scale in order to define precise kinetic models, the thermal, flammability and combustibility parameters are captured at the scale of the cone calorimeter. Then, based on the experimental data, these parameters are implemented under FDS in order to faithfully reproduce the observed behaviors. Finally, larger scale models will be carried out in order to validate the flame propagation behavior, leading to the simulation of a complete facade fire, reproducing the LEPIR test.

In addition to this project alongside the Pprime Institute, DuoRisk carries out a large number of courses at all academic levels in the field of health/safety at work and industrial/environmental risks within, among others, the University of Poitiers. During the past year, nearly 200 hours of lessons were given by Fabien and Simon in different organizations. Two major courses mark this year with a new program relating to the modeling of industrial fires and another relating to the use of CFAST and FDS.

The orientation of French regulations towards a performance-based approach of fire safety also paves the way for engineering studies in industrial facilities. Throughout this year, DuoRisk was also called upon to carry out those kind of studies, choosing adapted methods to the needs of its customers, on the basis of in-depth risk assessments and scenarios which are highlighting major but possible situations, for more safety.

Feel free to visit our website and contact us! Fabien Hermouet and Simon Roblin - <u>contact@duorisk.fr</u> or website <u>www.duorisk.fr</u>

Signed: Thomas Rogaume, University of Poitiers

News from Pyregence (USA)

<u>Meet Pyregence</u>: A Consortium Advancing Wildfire Science, and Delivering the Next Generation of Fire Risk Models to Help Protect People, Property and the Grid (USA)

Due to increased levels of forest fuels, drought conditions, and more frequent extreme weather events related to climate change, the threat of wildfire across the U.S. is steadily increasing. With our country at an inflection point, everyone affected by wildfires - from concerned citizens, to state agencies and utility companies - need better information to understand and mitigate risks to people, property, and the electric grid.

Composed of wildfire, forestry, weather and climate experts from 18 institutions across academic, private consultancy and government sectors, the Pyregence consortium was formed to deliver research and tools to enhance situational awareness and strategic planning. Our team is collectively working towards two main goals:

1. <u>The advancement of fire behavior science through cutting-edge research</u> on forest fuels, fire physics, climate and weather dynamics. Members of the consortium are developing a new system for measuring forest fuels, and driving research on the role of weather and fire physics on wildfire spread.

2. Building on the consortium's research, and refining model inputs to integrate previously underrepresented factors (including embercast caused ignitions, forest fuel characteristics, large-scale tree mortality, fire-weather feed backs and fire spread), the consortium will <u>deliver the 'next generation' of fire forecasting tools.</u>

Pyregence got started in late 2019 after being awarded a 5-year, \$5MM (USD) grant fund from the California Energy Commission (CEC). The general premise of the project is to build open-source wildfire models that provide actionable information at a near-term temporal resolution for proactive ignition and fire risk mitigation and at a long-term temporal resolution for adaptation and resource planning.

Initial project focus is placed on California, but the models will eventually be available for use across the United States. The Principal Investigator is Dr. David Saah, founder of Spatial Informatics Group (SIG) and Professor at the University of San Francisco, and the work is structured around four technical workgroups contributing to various research and product outputs: 1) Extreme Weather, 2) Fire Behavior, 3) Near-term Fire Risk Forecasting, 4) Long-term Fire and Climate Change Scenario Planning.

A brief summary of each workgroup is as follows:

- <u>Extreme Weather:</u> Workgroup 1 is led by scientist Janice Coen, PhD, from both the University of San Francisco and the National Center for Atmospheric Research in Boulder, Colorado. Coen is dedicated to researching and modeling the interaction between wildland fires and the atmosphere. Two of the main focus areas of this workgroup are to improve understanding of the relationship of extreme weather conditions and wildfire in order to improve forecasting accuracy about future wildfire risk, and to develop a methodology for identifying optimal configurations of weather stations to enhance monitoring of near-term fire risk conditions.
- <u>Fire Behavior</u>: Workgroup 2 is led by Scott Stephens, PhD, researcher and professor of the interactions of wildland fire and ecosystems at the Fire Science Lab at University of California, Berkeley. This workgroup is faced with the challenge of developing new fuel classifications for the landscape which, due to unprecedented episodes of tree mortality, now has 10-100 times greater fuel biomass of woody material and deep duff layers than is portrayed in current models. Stephens and his team will conduct experimental fire testing to deliver the fundamental scientific advances toward physical wildfire models and fuel mapping techniques.
- <u>Short-term Fire Spread and Risk Forecasting:</u> Workgroup 3 is led by Chris Lautenberger, PhD, PE from Reax Engineering, Inc. located in Northern California. This group is focused on improving timely and accessible communication of real-time fire conditions, and accuracy of near-term forecasting of fire spread and risk. At the core of the forecast system is science-based fire modeling, enhanced by the outputs of Workgroups 1 and 2. A publicly available, web-based interface displays forecasts for active fires and fire risk at a five-day horizon, allowing stakeholders to make informed decisions and take proactive mitigation measures. While workgroup 2 is focused on addressing known limitations in the contemporary fire-spread, workgroup 3 pushes the envelope of our current capacity to capture and forecast fire risk. The strategy of linking application with basic research ensures that immediate needs are met while also addressing likely future challenges
- <u>Long-term Fire and Climate Change Scenario Planning</u>: Workgroup 4 is led by Leroy Westerling, PhD and Professor of Management of Complex Systems at the University of California, Merced. This workgroup aims to understand and develop plausible wildfire scenarios till the end of century differentiated by climate projections, land-use paths, and landscape interventions. A planning support tool backed by coupled statistical/dynamical fire-climate-vegetation models will be made publicly available so that stakeholders can assess long-term wildfire projections and strategically allocated resources for mitigation and adaptation of future risk.

Of particular interest to the IAFSS membership may be the experimental fire spread and risk forecasting tools which are publicly available for beta testing at <u>https://pyregence.org/forecast</u>. These tools were primarily developed by Workgroup 3 and are continually being enhanced to meet the following aims:

- Enhance existing fire spread models to create scalable next-generation fire spread models reflecting recent developments in fire science and computing power
- Disseminate timely, accurate, and easy to understand forecasts of wildland fire spread to the public, utilities, first responders, government agencies, and other stakeholders
- Forecast risk from fires that could be ignited over the next 5 days to communities, infrastructure, and natural resources so that appropriate mitigation actions can be undertaken

This figure provides an example of the "relative burn probability" data layer output as displayed in the interactive user interface. Using Monte-Carlo analysis and data optimization techniques, hundreds of millions of fire ignitions are placed across the landscape based on an ignition density factor and fire spread is then modeled under current and forecast fire weather and



fuel conditions. In this example, the provided information indicates the relative likelihood of a particular area burning up to 5 days in the future. Thus, directed actions for mitigation, such as firefighter staging, vegetation clearance, fire protection pre-treatments, or ignition risk reduction by de-energization of electric utilities, can be implemented as necessary.

Signed: Maria Theodori, P.E. and Chris Lautenberger, Ph.D., P.E. (both Reax Engineering, Inc.)

News from LEMTA - OS Feux, University of Lorraine



Research. The research group on *Fires* in Nancy is working on a series of new projects. The *LASHFIRE project* (funding from the European Union's Horizon 2020 research and innovation program under grant agreement n^o 814975), is devoted to the fire safety on ro-ro ships. Our group is addressing

two topics: one dedicated to the subdivision of the ro-ro decks (with large spaces for the storage of vehicles and trucks), the second dedicated to the evacuation of people. Solutions are sought based on water curtains and solid curtains to allow the



containment of heat and smoke and prevent large scale propagation. A reduced scale setup was just built to allow the experimental study of water curtain efficiency. Simulations are carried out simultaneously, both at reduced and large scale on real ships. Evacuation is addressed combined with fire propagation simulations with the aim to design second paths for evacuation in case of major hazard.

Another project is conducted in parallel: MARINER-DECM (funding by the French National Research Agency - ANR) on the fire propagation in multi-compartment vessels and buildings, in cooperation with the DGA and the French research groups in Marseille (IUSTI) and Poitiers (PPRIME Institute).

The close cooperation of our group with the CSTB is also active, with three PhD theses in course: on compartment fires to study the occurrence of flashover (work conducted by Mrs Racha Djebbar), on under-ventilated conditions leading to flame exit and consecutive façade propagation (work by Bouaza Lafdal) and on wood ignition and self-extinguishment (PhD defense of Lucas Terrei coming soon, see below).

Our experimental platform is also used for miscellaneous studies on vegetation fires, use of water curtains, smoke / spray interactions, characterization of wood, ...

Our group had a difficult period this spring due to the pandemics, just as a lot of other people around the world, with a containment period leading to the temporary closure of the laboratory, but the group kept in touch and worked as much as possible, going through this complicated period. We are happy to be able to now work together in quite normal conditions.

Congratulation to Anthony Collin!! Anthony just got a position of full Professor in our lab and we are particularly happy for him! Anthony got his PhD in 2006 on a topic related to the use of water curtains as a radiative shield. Then, he got a position of senior lecturer in the University of Lorraine in 2007, being involved in a group working on wildfires. He progressively extended his activities on compartment fire and evacuation problems. He is now the head of our *Fire* group and recently got a deserved Full Professor position, with research activities still in our laboratory.



PhD Defense. Lucas Terrei is ready for his PhD Defense on wood ignition and self-extinguishment, a study conducted in the frame of the collaboration between LEMTA and CSTB. In particular Lucas developed a very smart experimental device based on a double sliding cone calorimeter, which allowed him to vary the external heat flux on a given sample in well-controlled conditions. His contribution also lies in the fine measurement of temperature inside the degraded samples with embedded fine thermocouples. His experimental campaigns provided interesting inputs on ignition and extinction of wood, with a close connection to charring conditions (PhD defense on 16th October 2020).

Arrivals. Dr. Davood Zeinali joined the fire research division of LEMTA as a postdoctoral fellow in January for the European project of LASH Fire devoted to improving the fire safety of ro-ro ships, i.e., large ferries designed to carry wheeled cargo. This project brings together 29 partner institutes across Europe and has received funding from the European Union's Horizon 2020 research and innovation program. Davood is currently investigating the efficiency of water curtains for fire containment on the ships through reduced-scaled

experiments and CFD simulations, while a second experimental campaign at large scale is to be planned in cooperation with RISE (Sweden).

Moreover, evacuation simulations are being conducted in close cooperation with RS2N and Bureau Veritas (France) for evaluation of egress in connection with fire and smoke propagation on ro-ro ships.

Alex Royer just started his PhD on the use of Artificial Neural Networks (ANN) to approximate radiative heat transfer in a combustion chamber. Alex is graduated from the ISAT engineering school in Nevers (France). His study is conducted in cooperation with SAFRAN company. The

challenge is to speed up the simulation of this complex combined problem of combustion, with a special care brought to the radiation in the global heat and mass transfer mechanisms. This can be achieved using an adaption of the ANN methods.

Twitter: LEMTA (@Labo_Lemta) / LEMTA-OS Feux (@FeuxOs)

Web site: https://lemta.univ-lorraine.fr

Signed: Prof. Pascal Boulet, Prof. Anthony Collin, and Dr. Davood Zeinali, at LEMTA laboratory, University of Lorraine and CNRS.

News from the Warren Centre

The Warren Centre project: Professionalising Fire Safety Engineering

The Warren Centre Project: "Professionalising Fire Safety Engineering" was initiated in response to the Lacrosse fire in Melbourne in 2014 and reports of deep-rooted problems related to Fire Safety Engineering in the building sector in Australia. The project is a major collaboration between the Warren Centre, ARUP, the University of Queensland, University College London, RED Fire Engineers, SKIP Consulting, Scientific Fire Services, and some 40 other organisations from industry, government and academia.

Beginning work just before Grenfell, the project team have undertaken original, independent, evidence-based research on the urgent need to reform the professional structure of fire safety engineering. New insights were delivered on fire safety engineering regulation across Australian states, the education of Fire Safety Engineers internationally, the design methods used, the role of Fire Safety Engineers in complex buildings, and proposed competency standards for fire safety engineers.

The research delivered demonstrates why and how standards of practice and professionalism can be lifted for much improved safety. As a result of the substantial industry engagement, the projects recommendations reflect the collective opinion of a large cross section

of the fire engineering community. This is an important introspection into the profession of Fire Safety Engineering and the first of this type that has ever been undertaken. Outcomes reassert the importance of the professional engineer and tilt the balance for responsibility in achieving fire safety towards the educated and competent professional.



at one of the Warren Centre events







The findings and recommendations are reported in 8 reports which are all or will shortly be, available from the Warren Centre website. <u>https://www.sydney.edu.au/engineering/industry-and-community/the-warren-centre/fire-safety-engineering.html</u>.

A very quick summary of each of the reports (with brief comments as to whether the research and findings have potential international relevance) is as follows:

- Regulation Report¹ a review of the regulatory controls across all the Australian states and territories to show the lack of national consistency, and strengths and weaknesses affecting fire safety engineering practice (mostly relevant to Australia, but demonstrates regulatory failures which might be applicable when reviewing the regulatory systems in other countries)
- Education Report² a review of the current status of fire safety engineering education in Australia, the weaknesses in the existing competencies used by Engineers Australia and the IFE for professional accreditation, and the lack of sufficient education courses of the required quality in Australia, benchmarked against a summary of some 40 other fire safety engineering courses internationally (applicable internationally, particularly where competencies are not at world's best practice, and in cases where Fire Safety Engineering education is not strongly design oriented)
- Methods Report³ a technical evaluation of the Fire Safety Verification Method⁸ adopted into the building code in Australia , the need for a revised International Fire Engineering Guidelines⁹, and the value of practice notes issued by the Society of Fire Safety, fire brigades and others in Australia (more for Australia, except that some other countries seem to be considering VMs in a movement started in NZ)
- Roles Report⁴ based on extensive professional consultation within Australia, reviewing international evidence, and the work done for the three previous reports, development of proposed future roles and their definition for design fire safety engineers, peer reviewers, and fire safety engineers working in fire brigades who are involved in design reviews (issued initially as an Interim Report, now Final) (applicable for countries in which there needs to be a shift towards Fire Safety Engineers taking the creative lead on fire safety design and having a clear coordination role and "golden thread" follow through on fire safety design issues, not just reacting with analysis of a limited number of alternative solutions)
- Competency Report⁵ the development of a whole new set of professional competencies for Stage 1 and stage 2 accreditation of professional fire safety engineering in Australia, based on appropriate academic education and supervised professional experience. (applicable globally, builds on SFPE competencies¹², but takes to world's best practice new competencies in knowledge, skills and personal and professional attributes)
- Professional Development Report⁶ detailed recommendations on new fire safety engineering education initiatives required to drive the development of a sustainable and growing profession, with accreditation pathways, and career development opportunities (Final Draft) (generally applicable for growing a sustainable profession worldwide, with strong recommendations on reform of Fire Safety Engineering education)
- Professional Accreditation and Regulatory Reform Report⁷ development of clear recommendations for a co-regulatory system in which the professional bodies like Engineers Australia are responsible for all aspects of competency assessments, CPD and professional development, leaving governments to register fire safety engineers, provide permission to practice in the jurisdictions and manage sanctions (Final Draft) (more specifically for Australia, but potentially applicable for countries where professional standards and accreditation are not well controlled)
- Final Report⁸ this is a wrap of all the reports, including all key recommendations, with timeframes for implementation, and matters of transition. (Final Draft)

In addition to these 8 reports which are part of the Projects main research, the Warren Centre was also commissioned by the Australian **FIRE SAFETY ENGINEERING REPORT SERIES - BY THE WARREN CENTRE**

Building Codes Board to evaluate 4 potential Fire Safety Engineering guidance documents that might be used in place of an updated International Fire Engineering Guidelines¹⁰.

Some 4000 copies of these individual Warren Centre Reports have been circulated online to date. Conferences and public forums have promulgated the results and the research has received significant interest internationally.

Submissions to governments and direct testimony to Parliamentary hearings have

The Warren Centre project has resulted in the publication of 9 reports on the subject of professionalizing Fire Safety Engineering

supported fundamental legislative changes in Victoria through the introduction of the Professional Engineers Registration Bill 2019 and in New South Wales through the passing of the Design and Building Practitioners Bill 2019. Both of these bills require the registration of professional Fire Safety Engineering practitioners. This brings consistency to the registration requirements in eastern Australia. The Project recommendations support the implementation of this legislation, which will forever change the status of the entire engineering profession in Australia, not just Fire Safety Engineering.

References

- 1. Kip, S., Wynne-Jones, M., Johnson, P., (2019) The State of FSE Regulation, Control and Accreditation in Australia; The Warren Centre for Advanced Engineering, Sydney.
- 2. Torero J., Lange, D., Horasan, M., Osorio, A., Maluk, C., Hidalgo, J., Johnson, P., (2019) The Education Report: Current Status of Education, Training and Stated Competencies for Fire Safety Engineers; The Warren Centre for Advanced Engineering, Sydney
- 3. Lange, D., Torero, J., Osorio, A., Lobel, N., Maluk, C., Hidalgo, J., (2019) Fire Safety Engineering The Methods Report, The Warren Centre for Advanced Engineering, Sydney
- 4. Fire Safety Verification Method A Handbook, Australian Building Codes Board, Canberra, 2019
- 5. Lange, D., Torero, J., Johnson, P., The Roles Report (2020), The Warren Centre for Advanced Engineering, Sydney
- 6. Lange, David; Torero, Jose; Maluk, Cristian and Hidalgo, Juan: (2020) Fire Safety Engineering Competencies Report; The Warren Centre for Advanced Engineering, Sydney
- 7. Lange, D., Johnson, P., Torero, J., Hidalgo, J., Maluk, C., Wiesner, F., Professional Development Report; Fire Safety Education and Training Career Development and Resource/Skill Constraints, (2020), The Warren Centre for Advanced Engineering, Sydney (draft)
- 8. Hui, MC., Lobel, N., Lange, D., Torero, J., Johnson, P., (2020) Professional Accreditation and Regulatory Reform Report; The Warren Centre for Advanced Engineering, Sydney (draft)
- 9. Lange, D., Torero, J., Johnson, P., The Final Report, (2020), The Warren Centre for Advanced Engineering, Sydney (draft)
- 10. Fire Safety Engineering Comparison of FSE Guidance Documents, Report for Australian Building Codes Board, (2019), The Warren Centre for Advanced Engineering, Sydney,

Signed: Ashley Brinson, CEO of the Warren Centre; Peter Johnson, ARUP Australia; Dr David Lange, the University of Queensland; and Professor Jose Torero, University College London

News from CERIDES – Excellence in Innovation and Technology, European University Cyprus.

Consultancy and Training

Further to previous engagement in high level consultancy work (Prof Georgios Boustras to the Ministerial Council of the Republic of Cyprus on the modernization of firefighting capacity of the Republic and Prof Georgios Boustras to the World Bank on the modernization of fire licensing capacity of the Hellenic Republic), CERIDES – Excellence

in Innovation and Technology is involved in the establishment of a new Fire Service Academy in the Republic of Cyprus. In particular, Dr Klelia Petrou and Prof Georgios Boustras were in charge of developing the curriculum of the newly inaugurated Fire Service Academy. 56 new fire fighters will join the academy in September 2020.

Project Work

CERIDES – Excellence in Innovation and Technology, European University Cyprus hosts 2 ESRs from the **Marie Sklodowska Curie ITN funded "**<u>Pyrolife</u>". Ms Judith Kirschner (ESR11) in Fire Resilient Governance and Ms Pooja Pandey (ESR 13) in European Interagency Exchange are the EUC team in this unique project which is coordinated by Dr Cathelijne Stoof from Wageningen University.

In July 1st 2020, CERIDES – Excellence in Innovation and Technology kicked off a brand new **H2020 project as coordinator. RESPOND-A** / Next-generation equipment tools and mission-critical strategies for First Responders is funded under the SU-DRS02-2018-2019-2020, Technologies for first responders call of Horizon 2020. With the evolving threat of climate change and the consequences of industrial accidents to becoming more severe, there is an increasing need for First Responders to access reliable and agile information management systems that offer as higher Situational Awareness and better Common Operational Picture. To match with current trends, the



RESPOND-A project aims at developing holistic and easy-to-use solutions for First Responders by bringing together the complementary strengths of its Investigators in 5G wireless communications, Augmented and Virtual Reality, autonomous robot and unmanned aerial vehicle coordination, intelligent wearable sensors and smart monitoring, geovisual analytics and immersive geospatial data analysis, passive and active localisation and tracking, and interactive multi-view 3600 video streaming. The synergy of such cutting-edge technological advancements is likely to provide high-end and continuous flows of data, voice and video information to First Responders and their Command & Control Centers for predicting and assessing the various incidents readily and reliably, and saving lives more efficiently and effectively, while maximising the safeguarding of themselves, before, during and after disasters. To this end, RESPOND-A envisions at exercising First Responders for getting familiar with the project technological outcomes, and demonstrating their real-world performance and effectiveness in the classified training facilities of our Responder Partners under hydrometeorological, geophysical and technological disaster scenarios.

A large scale implementation exercise, focusing on a WUI scenario will take part in year 3 of the project. It is anticipated that this project will generate a number of new jobs.

Signed: Prof. George Boustras, European University Cyprus

News from Stellenbosch University

As the population, mining activities, informal settlements, cities and industrial centres in Africa continue to grow at an alarming rate there is an important question to be asked: how can we keep Africa fire safe? In the developed world it can be seen that fire safety engineering (FSE) has made significant progress in protecting people, assets and the environment from the destructive effects of fire. The consultants and practitioners developing FSE solutions have often been trained through formal university programs. However, the FSE degree programmes in countries such as the USA and UK are many decades old, require extensive resources, and have highly trained staff members with rare skills. Until recently Africa had virtually no formalised university training for consulting fire safety engineers. This article gives a short introduction to fire safety educational work that has been developing on the continent in the past few years.

Structural fire engineering research at Stellenbosch University (located in the beautiful winelands outside of Cape Town, South Africa) started in 2014 with a single PhD study. Through this study and ongoing research other students and team members have gradually became involved. In 2017 the Fire Engineering Research Unit at Stellenbosch University (FireSUN) was founded, with a focus on developing technical expertise in fire safety. The team has now expanded to currently have around 20 students, including 6 PhDs, 7-9 research masters students, 2 postdoctoral fellows and 4-5 final year students working on fire safety research topics. Two formal postgraduate taught courses have been developed, namely structural fire engineering and fire dynamics. A third course on the fundamentals of fire safety engineering design is currently being developed.

However, even more exciting than the development of FSE research at one university is the fact that FSE is slowly starting to have an impact in multiple countries. In 2020 students and staff from the University of Zambia, University of Nairobi (Kenya), and Central University of Technology (Bloemfontein, South Africa) will be attending some of the courses being developed. Furthermore, students and consultants from other countries are starting to

get involved, such as in Namibia and Nigeria. The location of these groups is shown in Figure 1. All this represents a big step forward in a field that has been heavily neglected on the continent.

Support for the work

Fire safety education not only requires multiple staff members but also expensive equipment and laboratories. Hence, there has been a number of interim steps in developing the capacity to undertake research, teaching and testing. A large project on informal settlement fire safety in collaboration with the University of Edinburgh, sponsored by the EPSRC (UK), helped the initial work. Additional assistance was then obtained from the Lloyd's Register Foundation (UK) to specifically focus on the educational development of fire engineering, through assisting in sponsoring the creation of two taught postgraduate courses (structural fire engineering & fire dynamics). In 2020 a second educational grant has been received through the Engineering X program by the Royal Academy of Engineers and Lloyd's Register Foundation together. This is allowing for the creation of a third taught course on the fundamentals of fire safety engineering (to be rolled out late 2021/early 2022), and to also make the new courses 100% online, such that they can become more widely accessible. Due to the limited staff capacity available, and the large geographic distances between



Figure 1: Locations of universities or individuals getting involved in developing fire safety in Africa. Hopefully the work will spread across much of the continent.

participants, the team has rapidly embraced online teaching and technology to promote FSE education, as shown in Figure 2. Local fire testing has been made possible through generous support by a local fire testing laboratory in Cape Town, Ignis Testing. It has been exciting that a small research team has been provided with access to standard fire test furnaces and other facilities.

The development of highly technical postgraduate courses is also not possible without technical input and assistance. To this end the University of Maryland, along with academics from other universities, have provided initial guidance on the establishment of fire dynamics courses. Prof Erica Fischer from Oregon State University visited South Africa in 2019 and helped run two structural design seminars for industry participants. The National Fire Protection Association (NFPA) has provided advisory assistance and access to material to bolster the efforts. The SFPE core competencies and degree curricula have formed the basis for guiding the development of educational content (although it will be a number of years before all aspects can be addressed).



Figure 2: Embracing the electronic world - the development of fire engineering has rapidly gone online at Stellenbosch University. Here are YouTube explanations on the calculation of the configuration factor for radiative heat transfer and Eurocode parametric fires.

We're not always as far behind as you may think...

An advantage of having a young, energetic team in a country/continent with minimal academic fire engineering knowledge is that a variety of unusual projects have been started, with some of these being shown in Figure 3. This has allowed innovative research to be conducted in relatively new fields. Some of these include:

- Informal settlement fire safety testing, modelling and development of guidelines
- Development of fire spread models for large informal settlement fires
- Development of fire safety products using 3D printed concrete

- Testing of Ecobrick walls in fire. (Ecobricks are highly popular plastic bottles that are filled with non-recyclable plastics and waste material, and then built into walls such as for schools and crèches in developing countries. [Many a fire engineer reading this is currently worried about the combustible plastics being put into public buildings without understanding their usage.])
- Development of novel cellular steel structures through large-scale testing. The largest standard testing furnace in Africa (4x6m) was developed by Ignis Testing Laboratory (a local partner) to assist this work.
- Understanding fires on passenger trains based on the extensive number of arson attacks that have occurred in South Africa. This being done under the national passenger train agency.
- Timber structures in fire, including connection modelling.
- Analysis and benchmarking of test standards for South Africa.
- Computational modelling of large structures.
- Fire modelling
- Petrochemical facility fire safety

Conclusions

There is a huge fire safety educational mountain to be climbed to develop a thorough fire safety engineering curriculum at multiple universities on the African continent. However, there is progress, and hopefully in the years to come Africa can start solving her own fire safety problems by producing well-trained engineers. Partnerships with leaders around the world is making all of this possible. For more information on the program, contact us at fire@sun.ac.za.

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Signed: Prof Richard Walls, Stellenbosch University, South Africa

Building Research Institute (ITB) - Poland

The last months have been like nothing before, as for all of the community. With COVID-19 having a lesser impact in Poland than for our neighbours, the economy shutdown and restrictions did not have an immediate significant impact on our operations. However, with the possible 2nd wave around the corner and limitations that will not be lifted soon, it isn't easy to estimate when we will come back to normal. While the shutdown of the fire laboratory was minimized, most of the researchers had to switch to remote offices in their homes, and a rotating schedule of 'office' – 'remote office' time is now introduced to maintain business and research integrity. The part of our work that suffered the most are international collaborations - international travel is almost not possible, and many of the experiments were postponed or cancelled. And for some reason, it is impossible to ship a package to Australia...

As the year has been rough on everyone, let us focus on the great stuff that happened in the Q1 & Q2 of 2020. Most importantly, we have finally openeed the newest Fire Research Department facility tunnel – the Jerzy A. Żurański Atmospheric Boundary Layer Wind Tunnel. The wind tunnel is named after our mentor and a friend – dr hab. Jerzy A. Żurański, Professor of ITB (1935 – 2017), who was a renowned wind expert in Poland and one of the founding fathers of polish wind engineering. The wind tunnel has a cross-section of 4 x 3 m and length of 10 m. It is placed within a large building, which acts as a recirculation zone for the tunnel. The construction of the inlet and outlet provide a very stable flow for precise atmospheric boundary layer creation. The tunnel will open possibilities to research wind and fire interaction, wind flow around buildings and structures and pollutant dispersion in urban environments. We also hope this tool can be useful in investigating various phenomena at Wildland-Urban Interface.



Figure 3: Examples of research or consultanting projects currently underway: (A) Large-scale testing on informal settlement dwellings, (B) model of a burning train in a manufacturing facility, (C & D) 3D printed concrete being tested for fire resistance, (E) charring of South African pine in a furnace test, (F) computational modelling of an informal settlement dwelling, (G) testing of Ecobrick walling systems, (H) benchmarking of suppression products for informal settlements (including bucket brigades and proprietary products).

The last months were a time of our intense grant application efforts. These include one NAWA (polish agency) post-doc application related to furnace testing; research programme on wind and fire coupled risk analysis and a joint project with Stellenbosch University (RPA) and West-Pomeranian Technical University (Poland) related to the fire safety of 3D printed concrete structures. We were also successful in obtaining funds from the internal ITB funding agency, including projects on the use of advanceddin computer techniques in data mining our vast archive of test results; test furnace virtualization and a digital twin of a furnace and projects related to smoke control in corridors. We hope that these new developments will be exciting to the international community.



The ITB Jerzy A. Zuranski Atmospheric Boundary Layer Wind Tunnel

Finally, in the last months our dr Wojciech Węgrzyński has been awarded 2020 Jack Watts Award for Outstanding Reviewer from the Fire Technology journal and SFPE 5 Under 35 Award from the SFPE. Our collaborator, Matt Bonner from Imperial College London, has been awarded the Best Student award from SFPE, for his research on the fire safety of facades performed jointly with the ITB. We are delighted with these awards and recognition of the excellent research conducted at the ITB.

Signed: Wojciech Wegrzynski, Building Research Institute

News from NFPA and the Fire Protection Research Foundation

FPRF Updates

- FPRF Webinar on "Modern Vehicle Hazards in Parking Garages and Vehicles" had a record attendance with 2,699 registrants from 90 countries, where 1,438 registrants from 78 countries attended live.
- Awards: Research team from Johns Hopkins University and University of Buffalo were awarded the 2019 Foundation Medal for the Digitized Fuel Load Survey in Buildings using Machine Vision project. The report can be downloaded <u>here</u>.
- Staff Update: Nathan Johansen, Graduate Student at Worcester Polytechnic Institute (WPI) joined FPRF as a Research Co-op for the Summer 2020.

Notice of New Fire Protection Research Foundation Reports

- Audible Alarm Signal Waking Effectiveness: Literature Review This report documents a comprehensive analysis undertaken on waking effectiveness of smoke alarms to determine an acceptable reduction in the sound pressure for low-frequency sounders that still provides superior waking effectiveness over high-frequency sounders. The report can be found <u>here</u>.
- Electrical Data Summit: Impact of Data on the Electrical World The overall goal of Electrical Data Summit was to evaluate the impact that emerging technologies and data-driven solutions can have on model electrical codes and standards and assess the value of universal data collection activities for the electrical safety infrastructure. The proceedings can be downloaded <u>here</u>.
- Safe Quantity of Open Medical Gas Storage in a Healthcare Facility Smoke Compartments This report addresses the hazards associated with medical gases through a review of incident case studies, relevant literature and a hazard assessment to evaluate the current code requirement in NFPA 99. The report can be found <u>here</u>.

Webinar on Crowd Management

Staff from NFPA's Data & Analytics group and the Research Foundation will present a webinar - **Using Data to Inform Crowd Management** on Thursday, November 12, 12:30 p.m. EDT. Crowd management has been a longstanding life safety challenge for both fire-related and non-fire emergencies in assembly occupancies. The lack of data-informed situational awareness to identify rapid changes in crowd density, movement, and other behaviors presents challenges to crowd managers. Although tramplings, crowd crushes, and other disasters lead to civilian deaths every year, modern technologies can enhance existing crowd management strategies. This webinar will present a proof-of-concept tool for data-informed crowd management and decision support, highlighting the collection, analysis, visualization, and reporting of crowd movement to inform near real-time crowd management strategies. Register at: https://zoom.us/webinar/register/WN_ZU3j451MTEuRGPci2LiKhw

Reports from the Applied Research Group

Several reports on aspects of the U.S. fire problem have been completed recently and posted on our website. The topics include school fires, vehicle fires, fires in buildings under construction, fire loss in the U.S. during 2019, large-loss fires and explosions in the U.S. in 2019 and firefighter deaths and injuries. They can all be found at https://www.nfpa.org/News-and-Research/Data-research-and-tools/US-Fire-Problem.

Signed: Eric Llama (NFPA) and Amanda Kimball (FPRF)

News from Pell Frischmann

Dr. Rodrigo Machado Tavares joined Pell Frischmann (<u>http://pellfrischmann.com</u>) back in March this year, where he is leading the Fire Engineering team. With his leadership, the Fire Engineering team at Pell Frischmann has already established a collaborative relationship with the Fire Safety Engineering Group (FSEG: <u>https://fseg.gre.ac.uk</u>) from The University of Greenwich. He says: "*I have a good long-term relationship with FSEG, and it is part of our plan to extend and strength this relationship between FSEG and Pell Frischmann, not only via using FSEG computer models, but also in developing R&D proposals for addressing real problems in our societies covering the fire safety discipline based on a holistic approach."*



It has been a peculiar year so far, nevertheless, 2020 has been also a very exciting year for the Fire Engineering team at Pell Frischmann which has been growing and expanding its capabilities as well to cover Structural Fire Engineering.

More good news to come very soon... keep safe and be happy!

Signed: Rodrigo Machado Tavares, Pell Frischmann

UPCOMING CONFERENCES

6th International Conference on Fires in Vehicles (FIVE 2020) – now taking place virtually - December 15 (afternoon) and December 16 (morning) (CET, UCT+1)

Earlier this year, FIVE 2020 was postponed until March 25-26, 2021, due to the COVID-19 pandemic. However, as the situation still remains very uncertain, e.g. how the pandemic will evolve, when a vaccine will be available, when basic restrictions will ease, etc., we have taken the difficult decision to cancel the event in Amsterdam.

It is unfortunate that we cannot meet physically at FIVE 2020, but we did have a lot of interesting presentations planned so we move online and make FIVE 2020 a digital conference. The online event will be **free of charge** for all participants. Save the dates: **December 15** (afternoon) and **December 16** (morning) (CET, UCT+1).

You can find the conference program here: <u>https://www.ri.se/en/five/five2020?utm campaign=FIVE+-</u> +International+conference+on+Fires+in+vehicles&utm medium=email&utm source=BizWizard

You can find th link to register at this link:. <u>https://www.ri.se/en/five/registration?utm campaign=FIVE+-</u> +International+conference+on+Fires+in+vehicles&utm medium=email&utm source=BizWizard

Registration closes December 11, 2020. See the conference website at https://firesinvehicles.com/registration/.

Fire and Materials 2021 - 16th International Conference and Exhibition - POSTPONED

Regretfully we must postpone the 16th Fire and Materials conference, which was due to be held in San Francisco on 1-3 February 2021. The consequences of the COVID-19 and the regulatory, hosting, travel and quarantines restrictions both in the US and in the home countries of our delegates make it impossible to convene the meeting at that time.

We did have enormous interest in the event with record numbers of abstracts submitted so this is very disappointing for all of us.. We will re-plan and convene this event in San Francisco, but timing is very uncertain

because of the unknown future epidemic and regulatory situation. As soon as we are confident that it is safe and sensible to do so we will re-schedule.

We apologize for any inconvenience especially to those of you who have submitted abstracts for consideration. Thank you for your kind support.

Best Regards, Steve Grayson, Conference Chair

Society of Fire Protection Engineers, 4th SFPE Europe Conference & Expo – 22-25 March 2021, Berlin (Germany)

SFPE is pleased to announce that its European Conference on Fire Safety Engineering will be held in Germany on March 24-25, 2021 at the Berlin Marriott Hotel. SFPE conferences have established a reputation globally as the premier events for keeping abreast of advancements in fire safety engineering. SFPE Europe has been



addressing the regional needs to facilitate greater networking, collaboration, and exchange among fire safety engineering professionals as well as a pursuit of technical knowledge and education.

This conference will be a significant benefit to all fire protection practitioners, such as engineers, designers, regulators, enforcers, insurers, developers and building owners and managers. Contributions and conference attendance on a global basis, and particularly from Europe are encouraged.

Check the SFPE website for details on registration, accommodations, etc. at https://www.sfpe.org.

International Conference on Electrical Fires (ICEF) – 15-16 April 2021, Porto Alegre (Brazil)

ICEF 2021 is an international conference for exchanging knowledge and new developments on electrical fires research and prevention. A significant number of fires has origin on faults and malfunctions in electrical installations. This can be mitigated by appropriate fire detection systems, use of improved fire behaviour materials, efficient building evacuation techniques, among others. In spite of this, a few has been done on reducing the fire risk of electrical installations. This Conference provides a unique opportunity to discuss how to prevent electrical fires ignitions and potential fire hazard on equipment and installations.



Conference topics include:

- Electrical fire hazard and risk assessment
- Electrical fires investigation
- Firefighting on energized installations
- Nuclear power plants

- Certification of electrical installations
- Electrical installations, equipment and materials
- Education on electrical fires

For any query, please do not hesitate to contact the Organizing Committee at the following e-mail address: <u>ICEF.organizing@gmail.com</u> (or organisational questions) or <u>ICEF.scientific@gmail.com</u> (for papers and scientific related questions). Register at <u>https://www.icef.online/</u>.

20th International Water Mist Conference (IWMC) – 21-22 April 2021, Warsaw (Poland)

IWMC 2021 will take place in Warsaw, Poland, on 21st and 22nd April 2021. The conference hotel will be the Regent Warsaw. The conference webpage and the registration platform will be activated on 30th October 2020. IWMA will offer reduced prices up to 15th January 2021. Day one of the conference will be Applications Day and can be booked separately. Day two will primarily focus on the scientific side of the technology.

Deadline for submissions for the IWMA Young Talent Award is 30th December 2020. In 2021 this award will go to the author of the best master thesis dealing with water mist.

See details on the website at www.iwma.net.

Nordic Fire & Safety Days (NFSD) - 15-16 June 2021, Lund (Sweden)

The Nordic Fire & Safety Days is the meeting point for the Fire and Safety community in the Nordic countries. NFSD is an event carried out by the Nordic universities and research institutes dealing with risk and fire safety - RISE Research Institutes of Sweden, together with Technical University of Denmark (DTU), Norwegian University of Science and Technology, Lund University, Aalto University, Luleå University, University of Stavanger University

College Haugesund and Iceland University as well as VTT Technical Research Centre of Finland Ltd and the Danish Institute of Fire and Security Technology.

The days focus on risk and fire research in the Nordic countries. Contributions from other countries are more than welcome. The conference language is English. All earlier NFSD conferences were known for giving a great opportunities to tie bands between fire industry, municipalities, research institutes and universities. At the Nordic Fire & Safety Days you will have the opportunity to get information on different aspects within fire research.

The Call for Papers will be released soon. For details on the conference, see <u>https://app.bwz.se/ri/b/v/?vid=2998&v=1&share=1&ucrc=2BC1591722</u>.

AUBE '21 / SUPDET® 2021 - 21-23 September 2021, Duisberg (Germany)

AUBE '21/SUPDET 2021, a joint conference of the 17th International Conference on Automatic Fire Detection (AUBE '21) and the Suppression, Detection and Signaling Research and Applications Symposium (SUPDET 2021) will be jointly hosted by the Department of Communication Systems NTS at the University of Duisburg-Essen, Germany and the Fire Protection Research Foundation. The combination of these two international conferences continues the tradition of presenting the latest developments in research, technology and applications for the fire protection community. The joint conference will be held September 21-23, 2021 in Duisberg, Germany.

Registration information will be available soon on the conference website: <u>http://nts.uni-duisburg-essen.de/aube/aube21/aube21.html</u>.

CALLS FOR PAPERS/ABSTRACTS

Suppression, Detection and Signaling Research and Applications Conference (SUPDET 2021) & 17th International Conference on Automatic Fire Detection (AUBE '21)

The Department of Communication Systems NTS at the University of Duisburg-Essen, Germany, is pleased to announce that the 17th International Conference on Automatic Fire Detection' (AUBE '21) will be held jointly with the Fire Protection Research Foundation's Suppression, Detection and Signaling Research and Applications Symposium (SUPDET 2021).

SUPDET/AUBE will address the latest developments in research, technology, and applications for the fire protection community. Interested presenters are asked to submit an extended abstract (three pages) by email no later than December 31, 2020. For the complete call, see https://www.nfpa.org/-/media/Files/News-and-Research/Resources/Research-Foundation/Symposia/2021-SUPDET/SupDetAUBE21CallforPapers.ashx

The conference will be held September 21-23, 2021 at the University of Duisburg-Essen (UDE), Duisburg, Germany.

UPCOMING EVENTS -2020-2021

<u>2020</u>

Nov 9 or 10 IAFSS Large Outdoor Fires and the Built Environment (LOF&BE) Webinar Series - 8 am Tokyo (Nov. 9, 6 pm US East Coast: 11 pm London) Register at: <u>https://forms.gle/bDcHsbcV1RZ1Srz28</u>

Dec 15-16 6th International Conference on Fires in Vehicles (FIVE 2020) – Virtual – <u>https://firesinvehicles.com/</u>

<u>2021</u>

- April 21-22 20th International Water Mist Conference (IWMC) Warsaw (Poland) www.iwma.net
- Sep 21-23 Suppression, Detection and Signaling Research and Applications Symposium (SUPDET 2021) and 17th International Conference on Automatic Fire Detection (AUBE '21) - Duisburg (Germany) https://www.nfpa.org/supdet

JOB POSTINGS ON THE IAFSS WEBSITE

Sandia National Laboratories (USA) is seeking a Risk Analysis Postdoctoral Appointee to conduct fire risk research in alternative fuels, nuclear power and other critical infrastructure. The position requires, among other things, a PhD in Electrical, Chemical, Mechanical or Nuclear Engineering, Mathematics or a related field. For details, see the full description at:

https://cg.sandia.gov/psc/applicant/EMPLOYEE/HRMS/c/HRS_HRAM_FL.HRS_CG_SEARCH_FL.GBL?Page=HRS_APP_SCHJOB_FL&Action=U

FM Global, Norwood MA (USA) is seeking a senior research engineer/scientist. The purpose of this position is to develop new scientific knowledge, engineering technologies, and engineering solutions to problems in fire protection, which can be used an applied by FM Global for mitigating commercial property loss. The position requires, among other things, an M.S. or PhD in Mechanical, Chemical, Aerospace Engineering or related fields and a strong background in combustion, fluid mechanics, heat transer and applied mathematics. Title and salary are commensurate with qualifications and experience. See the complete job description and the direct application at: https://jobs-fmglobal.icims.com/jobs/10021/senior-research-

scientist/job?mode=view&mobile=false&width=787&height=500&bga=true&needsRedirect=false&jan1offset=-300&jun1offset=-240

Worcester Polytechnic Institute (USA)'s Fire Protection Engineering Program is seeking a postdoctoral fellow to conduct research in the area of wildland fire behavior and particularly on the multi-scale physics of the interactions between fire, wind and vegetation. The primary responsibility will be to support existing research projects related to wind-tunnel experiments in the laboratory and in the field. Applications and associated information are requested to be submitted by September 1st, 2020 but will be accepted until the position is filled. The target start date of this position is October 1st, 2020. For complete job posting and to apply, see: https://wpi.wd5.myworkdayjobs.com/WPI External Career Site/job/Worcester/Post-Doctoral-Fellow_R0001069

Remember, you can always check the website for current job postings at the bottom of the front page.

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, <u>rfahy@nfpa.org</u>).

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. 46), the deadline for submissions is February 28, 2021.



http://www.iafss.org

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