



## IN THIS ISSUE

### Letter from the Chair

### Letter from the Immediate Past Chair

### News from IAFSS

10th IAFSS Symposium, University of Maryland  
 Drysdale Award  
 10th Symposium Volume  
 Summary of the IAFSS Workshop on Fire and Structures  
 Summary of the IAFSS Workshop on Pyrolysis Models  
 Summary of the Workshop on Human Behavior  
 11th IAFSS Symposium 2014 in Canterbury  
 12th IAFSS Symposium in Lund  
 IAFSS On-Line

### News from other Institutions

AOAFST  
 University of Cantabria  
 University of Canterbury  
 University of Central Lancashire  
 University of California  
 University of Edinburgh  
 FM Global  
 Japan Association for Fire Science and Engineering  
 University of Maryland  
 NIST  
 NFPA  
 Lund University  
 SP  
 Waseda University  
 Universidad Pontificia de Comillas  
 Int Master of Science in Fire Safety Engineering

### Featured Articles

### Conference Reports

### Call for Papers

### Conferences and Upcoming Events

### New Publications

### Jobs

### Obituaries

## EDITORIAL BOARD

### **Editor-in-Chief**

Guillermo Rein (UK)

### **Associate Editors**

Patrick van Hees (Sweden),  
 Ai Sekizawa (Japan),  
 Michael Spearpoint (New Zealand),  
 Jack Watts (USA),

### **Contributing Editors**

Marcos Chaos (USA),  
 Wan-ki Chow (Hong Kong)  
 Rita Fahy (USA),  
 Michael Gollner, (USA),  
 Anthony Hammins (USA),  
 David Lange (Sweden),  
 Mariano Lazaro (Spain),  
 David Rush (UK),  
 Albert Simeoni (USA),  
 Anna Stec (UK),  
 Peter Sunderland (USA),  
 Russ Thomas (Canada).

## Call for Contributions to the Newsletter

To succeed with the Newsletter, it is important that we receive contributions from the IAFSS membership at large. Please consider submitting information, articles, letters and photos related to fire safety science. These could be collected from your group, department, institution, country or region.

There will be two issues per year; one around July, the other around January. For the next issue (issue number 32), the deadline for submissions is Jan 10, 2012. We are interested in a wide range of contributions. Please send your contributions to the Editor-in-Chief Dr Guillermo Rein at <[G.Rein@ed.ac.uk](mailto:G.Rein@ed.ac.uk)>.

***Our cover** is illustrated with the winner of the 2011 10th IAFSS Symposium Photo Competition. This “fan of fire” visually displays the effect gravity has on upward flame spread over thermally-thick materials (Polymethyl Methacrylate). These tests have helped in finding critical inclinations with maximum flame spread rates.*

## Letter from the Chair

Our Association has grown significantly over last years in terms of its membership and activities. No doubt you have noticed increases in the numbers and size of the papers presented at the last Symposium, expansion of the workshop program and new awards, new IAFSS Digital Community that includes the IAFSS Digital Archives and the prototype of the IAFSS Federated Search Engine, and finally a new format of this Newsletter. Some of these initiatives have grown out of ideas, vision and hard work of our past Chairman, Dr Craig Beyler. He has transformed IAFSS into a modern Association that has many of the best and brightest minds in fire safety science and engineering. Let me express thanks and gratitude to Dr Beyler on behalf of all of us.

For me the most important features of our Association are its commitment to improve fire safety, its devotion to research excellence, its international nature, its dedication to developing educational programs to train new generations of fire safety engineers and scientists, as well as its willingness to embrace new technology to serve the membership and community around the world.



### **Prof Bogdan Dlugogorski, Chair IAFSS and University of Newcastle (Australia)**

I wish to maintain our attention to excellence in research where it already exists, and intend to work with fire safety scientists in countries which are now building up their capability to study fires. I hope that we will continue with reaching out to all fire scientists around the world encouraging them to attend the Fire Safety Symposia, with the Symposia retaining and expanding their workshops and the English mentoring scheme. For many years, the Asia-Oceania region of the Association has been organizing its own Symposia on Fire Science and Technology, usually in midterm between the meetings of the IAFSS. The Symposia on Fire Science and Technology have worked well by providing tribunes for presentation of solutions to local fire problems and affording opportunities for younger researchers to polish their English expression. But the concept of local symposia has not spread to other regions of the world where we operate, for reasons that remain to be elucidated.

Historically, the outcomes of our work have been published in the Proceedings of Fire Safety Symposia and in the Fire Safety Journal. Very high quality of the articles included in the Proceedings and in the Journal testifies to excellence of the authors and to the dedication of the editors. We need to maintain a focus on research quality to ensure that the Proceedings and the Journal retain their status, as the leading publications in our field. The time has come to examine whether the publication portfolio of the Association needs modifying and expanding. In particular, whether the Proceedings of the Fire Safety Symposia should be morphed into a proper archival journal, as done by our colleagues at the Combustion Institute, and whether the Association should institute a new review journal.

Over the past weeks, the IAFSS mailing list has been promulgating a discussion about visibility criterion in smoke and the nexus between the predictions of computer codes and building approvals. Since founding of the Association, computer models have perhaps engendered the biggest revolution in our field. They require skilful and honest engineers to operate them, and rely on continuous flux of new scientific findings to improve their predictions. This discussion has stressed to me again the importance of the Association contributing to the development of educational programs in fire safety science and engineering that are offered at universities around the world. The IAFSS Committee has formally resolved to introduce free student membership in the Association.

Under Dr Beyler's leadership, the Association deployed digital technology to enhance its services to the membership and the community. Fire Research Notes, which had published results of the pioneering research, have been fully digitized, likewise the Proceedings of the Fire Safety and Asia-Oceania Symposia. This has been a significant effort. The IAFSS Committee has voted to make the Proceedings freely accessible online. Much remains to be done, especially in converting the prototyped Federated Search Engine into tools that increase our daily productivity. I need to thank and congratulate Terry Fay and Amanda Robbins for their contributions.

The Bylaws of the Association have served us well for more than a quarter of a century, constituting the foundation of our activities. They were written just before the computerization. As a natural evolution, some of the Articles may need to be revisited and their wording adjusted to continue underpinning our endeavors well into the future. In due course, I will consult with you about these adjustments. The new Nominating Committee of the Association has been established early in this term to help re-examine our nomination process, and contribute new ideas and suggestions. The Nominating Committee is chaired by Dr Beyler and its membership comprises Dr Karen Boyce (Ulster), Professor Dougal Drysdale (Edinburgh), Dr William Grosshandler (NIST) and Professor Ai Sekizawa (Tokyo).

May I conclude this letter by encouraging you to contact me directly with your suggestions and advice, on [Bogdan.Dlugogorski@newcastle.edu.au](mailto:Bogdan.Dlugogorski@newcastle.edu.au)

*Signed: Bogdan Dlugogorski, Chair IAFSS and University of Newcastle, Australia*

## Letter from the Immediate Past Chair

As I end my six years as the Chair of the IAFSS Committee, I want to congratulate Prof Dlugogorski upon his election as the new Chair of the IAFSS Committee. He will have my full support as he works to enhance the IAFSS in its service to the membership and the fire safety science community. I encourage all members to actively engage with IAFSS in its activities and initiatives.

The past six years have seen a lot of changes at IAFSS. We developed the digital archives which include over 2,000 papers, including all paper from Fire Safety Science, the Proceedings of the Asia-Oceania Symposium on Fire Science and Technology, and the Fire Research Notes collection from the old UK Fire Research Station. This involved development of the digital archive website by Terry Fay, as well as scanning, OCR'ing, and indexing all the papers.

IAFSS joined CrossRef and integrated Fire Safety Science into the CrossRef system, assigning and registering DOIs for all Fire Safety Science papers. In the past three years, over 13,000 citations from Fire Safety Science papers have been submitted into the CrossRef system. This involved a serious effort performed by Terry Fay and Matthew Beyler. This will facilitate forward linking of citations via CrossRef, to be included in the forthcoming new version of the IAFSS Digital Archives. This feature will be valuable to users and will provide authors with important data concerning the citation of their work. After initially instituting on-line access to Fire Safety Science and AOAFST Symposium papers as a member benefit, the IAFSS Committee recently voted to make the IAFSS Digital Archive open to the public. This will maximize the utility of the collection to the broader community and to disseminate the work of authors as broadly as possible.

Over the past two symposia, the size of the papers has increased by 50% with an increase in both the page size and page count. In addition, in Volumes 9 and 10 of Fire Safety Science, DOI's have been included in reference lists of the papers to facilitate finding and accessing the references on-line. IAFSS was ahead of the curve in the technical publishing industry in the inclusion of DOI's in reference lists.

The 9th Symposium, held at Karlsruhe University, and the 10th Symposium, held at the University of Maryland College Park campus, were definite successes due to the

contributions of countless individuals and organizations. There were about 350 attendees at both symposia, and both symposia included three parallel sessions of peer reviewed papers in addition to the invited lectures presented to all participants in a single session format. The posters were presented in two afternoon sessions. Workshops were first instituted at the Karlsruhe symposium and were expanded from three to six at the University of Maryland symposium. We have been blessed with excellent volume editors, Björn Karlsson and Michael Spearpoint, who have assured timely publication of the volumes, and Terry Fay has achieved timely on-line publication as well.

After a long term decline to less than 250 members, at the time of the 10th Symposium IAFSS membership reached 500 members for the first time. This is a definite sign of the good health of the organization and the vigorous recruiting by members. Continue to spread the word.

The newsletter, edited by Dr Jack Watts over the past three years, continued to be published twice a year with substantial content from within IAFSS as well as the broader fire science community. The page count of the newsletter was 13-22 pages per issue, up from historical levels of about 8 pages. Jack instituted a team approach to the newsletter through the development of a team of associate editors from around the world (Prof Ali Rangwala, Dr Guillermo Rein, Prof Michael Spearpoint, Prof Patrick Van Hees, Prof W.K. Chow, and Prof Ai Sekizawa) to facilitate collection of news. At the 10th Symposium Dr Watts announced his retirement as newsletter editor and Prof Guillermo Rein was announced as the new editor.

Over the past few years, Prof Mario Fontana and Prof Bodzio Dlugogorski, with assistance of Prof Pat Pagni, have collected and published on the website both historical and process information concerning IAFSS awards. This provides easy access to awards information and will serve the IAFSS community going forward.

At the 10th Symposium, IAFSS instituted a new award, the Drysdale Award. This award honors extraordinary service to IAFSS. This award is named for Prof Dougal Drysdale as he retires from IAFSS Committee service in recognition of his significant accomplishments and service to the fire science community. The first award winner was Terry Fay for his development of the IAFSS Digital Archive system. The award is selected by the Chair of the IAFSS Committee.

During 2008-2011, planning for two new IAFSS initiatives, the IAFSS Digital Community and the IAFSS Federated Search Facility, was begun. Terry Fay headed the feasibility study for the Digital Community, an enhanced online IAFSS presence, and Dr Amanda Robbins headed the development of a

prototype Federated Search facility (see <http://www.fire-information.net/wiki/tiki-index.php>), a one stop on-line search site for the fire safety science literature. The IAFSS committee formally voted at the 10th Symposium to implement these innovations. These initiatives will be definite assets to IAFSS members and the fire safety science community at large. I urge that you investigate and participate in these activities.

During my two terms as Chair, the IAFSS committee met at each symposium as well as a midterm meeting. The committee met via a parallel session held at Interflam and the AOAFST symposia. This split meeting assured maximum participation by committee members from around the world.

With its 2007 symposium in Hong Kong and its 2010 symposium in Melbourne Australia, the Asia-Oceania Association for Fire Science and Technology (AOAFST) continues to be a vibrant regional IAFSS organization.

The current Chair is Prof W.K. Chow of Hong Kong Polytechnic University. It's been a definite pleasure to work with the active fire safety science community in Asia-Oceania.

IAFSS is blessed with a skilled and active Secretariat in the person of Carole Franks. She provides invaluable service and continuity to IAFSS. It has been a pleasure to work with her over my term.

As of this writing, I have completed my service as Chair. It has been an eventful six years and there is much more to do to continue to enhance the service that IAFSS provides to the fire science community and the membership. The ongoing goal is to make membership in IAFSS more valuable and to enhance the contributions that IAFSS can make to the fire science community and to fire safety around the world. With your ongoing support and participation, IAFSS is making a difference.

*Signed: Craig Beyler, Immediate Past Chair IAFSS and Hughes Associates*

## NEWS FROM IAFSS

### 10th IAFSS Symposium, University of Maryland

The Department of Fire Protection Engineering at the University of Maryland hosted the 10th Symposium of the International Association of Fire Safety Science on June 19-24 in the Adele H. Stamp Student Union building located on the University campus. Over 340 participants attended the Symposium, traveling from 25 countries (the Symposium featured approximately 155 participants from the US and Canada, 115 from Europe and 70 from Asia and Oceania). All technical papers

were available online prior to the meeting as preprints. Publication of the print version will occur within the coming months. You can relive some of the Symposium exploits by visiting the Symposium Facebook page (<http://www.facebook.com/IAFSS>).

### Technical Program

The technical program included 6 workshops during Sunday afternoon and Friday morning sessions, 6 invited plenary lectures (including the Emmons Lecture and 5 keynote lectures), presentation of more than 109 papers during 3 parallel sessions, presentation of more than 100 posters during 2 special sessions, and presentation of 20 images for the best fire image competition. Details can be found on the Symposium web site (<http://www.fpe.umd.edu/iafss-june11>).

Over 225 scientists and engineers from 23 countries provided 560 reviews for 216 papers (2.6 reviews per paper on average), leading to the acceptance of 110 papers. There were 67, 79, and 64 papers submitted from the Americas, Europe, and Asia/Oceania with an acceptance rate of 54%, 54% and 50%, respectively. Overall, 53% of papers were accepted. In order to enhance the quality of the proceedings and promote international goodwill, English language editing was offered to all accepted papers, and 15 volunteers helped mentor 14 papers.



**Prof Charles M. Fleischmann, one of six plenary speakers at the 10th IAFSS Symposium.**

The plenary lectures program provided a striking illustration of the richness and diversity of the fire research community: plenary speakers covered topics ranging from the fundamentals of fire science to the practical engineering concepts of fire safety design, and including a variety of configurations ranging from

compartment fires to earthquake-triggered fires and forest fires.

The 2011 Emmons Lecture was given by Prof Takeyoshi Tanaka from Kyoto University (Japan). The lecture provided an overview of the fires that resulted from the 8.9-magnitude earthquake and subsequent tsunami that devastated Japan on March 11 2011 (see Featured Article in this Newsletter). The lecture then proceeded to a presentation on performance-based design (Integration of Fire Risk Concept into Performance-Based Evacuation Safety Design of Buildings).

Carlos Fernández-Pello from the University of California at Berkeley (USA) made a presentation on ignition (On Fire Ignition). Margaret Simonson McNamee from SP Technical Research Institute (Sweden) made a presentation on sustainability applied to fire safety design (Evaluating the Impact of Fires on the Environment). Andre Marshall from the University of Maryland (USA) made a presentation on sprinkler sprays (Unraveling Fire Suppression Spray). Charles Fleischmann from the University of Canterbury (New Zealand) made a presentation on performance-based design (Is Prescription the Future of Performance Based Design?). Domingos Viegas from the University of Coimbra (Portugal) made a presentation on the state of the art on wildfire propagation (Overview of Forest Fire Propagation Research). Note that all 6 plenary presentations have been video recorded and are available on the Symposium web site <http://www.fpe.umd.edu/iafss-june11/downloads.html>.

## Workshop Program

The workshops program was expanded to include three technical workshops held Sunday afternoon before the start of the symposium, a student networking session on Sunday afternoon, and three workshops on Friday at the end of the symposium. The workshop program covered a wide range of topics, including: water-based suppression; human response (elevators); pyrolysis models; evacuation and fire models; fire safety education; and fire and structures. The workshops were well-attended with about 100 and 70 participants attending the Sunday and Friday Technical Workshops, respectively, and more than 50 attendees at the Student



Questions and answers during one of the parallel sessions.

Networking Workshop, representing more than half of the student attendees at the Symposium. More detailed reports on the workshops on fire and structures, pyrolysis models, and human response are published as well in this newsletter.

## Poster Session

About 120 posters and 20 images were presented during two lively and well attended poster sessions. The first poster session on June 21 was organized around several topical areas including fire dynamics; flame/fire spread; ignition; smoke and fire induced flows; and fire-related images. The second poster session on June 23 was organized around topical areas including fire investigation; fire sustainability and fire-structure interaction; detection and suppression; explosions, multi-phase phenomena and flame dynamics; human behavior and fire fighting; wildland/wildland-urban interface fires; and fire-related images. A series of best posters and images were selected for awards (see below).

## Awards

A number of distinguished awards were presented during the Symposium, including the following:

Howard W. Emmons Lectureship Award for Distinguished Achievement in Fire Safety Science to: Takeyoshi Tanaka, Kyoto University, Japan.

Kunio Kawagoe Gold Medal for Outstanding Lifelong Contributions to Fire Safety Science to: James Quintiere, The University of Maryland, USA.

Philip Thomas Silver Medal of Excellence for the Best Paper of the Previous Symposium to: Ning Ren, Andrew Blum, Ying Hui Zheng, Chi Do and Andre Marshall, The University of Maryland, USA, for their paper titled "Quantifying the Initial Spray from Fire Sprinklers".

IAFSS Best Thesis Award "Excellence in Research" for Best Masters or PhD Theses:

- Americas: Christopher Lautenberger, for the thesis titled "Generalized Pyrolysis Model for Combustible Solids", University of California, Berkeley, USA (2007).
- Europe and Africa: Angus Law, for the thesis titled "The Assessment and Response of Concrete Structures Subject to Fire", The University of Edinburgh, UK (2010).
- Asia and Oceania: Kai Chen, for the thesis titled "Formation of Toxic Pollutants in the Thermal Decomposition of the Sulfenimide Fungicides", The University of Newcastle, Australia (2011).

Several new and ad hoc awards and letters of appreciation were presented at the Symposium:

Dougal Drysdale Award for Extraordinary Service to the International Association for Fire Safety Science: Terry Fay, Hughes Associates Inc., USA in recognition of his development of the IAFSS digital archives system.

Honorable Mentions of the 2011 IAFSS Awards Committee:

- Chris Lautenberger, Esther Kim, Nicholas Dembsey and Carlos Fernández-Pello, University of California, Berkeley, USA, for their paper titled "The Role of Decomposition Kinetics in Pyrolysis Modeling- Application to a Fire Retardant Polyester Composite", published in the Proceedings of the 9th Symposium.
- Roger Harrison and Michael Spearpoint, University of Canterbury, New Zealand, for their paper titled "Characterization of Balcony Spill Plume Entrainment Using Physical Scale Modelling", published in the Proceedings of the 9th Symposium.

Several awards were presented for outstanding posters and images:

Best Fire Science Image Award: Mr. Michael Gollner (University of California, San Diego), X. Huang (UCSD), F. Williams (UCSD) and A. Rangwala (WPI): "Fan of Fire" (reproduced on the front cover of this newsletter).

Best Poster Award: Mr. Michael Gollner (University of California, San Diego), X. Huang (UCSD), A. Rangwala (WPI) and F. Williams (UCSD): "An experimental study of upward flame spread over inclined fuels"

Best Student Poster Awards:

- Mr. Cristian Maluk (The University of Edinburgh), L. Bisby (The University of Edinburgh), G. Terrasi (EMPA Dübendorf) and M. Green (Queen's University): "Bond Strength Degradation for CFRP Bars and Steel Prestressing Wires in Concrete at Elevated Temperature Fire Behaviour of Novel Concrete Structural Elements"
- Ms. Nele Tilley (Ghent University), S. Van de Vel and B. Merci (Ghent University): "CFD parameter variation study for smoke extraction in small-scale atria".

Letters of Appreciation for the Retiring Members of the IAFSS Committee: Dougal Drysdale, Guylène Proulx, Pierre Joulain, Suresh Kumar and Fred Mowrer.

The International FORUM of Fire Research Directors presented several awards, including:

The FORUM Sjölin Awards for Outstanding Contribution to the Science of Fire Safety

- 2011: Takeyoshi Tanaka, Kyoto University, Japan.
- 2010: Yuji Hasemi, Waseda University, Japan.
- 2009: Gunnar Heskestad, FM Global, USA.

The FORUM Student Travel Awards for the Best Student Papers Accepted for the Symposium

- Test Development, Diagnostics and Large Scale Experiments: Ying Zhen Li, for the paper titled "The Fire Growth Rate in a Ventilated Tunnel Fire".
- Human Factors and Risk Assessment: Tomoaki Nishino, for the paper titled "Modeling Recognition Degree of Refuges by Kyoto City Residents in Post-earthquake Fire Event".
- Fire Chemistry and Fire Toxicity: Sindra Summoogum, for the paper titled "Formation of Polychlorinated Dibenzo-*p*-Dioxins and Polychlorinated Dibenzofurans and Their Precursors in Fires of Pyrethroid Pesticide Alpha-Cypermethrin".
- Fire Physics and Fire Modeling: Zhibin Chen, for the paper titled "Large Eddy Simulation of Fire Dynamics with the Improved Eddy Dissipation Concept".

## Social Program

The Host Committee put together an exciting and busy social program. The program included a student networking session on Sunday afternoon, a Welcome reception on Sunday night; a dinner in Annapolis on Monday night (featuring traditional seafood - including crab - from the Chesapeake Bay); a reception in the Clarice Smith Performing Art Center on Tuesday night (featuring an a cappella singing group called the Chromatics, see <http://www.thechromatics.com>), a major league baseball game at the Washington Nationals Stadium on Wednesday night (the Washington Nationals won their game against the Seattle Mariners), and the Symposium banquet at the Samuel IV Riggs Alumni Center.



**Discussions during a coffee break**

## Proceedings Publication

The page count in the Symposium proceedings, *Fire Safety Science*, was increased by two pages in this volume, bringing the increases in length over the past two symposia to 50% above historic levels. Publication of the print version is expected within the next few months.

In the past three years, *Fire Safety Science* was fully integrated into CrossRef, with the deposition of over 13,000 citations from its papers into the CrossRef system. This will facilitate forward linking of citations via CrossRef, to be included in the forthcoming new version of the IAFSS Digital Archives. This feature will be valuable to users and will provide authors with important data concerning the citation of their work.

## Acknowledgements

The Symposium could not have happened without the time and effort of a small army of volunteers. The success of the symposium is the result of significant efforts by many individuals and organizations. Literally, hundreds of people assisted with the many parts of Symposium logistics, planning, and conduct. Special thanks are due to Mike Spearpoint, Volume Editor; Steve Gwynne, Workshop Coordinator; Bart Merci, Poster Session Coordinator; Terry Fay, Symposium Paper/Poster Website Coordinator; Bodzio Dlugogorski, Awards Committee Chair; Carole Franks, IAFSS Secretariat; and Craig Beyler, IAFSS Chair. Local host duties and responsibilities were handled by an enthusiastic team of approximately 30 University of Maryland student volunteers.

The Symposium was made possible in part thanks to the generous support of the following Sponsors: FM Global (platinum sponsor), the National Science Foundation (student sponsor), the University of Maryland's A. James Clark School of Engineering and the Department of Fire Protection Engineering (gold sponsors), *Fire Technology* and Springer (poster session sponsors) and the Institution of Fire Engineers (sponsor).

The Symposium also featured the following exhibitors: FireTEC, Fire Technology (Springer), Fire Testing Technology Ltd., Southwest Research Institute, and The Govmark Organization.

*Signed: Arnaud Trouve, Chair of the Local Arrangements Committee, Nick Dembsey, Chair, Technical Program Committee, and Anthony Hamins, Symposium Organizing Chair*

## Drysdale Award

As Prof Dougal Drysdale retires from IAFSS Committee service, the IAFSS has instituted an award in his name to honor his many contributions to IAFSS and the fire safety science community. As the author of three editions of *An Introduction to Fire Dynamics*, as the long time editor of *Fire Safety Journal*, as a section editor of the *SFPE Handbook of Fire Protection Engineering*, as a long time member of the faculty of the University of Edinburgh, and as a member and chair of the IAFSS Committee, Dougal has provided technical, educational, and organizational leadership in our field over his long and productive career. In all his many contributions to our field, his generosity in helping others is always in evidence.

The IAFSS has many dedicated volunteers who contribute to the health and success of IAFSS. The Drysdale Award honors extraordinary service to IAFSS. The award is selected by the Chair of the IAFSS Committee and is presented at each IAFSS Symposium.

The first award winner was Terry Fay for his development of the IAFSS Digital Archive system. Terry was the architect of this on-line collection of over 2000 papers from Fire Safety Science, the Proceedings of the Asia-Oceania Symposium on Fire Science and Technology, and the Fire Research Notes collection from the old UK Fire Research Station. Terry also spearheaded the integration of Fire Safety Science into the DOI/CrossRef system. These efforts have been an important element of bringing IAFSS into the digital age.

*Signed: Craig Beyler, Immediate Past Chair*

## 10th Symposium Volume

After a very successful 10th symposium I have the job of putting together the printed copy of the proceedings. At the time of writing the material is with the printers so hopefully bound copies will be available soon. The proceedings includes the 109 fully peer reviewed papers, the six invited papers, a comprehensive record of the numerous awards presented at the first ten symposia plus other information. Authors were given the option to publish papers up to 14 pages long rather than the 12 page limit set for the previous symposium. The extended page length plus the accompanying support material has meant the printed copy runs in excess of 1,600 pages.



I would like to thank all of the authors for their patience during the editorial process. Many authors had to deal with my sometimes very nit-picky changes but I hope the effort has led to a high quality publication. I realize that having to upload all of their references into the new IAFSS bibliographic database was an additional task but authors will see the benefit in the future as they will be able to track who is citing their work.

Of course I could not have done my job without the help of many other people. Greg Baker and Kai-Yuan Li served as assistant editors. Greg helped me deal with a whole range of tricky grammar questions by having somebody to elicit a second opinion from and Kai assisted with checking the page layout. Terry Fay set up the bibliographic database site and assembled the web-based preprint versions of the papers. I would like to thank Björn Karlsson, editor of the 9th IAFSS Symposium Volume, for his valuable advice and suggestions and finally the support of the 10th symposium organizing committee.

If you are planning to submit a paper to the next conference then please do not forget to help the next editor by carefully following the template and formatting instructions; sourcing DOIs for as many references as possible and helping non-native English speaking authors with their grammar, etc. if you happen to be a native English speaking co-author. And if you are keen to be the next editor I am sure the IAFSS committee would welcome your interest.

*Signed: Mike Spearpoint, University of Canterbury and 10th IAFSS Symposium Volume Editor*

## Summary of the IAFSS Workshop on Fire and Structures

How Can Sustainability be Achieved or Enhanced through Fire Safe Structural Design?

The workshop co-chairs were Dr Luke Bisby (Senior Research Fellow in Structures in Fire, BRE Centre for Fire Safety Engineering, University of Edinburgh, UK) and David Barber (Arup, Australia). The panel members were Prof José Torero (University of Edinburgh, UK), Dr Jiann Yang (NIST, USA) and Prof Mark Green (Queen's University, Canada).

Sustainability within buildings is a broad topic, and any decisions on fire protection need to consider their impacts on energy use, waste, fire event pollution, greenhouse gas emissions, and other environmental factors. Hence, design decisions need to be based on the three phases of a building's life from cradle to grave; construction, operation and decommissioning/recycling.

Prof José Torero kicked off the workshop by presenting

four key issues for sustainability for contemporary building structures; these set the direction of the workshop:

1. A high level of optimization of structures and materials
2. The impacts of design and management decisions on fire protection
3. Utilization of trade-offs
4. Understanding consequential and indirect losses (what is the result of a fire?)

The workshop was based on three different breakout sessions in which the participants discussed issues in smaller groups and then presented their ideas, solutions and commentary to the everybody. Central items of discussion included, in no particular order:

1. Design for fire safe and sustainable structures must consider the impacts of the materials being used in construction and how they can be utilized in a holistically optimized fashion, and the waste they produce once a building is demolished.
2. All building codes have objectives based around allowing certain buildings (or all buildings) to be designed for complete burn-out in a fire, and potentially collapse. Is this acceptable? A building code that allows for large/tall buildings to be designed such that they may suffer complete burn-out and potentially collapse may not be providing a sustainable outcome (and was never the intent of the original conceptualization of structural fire resistance ratings).
3. Building sustainability for fire safety has to consider the probability of occurrence, as a fire may not occur within a building, over its life. Should the probability of occurrence for fire play a part in determining which fire protection measures are installed (particularly if sustainability gains are to be achieved)?
4. Performance based fire engineering design can be utilized to determine specific compartment design fires which can result in reduced fire ratings, which can then reduce material use required to achieve fire ratings and increase overall sustainability of a building design.
5. Fire safety engineers can influence building design to reduce the building weight, through the use of steel/concrete composite buildings and the optimization of building structures for

fire (such as the use of steel lateral framing in lieu of concrete shear walls).

6. Rating systems such as LEED, BREEAM and Green Star do not currently account for fire protection measures. Are fires within buildings so rare that the rating systems do not need to consider them? How can this be addressed further? What actions should the fire safety community take to initiate dialogue with these environmental ratings providers?

Sustainability in fire safety design needs to be based on the correct utilization of fire protection measures. Improving fire safety through additional fire protection measures may result in an increased carbon footprint at construction, but the measures will improve the durability and the expected life of the building, such that if a fire occurs the fire protection measures will result in a minimized fire impact, hence providing a more sustainable outcome.

Fire safety engineers/fire protection engineers need to better understand sustainability and the outcomes and impacts of the decisions they make. The fire research community needs to assist with influencing policy by providing decision makers with correct, quantifiable information and an understanding of the key issues and potential benefits.

Regulators and code officials also need to understand the impact of current prescriptive solutions within codes and how these impact on a building's sustainable credentials, so that future codes may provide more sustainable outcomes while still retaining the societal accepted levels of fire safety.

It was evident from the discussions that designing for sustainability will result in a greater level of safety, where the design is specifically tailored to the building and seeks to protect not only life safety but also the fabric of the building itself.

Many questions were raised during the workshop, and an initial agenda for future research was discussed. Key questions that require increased understanding are:

1. The losses incurred when a building burns down need to be understood, not just in terms of financial loss, but also in the impact on the environment and the waste associated with the demolition. Until these whole life-cycle costs are determined, the full answer to sustainability for fire protection of structures cannot be understood, or promoted, in any significant detail.
2. What is the energy cost and carbon footprint of a sprinkler system? What are the quantifiable economic and sustainability benefits?

3. Could the study of probability of occurrence show that fire protection measures could be substantially reduced within a particular jurisdiction, therefore reducing upfront construction materials and enhancing sustainability? This has to be balanced against the impact of a fire and the damage caused that may occur in the life of the building. More rigorous design for fire safety, using a performance based approach, should enable conversations on these issues to occur on real projects.
4. The sustainable impact of fire safety engineering concepts and fire protection products has largely not been determined. More detailed research is required to answer this fundamental question. There appears to be no comprehensive, quantifiable assessment of the impact of fire protection on sustainability and life cycle costs.
5. Research must be developed to define the fire safety objectives with regard to sustainability and how these can be attained, for fire protection, when combined with the objectives for a country's building code.

It was evident from the workshop that without detailed data decisions on sustainability are limited to fairly simple, qualitative assessments, which carry relatively little weight during design discussions.

*Signed: Luke Bisby, University of Edinburgh, and David Barber, Arup Australia.*

## Summary of the IAFSS Workshop on Pyrolysis Models

On Sunday afternoon a workshop was held on approaches for and challenges in parameter estimation for pyrolysis models. Approximately 50 people participated.

Marc Janssens, co-chair, opened the workshop and explained the goals and background of the workshop. Background of the workshop was the grant that NIST awarded to WPI, SFPE and SwRI to update ASTM E1591 "Standard Guide for Obtaining Data for Deterministic Fire Models", first published in 1994, and to publish it as an SFPE guide. While the guide will contain information on empirical models, simple analytical models and comprehensive models with or without kinetics, the workshop focused on the so-called category 4 models, i.e., comprehensive pyrolysis models within CFD codes, and how input data can be obtained. In the first part of the workshop, presentations were made by key-players in this area.

Nick Dembsey (Fire pyrolysis parameter guidance and lessons learned for future work) and Chris Lautenberger (Automated property estimation: possibility or pipe dream) made a case for more research in chemical and physical models while explaining their approach. They advised to start simple and to add complexity later.

Sergey Dorofeev (Evaluation of effective material properties for pyrolysis models from bench scale tests) pointed out that, although a lot of work has already been done on flame spread modeling, there still are many challenges. Important factors to consider are the fact that the parameters are often model-specific and that the boundary conditions must be characterized appropriately. He also elaborated on the surface emissivity and surface temperature.

Simo Hostikka and Anna Matala (Pyrolysis model parameters for electrical cables) presented an application for flame spread on cables. They showed how to model the degradation reactions for a flame retardant material from interpretation of TGA data. The resulting parameters are model dependent. However if these effective properties lead to reasonably accurate predictions, a detailed description of the chemistry may not be very important.

Guillermo Rein (Issues in property inverse modeling: Uncertainty, uniqueness and model complexity) explained that errors in the estimated parameters can compensate each other and that the solution may not be unique. He also mentioned that choosing a model with the right complexity is not so easy.

Finally, Stanislav Stoliarov (Formulation and parameterization of burning models for polymeric materials) showed the importance of radiation and parameters such as activation energy. He explained that TGA is a robust methodology but explained the importance of choosing the appropriate heating rate(s). He concluded by mentioning that we need better knowledge of the heat of reaction and explained that a new generation of DSC and TGA is under development.

The second part of the workshop consisted of a panel discussion during which an intense debate was held on why we should use these advanced models. After the pros and cons of the use of advanced models were presented, a discussion followed on how to define the parameters and how experiments should be used in this context.

The workshop was summarized and closed by the co-chair, Patrick van Hees, who thanked all participants for their invaluable contribution.

*Signed: Marc Janssen, SwRI, and Patrick van Hees, Lund University*

## Summary of the Workshop on Human Behavior

*How will People Use Elevators for Evacuation during a Building Fire?*

Co-Chairs: Ai Sekizawa, Tokyo University of Science, and Erica Kuligowski, National Institute of Standards and Technology, USA. Panelists: Richard Bukowski, Ed Galea, Daniel Nilsson.

The purpose of this workshop was to present the current state-of-the-art in practice and research from around the world on occupant elevator usage for evacuation during building fire emergencies. First, presentations were made on the current state of elevator usage for evacuation in different countries, including regulations on elevators as well as how buildings incorporate elevators in their evacuation procedures. Second, research was presented on the behavioral aspects of elevator usage and the issues and challenges associated with their use, addressing occupant selection behavior of elevators versus stairs, confidence or comfort with elevator usage, priority for people who cannot negotiate the stairs, maximum thresholds for queuing and/or waiting times, and transportation efficiency regarding elevator use in fire evacuation. Finally, the workshop ended with a discussion on future research needs to improve our understanding of how elevators will be used during fire emergencies so that the fire safety community can ensure safe, efficient and economical egress systems in tall buildings around the world. In the end, co-organizers expressed their interest in developing a means for future communication among the workshop participants to encourage collaboration and knowledge sharing on this topic.

*Signed: Ai Sekizawa, Tokyo University of Science, and Erica Kuligowski, National Institute of Standards and Technology*



**Some of the student volunteers from the University of Maryland who helped organize the Symposium.**

*Are you a  
member of the IAFSS?  
If not, you should be!*

# International Association for Fire Safety Science

You are invited to be a member of a professional association that is committed to facilitating communication and providing leadership for the Fire Science and Engineering Community.

Membership of the IAFSS provides international networking opportunities.

*Visit our website for more information and sign up today!*

[www.iafss.org](http://www.iafss.org)

IAFSS

West Yard House, Guildford Grove, London SE10 8JT, UK

Tel: +44 020 8692 5050 Fax: +44 20 8692 5155

Email: [iafssmembers@dial.pipex.com](mailto:iafssmembers@dial.pipex.com)

*A charity registered in England and Wales no 800306*

## Membership Benefits



Access to Full Papers of IAFSS Conference Proceedings Online\*



Substantial discount off IAFSS conference registration fees



Access to the contact information for all IAFSS members



Subscription to the IAFSS newsletter



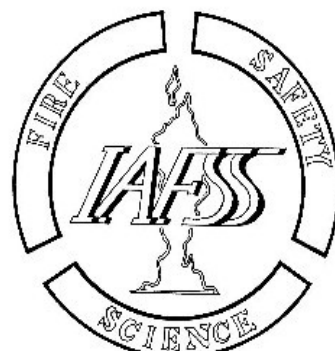
Eligibility to hold a Management Committee seat



Eligibility for Student Awards

\* From October 2011, the Association will make the papers presented at the past Fire Symposia freely accessible online

**Annual Membership fees only £25 per calendar year. Students eligible for 50% discount.**



## 11th IAFSS Symposium 2014 in Canterbury

Even as we wind down from the 10th Symposium work has already started on planning for the next one (and of course the one after that). The 11th IAFSS Symposium will be held at the University of Canterbury, New Zealand in February, 2014. We are looking forward to hosting delegates from around the world at the University during the southern hemisphere summer. We plan to host a technical program that is as good as those that have taken place at previous Symposia and also have a range of social events that will give people a chance to sample some local food and world famous New Zealand wine. We hope delegates will also take the opportunity to spend some time traveling around our corner of the world. New Zealand has much to offer in terms of scenery, native flora and fauna, and a mixture of Maori, European and Asian cultures. The more adventurous might like to try bungee jumping, jet boat rides or mountaineering while others might be more content with whale watching or less challenging day walks.

*Signed: Michael Spearpoint, University of Canterbury*



**Campus of the University of Canterbury, New Zealand**

## 12th IAFSS Symposium 2017 in Lund

During the 10th IAFSS conference in Maryland the IAFSS committee decided where the 12th IAFSS conference would be held in 2017. That conference will be held in Europe and candidates from Ulster (UK), Cantabria (Spain), Lund (Sweden) and Rouen (France) had all sent in bids for this conference. All bids were very professionally prepared. After a deliberation of the committee without the representatives from the different bids, Lund University won the bid and will bring the 2017 conference to Sweden. The time of the conference will most probably be June. During that time of the year days will be long and nights will be short so that there is plenty of time for networking! See you all in Lund in 2017.

*Signed: Patrick van Hees, Lund University*



**The major university building in Lund (by Kennet Ruona).**

## IAFSS online

I would like to share some of the major events related to the IAFSS and its online presences. Over the last few months, we finished depositing all of our metadata into CrossRef, voted to go open access with the IAFSS proceedings, and set up a new committee for redesigning the IAFSS online presence. These events will increase exposure for our authors and enable distribution of information to a wider audience.

The IAFSS deposited all the metadata and over 13,000 citations for volumes 1 through 9 of the IAFSS Proceedings. We can now take part in CrossRef's Cited-By program. The Cited-By program will allow us to show which papers in the CrossRef database have cited one of the IAFSS papers.

At the symposium in Maryland, the IAFSS Committee approved a motion to convert the IAFSS proceedings to open access. By converting to open access, the papers published in the proceedings will reach a much wider audience. As part of this effort, we are developing an updated version of the IAFSS Digital Archive web site (<http://iafss.haifire.com>), which should go live by September. The new Digital Archive will include the Cited-by feature mentioned above and will enable open access for all papers from the IAFSS Symposiums, AOFST Symposiums, and the Fire Research Notes.

As well as voting for Open Access, the IAFSS Committee also formed a committee to develop a new website for the IAFSS. The new IAFSS website will take advantage of current web based technology and use the WordPress platform. The current schedule is to start development on the new IAFSS website before the end of 2011, after the launch of the new Digital Archive site. A few people have volunteered and they will hear from me soon. If you are interested in volunteering or have a suggestion for the new site, feel free to contact me at [tfay@haifire.com](mailto:tfay@haifire.com).

Finally, I would like to share some information on the current traffic at the Digital Archive site. We have seen a large increase in the number of visits a month. From

the time we went online in late 2008 until the summer of 2010, we averaged about 800 visits a month. After the summer of 2010, we have increased to about 1,500 visits a month. Part of this increase can be attributed to the symposium and the increase in our membership. However, I believe we will see even higher numbers when the new WordPress site is launched.

*Signed: Terry Fay, Hughes Associates*

## **IAFSS Proceedings Accepted for Inclusion in Scopus**

The IAFSS has been working to get the IAFSS Proceedings into the major citation indexing services. It took over a year of effort by Terry Fay (Hughes Associates), but SciVerse Scopus accepted the Proceedings on July 7, 2011, and will start indexing them soon. Once Scopus completes the indexing, our community can take advantage of all the services offered by Scopus (see <http://www.info.sciverse.com/scopus>).

With 41 million records, Scopus is the world's largest abstract and citation database of peer-reviewed literature. In addition to Scopus, the IAFSS is working to get the proceedings included in EI Compendex, ISI Conference Proceedings Citation Index (CPCI), and Google Scholar.

*Signed: Peter Sunderland, University of Maryland*

## **Federated Search Tool for the International Fire Community**

The fire research community has large amounts of ever-growing research outputs and information in a vast array of formats located in discrete repositories around the world. This fragmented environment is collectively inefficient, resulting in a loss of unidentified opportunities to use research outputs, increasing duplication, and limiting project sizes, scope and impact. There is an opportunity to more effectively utilize our fire information.

To improve the search process and access to relevant fire research and fire safety information, a collaborative effort is currently underway to develop and implement a federated search tool for the international fire community. A federated search tool is located on a single website, where a user can search at will a collection of online fire repositories, web-based information and databases to locate relevant papers.

This direction of the fire research community working towards providing succinct location of relevant publications stored in various repositories that we create and need for research is supported by IAFSS and

other organizations. As such, IAFSS has put together a Technology sub-committee chaired by Guillermo Rein and Ed Galea to form a cohesive head for this multi-organizational and multi-person collaborative project.

There is currently a draft version of the Federated Search at <http://fire-information.net>. This draft is intended as a demonstration of concept and to promote discussion and suggestions of such aspects as additional repositories to include and features that may be useful for the search tool.

This is an emerging and dynamic project. If you wish to register your support, participate in the developments or would like additional information, please contact the team via [fire.information.net@gmail.com](mailto:fire.information.net@gmail.com), or Amanda Robbins ([Amanda.Robbins@branz.co.nz](mailto:Amanda.Robbins@branz.co.nz)), or Terry Fay ([iafss.bibDB@haifire.com](mailto:iafss.bibDB@haifire.com)).

*Signed: Amanda Robbins, BRANZ and NIST*

## **NEWS FROM OTHER INSTITUTIONS**

### **News from AOAFST**

Collaboration between fire scientists and engineers of Asia-Oceania countries is very strong, and there are big construction projects requiring special fire safety design. The Asia-Oceania Association for Fire Science and Technology (AOAFST) was established in 1995 to improve the level of basic fire science and technology in the region, satisfying the increasing demand. Now, AOAFST is one of the most successful branch organizations of the International Association for Fire Safety Science (IAFSS). International meetings are arranged periodically for scientists and engineers dealing with fire research in the region to keep its activities at a high level. Almost all associated activities in fire science and engineering in the Asia-Oceania region were discussed.

The Asia-Oceania Symposium for Fire Science and Technology (AOSFST) is one of the most important activities of the AOAFST. This symposium will be organized once every 2 to 3 years. Six were held before in China, Russia, Singapore, Japan, Australia and Korea in 1992, 1995, 1998, 2000, 2001 and 2004, respectively.

### **7th AOSFST Symposium, Hong Kong:**

The 7th AOSFST was held successfully from 20 to 22 September 2007 at the Hong Kong International Trade & Exhibition Centre with over 200 delegates

attending (including experts from Japan, Korea, China, Singapore, India, Russia, UK, USA, Canada, Australia, France, Finland and the Netherlands). The Symposium was organized by Prof W.K. Chow from The Hong Kong Polytechnic University. The Technical Committee was chaired by Prof Y. Hasemi, Waseda University, Japan; and financially supported by Mr. J.C. Yang, China Public Security, official journal of the Ministry of Public Security, People's Republic of China. There were also local sponsorships from the Research Engineering Development Façade Consultants Limited and Asia Aluminum Holdings Limited. The opening address was delivered by Mr J.K. Kwok, JP, Director of Fire Services Department; and the honorary address by Mr H.W. Cheung, JP, Director of Buildings Department, government of the Hong Kong Special Administrative Region. Ten invited lectures and seventy-three presentations were delivered. Awards were presented to Prof T. Hirano, Prof W.C. Fan and Prof Victor Bulgakov for founding and active promotion of AOFST, and to Dr Caird Ramsay for promotion of AOFST. A reception where all experts brought their special wines from their countries was held in the Conference Banquet.

As raised by Prof T. Hirano, founding president of AOFST, there is a trend that researchers in the Asian and Oceanian countries tend to carry out studies of important topics in support of local demand, which are different from other countries. Those areas such as fire safety in karaoke establishments would require in-depth investigations. The establishment of AOFST would promote better discussion and exchange of information on such activities in the Far East.



**Photo during the 7th AOSFST in Hong Kong.**

Prof W.K. Chow was elected as the new President. It was agreed that the executive committee will consist of one president, three vice-presidents from Australia, Japan and China, one committee member of IAFSS and three other elected members. The three vice-presidents elected are Prof Shinichi Sugahara (Tokyo University of Science, Japan), Prof Jinhua Sun (University of Science and Technology of China, China) and Dr Yaping He (University of Western Sydney, Australia). Prof Chow pointed out that there are very tall buildings, very large

subway stations and very long tunnels in the Far East. All associated fire safety designs would require good fire research. Attempts will be made to get financial support from the industry to carry out such studies.

### **8th AOSFST Symposium, Melbourne:**

The 8th AOSFST was held successfully from 7 to 9 December 2010 in Rydges on Swanston, Melbourne, Australia by Victoria University's Centre for Environmental Safety and Risk Engineering (CESARE). The Symposium was organized by Prof Ian Thomas, CESARE. The Technical Committee was co-chaired by Prof B.Z. Dlugogorski and Prof E.A. Kennedy.

The opening address was delivered by Prof Warren Payne, Pro-Vice Chancellor, Research and Research Training, Victoria University. Dr Craig Beyler, Chairman of the IAFSS and Prof W.K. Chow, President of AOFST welcomed delegates.

About 80 delegates attended the symposium. Five invited lectures were delivered by Dr Craig Beyler (USA), Prof Yuji Hasemi (Japan), Prof Alexander Klimenko (Australia), Prof Naian Liu (China) and Prof Ian Thomas (Australia). Twenty-six papers and 12 posters were also presented.

Prof N.A. Liu proposed the next AOSFST to be held in China and hosted by the State Key Laboratory of China. He said that the laboratory would be re-validated in the same year. Some changes in good faith could be anticipated. Besides, more conference papers from local universities were expected. Prof O. Sugawa asked if the event could be held in Japan with additional conference papers on Fire Investigation. However, he had to seek view from Prof S. Sugahara. Prof S. Sugahara agreed to support the next AOSFST to be held in China. The next AOSFST Symposium is proposed to be held in State Key Laboratory of Fire Science, University of Science and Technology of China, Hefei, Anhui, China.

*Signed: W.K. Chow, Hong Kong Polytechnic University, President of AOFST*

### **News from the University of Cantabria**

#### **Fire Safety System for Underfloor Equipment of Subway Vehicles:**

Nowadays, underground transport is very important in large cities in terms of speed, convenience and security. Thus, a more rigorous assessment of the fire risks affecting this transportation system is needed. To this end a consortium has been established consisting of Metro of Madrid, GIDAI Group at University of Cantabria, Marioff HI-FOG and Modelado y Simulacion Computacional S.L. and is developing the Project "Fire Safety System for Underfloor Equipment

of Subway Vehicles". The objective is to establish the design factors for the development of a new extinction system in the underfloor of metropolitan railway vehicles, and to experimentally assess the features of the system in real-scale fire tests.

After an extensive study of the possible causes of fire in the underfloor of such vehicles, the thermal properties of the materials, the boundary conditions and other variables were analyzed; a prototype of the safety system was also designed. Last June 2011, the prototype focused on the braking elements of the bogie and was tested in several full scale tests. During the experiments three different nozzles were tested in order to verify the optimal suppression configuration. The test results were satisfactory and a large amount of data was collected. The analysis of the results will prove which of the configurations had a better performance in real operating conditions, and thus would help improve passenger safety.

#### **XV Anniversary Medal of GIDAI:**

Since last October 2010, the GIDAI Group has presented its 15th anniversary medal to several researchers in the fire safety field that have supported or collaborated unselfishly with this group during the past years. The last medal was presented to Prof Arnaud Trouvé (University of Maryland) taking advantage of the celebration of the 10th International IAFSS Symposium at the University of Maryland. Previously, nine medals were given to Prof Carlos Fernández-Pello (University of Berkeley at Berkeley), Prof José L. Torero (University of Edinburgh), Prof Charles M. Fleischmann (University of Canterbury), Prof Francisco J. Jiménez (University of Córdoba), Prof Guillermo Rein (University of Edinburgh), Prof Paulo Piloto (Polytechnic Institute of Bragança), Dr Aurelio Rojo (APICI), Dr Rafael Sarasola (TECNIFUEGO AESPI) and Dr Marcelo Hirschler (GBH International). Prior to the presentation of these medals, the GIDAI Group prepared a tribute to Prof Carlos Fernández-Pello in the context of the Combustion and Fire Dynamics Congress, 2010 held in Santander. This tribute was a gesture of gratitude to his selfless and constant support to the initiatives of GIDAI, and recognition of his excellent scientific career. The Rector of the University of Cantabria presented him a plaque and a facsimile of the "Book of the Works of Hercules".

*Signed: Mariano Lázaro, Universidad de Cantabria*

#### **News from the University of Canterbury**

Following on from the 7.1 magnitude earthquake that hit the Canterbury region in September 2010 there have been over 7,500 aftershocks some of which have been very significant. In particular a 6.3 magnitude event occurred on 22 Feb 2011, which caused major damage to much of the Christchurch central business district and a number of outlying eastern suburbs. Several buildings collapsed as a result of the incident and

unfortunately 181 people were killed.

The earthquake occurred on the second day of the new academic year and the University was subsequently closed for several weeks while buildings and infrastructure went through a rigorous safety assessment. During this time lectures continued in various makeshift facilities including tents. The Department of Civil and Natural Resources Engineering ended up using a local church hall as the new 'campus'. This was a major challenge for both students and staff. Fire engineering block courses had to be postponed, inventive solutions were needed for laboratory classes and research activities had to be adjusted. However things are starting to return to some sense of normality with most of the University campus back in operation although there is very limited access to the main fire engineering laboratory because of the need to strengthen a neighboring office building.

To inform the fire engineering industry and to influence current standards, the Fire Protection Association of New Zealand (FPANZ), with the assistance of the University, has commissioned a report on the performance of fire safety systems post-earthquake. It aims at cataloguing post-earthquake fires in Christchurch and the response of active and passive fire protection systems, in order to improve their robustness to at least ensure fire safety in the early hours after earthquakes. Due to the significant earthquake damage to the building stock in general, the project has been adopted by the Natural Hazards Research Platform (New Zealand) - a multi-disciplinary research platform dedicated to making New Zealand more resilient to Natural Hazards.

*Signed: Michael Spearpoint, University of Canterbury*

#### **News from University of Central Lancashire**

##### **Fire Investigation MSc:**

In 2009 the University of Central Lancashire, UK (UCLan) validated a full time Master of Science Course in Fire Investigation. The course is now in its third year and is widely recognized for combining top quality tutorial and academic support with a strong emphasis on up to date industry practice and guidance. The development of practical skills for the workplace is achieved by close collaboration with current practitioner experience and expertise. Practical sessions benefit from the use of live burn facilities at Lancashire Fire and Rescue Service Training Centre and workplace secondments consolidate theoretical input.

In 2010, at the request of several UK fire and rescue services, a part time option was added, designed



specifically to offer students the flexibility to fit their studies around employment commitments. Study periods are flexible and students can learn more or less intensively as long as the full program is completed within three years. The syllabus emphasizes both underpinning academic content and practical application in order to ensure graduates are equipped for the challenges posed by the field environment. There are a few places remaining for the 2011 intake, which will start on 12th September.

Contact: Simon Cable, [scable@uclan.ac.uk](mailto:scable@uclan.ac.uk),  
[http://www.uclan.ac.uk/information/courses/  
 msc\\_fire\\_investigation.php](http://www.uclan.ac.uk/information/courses/msc_fire_investigation.php)

*Signed: Anna Stec, University of Central Lancashire*

## News from University of California

Sonia Fereres presented her PhD dissertation "On the Piloted Ignition of Solid Fuels in Spacecraft Environments" at the University of California, Berkeley in May 2011. Her advisor was Prof Carlos Fernández-Pello.

*Signed: Michael Gollner, University of California at San Diego*

## News from University of Edinburgh

During the first semester of 2011, two new PhD students have joined the BRE Centre for Fire Safety Engineering at the University of Edinburgh: Shaun Devaney (Ireland) and Ryan Hilditch (UK). During the same time, three students received the PhD degree: Dr Rory Hadden (now at University of Western Ontario, Canada), Dr Pauline Bartoli (now University of Corsica, France) and Jamie Stern-Gottfried (now at Arup, UK). Two Research Associates promoted outside the group: Dr David Lange joined SP, Sweden, and Dr Claire Belcher got an academic position at University of Exeter, UK, in Earth System Science. The current group consists of nine academics, four research associates and 26 PhD students.

The Ove Arup Foundation has made a major investment to tackle the obdurate problems surrounding fire safety. Working with Fire Safety Engineers and Architects at the University of Edinburgh, The Institute for the Study of Science, Technology and Innovation (ISSTI) will explore how to ensure the effective adoption of technical advances in the built environment. The Ove Arup Foundation has agreed to invest £200,000 over the next 5 years in a major interdisciplinary research and knowledge transfer initiative aimed at Integrating Technical and Social Aspects of Fire Safety Engineering Expertise (ITSAFE).

The Centre has secured a major grant from The Lloyd's Register Educational Trust (LRET) to hold a series of

three annual week-long intensive seminars ("think tanks") in areas related to Fire Safety Engineering. This series of seminars was motivated by the need to have a new generation of leaders in Fire Safety Engineering that can drive the field through the drastic transition it is currently experiencing. An ever evolving construction industry, drastic changes in regulatory environment, multi-disciplinary drivers for innovation, and ever increasing demands for the fire service require a new face of leadership. The seminars are intended to bring together selected leaders of today with the leaders of the future to define a coherent path for different areas of critical importance to the field. This unique initiative was launched this year with The 1st Annual LRET/UoE Global Technical Leadership Seminar in Fire Safety Engineering. The seminar had the theme of "Education for the Future of Fire Safety Engineering," and was held in Scotland between 30 May and 3 June 2011. Participants were selected as key players in defining the future of advanced fire safety engineering as a professional/academic discipline. The seminar was run as a five day retreat, delivered by the BRE Centre for Fire Safety Engineering at a residential venue close to Edinburgh. Each session began with a presentation to be given by one of the participants (see below). This initiated discussions on the relevant issues. A small group of undergraduate and graduate students, some of whose studies are also financially supported by The LRET, were also competitively selected to join the seminar, bringing the total number of participants to approximately 20. Dissemination activities will include the publication of a "white paper" based on the seminar's discussions and outcomes. All of the participants felt that the event was a great success and will lead to a number of important changes, actions, and significant progress for fire safety engineering education globally. Feedback has been very positive thus far, and several participants have formulated specific personal action items within their own organizations.

Prof José Torero delivered the public lecture: "The Twin Towers: 10 years – 10 Lessons on Sustainable Infrastructure" on 14<sup>th</sup> March 2011. This was a joint event of The Royal Academy of Engineering and The Royal Society of Edinburgh. The collapse of the World Trade Center towers represents one of the most dramatic failures of modern structural engineering. One of the most exhaustive and expensive failure analyses in history was conducted in the midst of speculation, controversy and conspiracy theories. In parallel, the world has seen an extraordinary evolution of the super-tall building. Seven of the ten tallest buildings in the world have been built after 9/11. These not only include the tallest four, but eight of these buildings are outside the USA. Furthermore, a strong drive towards sustainability has driven tall building design to levels of innovation never seen before. Prof Torero's presentation extracted, from a decade of questioning and innovation, ten lessons on

what is sustainable infrastructure. The lecture can be viewed online at: <http://youtu.be/vSEuTFPPjO4>.

Prof José Torero was awarded the 2010 Tom Dalyell Prize for Science Communication at the University of Edinburgh during his Christmas Lecture "Fire: A story of fascination, fear and familiarity". In his lecture, Prof Torero discussed how humans have been fascinated with fire for millions of years. He examined how fire can provide welcome warmth in everyday life but, on a bigger scale, the unpredictability of fire can be terrifying. He contrasted the emotions associated with fire, depending on whether it is under control or not. To view the Christmas Lecture online, visit <http://youtu.be/cIY0litILRA>.



**Dr Richard Ward, CEO of Lloyds, awards the prize to Dr Francesco Colella.**

Congratulations to Dr Francesco Colella for winning the Lloyd's Science of Risk Prize in the Technology Category. The prize was for his research paper "A Novel Multiscale Methodology for Simulating Tunnel Ventilation Flows During Fires" (published in *Fire Technology*). He led this work as a Research Associate at The School of Engineering from 2007 to 2010. This is Lloyd's research prize for academics and aims at keeping the world's leading specialist insurance market with the pace of academic knowledge and cutting edge thinking. For the same award competition, the fire group had two more papers short-listed as the top of each category. Dr Wolfram Jahn was short-listed in Technology Risk, for his paper "Forecasting Fire Growth using an Inverse Zone Modelling Approach" (published in *Fire Safety Journal*). And Dr Claire Belcher was short-listed in Climate Change Risk for her paper "Increased fire activity at the Triassic/Jurassic boundary in Greenland due to climate-driven floral change" (published in *Nature Geoscience*).

The University is one of 13 partners collaborating on a three year, EU FP7 funded research project on Aircraft Fire Safety. The 'kick-off' meeting was in Poitiers, France, in January 2010.

On Nov 2010 Dr Guillermo Rein was interviewed by Scottish TV about a recent research paper published in *Fire Safety Journal* on "Forecasting Fire Growth". On the same day he was interviewed for BBC Radio Scotland

(<http://chirb.it/4NzyI7>) and newspaper The Scotsman.

The Royal Society of Edinburgh has awarded a JM Lessells Scholarship Award to the fire group PhD student Holly Smith. She will spend two months at the Department of Civil Engineering, Queen's University, Kingston, Canada and work on shear failure of concrete structures during fire.

We will continue communicating views, news and achievements in our blog <http://edinburghfireresearch.blogspot.com>

*Signed: Guillermo Rein, University of Edinburgh*

## News from FM Global

### Dr Dorofeev appointed Research Area Director, Fire Hazards and Protection:



### Dr Sergey Dorofeev, Research Area Director, Fire Hazards and Protection, FM Global

FM Global, one of the world's largest commercial property insurers, has appointed Dr Sergey Dorofeev as research area director, fire hazards and protection at the company's research division based in Norwood, Mass. In his new role, Dorofeev oversees a team of research scientists that develop fire protection solutions for the company's clients. Prior to joining the company as a senior research specialist in 2004, Dorofeev was a staff scientist at the Institute for Nuclear and Energy Technologies, Research Center Karlsruhe in Germany and an adjunct Prof at the University of Coimbra in Portugal. He holds a bachelor's and master's degree in physics and engineering from the Moscow Institute of Physics and Technology, and a doctorate in chemical physics from Kurchatov Institute.

### ISO 12136 Reaction to fire tests:

The Fire Propagation Apparatus (FPA), a technology developed by FM Global, is currently a standard under guidelines from the NFPA (NFPA 287) and ASTM International (ASTM E2058). Thanks to the efforts of Mohammed M. Khan, senior research specialist at FM Global, the International Organization for

Standardization (ISO) recently approved a new standard developed by technical committee ISO/TC92 (Fire Safety), and subcommittee SC1 (Fire Initiation and Growth). The standard ISO 12136: Reaction to fire tests - Measurement of material properties using a fire propagation apparatus - presently in the publication stage, determines and quantifies the flammability characteristics of materials, related to the propensity of materials to support fire propagation, by means of a fire propagation apparatus. Material flammability characteristics that are quantified include time to ignition, chemical and convective heat release rates, mass loss rate, effective heat of combustion, heat of gasification and smoke yield. These properties can be used for fire safety engineering and for fire modeling.

*Signed: Marcos Chaos, FM Global*

## News from the Japan Association for Fire Science and Engineering

The Japan Association for Fire Science and Engineering (JAFSE) is a unique academic society that aims to fulfill its mission to contribute to the welfare of the society by the research, development and investigation of science and technology concerning fire, combustion, explosion, and the related engineering measures, etc. We systematically investigated the 1995 earthquake disaster at Hanshin-Awaji (Kobe), and returned the findings and lessons from the research to society extensively, making use of the results afterwards. From this experience, for a large-scale earthquake disaster like this time, we think it is extremely important to promote the surveillance study in a comprehensive and agile fashion while attempting cooperation and the information sharing among the researchers and engineers in related fields as the academic society. Then, the Investigation Committee of JAFSE on the 2011 Great East-Japan Earthquake was established on April 18, 2011.

Members of existing specialty committees in JAFSE are supposed to play a key role in each aspect of earthquake-related disasters. We constructed the Investigation Committee that consists of a plenary meeting and the working group (WG) according to each existing specialty committee. Working groups have been quite active thus far in collecting, analyzing, and summarizing data by suitable search procedure (field survey, questionnaire study, collecting and summarizing search documentation and image material, etc.).

We plan to disclose the results of our investigation to the society as well as members of JAFSE periodically and as soon as we can. The interim report is assumed to be made in the end of September in sight. The achieved result should be widely announced to the members and the general public as well through workshops, journals and bulletins of JAFSE for contribution to society besides the above-mentioned report. Final report is assumed to be published in one or two years.

We are thinking to hold a special session or an international workshop on this topic during the next annual meeting of JAFSE in May 21-22, 2012.

For more detailed information, please contact with Ai Sekizawa at [sekizawa@rs.kagu.tus.ac.jp](mailto:sekizawa@rs.kagu.tus.ac.jp)

*Signed: Ai Sekizawa, Tokyo University of Science*

## News from University of Maryland

Prof James A. Milke has been named Chair of the UMD Department of Fire Protection Engineering. He replaces Prof Marino di Marzo, who will remain on the Department faculty. Milke is the fourth chair of the department, following John Bryan, Steven Spivak and di Marzo.

In 2011 the UMD Department of Fire Protection Engineering graduated its 1,000th undergraduate student and its 300th master's degree student. The 20th Ph.D. degree where the principal research advisor was a faculty member in the Department also was awarded.

James A. Milke, Prof and Chair of the UMD Department of Fire Protection Engineering, has been selected as the 2010-2011 UMD Provost's Faculty Academic Advisor of the Year. Milke was nominated by students in the Department. He is credited by many students as making a difference in their professional lives and is valued for the honest and forthright feedback that he provides to students in fire protection.



**Michael Bustamante,  
NASA Space Technology Research Fellow**

UMD Department of Fire Protection Engineering M.S. student Michael Bustamante has been selected as a NASA Space Technology Research Fellow for 2011/2012. Bustamante's application was entitled "Burning Rate Emulator Experiments for Spacecraft Fire Safety" and he is advised by Peter B. Sunderland and James G. Quintiere. Bustamante's research is focused on experimental investigation of emulated burning rate at various gravity levels. The fellowship includes a student stipend, faculty advisor funding, on-site allowance, and support for health insurance and tuition and fees. He will spend time conducting research at the NASA Glenn Research Center in Cleveland, Ohio, USA.

*Signed: Peter Sunderland, University of Maryland*

## News from NIST

In 2012, NIST's Engineering Laboratory will complete construction of a new structural fire resistance testing facility with unique capability to test large scale structural elements, systems, and their connections in the fire condition. The goal of the facility is to serve as a center of excellence for fire performance of structures ranging in size from small components to large systems up to 2 stories in height. The laboratory will be led, managed and operated as a collaborative facility through a public-private partnership between NIST and industry, academia, and other government agencies.

NIST has asked the Fire Protection Research Foundation to assist in developing a prioritized research agenda for work in the new facility. Over the past year, the Foundation has assembled input from a variety of industry stakeholders. This workshop is designed to review and further develop that input to develop a NIST's Engineering Laboratory prioritized national agenda for work in the new facility. Industry leaders have been asked to provide their perspective on needs; you are invited to participate in the dialogue from 11:00 a.m. – 4:00 p.m., Thursday September 8, 2011 at NIST's Engineering Laboratory, Building 224, in Gaithersburg, MD. A tour of the site of the new facility will be provided at the end of the day. We invite your participation; please contact [epeterson@nfpa.org](mailto:epeterson@nfpa.org) with your attendance plans no later than September 1st.

## News from the Fire Protection Research Foundation, NFPA

### Harry C. Bigglestone Award:

The Harry C. Bigglestone award is presented annually, along with a \$5,000 cash prize, to the authors of the most outstanding paper submitted to *Fire Technology* during the previous calendar year, as voted by the International Editorial Board.

The 2011 Bigglestone Award for Excellence in Communication of Fire Protection Concepts went to Robert Jansson and Lars Borstrom for their paper, "The Influence of Pressure in the Pore System on Fire Spalling of Concrete".

In 2010, NFPA celebrated the 25th anniversary of the Bigglestone award. These twenty five award winning papers represent a significant contribution to the advancement of the state of the art of fire safety research and engineering. Eight original award winning authors responded to our invitation to submit a retrospective on the topic addressed in their original paper. Like *Fire Technology* itself, the papers cover a broad range of fire protection engineering and research subjects, reflecting on advances in the science and practice since the time the paper was written.

## 2nd Annual Electric Vehicle Safety Summit:

NFPA and SAE International will co-sponsor the 2nd Annual Electric Vehicle Safety Summit, September 27–28, 2011, at the Marriott Detroit Renaissance Center Hotel in Detroit, MI. <http://www.sae.org/events/nevss>

The Electric Vehicle Safety Standards Summit is a continuation of the dialogue begun at last year's groundbreaking Summit initiated in order to support the rapid implementation of electric and hybrid electric vehicles in North America. The Summit provides a forum in which all relevant individuals, organizations and agencies can contribute to the development of action plans regarding the codes and standards necessary to effectively address safety as it relates to electrified vehicles and their infrastructure.

### Project on Fire Detection in Warehouse Facilities:

This project is designed to explore the potential role for fire detection in fire protection strategies for today's modern high challenge warehouses. The objective of this first Phase program is to explore relevant literature and fire hazard scenarios and develop a proposed research plan to develop technical information for the development of guidelines and standards.

[Click here for more information](#)

### Project on Performance Objectives for Light Sources Used in Emergency Notification Appliances:

LEDs and other innovative energy saving lighting technologies (e.g. fluorescents) are rapidly entering the marketplace and present themselves for application to emergency notification appliances. The existing requirements for the performance and application of visible notification appliances are based on traditional incandescent light sources. The objective of this project is to develop performance requirements for light sources for emergency notification for incorporation in the *National Fire Alarm Code*.

[Click here for more information](#)

### Project on Elevator Messaging Strategies:

The goal of this project is to develop practical guidance for use by message providers, including message content for visual strategies, to convey the status of elevator usage during building emergencies. In addition, some example canned or standardized elevator messages to be used during fire emergencies will also be included. The guidance document will be the primary project deliverable, and will be in a clear, concise format that is practical and readily useable. The project will be undertaken by the Engineering Laboratory at the National Institute of Standards and Technology by Erica Kuligowski and will be complete at the end of 2011.

[Click here for more information](#)

Two new reports are available online:

[Validation of Methodologies to Determine Fire Load for Use in Structural Fire Protection](#)

[Towards Estimating Entrainment Fraction For Dust Layer](#)

*Signed: Kathleen Almand*

*The Fire Protection Research Foundation, NFPA*

## News from Lund University

The fire safety protection education program in Lund will celebrate its 25th anniversary on 24 and 25th of November. At the same time the Swedish chapter of SFPE will celebrate its 15th anniversary.

On June 1st Anders Jacobsson defended successfully his PhD titled "Methodology for Assessing Learning from Incidents - a Process Industry Perspective". Faculty opponent was Prof JanHovden NTNU, Trondheim, Norway. The PhD thesis can be downloaded from the Lund website (<http://www.brand.lth.se/publications/#0>). Here you can also find previous PhD dissertations as well as research reports, licentiate theses and master theses by the department and students.

Dr Per Becker was appointed as associate Prof before the holiday period. Per Becker will continue working with international disaster management. On September 1st the department welcomes a new PhD student. Martin Nilsson. He holds a BSc in fire protection engineering and a MSc in risk management and safety engineering and has previously working at Fire Safety Design AB and FM global. He will work in the new project on multifunctional buildings.

Just before the summer the department conducted large-scale evacuation experiments in a train tunnel. The experiments are a part of the METRO project (<http://www.metroproject.se>), a Swedish research project about infrastructure protection of underground rail mass transport systems, and the results will be analyzed and presented in 2011 during a two day seminar on September 13th and 14th.

*Signed: Patrick van Hees, Lund University*

## News from SP

METRO is a three year Swedish research project about infrastructure protection. The focus of the project is on the protection of underground rail mass transport systems, such as tunnels and subway stations. Both fire and explosion hazards are studied, and aspects such as evacuation, rescue operations and smoke control are important parts of the project.

As part of the project a series of small-scale, medium-scale and full-scale experiments will be performed. The full-scale test will be performed 13 September in the Brunsberg tunnel near Arvika, Sweden. The goal with these tests is to develop design fires for underground rail mass transport systems. In the full-scale fire experiments, commuter trains provided by Stockholm Public Transport (SL) will be used. The experiments will result in heat release rate curves for varying conditions (materials, ventilation, etc). These results, together with the developed mathematical models for gas temperatures, radiation, smoke spread, toxicity and extraordinary strain on construction, will be valuable tools when designing tunnels and planning rescue operations.

A total of nine partners take part in the project. METRO is funded by five organizations, namely Stockholm Public Transport (SL), Swedish Civil Contingencies Agency (MSB), the Swedish Transport Administration, the Swedish Fortifications Agency, and the Swedish Fire Research Board.  
<http://www.metroproject.se>

## News from Waseda University

A large-scale wooden three-storey school building fire test has been undertaken at Waseda University. The Japanese government started to consider a proposal to build a wooden three-storey school building not rated as Fireproof Construction, and adopted the proposal as part of a three year R&D program for the development of fire safety standards led by Prof Yuji Hasemi, Waseda University. The program will be run under the cooperation of the National Institute for Land Infrastructure Management (NILIM) and Building Research Institute, and includes full-scale fire tests on several approximately 2,300 m<sup>2</sup> three storey buildings, fire growth tests with a model of classroom beneath a large calorimeter, and series of furnace tests to identify fire safety performance of load bearing assemblies and fire separations under different fire scenarios. The full-scale building test will be the largest building fire test in Japan, and is scheduled to begin in February 2012 in Tsukuba, Japan.

*Signed: Yuji Hasemi, Waseda University*

## News from Universidad Pontificia de Comillas

The 2nd edition of the "Master in Fire Protection Engineering" at Universidad Pontificia de Comillas in Madrid is finished. A group of fifteen students, from different regions of Spain, have completed successfully the program with their final projects.

The University and the Association of Professional Fire Protection Engineering (APICI) have joined their efforts

in developing this Master as a response to the needs of qualified professionals within the Fire Protection field. The program has a total 60 ECTS (European Credit Transfer System) credits and carries out complementary activities such as scheduled site visits, seminars and roundtables, which are offered to students and lecturers. The aim of the Master is to offer a deep knowledge in fire protection. Therefore, it is divided into four modules: Fundamentals, Fire Protection Systems, Design applied to Sectors and Exploitation and Operating Systems.

The University, within the framework of the Masters degree program, is participating in meetings and conferences, like in the VI International Congress of Fire Safety organized by APICI and held in Madrid. Also, a Meeting of the Iberoamerican Chapter of the SFPE was held in the University with the participation of Prof Robert Jönsson from the University of Lund.

In addition, in the Institute for Research in Technology (IIT) that belongs to the Comillas Pontifical University, a new PhD student, Pablo Ayala, is doing a research in smoke movement in large volume spaces. His work is being supervised by Dr Alexis Cantizano, from Pontifical Comillas University and Dr Guillermo Rein from the University of Edinburgh. He is also collaborating with Dr Cándido Jiménez from the University of Jaen who has a deep experience within this field.

*Signed: Alexis Cantizano, Universidad Pontificia de Comillas*

## News from the International Master of Science in Fire Safety Engineering

The second edition of the International Master of Science in Fire Safety Engineering (IMFSE), educational program in the Erasmus Mundus framework, is about to take off. A new group of future Fire Safety Engineers starts their first semester Mid-September 2011 in either Ghent or Edinburgh. These 27 incoming students, from 20 different nationalities worldwide, join IMFSE supported by scholarships of the European Commission and Lloyd's Register Educational Trust or on a self-sponsoring basis. At the same time, the 18 students from the first edition who have successfully finished their first IMFSE year will start their second Master's year and gradually start preparing the research for their Master Dissertation.

Students or companies interested in joining IMFSE will be able to apply between September 2011 and January 2012, for the IMFSE edition starting in September 2012. The application forms and all other information can be found on our website (<http://www.imfse.ugent.be>)

As a reminder for recently joined IAFSS Members: IMFSE is commonly organized by the Universities of Ghent (Belgium, coordinator), Edinburgh (Scotland) and Lund (Sweden). The main objective of this two-year full

time educational program is providing the required knowledge for a professional fire safety engineer in a performance based design environment. Besides inter-university cooperation, student mobility in Europe is one of the main points of interest of the overall program. The mobility structure, with possible change in study location after each semester, gives the students the opportunity to gain from the strengths and expertise of each of the three universities.

*Signed: Elise Meerburg, IMFSE, Ghent University*

## Featured Article: Overview of Post-earthquake Fires following the 2011 Great East-Japan Earthquake

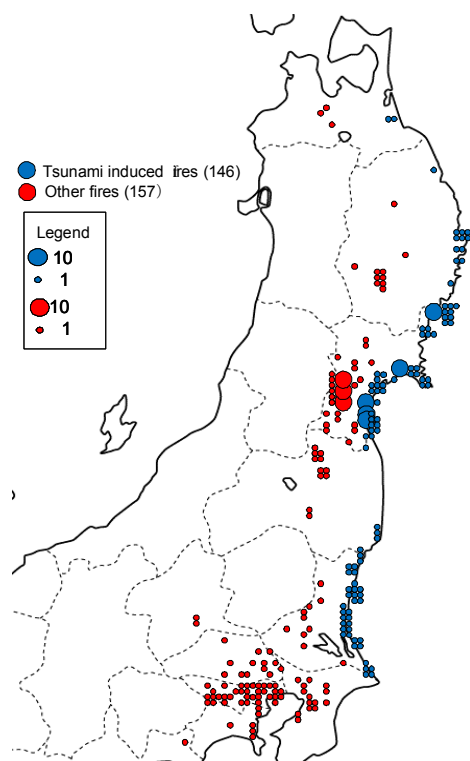
The Great East-Japan Earthquake, which occurred on March 11, 2011, brought immense devastation. The earthquake triggered the giant tsunami that inflicted widespread damage, caused a serious accident at a nuclear power plant, destroyed houses, and left roughly 20,000 people dead or missing. Although the damage caused by fire as a result of this earthquake was perhaps relatively less horrifying than the damage caused by the tsunami or the nuclear power plant, fire damage still occurred on a large scale and affected wide areas.



**Photo of two tsunami-induced fires expanding into conflagration (from Newspaper Yomiuri, Mar 12, 2011)**

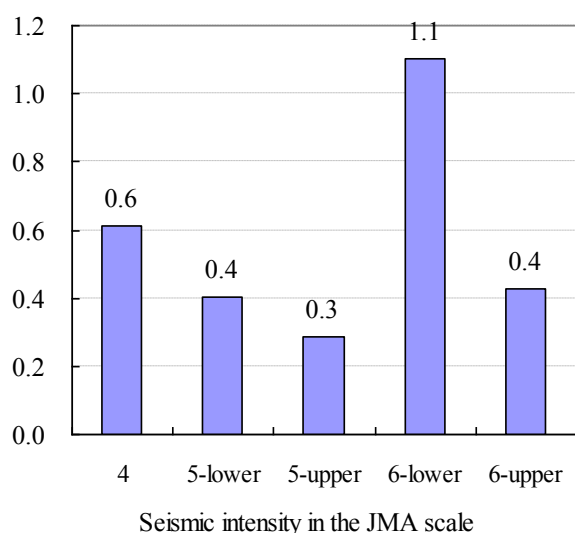
The map presents an overview of post-earthquake fires following the Great East-Japan Earthquake. In the map, blue circles indicate fire instances in affected cities/towns along the coast; many of these fires were a direct or indirect consequence of the tsunami and are, therefore, distinguished from the rest of the fires. In contrast, red circles indicate fire instances in cities/

towns located further inland and not affected by the tsunami. These cases are regarded as instances of post-earthquake fire, which have been observed in the past earthquakes.



**Map of post-earthquake fires following the Great East-Japan Earthquake. From report "2011 Tohoku earthquake and tsunami", 21 Mar 2011, Fire and Disaster Management Agency, Japan.**

Number of fires per 100,000 inhabitants.



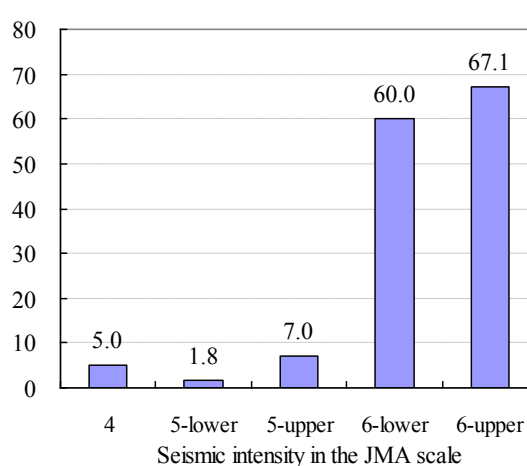
In a broad area facing the Pacific Ocean, a large number of fires emerged after they suffered from the direct damage by the tsunami. Several of these fires expanded into conflagrations. (See photo) One characteristic event of this earthquake was tsunami-induced fires, as we received a shock from the images, which were presented on the television news. Even based on

information acquired solely from television footage, magazine and newspaper articles, and on-site investigations, several causes for the emergence of tsunami-induced fires can be identified as follows:

1. Ignition of flowing oil and liquefied petroleum gas (LPG) leaked from overturned and broken tanks located in industrial complexes and quay areas.
2. Ignition of residential houses destroyed by the tsunami.
3. Also even at the level of individual residential houses, ignition of leakages from overturned LPG canisters, kerosene tanks, or broken gas pipes.
4. Ignition of buildings from burning piles of rubble, ships and cars drifting along the course of the tsunami.
5. Natural ignition by accumulation of heat in large mounds of scrap iron, owing to rapid oxidation of the iron induced by seawater.

Nevertheless, the complete picture of tsunami-induced fires is still unclear, and many researchers at universities and laboratories are currently in the process of elucidating the details of these fires through on-site investigations. Therefore, here the author focuses on the 157 conventional post-earthquake fires and discusses on the relationship between the seismic intensity on one hand, and the ratio of collapsed structures to post-earthquake fires on the other.

Number of collapsed structures per 100,000 inhabitants



In the 1995 Kobe Earthquake, the number of totally collapsed structures was approximately 67,000, equating to approximately 4,400 totally collapsed structures per 100,000 inhabitants (in 1995 the population of Kobe city was 1,520,000). Since a number of areas in Kobe city attained seismic

intensity of 7 on the Japanese Meteorological Agency (JMA) scale, this point must be considered when comparing the 1995 Kobe Earthquake with the area affected by the Great East-Japan Earthquake, where the seismic intensity was predominantly 6. Nevertheless, it is meaningful to perform a comparison between the damage by the Great East-Japan Earthquake and the damage caused by the 1995 Kobe Earthquake. In regard to the Great East-Japan Earthquake, the ratio between collapsed structures and seismic intensity is presented in the first graph. In areas with seismic intensity of 6-upper, only 67 structures per 100,000 inhabitants collapsed. This graph is nearly two orders of magnitude lower than the corresponding for Kobe city. In addition, in the Great East-Japan Earthquake, there was almost no structural damage in areas with seismic intensity of 5-upper and below. Conversely, no correlation is observed between the incidence rate of post-earthquake fires and seismic intensity for the Great East-Japan Earthquake, as shown in the second graph. Moreover, although the incidence rate of post-earthquake fires in areas with seismic intensity of 6-upper was 0.4 per 100,000 inhabitants, which is much lower if comparing with the rate of 1.1 per 100,000 inhabitants in areas with seismic intensity of 6-lower. For the 1995 Kobe Earthquake, there were 175 instances of fire in Kobe city, equivalent to an incidence rate of post-earthquake fires of 11.5 per 100,000 inhabitants. In the Great East-Japan Earthquake, even the highest incidence rate of post-earthquake fires in regions with seismic intensity of 6-lower was still only 1.1, which is an order of magnitude lower than that in Kobe city.

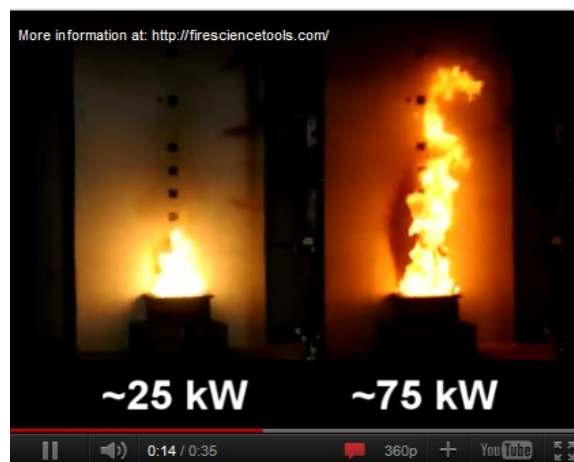
Taking into account seismic intensity recorded in each region, an overview of structural and fire-induced damage for the Great East-Japan Earthquake shows that both the ratios of collapsed structures and fire incidents per capita were decidedly lower than for the 1995 Kobe Earthquake. Nevertheless, one of the lessons learned from the Great East-Japan Earthquake is that there is less clear causal relationship seen between post-earthquake fires and the number of totally collapsed buildings. Rather, even if the buildings themselves do not collapse, earthquakes can overturn objects inside of buildings such as cooking stoves, space heaters, and flammable materials, or they can damage lifeline systems such as electric power lines and gas pipes that may result in fire ignitions. In addition, there are cases where fires emerge after power distribution has been restored.

*Signed: Ai Sekizawa, Tokyo University of Science*

## Featured Article: Digital Tools for Fire Safety Education

A wide collection of digital tools have become available online that aid in the presentation of fire science and fire protection engineering material both to students in the field and those that may be interested in future

education. Several of these resources were shared at the symposium workshop on education, however there are many more and we would like to share these resources to the broader membership.



Example YouTube video hosted on <http://firesciencetools.com> showing the difference in flame height of a 25kW and 75 kW propane burner fire.

Scott Rockwell, a PhD candidate at Worcester Polytechnic Institute developed a fire science tools resource site: <http://www.firesciencetools.com>. The site includes dozens of videos with fire and explosion demonstrations, worked example problems, programming and imaging resources for researchers and instructions on hosting a combustion workshop for high school students. The website is an outstanding resource for those hosting a demonstration lab for interested students, young researchers in the field, or instructors wishing to supplement their courses with experiments that cannot be performed in the classroom. A screen shot of one fire behavior demonstration video comparing heat release rate to flame height is shown in the photo. For more information about the site, please contact Scott Rockwell, [srockwel@wpi.edu](mailto:srockwel@wpi.edu).

In 2008 The Society of Fire Protection Engineers partnered with Discovery Education to create a new in-school program titled The Chemistry of Fire. The program was funded by a grant from the U.S. Department of Homeland Security.

The Chemistry of Fire is geared to high school chemistry students. It will teach students the science behind fire as a way for students to fully understand the dangers of fire. As a result, it will increase the awareness of fire and the importance of home fire prevention. The interactive program includes a teacher's guide with five lesson plans, a DVD that demonstrates exciting experiments included in the lessons, three classroom posters and a web site where teachers and students can find more classroom and career resources.



As part of this project, a microsite was developed that has videos and information about careers in fire protection engineering. It can be found at: <http://sfpe.discoveryeducation.com/site/>. The program was released to nearly 20,000 high school science department chairs in January 2008.

If you would like a free copy of the Chemistry of Fire Program or would like more information please visit: <http://www.sfpe.org/profession/chemistryoffire.aspx>. Another website maintained by the Society of Fire Protection Engineers, <http://www.careersinfireprotectionengineering.com>, is a great resource to introduce students to the field of fire protection engineering and careers available in the field.

Kris Overholt, a PhD student at UT Austin has also developed a website with a host of modeling tutorials for FDS as well as online fire protection engineering calculators. His website is <http://www.koverholt.com>.

Several other organizations also have YouTube channels with videos that introduce fire concepts, present research, and introduce their programs to wider audiences:

University of Edinburgh:  
<http://www.youtube.com/user/FireSafetyEngineerin>

NFPA:<http://www.youtube.com/user/nfpadotorg>

FM global:  
<http://www.youtube.com/user/FMGlobalVideos>

Laboratory demonstrations from the book "Fundamentals of Combustion Processes":  
<http://www.youtube.com/user/FndmtlsofCombustion>

We hope this list of digital fire resources will grow in the future, and we will continue to post updates on the new IAFSS website as they become available.

*Signed: Michael Gollner, University of California at San Diego*

## CONFERENCE REPORTS

### Workshop Urban and Wildland-Urban Interface Fires, June 2011, NIST

Large outdoor fires are an important, emerging research topic in fire safety engineering. Of particular societal importance are large outdoor fires that present risk to the built environment. Two important examples of such large outdoor fires are urban fires, a concern in Japan, and wildfires that spread into communities, commonly referred to as Wildland-Urban Interface Fires (WUI),

which is a concern in several countries including the USA. In the field of fire protection engineering, significant research has been focused on fires inside buildings; such fires may be thought of as compartment fire research. Compared to large outdoor fire research, compartment fire research is far more advanced with significant understanding obtained from years of focused research conducted internationally in a collaborative nature. On the contrary, little understanding exists on how to contain and mitigate the hazard associated with urban and WUI fires. These topics are extraordinarily challenging and present the next frontier in fire safety engineering.



Specifically, WUI fires have caused significant damage to communities throughout the world. In 2007 and 2008, Southern California WUI fires displaced half a million people and destroyed several thousand structures. The Wildland-Urban Interface (WUI) fire problem can be seen as a structure ignition problem. Little effort has been spent on improving understanding of WUI fire behavior. There is a lack of quantitative information on the processes of structure ignition in WUI fires. Post-fire damage studies suggest that firebrands are a major cause of structural ignition in WUI fires, yet research on firebrands conducted over the past 40 years has focused on how far firebrands fly. Such information is of limited use in the development of firebrand resistant structures.

Japan is a country subjected to many earthquakes, due to its geographical location. After these earthquakes occur, many fires are produced. Exterior claddings and ceramic roofing tiles are displaced as a result of the earthquakes exposing bare wood members that are easily ignited due to external heating. As in WUI fires, firebrands are produced as structures burn and in the presence of high winds, these firebrands are dispersed and transported, producing spot fires can result in severe urban fires. Exposure to wind-blown fire plumes downwind of the burning area also presents difficulty in firefighting and evacuation operations. Mitigation of urban fire spread is also of special importance to Japan from a historical perspective. Kyoto is one of the few remaining cities in Japan with traditional wooden structures that are

vulnerable to ignition. Preservation of such structures is of great importance from a cultural heritage point of view.

Although urban and WUI fires have been termed differently, there are substantial phenomenological similarities between these fires. However, research on urban fires in Japan and WUI fires in the USA has been conducted in each country independently, with little chance of constructive research collaboration. To this end, an international workshop was held within the Fire Research Division at NIST's Engineering Laboratory (EL-NIST) on June 27th, 2011. The workshop was entitled "Urban and Wildland-Urban Interface (WUI) Fires: A Workshop to Explore Future Japan/USA Research Collaborations" and was organized by Dr Samuel L. Manzello (EL-NIST/USA) and Dr Keisuke Himoto (Kyoto University/Japan). The goal of this workshop was to open a dialogue to embark on new research collaborations in an effort to begin develop scientifically based building codes and standards that will reduce the devastation caused by urban and WUI fires. To this end, thirteen presentations were delivered in the areas of urban fire spread in Japan and WUI fire spread in the USA. Six presentations were delivered from the Japanese perspective; from evacuation/firefighter-response models, to fire whirl research, to post-tsunami fires following historical earthquakes in Japan. Seven presentations were delivered from the USA perspective; from the overall view of WUI fire problem, to detailed ignition studies on fuel beds, to vulnerabilities of structures to wind driven firebrand showers.

The workshop was considered a success and was intended to be a first step in bringing together a diverse group of researchers and code officials. The valuable input received for future efforts will be considered by Drs. Manzello and Himoto when considering the next workshop. A NIST special publication documents the presentations and discussions. In addition, participants from the workshop are in the process of preparing papers for publication in a special issue of Fire Safety Journal. Dr Manzello and Dr Himoto will serve as Co-Guest Editors of the special issue.

*Signed: Sam Manzello, NIST*

## **7th U.S. National Combustion Meeting, Atlanta, March 2011**

<http://www.combustioninstitute.org>

The 7th U.S. National Combustion Meeting was held March 20-23, 2011 at the Georgia Institute of Technology in Atlanta, Georgia. While the conference focused on all aspects of combustion research, a very active fire research community presented and participated during the event. Many fire research topics were presented throughout the conference including

numerical modeling and experimental testing of ignition on solid fuels, ignition and propagation of deflagrations in dust, buoyancy effects on steady and spreading fires, and the selection of appropriate parameters for numerical modeling flame spread and ignition. A highlight of the fire research section was a topical review by Andre Marshall of the University of Maryland, entitled "Establishing an analytical basis for fire suppression sprays." Beyond the daytime program were several evening events, culminating in a trip to the Georgia Aquarium for the closing banquet. The aquarium venue was outstanding, with full-wall views of the world's largest aquarium while feasting on delicious food. Memorable discussions between many attendees from academia and industry made this both a memorable and productive meeting.

*Signed: Michael Gollner, University of California at San Diego*

## **FM Global Open Source CFD Fire Modeling Workshop, Boston, May 2011**

<https://sites.google.com/site/firemodelingworkshop>

The third FM Global Open Source CFD Fire Modeling Workshop was held in Norwood, Massachusetts, USA on May 9-10, 2011. The workshop was hosted by FM Global and included members of both public and private research groups, presenting the state of the art in fire modeling and discussing current trends in parameter estimation. Updates to the current version of FireFOAM were presented, and many presentations were made where it had been used to model warehouse fire phenomena. In my opinion, two important research topics stood out during the conference that have the potential to affect the fire modeling community in the future. First, extinction criteria in numerical models is an important topic that is as of yet unresolved. Different numerical codes use different criteria, and Arnaud Trouvé and James T'ien both presented new approaches to comprehensive extinction criteria for use in combustion and fire modeling. Another active topic was on the selection of appropriate parameters for fire modeling, which included presentations and discussion of experimental methods, numerical algorithms, and error estimation. The participants were very thankful to FM Global for hosting the workshop, especially Sergey Dorofeev for all his efforts planning the event.

*Signed: Michael Gollner, University of California at San Diego*

## 14th International symposium on Aerodynamics and Ventilation of Tunnels, Dundee, 11-13 May 2011

The 14th International symposium on Aerodynamics and Ventilation of Tunnels was held in Dundee, Scotland on the 11-13 May 2011.

About 50 papers were presented to 110 delegates from 24 countries, with a majority of engineering consultants and about 10% of academics. Out of the 50 papers, 50% concerned directly fire issues (smoke control, design fires, fire modeling, risk assessment), the remainder being focused on pollution control, pressure transient and equipments designed to withstand high temperatures.

One of the main issues which was discussed is the interest and use of Fixed Fire Fighting Systems. A remarkable paper in this subject was B Melvin and W Connel, Cost benefit in tunnel ventilation and other systems resulting from installation of fixed fire fighting systems in road tunnels. A debate was organized with the attendance on the issue "do Fixed Fire Suppression Systems justify a reduction in the design fire size in tunnels?" Another paper which generated great interest was "Proposed idealized design fire curves for road tunnels", which was a multi-country review of all fire tests and fire design curves.

As often in fire safety engineering conferences, there was much discussion around the right level of numerical modeling and the adapted tools. It was agreed that, for engineering purposes, numerical simulations are of great interest when the aim of the simulation is clear and when they are performed with care. In such cases they compare very well with extensive data for fire test (e.g. "Energy balance in a tunnel fire - midscale tests and CFD simulations", by Elizabeth Blanchard et al.), but may also, when improperly used, perform very badly, hence the need of defining clearly, when doing a simulation, the aims and limitations of this simulation.

The proceedings were edited by Kate Hunt, with BHR Group Ltd as publisher (BHR Group Ltd, Cranfield, Bedfordshire MK43 0AJ, UK, +44 (0) 1234 750 422, [www.bhrconferences.com](http://www.bhrconferences.com) under ISBN number 978-1-85596-123-2.

*Signed: Pierre Carlotti, CSTB*

## 1st International Conference on Safety and Crisis Management in the Construction, Tourism and SME's Sectors

The 1st International Conference on Safety and Crisis Management in the Construction, Tourism and SME's

Sectors (1stCoSaCM) was held in Nicosia, Cyprus between 24th and 28th June 2011. Over 100 attendees from 21 countries presented 78 papers in the areas of safety. The conference was inaugurated by the Minister of Labour and Social Insurance of the Republic of Cyprus, Ms Sotiroula Charalambous and was under the auspices of the Mayor of Nicosia, Ms Eleni Mavrou.



### Special Session in Fire Engineering in South Europe

A Special Session in Fire Engineering in South Europe chaired by Dr Guillermo Rein from the University of Edinburgh took place on Monday. The session was the most popular as it took over 8 parallel sessions with over 30 papers in fire safety engineering in the urban and wildland environment. The Session was supported by the International Association for Fire Safety Science (IAFSS) and the International Association for Wildland Fires (IAWF). The morning plenary lecture was given by Prof José Luis Torero from the University of Edinburgh and the afternoon plenary was provided by Dr Gavriil Xanthopoulos from National Agriculture Research Foundation (NAGREF), Greece. Fire Engineering, Wildland Fires, Wildland Urban Interface (WUI) fires, emerging technologies in fire safety engineering were among the main themes discussed through the session.

The special session coincided with the announcement that the new fire code in Cyprus is in public consultation and will soon be a law. The 2nd CoSaCM is scheduled to take place in summer 2013.

*Signed: George Boustras, European University Cyprus*

## XIII International Congress on the Chemistry of Cement

<http://www.icccmadrid2011.org/uk/index.htm>

It was celebrated from 4th to 8th July, 2011, and was organized by the Eduardo Torroja Institute and the Spanish Institute of Cement and its Applications (IECA). The congress was held at the Congress Palace of Madrid, Spain. Over 900 people participated and there were over 650 presentations in three modalities: Poster, Brief Oral Presentation + Poster, and Oral Presentation. This Congress is the most important forum within the scientific community

specialized in the field and is held every 4 years. It gave a unique opportunity to show and review the advances on the chemistry of cement and the chemical properties of cementitious material.

*Signed: Mariano Lazaro, Universidad de Cantabria*

## CALL FOR PAPERS

### **Fire Technology special issue on WTC Collapse**

*Fire Technology*, the journal of the National Fire Protection Association published by Springer, is preparing an issue on the 2001 fire and collapse of World Trade Center. The purpose is to collect research, forensic and engineering output of the highest scholarly standards synthesized in the 10 years passed since the event.

Multidisciplinary and international contributions are especially encouraged. Topics of interests include: WTC 1, 2, 5 and 7, the crash, fires, structural response, collapse, forensic conclusions, experiments, modeling, Fire and Rescue intervention, human behavior, building design, post-collapse fires and recovery, previous attacks on WTC and related subjects. Submissions will be accepted until 11th Nov 2011 at: <http://fire.edmgr.com> (choose article type "World Trade Center"). For further information, contact Associate Editor Dr Guillermo Rein at [G.Rein@ed.ac.uk](mailto:G.Rein@ed.ac.uk).

### **Fire Technology special issue on Wildland-Urban Interface (WUI) Fires**

Wildfires that spread into communities, commonly referred to as Wildland-Urban Interface Fires (WUI), are a significant problem around the world. WUI fire spread is extraordinarily challenging and presents the next frontier in fire safety engineering. Papers are invited as part of a special issue of *Fire Technology* devoted to the state of the art in WUI fire research. Of interest are research studies (field, experimental, numerical) that may provide the scientific basis for cost-effective building codes/standards as well as retrofit strategies to reduce the number of structures lost in these fires.

Guest Editor: Dr Samuel L. Manzello, NIST. Manuscripts should be submitted to: <http://FIRE.edmgr.com>

Important Dates: paper submission deadline: December 1, 2011; notification of acceptance: April 1, 2012; final manuscript: June 1, 2012.

### **SFPE Fire Protection Engineering**

**Track** at the 2012 NFPA Conference & Expo in Las Vegas, NV, June 11-14, 2012. Deadline for submissions is September 12, 2011.

<http://www.sfpe.org> for information

### **7th International Conference on Structures in Fire (SiF 2012), Zurich, Switzerland, June 6-8, 2012.**

<http://www.sif2012.ethz.ch>

The International Conference on Structures in Fire (SiF2012) in Zurich, is focused on the behaviour of structures under fire exposure, including the art, science and practice of structural fire engineering.

The organizing committee invites to submit extended abstracts on these topics. The extended abstract should be maximal 2 pages A4 in length and must provide a clear summary of the proposed paper. Deadline for submission of extended abstracts is December 31, 2011.

### **6th International Conference on Pedestrian and Evacuation Dynamics**

ETH Zurich, Switzerland, 6 June to 8 June 2012.

<http://www.ped2012.org>. Abstracts are due 15 November 2011 and full papers or posters will be due 31 March 2012.

### **5th International Symposium on Human Behaviour in Fire**

at Downing College in Cambridge, UK, 19th-21st September 2012.

<http://www.intersciencecomms.co.uk>  
To propose a paper or abstract, submit an abstract for review (two-pages for paper presentations, one-page for posters) by email to the organizers before 31st December, 2011. For more information, contact: [office@intersciencecomms.co.uk](mailto:office@intersciencecomms.co.uk)

### **34th International Symposium on Combustion**

will be held at the Warsaw University of Technology, Poland July 29th to August 3rd, 2012. Scientists, engineers and others interested in combustion are invited to attend and participate in this biennial event. Papers wishing to be submitted to the symposia are to be received by midnight, Pacific Standard Time (GMT-5hrs) January 3rd, 2012. The abstract submissions are to be received by midnight, Pacific Standard Time (GMT-5hrs) on April 27th, 2012. For more detailed venue and accommodation information, please go to the conference homepage at: <http://www.combustion2012.itc.pw.edu.pl>

## CONFERENCES and UPCOMING EVENTS

2nd Annual Electric Vehicle Safety Summit, Sep 27-28, 2011, Detroit, USA. <http://www.sae.org/events/nevss>

7th Mediterranean Combustion Symposium, Cagliari, Italy, Sep 11-15, 2011. <http://www.ichmt.org/mcs-11>. It includes 2nd Workshop on Measurement and Computation of Turbulent Spray Combustion.

International Conference on Fire Behaviour and Risk Modelling, Alghero, Italy, Oct 4-6, 2011. <http://www.icfbr2011.it>

2nd International RILEM Workshop on Concrete Spalling due to Fire Exposure, Delft, Netherlands, Oct 5-7, 2011. <http://firespalling.tudelft.nl>

Advanced Research Workshop "Evacuation and Human Behavior in Emergency Situations", Santander, Spain, October 21, 2011. <http://www.evac2011.unican.es>

SFPE Annual Meeting: Professional Development Conference and Exposition, Oct 23-28, 2011, Portland, USA. <http://www.sfpe.org>

The Science of Suppression - A FIRESEAT symposium, Edinburgh, UK, Nov 9, 2011. <http://www.eng.ed.ac.uk/FIRESEAT>

Exploring the Mega-fire Reality 2011, A Forest Ecology and Management Conference, Nov 14-17, 2011, Tallahassee, Florida, USA. <http://www.megafirereality.com>

Fall Meeting Eastern States Section of the Combustion Institute, Connecticut, USA Oct 9-12, 2011. <http://www.engr.ucr.edu/WSSCIConference/index.htm>

Fall Meeting Western States Section of the Combustion Institute, Riverside, California, USA, Oct 16-18, 2011. <http://essci.engr.uconn.edu/uconn-fall11>

2011 Dust Symposium, Fire Protection Research Foundation, NFPA, Detroit, USA Sep 20-21, 2011 <http://www.nfpa.org>

2011 SFPE Annual Meeting: Professional Development Conference & Exposition being held Oct 23-28, Portland, USA. <http://www.sfpe.org>

2011 NFPA Symposium Alternative Energy Technologies and Electrical Safety Standards, Fire protection Research Foundation, Atlanta, USA, Dec 6, 2011. <http://www.nfpa.org>

5th International Symposium on Tunnel Safety and Security (ISTSS), Mar 14-16, 2012, New York, USA. <http://www.istss.se>

3rd Human Dimensions of Wildland Fire Conference, Seattle, Washington, USA, Apr 17-19, 2012. <http://www.iawfonline.org>

Spring Meeting Central States Section of the Combustion Institute, Dayton, Ohio, USA, Apr 22-24, 2012. <http://www.cssci.org>

7th conference Wood and Fire Safety on 13-16 May 2012, High Tatras, Slovakia. For information, contact [linda.osvaldova@fsi.uniza.sk](mailto:linda.osvaldova@fsi.uniza.sk)

7th International Conference on Structures in Fire (SiF), Zurich, Switzerland, Jun 6-8, 2012. <http://www.sif2012.ethz.ch>

6th International Conference on Pedestrian and Evacuation Dynamics, Zurich, Switzerland, Jun 6-8, 2012. <http://www.ped2012.org>

9th International Conference on Performance-Based Codes and Fire Safety Design Methods, Hong Kong, Jun 20-22, 2012. <http://www.sfpe.org>

34th International Symposium on Combustion, Warsaw University of Technology, Poland, Jul 29-Aug 3, 2012. <http://www.combustion2012.itc.pw.edu.pl>

2nd International Conference on Fires in Vehicles (FIVE), Chicago, USA, Sep 27-28, 2012. <http://www.firesinvehicles.com>

5th International Symposium on Human Behaviour in Fire, Cambridge, UK, Sep 19-21, 2012. <http://www.intersciencecomms.co.uk>

2012 SFPE Annual Meeting: Professional Development Conference and Exposition. Oct 14-19, 2012, Savannah, USA. <http://www.sfpe.org>

2012 International Symposium on Fire Investigation Science and Technology (IFSI), Maryland, USA, Oct 15-17, 2012. <http://www.isfconference.com>

## NEW PUBLICATIONS

### Fire safety in timber buildings - Technical guideline for Europe:

The very first technical guideline on the European level, presented in issue number 30, is available as SP Report 2010:19. Further information and orders at <http://www.sp.se/en/publications>. Contact person [Birgit.Ostman@sp.se](mailto:Birgit.Ostman@sp.se)

## **Fundamentals of Combustion Processes**

<http://www.springer.com/>

Book by Sara McAllister, Jyh-Yuan Chen, Carlos Fernández-Pello (University of California at Berkeley). It serves students as a textbook for an upper-division undergraduate and graduate level course in mechanical engineering. The authors focus on fundamental theory of combustion and provide a simplified discussion of basic combustion parameters and processes such as thermodynamics, chemical kinetics, ignition, diffusion, and pre-mixed flames. The text includes applications, example exercises, suggested homework problems, and videos of laboratory demonstrations (<http://www.youtube.com/user/FndmtlsofCombustion>)

## **Transforming Combustion Research through Cyberinfrastructure**

[http://www.nap.edu/catalog.php?record\\_id=13049](http://www.nap.edu/catalog.php?record_id=13049)

Report by The National Research Council, USA. It explains the need for a combustion cyberinfrastructure and the relationships between combustion science, the mathematical sciences, and computer science required to implement such a cyberinfrastructure. It also presents a strategic view for the development of the cyberinfrastructure. This report is the result of two years deliberation by the Committee on Building Cyberinfrastructure for Combustion Research, chaired by Mitchell Smooke of Yale University. It concludes with several recommendations of the committee concerning the importance of such a cyberinfrastructure for research and education, its funding requirements, its benefits to the combustion and other scientific communities, and key steps for planning it.

## **SFPE Engineering Guide to Substantiating a Fire Model for a Given Application, and SFPE Engineering Standard on Calculating Fire Exposures to Structures.**

<http://www.sfpe.org>

## **Proceedings for the 5th International Conference on Pedestrian and Evacuation Dynamics (PED 2010), held at NIST in Gaithersburg MD, 8th-10th March, 2010, have now been published.**

<http://www.springerlink.com>

## **JOBS**

### **Senior Research Scientist/Specialist, FM Global, Norwood, Massachusetts, USA**

The purpose of this position is develop new scientific knowledge, engineering technologies, and engineering solutions to problems in material flammability, fire

dynamics, and fire protection, which can be used and applied by FM Global for the prevention or control of industrial property loss. The primary responsibility of the position is to plan, conduct, and communicate results of research projects in support of the critical business needs.

The principal responsibilities are to carry out internally-funded research projects in the areas of flammability of materials, fluid dynamics, combustion, fire propagation, suppression / extinguishment, heat and smoke generation, and heat transfer from fires. Key areas of research include understanding of fire behavior at the medium and large scales via bench-scale experiments and theoretical models on material pyrolysis and flammability. The experimental and theoretical studies will be closely integrated with Computer Fluid Dynamic (CFD) fire model development and validation within the work group. Additional component will be to perform focused studies and to convey the results of the studies in a form suitable for use by FM Global field engineering. Long-range studies of a fundamental nature will be balanced with applied research focused on critical business needs.

The position is responsible for all aspects of project management including project proposals, budget, and reporting. The position will work with a team of senior scientists and their technical support to maintain progress within the FM Global research programs. In addition, the position is responsible to communicate and transfer research results for practical use within FM Global and, as appropriate, to outside organizations including the scientific/engineering communities and standards organizations. The position also acts as a consultant to FM Global business units such as Engineering, Approvals, and Underwriting, as well as to insured clients.

The position requires a PhD in Mechanical, Chemical Engineering, or related fields with a strong fundamental background in combustion, fluid mechanics, heat transfer, and applied mathematics. Extensive experience in combustion/fire research and an understanding of experimental methods in thermal fluids, combustion and/or fire is required. Experience in numerical methods associated with combustion is desirable. Excellent written and verbal communication skills are required. Title and salary are commensurate with qualifications and experience.

Contact: Sergey B. Dorofeev, Research Area Director, Fire Hazards and Protection, FM Global, 1151 Boston-Providence Highway, Norwood, MA 02062, e-mail: [sergey.dorofeev@fmglobal.com](mailto:sergey.dorofeev@fmglobal.com)

## **Assistant Professor, Fire Protection Engineering, University of Maryland, College Park, USA**

The Department of Fire Protection Engineering at the University of Maryland offers a challenging opportunity in fire protection engineering education and research. Fire safety embraces many topics, including the behavior of fire and smoke; the interaction of fire with people, structures and the environment; fire hazard and risk analysis; and fire safety design, regulation and investigation. Fire research includes, but is not limited to, wild land fire; process safety and explosion; the fundamentals of combustion; suppression; material flammability; structural resistance to fire; and human response and behavior in fire.

Applications are invited for a tenure-track position at the Assistant Prof level. The applicant should have a doctorate in a relevant discipline and a proven record in research. Teaching expertise and a background in fire protection are desirable. The position requires teaching at the undergraduate and graduate levels, and establishing a successful externally funded research program. Candidates with computational and/or experimental experience are encouraged to apply.

Please apply online at <https://jobs.umd.edu/applicants/jsp/shared/Welcome.css.jsp>, including a cover letter, full curriculum vitae and list of publications, statements of research and teaching interests, and the names and contact information for three references.

The University of Maryland offers an extensive benefits package. This position is a 9-month, tenure-track position (position # 105795).

The University of Maryland is an Equal Opportunity Affirmative Action Employer with a strong institutional commitment to achieving diversity among its faculty and staff. Women and minorities are especially encouraged to apply for this position. If you have questions or need additional information, please direct inquiries to [FPE-search@umd.edu](mailto:FPE-search@umd.edu).

## **Fire safety engineer, SP Trätekt, Stockholm, Sweden**

SP Trätekt works on most aspects of fire safety in timber buildings. The research aims at promoting the use of wood as a predictable and fire safe building material in Sweden and on export markets.

We are active in building fire design, from ignition of materials to load bearing capacity of structures. Both active and passive fire protection are included. Our skills include fire safety design, material properties, risk assessment, residential sprinklers, fire retardant wood

products, international standardization and national fire regulations. Our experience from research projects and contracts has resulted in recognition and networks worldwide.

A recent European project is FireInTimber – Fire resistance of innovative timber structures within the WoodWisdom-Net research program. It resulted in the very first European guideline Fire safety in timber buildings.

We are now looking for a new person focusing on Fire Safety Engineering aspects and including coordination of national and international projects. Further information from Birgit Östman [birgit.ostman@sp.se](mailto:birgit.ostman@sp.se), phone +46 10 516 6224, and at <http://www.sp.se/en/index/services/fireproofbuilding/Sidor/default.aspx>

## **Post Doctoral Researcher in Fire Toxicity, at University of Central Lancashire, UK**

Applications are invited for a Post Doctoral Research Fellow in the Fire Toxicity Research Group in the Centre for Fire and Hazards Science at the University of Central Lancashire. Dr Anna Stec has been awarded a research grant funded by the Engineering & Physical Sciences Research Council (EPSRC) to carry out research on “Measurement and Prediction of Fire Smoke Toxicity of Materials in Enclosures” (<http://www.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/I033181/1>).

A versatile and enthusiastic scientist/engineer with both practical and modeling experience is required to develop our Large Instrumental Fire Enclosure (LIFE facility), based 10 miles off-campus at Lancashire Fire and Rescue Service’s Training Centre at Washington Hall. The facility will provide crucial information on the influence of ventilation conditions on rates of fire growth and product generation.

You would be based in the UCLan Centre for Fire and Hazards Science, at the University, but will lead the construction, instrumentation, fire tests, data analysis and modeling of the large scale test program. This will require knowledge and experience of basic methods of construction, control and monitoring of gas flow rates, sample collection and on-line analysis, and modeling fire growth and fire effluent movement. Two year fixed term contract. Salary in the range of £22,971-26,629 per annum.

Informal enquiries should be made to Dr Anna A Stec, [aastec@uclan.ac.uk](mailto:aastec@uclan.ac.uk). For further information about the School of Forensic and Investigative Sciences a please visit our websites: [http://www.uclan.ac.uk/scitech/forensic\\_investigative/index.php](http://www.uclan.ac.uk/scitech/forensic_investigative/index.php)

## PhD Studentship in Wildfire dynamics, Universitat Politecnica de Catalunya, Spain

The knowledge of the fire physical and geometrical characteristics is important to describe and understand wildfire behavior. Parameters such as flame length, temperature or emissive power determine directly the fire-fighters extinction capacity and give valuable information for the fire prevention management. The Centre for technological Risk Studies (CERTEC, <http://certec.upc.es>) from the Universitat Politecnica de Catalunya is working on laboratory and field wildfire behavior, modeling of forest fires, retardants and fire suppressants, flame geometry, carbon emissions in wildfires.

The candidate has to have a forestry, physics or engineering (specially mechanical or chemical) background with a good student record. The salary will be linked to Spanish official grants for PhD students (FI Generalitat de Catalunya, FPI or FPU Ministerio de Educacion y Ciencia, FPI UPC). Depending on the grant, the start shall be during the next fall season 2011 or January 2012. We will also be pleased to accept people coming with their own grant. The work will be carried out at the CERTEC premises (ETSEIB, Av. Diagonal 647, 08028 Barcelona). Contact: Prof Eulalia Planas at [eulalia.planas@upc.edu](mailto:eulalia.planas@upc.edu)

## Obituaries

### Prof. Kazuo Akita (1924 - 2009)



Prof. Kazuo Akita, Professor Emeritus of the University of Tokyo passed away on March 19, 2009 at the age of 85. According to the story by Mrs. Akita, he fell down at home and was carried to hospital by ambulance at the end of 2008, but he had felt considerable pain even before then without informing the people around him. Finally, he could not stand intense pain and fell down. He passed away just when it was decided he should move to another hospital.

Mrs. Akita said that Prof. Akita was a stubborn person, and when I heard that, I was deeply impressed and thought that as a person with a strong will, he did not want to bother others. There may be many people who have the impression that Prof. Akita always looked serious, but this is not true. Whenever we went to his home for New Year holidays etc., he looked very joyful and told various stories that have nothing to do with research. He pleasantly provided us with his extensive knowledge especially when discussing the fire in Edo. He later turned these stories into a book.

Prof. Akita worked for National Research Institute of Fire and Disaster, Fire and Disaster Management Agency from 1961 to 1967. He was engaged in liquid and solid combustion study and achieved research results recognized worldwide particularly for his pioneering work and leadership in pool fires and fire modeling from the 1950s to the 1970s.

After he had concurrently worked for the University of Tokyo for some years, he moved to the university in 1967 and dedicated himself to teaching and leading students. After the Hokuriku tunnel fire in 1972 that killed 30 people he took the leadership of real scale fire experiments and created the foundation for the instruction manual corresponding to train fires in a tunnel.

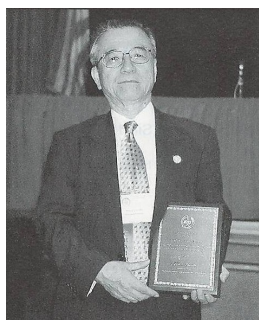
In relation to the Japan Association for Fire Science and Engineering, he played a role as an officer from about 1967, four years after the society had become a corporation. He was involved in the editing of the Bulletin of research papers of the Japan Association for Fire Science and Engineering for a long time, and created the basis of the bulletin. Later he acted as a Vice-Chairperson from 1988-1989 and a Chairperson from 1990-1991. Prof. Akita was also one of the founders of the international forum of fire research preceding the establishment of IAFSS.

He was a very strict teacher for us students because his principle was "letting students think for themselves." He was especially strict about written work, and I still remember that he corrected our conference papers in minute detail. I suppose that he is having a wry smile in heaven about this poorly-written text. I want to express our deep gratitude for his strict guidance, praise his achievements, and I respectfully offer my condolences.

*Signed: Ai Sekizawa, Tokyo University of Science.  
Translation of the obituary in KASAI, the official Journal of Japan Association of Fire Science and Engineering, Vol. 59 No. 2, April 2009 originally by Dr. Ichiro Nakaya, Japan Testing Center for Construction Materials)*



## Prof. Yoichi Uehara (1931 - 2009)



Prof. Yoichi Uehara, Professor Emeritus of the Yokohama National University passed away on August 8, 2009 at the age of 78. For the past several years he had been repeatedly hospitalized and/or released under home healthcare. We had worried about his state of health and we finally had the sad news. We knew that he was unwilling to show his illness in public as he was a very dandy gentleman, but now I regret the loss of opportunity to see him again.

Prof. Uehara was widely known both in Japan and abroad as a researcher in chemical fires. He was Chairperson of the Japan Association for Fire Science and Engineering, the Japan Society for Safety Engineering, and the Safety Engineering Research Communication Committee of the Science Council of Japan. He exerted himself to create places of international academic exchange. He worked toward the launch of the International Association for Fire Safety Science (IAFSS), the International Fire Safety Science Symposium, the Asia-Oceania Fire Science and Technology Symposium, and the Asia-Pacific Symposium on Safety, etc. Prof. Uehara was the Treasurer of IAFSS from 1991 to 1997 and IAFSS Vice-Chair from 1997 to 2002. The above photograph was taken at the 7th IAFSS symposium held in the United States in 2002, where he was awarded the prize for his distinguished service in IAFSS.

In relation to the Japan Association for Fire Science and Engineering, he served on the Academic Promotion Committee, the Editorial Committee, and the International Relations Committee for many years, and assumed an officer on the board of directors from 1973 to 1974 and for a further three terms, from 1993 to 1996. He was also the 17th Chairman of Japan Association for Fire Science and Engineering from 1995 to 1996.

Prof. Uehara did not complain about every little thing and the atmosphere of his laboratory was very free. Students enjoyed the liberal atmosphere, but Prof. Uehara was a reliable person and a tower of strength for anyone in trouble. I think that as a mentee of late Prof. Kenichi Fukui, who was a Nobel Prize winner, Prof. Uehara gave appropriate guidance that matched our ability, although I am afraid that he may have been very

disappointed with our poor theory development. I sincerely thank Prof. Uehara for his warm guidance, remember the achievements during his lifetime and give heartfelt condolences.

*Signed: Ai Sekizawa, Tokyo University of Science.  
Translation of the obituary in KASAI, the official Journal of Japan Association of Fire Science and Engineering, Vol. 59 No. 5, October 2009 originally written by Dr. Hideo, Professor, the Yokohama National University*

## Harold "Bud" Nelson, Father of Modern Fire Protection Engineering (1929 - 2011)



Harold "Bud" Nelson, 82, a primary force in the definition of modern fire protection engineering (FPE), died July 21, 2011 in Fairfax, Virginia. More than anyone else, Bud championed modern FPE as a discipline based upon quantitative hazard and risk assessment, rooted in fire safety science. Nelson was one of those rare individuals in fire protection who could relate both with the fire scientist creating the technology and also with the fire protection engineer who applies that technology. Bud was born on February 9, 1929 and grew up in and around Chicago, Illinois. In 1950, he graduated from the Illinois Institute of Technology with a bachelor's degree in Fire Protection and Safety Engineering. After graduating, he was drafted into the army and served during the Korean War at Fort Aberdeen Proving Ground.

In 1952, Bud moved with his wife, Theresa, to Wilmington, Delaware, where he worked as an engineer for E.I. DuPont Co. In 1956, Bud and his family moved to Washington, DC as he began to work with the U.S. Government Naval Yard. In 1958, he began a 17-year stint with the General Services Administration (GSA), where he served as Director of Accident and Fire Prevention Division. There, his leadership was integral in establishing GSA's international reputation as a leader in fire safety for high-rise buildings.

As has often been the case in fire safety, a tragedy led to the cornerstone for a leap forward. In February

1971, a fire occurred above the 30th floor of the office building at One New York Plaza in New York City. The difficulty encountered by the fire department in combating this fire highlighted growing concerns for fire safety in modern high-rise office buildings. The GSA convened an international conference to develop solutions to the fire problem in high-rise buildings, with Bud as the conference organizer and coordinator. The conferees concluded that fire protection for high-rise buildings was not keeping pace with high-rise building design. They established the basic fire protection design parameters for high-rise buildings and endorsed the need for a total systems concepts approach for high-rise fire safety.

Bud had been pioneering such an approach. Under his direction, GSA implemented his system and many of the conference recommendations into the final design of the 32-story Seattle Federal Building. This building became a model for high-rise fire protection design around the world. The GSA design approach, Bud's brainchild, led to the formal development and use of event logic trees for risk assessment and the formation of the National Fire Protection Association (NFPA) Committee on Systems Concepts for Fire Protection that formalized the practice. It has been in use ever since.

In 1975, Bud joined the new Center for Fire Research at the National Bureau of Standards. As Chief of the Design Concepts Section, he and his team conducted groundbreaking research in the areas of fire risk appraisal, human behavior in fires, applied fire growth and smoke transport modeling, fire safety for handicapped persons, and the application of personal computers to fire safety problems. He created the Fire Safety Evaluation System (FSES), a process in which experts' grading of fire protection technologies enabled minimizing the cost of providing a degree of fire safety equivalent to that provided by the fire code. Today, this is an integral part of the national fire codes and became the basis for the computer-based performance-based design that is spreading worldwide. Bud was one of the first in his profession to recognize the value of the emerging computer technology to practitioners. He organized a group of scientists and engineers who developed many of the early FPE software tools, including FSES tools for various occupancies. Bud was known to go to fire meetings and hand out floppy disks and, later, CDs by the hundreds.

Bud had such a unique influence on the Fire Research Program at NIST that his colleagues developed a preliminary expert system, ASKBUDJr, to attempt to capture how Bud approached fire safety analysis. It is likely that he was the only engineer in the history of NBS/NIST whose mind was thus encoded.

Bud's singular contributions while at NIST were recognized in 1982 when he received the U.S. Department of Commerce Silver Medal and again in 1989 when he received the Department's Gold Medal.

Bud retired from the Federal government in 1992, but remained affiliated with NIST throughout the rest of his life. His picture hangs in the NIST hall of distinguished alumni.

Early in the 1990s Bud was diagnosed with Parkinson's disease, but he never let his condition stop him. After his "retirement," Bud joined Hughes Associates, Inc., a global fire science and engineering consulting firm, where he continued to contribute for 10 years (1992-2002) by advancing computer based engineering tools used in modeling fire growth and fire hazards development, in smoke management analysis and design, and in fire investigation.

In 2002, Bud was again called upon by the Federal government. On September 11, 2001, in an unprecedented attack on the U.S. homeland, terrorists had destroyed the World Trade Center buildings in New York City. Counter to all expectations, three tall buildings had collapsed, killing nearly 3,000 people. The country wanted to know how this could have happened. Bud was a central figure on the 2002 expert committee assembled by the Federal Emergency Management Agency to appraise the response of the buildings to the attack. When NIST's National Construction Safety Team conducted the scientific reconstruction of the collapse of these buildings, Bud was a prized member of the team.

Throughout his career, Bud's devotion to his profession was legendary. He was a Fellow of the Society of Fire Protection Engineers and was awarded their John J. Ahern President's Award and their John L. Bryan Mentor Award. In 1987, the Society surprised him by creating the Harold E. Nelson Service Award and making him the first recipient.

Bud was a member and leader of many NFPA Technical Committees, including Safety to Life Correlating Committee; Board & Care Facilities; Means of Egress (Building Code/Safety to Life); Health Care Occupancies (Building Code/Safety to Life); Alternative Approaches to Life Safety (Chair); Fire Investigations; Building Construction (Chair), Records Protection (Chair), Smoke Management Systems (Chair). In 1990, NFPA awarded Bud their Standards Medal in recognition of his outstanding contribution to fire safety in the development of fire safety standards.

On a broader stage, Bud was a member of the committee that created the International Association for Fire Safety Science in 1985. He was adamant that "science" be in the organization's name and that it be a cornerstone of its function. In 1999, he received their prestigious Kunio Kawagoe Gold Medal in recognition of his life-long contributions and career achievements in fire science and engineering.

In 2005, the American Association of Engineering Societies recognized Bud with National Engineering Award. This award recognizes inspirational leadership and tireless devotion to the improvement of engineering education and to the advancement of the engineering profession, as well as to the development of sound public policies as an engineer-statesman. He is the only fire protection engineer to ever receive the award.

Bud was an avid student of history, with interests ranging from ancient Europe to the U.S. Civil War to modern days. He combined this with his love for his profession as a major contributor to the History of Fire Protection Engineering, which was jointly published by NFPA and SFPE.

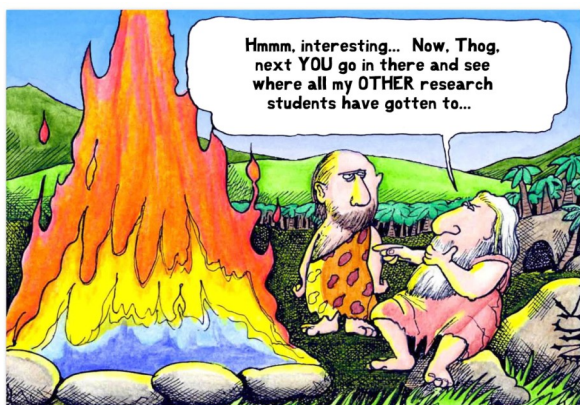
In all, Bud led the application of the advances in fire safety science to practical engineering problems and building fire investigations, and in the process developed and disseminated new engineering methodologies for broad use by practicing professionals. He earned worldwide recognition as the father of modern fire protection engineering.

And yet, even with this unparalleled professionalism, Bud's prime passion was always for his family. During 58 years of marriage, he was devoted to his wife Theresa, his four children, eight grandchildren, and three great-grandchildren. He was always there for his family as husband, father, friend, advisor, general handyman and always as practical engineer. He shared with each of them his passions for science, history, technology, fire science (of course) and above all marriage and family.

Bud lived fully the passions of his life and left an enduring legacy, both personally and professionally. His loss deeply moves us all and he will be deeply missed, but even more we will celebrate, cherish, and benefit always from his presence in our lives.

*Signed: Craig Beyler, Hughes Associates, and Richard G. Gann, National Institute of Standards and Technology.*

#### Proto-Professor Algarth Zag:



Proto-Professor Algarth Zag, pioneer in fire research.

By Nick D. Kim. <http://www.nearing-zero.net>  
(reproduced with permission)

## 2011 Officers and Committee Members

### EXECUTIVE COMMITTEE

#### Chairman:

Prof Bogdan Dlugogorski, Australia  
[Bogdan.Dlugogorski@newcastle.edu.au](mailto:Bogdan.Dlugogorski@newcastle.edu.au)

#### Vice-Chairmen

Dr Anthony Hamins, USA  
Prof Ai Sekizawa, Japan  
Prof Jose Torero, UK

#### Secretary

Dr Margaret Simonson McNamee, Sweden  
[margaret.mcnamee@sp.se](mailto:margaret.mcnamee@sp.se)

#### Treasurer

Dr Christopher Wieczorek, USA

#### Immediate Past Chairman

Dr Craig Beyler, USA

#### Executive Members

Dr Charles Fleischmann, New Zealand  
Dr Arnaud Trouvé, USA

### IAFSS COMMITTEE:

Dr Vytenis Babrauskas, USA  
Mr Dieter Brein, Germany  
Prof W-K Chow, Hong Kong, China  
Prof Nicholas Dembsey, USA  
Dr Rita Fahy, USA (co-opted)  
Ms Carole Franks, UK (co-opted)  
Prof Ed Galea, UK  
Prof George Hadjisophocleous, Canada  
Dr Tuula Hakkarainen, Finland  
Prof Yuji Hasemi, Japan  
Dr Yaping He, Australia  
Dr Björn Karlsson, Iceland  
Dr Bart Merci, Belgium  
Dr Guillermo Rein (co-opted)  
Prof Jinhua Sun, China  
Prof Takeyoshi Tanaka, Japan

### IAFSS SECRETARIAT OFFICE

Carole Franks  
Interscience Communications  
West Yard House, Guildford Grove, Greenwich  
London SE10 8JT, UK  
Tel: + 44 (0)208 692 5050  
Fax: + 44 (0)208 692 5155  
Email: [iafssmembers@dial.pipex.com](mailto:iafssmembers@dial.pipex.com)