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# Suppression, Detection and Signaling Research and Applications Conference (SupDet 2016)

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**FINAL BRIEF BY:**

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Fire Protection Research Foundation  
Quincy, Massachusetts, USA

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Antonio, TX

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## **FOREWORD**

Since 1997 NFPA has organized SupDet, an annual workshop which brings together leading experts in the field of fire protection engineering for the purpose of sharing recent research and development on techniques used for fire suppression, detection, and signaling. These seminars are generally attended by a multitude of fire protection professionals, such as engineers, designers, manufacturers, installers, and AHJs. This year SUPDET was held in San Antonio, TX. The workshop was split into two separate programs, a “Suppression Program” and a “Detection Program”, both of which lasted two days. In between the suppression and detection programs was a special workshop titled “Big Data and Fire Protection Systems” which was open to all SUPDET attendees. The goal of this workshop was to identify and prioritize the opportunities for big data to inform decision making for ITM (Inspection, Testing and Maintenance) used for built-in fire protection systems.

The format of SupDet 2016 consisted of mini-sessions that each included a handful of topics and presenters. The “Suppression Program” was composed of five sessions: Warehouse Sprinkler Protection, Applications, Water Mist, Protection of Li-Ion Batteries, and Clean Agents and Foam. There were six sessions in the “Detection Program”, including: Residential Applications, Detection Research, Smart Building Applications, Signaling and Notification, Nuisance Sources, and Smoke Characteristics and Detector Design. As can be seen from the Conference agenda below, there were many different sub-topics within each session, all related to the overall theme of either Suppression or Detection. All presentations from the event can be found on the [Foundations website](#).

## **SUPPRESSION PROGRAM**

**Tuesday, March 1, 2016**

**8:30 Welcome**  
**William M. Carey Award**

**8:45 Keynote Address**  
**History of Fire**  
Dick Gann, National Institute of Standards and Technology (NIST)

<b>9:30</b>	<b>Session I: Warehouse Sprinkler Protection</b>
<b>9:30</b>	<b>Early Suppression Fast Response Sprinklers and Obstructions</b> Garner Palenske, Aon Fire Protection Engineering Corporation
<b>10:00</b>	<b>ESFR K14 and High Clearance Update</b> Lorin Klein, Whirlpool James Golinveaux, Tyco Fire Protection Products Christopher Gates, Underwriters Laboratories (UL) Rich Gallagher, Zurich Services Corporation



10:30 Break sponsored by

<b>11:00</b>	<b>Session I: Warehouse Sprinkler Protection (continued)</b>
<b>11:00</b>	<b>A Numerical Study on the Effect of Ceiling Slope on Sprinkler Activations and Spray Transport</b> Prateep Chatterjee and Karl V. Meredith, FM Global
<b>11:30</b>	<b>Biomass Commodity Classification</b> Erin G. Webb, Ph.D., Oak Ridge National Laboratory Daniel Steppan, Underwriters Laboratories (UL)
<b>12:00</b>	<b>New Technology for Sprinklered High-Challenge Warehouses</b> Christina Francis, P&G

12:30 – 2:00 Lunch on own

<b>2:00</b>	<b>Session II: Applications</b>
<b>2:00</b>	<b>Sub-Scale Analysis of New Large Aircraft Pool Fire-Suppression</b> Christopher P. Menchini, Applied Research Associates, Inc. Steven P. Wells, Vulcan Research and Controls, LLC John R. Hawk, Air Force Civil Engineer Center
<b>2:30</b>	<b>Quantifying the Impact of Portable Fire Extinguisher Agents on Cultural Resource Materials</b> Matthew Benfer, Jensen Hughes



3:00 Break sponsored by

<b>3:30</b>	<b>Session III: Water Mist</b>
<b>3:30</b>	<b>Water Mist System Test Methods: Comparison of FM, UL, and IMO Procedures</b> Jason Huczek, Southwest Research Institute (SWRI)
<b>4:00</b>	<b>Development of a 1.5 GPM, Sprinkler Equivalent, Residential Water Mist Suppression System</b> William Makant, Plumis

5:00 – 6:30 Reception co-sponsored by



**Wednesday, March 2, 2016**

<b>8:30</b>	<b>Session IV: Protection of Li-Ion Batteries</b>
<b>8:30</b>	<b>Preventing Cell-to-Cell Thermal Runaway in Li-ion Battery Packs by Means of Fluid Application</b> <u>Mark Smith</u> , Nicholas Johnson, William Meyring, Paul Rivers, 3M
<b>9:00</b>	<b>Lithium-ion Energy Storage System Fires</b> <u>Andrew F. Blum</u> and R. Thomas Long, Exponent, Inc.
<b>9:30</b>	<b>Cartoned Lithium Ion Battery Storage Sprinkler Protection</b> Ben Ditch, FM Global R. Thomas Long, Exponent, Inc.



10:00 Break sponsored by

<b>10:30</b>	<b>Session V: Clean Agents and Foam</b>
<b>10:30</b>	<b>Experimental Research on the Jet-Distance of FK-5-1-12 Droplets after their Discharge out of a Fire Protection Nozzle</b> Hauke Petersen and <u>Gudrun Fay, Ph.D.</u> , Minimax GmbH & Co.
<b>11:00</b>	<b>Siloxane-Based AFFF: Testing of Experimental Foam Concentrates</b> <u>Ralf Helmut Hetzer</u> , Felix Kümmerlen, Angela Sager-Wiedmann, Bundeswehr Research Institute for Protective Technologies and NBC-Protection

**11:30 Closing Comments, Feedback**

**Wednesday, March 2, 2016**

**1:00 – 5:00 pm – Special Workshop  
Big Data and Fire Protection Systems  
(open to all symposium attendees)**

**DETECTION PROGRAM**

**Thursday, March 3, 2016**

**8:30 Welcome  
Ronald K. Mengel Award**

<b>8:45</b>	<b>Session I: Residential Applications</b>
<b>8:45</b>	<b>Public Benefits to a Smoke Alarm Performance Evaluation Scheme</b> Arthur Lee, Consumer Products Safety Commission (CPSC) Everett Baker, Tyler Bennett, Jimmy Mosteller, and John Williams, Worcester Polytechnic Institute (WPI)
<b>9:15</b>	<b>Improving Data Collection of Smoke Alarms in Fires</b> Joseph M. Fleming, Boston Fire Department Vyto Babrauskas, Ph.D., Fire Science and Technology, Inc.
<b>9:45</b>	<b>Experimental Investigation of Using CO Sensors to Detect Smouldering Fires in Dwellings</b> Christian Sesseng and Nina Kristine Reitan, Ph.D., SP



**10:15 Break sponsored by**

<b>10:45</b>	<b>Session II: Detection Research</b>
<b>10:45</b>	<b>Influence of the Operating Time on the Behaviour of Smoke Alarms in Typical Office Environments</b> Ingolf Willms, Ph.D., Thorsten Schultze, Ph.D., Lea Marcus, and Wolfgang Krüll, University of Duisburg-Essen
<b>11:15</b>	<b>Development and Testing of a Targeting System for Localized Suppression</b>

	Ian McNamara, FireStrike Industries LLC. James Andy Lynch, Fire Risk Alliance
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**11:45 – 1:15 Lunch on own**

<b>1:15</b>	<b>Session II: Detection Research (continued)</b>
<b>1:15</b>	<b>Effect of Detector Sensitivity Changes on the Provision of Adequate Warning to Building Occupants</b> <u>James Milke</u> , University of Maryland John Vythoulkas and Yun Jiang, Xtralis
<b>1:45</b>	<b>A Novel and Cost Effective Radiant Heat Flux Gauge</b> <u>S. Safaei</u> and A.S. Rangwala, Worcester Polytechnic Institute (WPI) V. Raghavan and T.M. Muruganandam, Indian Institute of Technology Madras L. Genovesi, Global Fire Products, Inc.
<b>2:15</b>	<b>A Fire-Induced Displacement Estimation Method for Civil Infrastructures</b> Gunhee Koo, Jaemook Choi, Kiyoung Kim, and <u>Hoon Sohn</u> , Korea Advanced Institute of Science and Technology



**2:45 Break sponsored by**

<b>3:15</b>	<b>Session III: Smart Building Applications</b>
<b>3:15</b>	<b>Indoor Positioning Systems Enhance Safety and Security in Buildings</b> Oliver Zechlin and <u>Lance Rütimann</u> , Siemens Switzerland Ltd.

<b>3:45</b>	<b>Session IV: Signaling and Notification</b>
<b>3:45</b>	<b>Visual Alarm Devices - Their Effectiveness in Warning of Fire</b> Raman Chagger, BRE Global Limited
<b>4:15</b>	<b>Occupant Evacuation Elevator (OEE) Case Studies</b> Eric Camiel, Jensen Hughes

**5:00 – 6:30 Reception**

**Friday, March 4, 2016**

<b>8:30</b>	<b>Session V: Nuisance Sources</b>
<b>8:30</b>	<b>Impact of Smoke Alarm Performance Considering New Nuisance and Fire Tests</b> Thomas Cleary, National Institute of Standards and Technology (NIST)
<b>9:00</b>	<b>Beyond Cooking: Smoke Alarm Nuisance Sources Evaluated</b> Joshua Dinaburg, Jensen Hughes

**9:30 Break**

<b>10:00</b>	<b>Session VI: Smoke Characteristics and Detector Design</b>
<b>10:00</b>	<b>Multi-angle Multi-wavelength Light Scattering of Smokes and Cooking Aerosols</b> <u>Thomas Cleary</u> and Amy Mensch, National Institute of Standards and Technology (NIST)
<b>10:30</b>	<b>Physics Based Assessment of Light Scattering in Multi-Color Smoke Detection</b> <u>Michael Birnkrant, Ph.D.</u> , Marcin Piech, Ph.D., and Peter Harris, Ph.D., United Technologies Research Center

**11:00 Closing Comments, Feedback**



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Founded in 1896, NFPA is a global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission. [All NFPA codes and standards can be viewed online for free.](#) NFPA's [membership](#) totals more than 65,000 individuals around the world.



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