

ELEVENTH  
INTERNATIONAL  
SEMINAR



UNDER THE PATRONAGE OF



SAPIENZA  
UNIVERSITÀ DI ROMA



**XI  
INTERNATIONAL  
SEMINAR  
FIRE AND  
EXPLOSION  
HAZARDS**

**ROME (ITALY)  
June 15 – 20, 2025**

**Faculty of Civil and  
Industrial Engineering  
*Sapienza University of Rome***

**PROGRAM**

**XI**  
**INTERNATIONAL**  
**SEMINAR**  
**FIRE AND**  
**EXPLOSION**  
**HAZARDS**



*Dear Colleagues and Friends,*

We are delighted to welcome you to the **11<sup>th</sup> International Seminar on Fire and Explosion Hazards** (ISFEH 11) and to the beautiful city of Rome. This year's Seminar is proudly hosted by the Faculty of Civil and Industrial Engineering at Sapienza University of Rome.

Since its inception in 1995, **ISFEH** has built a proud tradition of bringing together leading researchers from around the world. Previous seminars have been held in Moscow (1995, 1997), Lake Windermere (2000), Londonderry (2003), Edinburgh (2007), Leeds (2010), Providence (2013), Hefei (2016), St. Petersburg (2019), and Oslo (2022).

The 11th ISFEH features five outstanding Plenary Lectures, a series of oral presentations of peer-reviewed papers, and a Poster Session. All accepted and presented papers will be published in the seminar proceedings. The Poster Session offers an excellent opportunity for in-depth discussions and direct engagement with the latest research. Prizes will be awarded for outstanding contributions.

Beyond the scientific program, Rome provides an inspiring setting, rich with world-renowned landmarks and hidden treasures. To help you experience its charm, we have organized a social program for all participants.

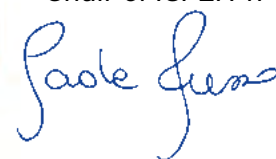
This year also marks the **30<sup>th</sup> anniversary** of ISFEH, and we look forward to celebrating this significant milestone with you.

**We wish you an enjoyable and enriching stay!**

Warm regards,



Prof. Paola Russo  
*Chair of ISFEH 11*







## **ISFEH 11 SEMINAR**

Paola Russo, Sapienza University of Rome (*Italy*), **Chair**

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Franco Tamanini, Formerly affiliated with FM (*USA*), *Co-Chair*

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Carla Menale, ENEA, Rome (*Italy*)

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## **ORGANIZING SECRETARIAT**



Rione Sirignano, 5 - 80121 Napoli

Ph. 081 7611085/081 668774

mcm@mcmcongressi.it - [www.mcmcongressi.it](http://www.mcmcongressi.it)

## PLENARY SPEAKERS



**Vladimir Molkov**

Professor  
Director of HYSAFER Centre  
Ulster University, N. Ireland, UK



**Franco Tamanini**

Consultant  
Formerly affiliated with FM  
Rhode Island, USA



**Akiko Matsuo**

Professor, Department of Mechanical Engineering, Keio University,  
Yokohama, Japan



**Mikhail Liberman**

Professor, The Nordic Institute for Theoretical Physics,  
Stockholm University, Sweden



**Albert Simeoni**

Full Professor  
PhD, Department of Fire Protection Engineering  
Worcester Polytechnic Institute, USA



## PROGRAM AT A GLANCE

Time	<b>SUNDAY, JUNE 15</b>
16.00/19.00	Registration
17.30/19.30	Welcome cocktail

Time	<b>MONDAY, JUNE 16</b>	
08.30	Registration	
	<b>Room Chiostro</b>	
09.20/10.00	<b>OPENING SESSION</b>	
10.00/11.00	<b>PLENARY LECTURE</b> Vladimir Molkov	
11.00/11.30	Coffee break and poster viewing	
11.30/12.20	<b>HIGHLIGHTED PRESENTATIONS</b> Hydrogen safety	
12.20/14.00	<i>Lunch</i>	
	<b>Room Chiostro</b>	<b>Room 1</b>
14.00/15.40	<b>Hydrogen safety I</b>	<b>Battery safety I</b>
15.40/16.10	Coffee break and poster session	
16.10/17.30	<b>Hydrogen safety II</b>	<b>Battery safety II</b>

Time	<b>TUESDAY, JUNE 17</b>	
	<b>Room Chiostro</b>	
09.00/10.00	<b>PLENARY LECTURE</b> Franco Tamanini	
10.00/10.30	<b>SESSION IN MEMORY OF PROF. JAMES G. QUINTIERE</b> Speakers: Carlos Fernandez-Pello, Vladimir Molkov	
10.30/11.00	Coffee break and poster viewing	
	<b>Room 1</b>	
11.00/11.50	<b>HIGHLIGHTED PRESENTATIONS</b> Wildland fires	
	<b>Room Chiostro</b>	<b>Room 1</b>
11.50/12.50	<b>Fundamentals of Fires and Explosions I + Two phase explosion</b>	<b>Wildland fires I</b>
12.50/14.00	<i>Lunch</i>	
14.00/15.40	<b>Industry-specific fire and explosion research: renewable energy, aerospace, oil and gas, nuclear, process industry</b>	<b>Wildland fires II</b>
15.40/16.10	Coffee break and poster session	
16.10/17.10	<b>Industrial risk and sustainability</b>	<b>Critical and Transient Combustion phenomena I + Combustion in extraordinary environment</b>
19.00/22.30	River Boat standing aperitif dinner	

Time	<b>WEDNESDAY, JUNE 18</b>	
	<b>Room Chiostro</b>	
09.00/10.00	<b>PLENARY LECTURE</b> Akiko Matsuo	
10.00/10.50	<b>HIGHLIGHTED PRESENTATIONS</b> Fire and explosion modelling in computer codes	
10.50/11.20	Coffee break and poster session	
	<b>Room Chiostro</b>	<b>Room 1</b>
11.20/12.40	<b>Fire and explosion modelling in computer codes I</b>	<b>Deflagration, DDT, detonation, and their mitigation I</b>
12.40/14.00	<i>Lunch</i>	
	<b>Room 1</b>	
14.00/14.50	<b>HIGHLIGHTED PRESENTATIONS</b> Deflagration, DDT, detonation, and their mitigation	
	<b>Room Chiostro</b>	<b>Room 1</b>
14.50/16.10	<b>Fire and explosion modelling in computer codes II + Evacuation</b>	<b>Deflagration, DDT, detonation, and their mitigation II</b>
16.45/19.00	Walking tour of ancient city	

Time	<b>THURSDAY, JUNE 19</b>	
	<b>Room Chiostro</b>	
09.00/10.00	<b>PLENARY LECTURE</b> Mikhail Liberman	
10.00/10.50	<b>HIGHLIGHTED PRESENTATIONS</b> Fundamentals of fires and explosions	
10.50/11.20	Coffee break and poster viewing	
	<b>Room Chiostro</b>	<b>Room 1</b>
11.20/13.00	<b>Fundamentals of fires and explosions II</b>	<b>Fire suppression and mitigation systems</b>
13.00/14.00	<i>Lunch</i>	
	<b>Room Chiostro</b>	
14.00/14.50	<b>HIGHLIGHTED PRESENTATIONS</b> Hydrogen Safety	
	<b>Room Chiostro</b>	<b>Room 1</b>
14.50/15.50	<b>Hydrogen safety III</b>	<b>Material flammability and flame retardancy + Fire Toxicity</b>
15.50/16.10	Coffee break and poster session	
	<b>Room Chiostro</b>	<b>Room 1</b>
16.10/17.10	<b>Critical and Transient Combustion Phenomena II</b>	<b>Battery safety III</b>
19.30/22.30	Social dinner	



## PROGRAM AT A GLANCE

Time	FRIDAY, JUNE 20	
	Room Chiostro	
09.15/10.15	PLENARY LECTURE Albert Simeoni	
10.15/10.35	Greeting and Introduction to the activities of the Italian Fire Corps Eros Mannino	
10.35/11.00	Coffee break	
11.00/11.50	HIGHLIGHTED PRESENTATIONS Battery Safety	
	Room Chiostro	Room 1
11.50/12.50	Battery safety IV	Wildland fires III
	Room Chiostro	
12.50/13.30	Closing session Best Presentation / Poster Awards	



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# PROGRAM

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16.00/19.00	Registration
17.30/19.30	Welcome cocktail

Time	MONDAY, JUNE 16	
08.30	Registration	
	Room Chiostro	
09.20/10.00	<b>OPENING SESSION</b> <i>Chair: Paola Russo</i> <b>Carlo Massimo Casciola</b> Dean of the Faculty of Civil and Industrial Engineering, Sapienza University of Rome <b>Paolo De Filippis</b> Head of Department of Chemical Engineering, Materials and Environment, Sapienza University of Rome <b>Giulia Monteleone</b> Director of ENEA Dept. of Energy, Technologies and Renewable Energy Sources	
10.00/11.00	<b>PLENARY LECTURE</b> <i>Chair: Paola Russo</i> <b>Progress in Computational Hydrogen Safety: Overview of Selected Problems</b> Vladimir Molkov	
11.00/11.30	Coffee break and poster viewing	
11.30/12.20	<b>HIGHLIGHTED PRESENTATIONS</b> <b>HYDROGEN SAFETY</b> <i>Chair: Federico Ustolin</i>	
11.30/11.55	<b>Thermal effects in concrete slabs impacted by impinging hydrogen jet flames</b> <u>Markert Frank</u> , Sørensen Lars Schiøtt, Liu Wenqian, Gaathaug Andre Vagner, Lach Agnieszka W. 68	
11.55/12.20	<b>Numerical investigation on the pressure multi-peaks structure of a LH2 storage tank "BLEVE"</b> <u>Cirrone Donatella</u> , Makarov Dmitriy, Molkov Vladimir 112	
12.20/14.00	Lunch	
	Room Chiostro	Room 1
14.00/15.40	<b>HYDROGEN SAFETY I</b> <i>Chair: Trygve Skjold</i>	<b>BATTERY SAFETY I</b> <i>Chair: Jenq-Renn Chen</i>
14.00/14.20	<b>Experimental results and comparison with FLIC model of delayed ignition of impinging under expanded hydrogen jet on pipe geometry in open atmosphere</b> <u>Lach Agnieszka</u> , Lundberg Joachim, Vågsæther Knut 119	<b>Unveiling the relationship between the energy released during thermal runaway of Li-ion cells and their stored electrical energy</b> Dubourg Sébastien, Rochard Thibaut, Marteau Daniel, Bengaouer Alain, Brun-Buisson David, Reytyer Magali, Vincent Rémi 45
14.20/14.40	<b>Numerical modelling of dynamic flashing behaviour in the release of ammonia from pressurised vessel</b> Sivaraman Srinivas, Cirrone Donatella, <u>Makarov Dmitriy</u> , Truchot Benjamin, Molkov Vladimir 60	<b>Analysis of ventilation parameters for explosion risk mitigation in Li-ion battery rooms</b> <u>Olse Brynhild Garberg</u> , Alonso Maria Justo, Risholt Birgit, Karchniwy Ewa Malgorzata 71

	Room Chiostro	Room 1
14.40/15.00	<b>The impact of hydrogen concentration on the explosion risk of a biogas-hydrogen-air mixture</b> <u>Kim Joonsik</u> , Kim Woogyung, Kang Chankyu, Park Byungjik, Yoon Unggi, Kim Yangkyun 20	<b>Comprehensive Modeling of Lithium-Ion Batteries Thermal Runaway Behavior</b> <u>Chakaroun Sirar</u> , Coste Pierre, de Persis Stéphanie, Bengaouer Alain, Cognard Jerome, Chaumeix Nabiha 81
15.00/15.20	<b>Safe operation of gas fires and cooker hobs on hydrogen</b> <u>Andrews G.E.</u> , Quinonez Ramon, Massey R., Phylaltou H.N., Wakeman R., Maxfield J., Smith S. 144	<b>Flame heat emissions in 18650-type lithium-ion battery thermal runaway with thermally active particles</b> <u>Sadeghi Hosein</u> , Restuccia Francesco 7
15.20/15.40	<b>Numerical Experiments on Flame Geometry and Thermal Heat Fluxes on Surfaces of New Hydrogen Trailer Using FDS Software</b> Dréan Virginie, Rengel Borja, Soubeyran Aurelien, Bernard Laurence, Paris Laurent, Guillaume Eric, Paping Philippe 37	<b>Exploring the thermal stability of NaNi1/3Fe1/3Mn1/3O2 cathode for sodium ion batteries</b> <u>Gan Yixiu</u> , Gao Wei 33
15.40/16.10	<i>Coffee break and poster session</i>	
16.10/17.30	<b>HYDROGEN SAFETY II</b> <i>Chair: Almerinda Di Benedetto</i>	<b>BATTERY SAFETY II</b> <i>Chair: Brynhild Garberg Olso</i>
16.10/16.30	<b>Understanding the conceptual sLH2 Refuelling Protocol: Importance of Restriction on the Initial Mass Flow Rate</b> Ebne-Abbasi Hazhir, <u>Makarov Dmitriy</u> , Molkov Vladimir 95	<b>Quantifying the Hazard from E-Scooter Explosions in a Residential Scale Compartment</b> <u>Fleischmann Charles</u> , Madrzykowski Daniel 140
16.30/16.50	<b>Enhancing Hydrogen Safety and Streamlining Permit Processes: A Preliminary Investigation into Permitting Hydrogen Refueling Stations in Norway</b> <u>Claussner Lucas</u> , Faisal Muhammad, Ustolin Federico 145	<b>State of the Art and Safety Challenges of Lithium-ion Batteries in Underground Mining Operations</b> <u>Jahn Wolfram</u> , Fernanda García, Caro Rodrigo, Ramirez Gonzalo, Rivera Juan de Dios, Walker-Ravenna Carlos 51
16.50/17.10	<b>Performance of standard and self-venting conformable hydrogen storage systems in fires</b> <u>Kashkarov Sergii</u> , Molkov Vladimir 49	<b>Characteristics of Gas Venting and Detection During Thermal Runaway of LiFePO4 Battery</b> Huang Po-Hsun, Huang Yi-Peng, Yeh Li-Yu, Peng Hsiang-Ching, Tsai Hsiao-Yun, <u>Chen Jenq-Renn</u> 115
17.10/17.30	<b>Operational safety analysis for prototype hydrogen production via PEM</b> <u>Jorjani Sasan</u> , Testi Matteo 41	<b>Physics-Based Model to Quantify the Fire Hazard of Lithium-Ion Batteries Based Energy Storage Systems</b> Hodges Jonathan, Kapahi Anil, <u>Kraft Stefan</u> 42



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Time	<b>TUESDAY, JUNE 17</b>	
	Room Chiostro	
09.00/10.00	<b>PLENARY LECTURE</b> <i>Chair:</i> Charles Fleischmann <b>Combined Use of Testing, Computer Modeling and Analytical Correlations to Address Fire Protection Problems</b> Franco Tamanini	
10.00/10.30	<b>SESSION IN MEMORY OF PROF. JAMES G. QUINTIERE</b> <i>Chair:</i> Charles Fleischmann <i>Speakers:</i> Carlos Fernandez-Pello, Vladimir Molkov	
10.30/11.00	Coffee break and poster viewing	
	Room 1	
11.00/11.50	<b>HIGHLIGHTED PRESENTATIONS WILDLAND FIRES</b> <i>Chair:</i> Ruowen Zong	
11.00/11.25	<b>Investigating the Potential of Biogenic Volatile Organic Compound Accumulation to Cause Eruptive Fires within Windless Canyons</b> <u>He Zhuoyang</u> , Liu Naian, Xie Xiaodong, Zhang Linhe, Zhang Yang, Jiang Siqi 114	
11.25/11.50	<b>Wildfire NaTech Accidents in the Wildland-Industrial Interface: Exposure Pathways Analysis</b> <u>Dossi Simona</u> , Ricci Federica, Planas Eulalia, Scarponi Giordano, Cozzani Valerio, Pastor Elsa 90	
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11.50/12.50	<b>FUNDAMENTALS OF FIRES AND EXPLOSIONS I + TWO PHASE EXPLOSION</b> <i>Chair:</i> Michael John Pegg	<b>WILDLAND FIRES I</b> <i>Chair:</i> Hui Ying Wang
11.50/12.10	<b>Can Fluidized Bed Reactor Technology Provide a Novel Solution for Measuring Dust Flammability/Explosion Parameters?</b> <u>Di Benedetto Almerinda</u> , Portarapillo Maria, Sanchirico Roberto 122	<b>Firebrands-Induced Cavity Development in Pressure Treated Wood Decking</b> <u>Mohamed Mohamed</u> , Penman Trent, Filkov Alexander 25
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12.30/12.50	<b>Silicon Dust Explosions in Ducts and Pipes</b> <u>Skjold Trygve</u> , Faye Andreas, Bjørnsen Anders, van Wingerden Matthijs, Arntzen Bjørn Johan, Buseth Torfinn 137	<b>Small-World Network with Adaptive Time Steps for Upslope Fire Spread: Balancing Simulation Accuracy and Efficiency</b> <u>Wang Xinyu</u> , Lei Jiao, Dai Jiakun, Zekri Nouredine 54
12.50/14.00	Lunch	

	Room Chiostro	Room 1
14.00/15.40	<b>INDUSTRY-SPECIFIC FIRE AND EXPLOSION RESEARCH: RENEWABLE ENERGY, AEROSPACE, OIL AND GAS, NUCLEAR, PROCESS INDUSTRY</b> Chair: Dmitriy Makarov	<b>WILDLAND FIRES II</b> Chair: Alex Filkov
14.00/14.20	<b>Effects of Underwater Explosions: A Small-Scale Study with High-Speed Imaging</b> <u>Trelat Sophie</u> , Sturtzer Michel 56	<b>Review of the Interaction between Extreme Climate and the Wildfires Spread</b> <u>Ran Dezhi</u> , Wang Yu 83
14.20/14.40	<b>Experimental study of flame radiation characteristics and thermal hazard analysis of pool fires with crosswinds</b> <u>Tao Ruoyi</u> , Tang Fei, Deng Lei, Peng Xinyu, Hu Longhua 26	<b>How does smoldering wildfires impact the plant roots?</b> <u>Zhang Yichao</u> , Qin Yunzhu, Chen Yuing, Lin Shaorun, Shu Yang, Huang Xinyan, Zhou Mei 29
14.40/15.00	<b>Experimental Study of Burning Rate and Flame Pulsation of Fires Considering the Interactions between a Thin Layer Pool and an Oil Tank</b> <u>Fang Lulu</u> , Fang Jun, Hu Yong, Tao Shangqing 43	<b>Experimental and Numerical Study on Flashovers Induced by VOC Accumulations in Forest Valley</b> <u>Wang Hui Ying</u> , Jamaladdeen Rawaa, Coudour Bruno, Garo Jean Pierre 16
15.00/15.20	<b>Full-scale pool fire plume characteristics in the 800 kV transformer station surrounded by the U-shaped firewalls</b> <u>Zhu Xiaolong</u> , Zhao Jiangyue, Hu Shi, Cheng Kaige, Pan Chuanyu, Wang Xishi 32	<b>Quantifying Burning Dynamics in Wildland Surface Fires: An Experimental and Computational Analysis</b> <u>Ziazi Reza</u> , Selvaraj Muthu Kumaran, Porwal Sumukh, Singh Abhinandan, Simeoni Albert 101
15.20/15.40	<b>Inspection activity after a major accident: the case of handling flammable substances</b> <u>Marrazzo Romualdo</u> , Bragatto Paolo 6	<b>CFD Modeling of Wildfire Suppression Operations: A Case Study of Ischia Island</b> <u>Galuppi Marta</u> , Berardi Davide, Lombardi Mara 15
15.40/16.10	<i>Coffee break and poster session</i>	
16.10/17.10	<b>INDUSTRIAL RISK AND SUSTAINABILITY</b> Chair: Romualdo Marrazzo	<b>CRITICAL AND TRANSIENT COMBUSTION PHENOMENA I + COMBUSTION IN EXTRAORDINARY ENVIRONMENT</b> Chair: Tomohiko Imamura
16.10/16.30	<b>Combustible Dust Management: Regulatory Frameworks and best practices to improve safety in the industries</b> <u>Panico Alessandro</u> , Tonelli Giovanni 116	<b>Flame spread in large compartment experiments: comparison of Obora and CodeRed</b> <u>Mitchell Harry</u> , Rackauskaite Egle, Amin Rikesh, Kotsovinos Panagiotis, Rein Guillermo 65
16.30/16.50	<b>Smoldering Fire and Explosion Risks of Black Mass in the Lithium-ion Battery Recycling Industry</b> Wu Dejian, Norman Frederik, <u>Hack Jens</u> 131	<b>In-depth temperature during fire spread on a wooden panel at intermediate scale</b> <u>Terrei Lucas</u> , Acem Zoubir, Mehaddi Rabah, Boulet Pascal, Parent Gilles, Aguilar Boris, Lejeune Sébastien 98
16.50/17.10		<b>An Exotic Oxygen-Enriched Explosion: Forensic Analysis of a Diesel Tank Incident</b> Puccia Vincenzo 117
19.00/22.30	<i>River Boat Standing Aperitif Dinner</i>	





Time	<b>WEDNESDAY, JUNE 18</b>	
	Room Chiostro	
09.00/10.00	<b>PLENARY LECTURE</b> <i>Chair: Xiangyang Zhou</i> <b>Computational Fluid Dynamics from Explosion of Atomic Bomb to New Concept of Space Propulsion</b> Akiko Matsuo	
10.00/10.50	<b>HIGHLIGHTED PRESENTATIONS</b> <b>FIRE AND EXPLOSION MODELLING IN COMPUTER CODES</b> <i>Chair: Xiangyang Zhou</i>	
10.00/10.25	<b>Uncertainty of Calorimetry Measurement for Medium-scale Fire Experiments</b> Chaudhari Dushyant M, <u>Dow Nicholas</u> 97	
10.25/10.50	<b>Physics-based model for wood charring accurate for a wide range of compartment fire conditions</b> <u>Castagna Alexander</u> , Rein Guillermo 84	
10.50/11.20	<i>Coffee break and poster session</i>	
	Room Chiostro	Room 1
11.20/12.40	<b>FIRE AND EXPLOSION MODELLING IN COMPUTER CODES I</b> <i>Chair: Donatella Cirrone</i>	<b>DEFLAGRATION, DDT, DETONATION AND THEIR MITIGATION I</b> <i>Chair: Ritsu Dobashi</i>
11.20/11.40	<b>Influence of Compartment Geometry on Internal Flows in a Fully developed Fire</b> <u>Calderón Ignacio</u> , Majdalani Agustín H., Arnold Lukas, Jahn Wolfram 78	<b>Development of a Non-Reactive Explosion Vent Panel Testing Methodology</b> <u>Bauwens C. Regis L.</u> , Dorofeev Sergey B. 104
11.40/12.00	<b>A mesoscale CFD model to simulate wood combustion</b> Banagiri Shrikar, Khadakkar Ishanee, Parameswaran Manjunath, Meadows Joseph, <u>Lattimer Brian</u> 100	<b>Blast effect of sand-buried explosive charges</b> <u>Sturtzer Michel</u> , Trélat Sophie, Gilbert Franck 58
12.00/12.20	<b>Numerical Investigation on Blast Waves of Atomic Bombing of Nagasaki</b> <u>Nakajima Kenta</u> , Matsuo Akiko 24	<b>Effects of obstacle tilted angle and blockage ratio on the vented ethanol-gasoline vapor explosion in a small-scale channel</b> <u>Zhao Jiang Yue</u> , Pan Chuan Yu, Wang Xi Shi 28
12.20/12.40	<b>Modeling Monodispersed Water Droplets in Hydrogen Deflagration using OpenFOAM</b> <u>Lande Anne Marie</u> , Lundberg Joachim, Henriksen Mathias 99	<b>Effect of Vent Geometry on Dust Explosion Venting Efficiency</b> <u>Bloching Marius</u> , Boeck Lorenz R., Lottermann Johannes, Becker Dominik, Bunse Roland, Slaunwhite Jeramy, Siwek Richard 72
12.40/14.00	<i>Lunch</i>	

	Room 1	
14.00/14.50	<b>HIGHLIGHTED PRESENTATIONS</b> <b>DEFLAGRATION, DDT, DETONATION AND THEIR MITIGATION</b> <i>Chair: C. Regis L. Bauwens</i>	
14.00/14.25	<b>Experimental observations of Shock-flame interaction</b> Roque Ccacya Anthony, Idir Mahmoud, <u>Chaumeix Nabiha</u> 125	
14.25/14.50	<b>Predictions of Blast Pressure Intensity in Open Space Gas Explosions</b> <u>Dobashi Ritsu</u> , Kaneko Kazumasa, Mogi Toshio 85	
	Room Chiostro	Room 1
14.50/16.10	<b>FIRE AND EXPLOSION MODELLING IN COMPUTER CODES II + EVACUATION</b> <i>Chair: Davide Berardi</i>	<b>DEFLAGRATION, DDT, DETONATION AND THEIR MITIGATION II</b> <i>Chair: Gordon Andrews</i>
14.50/15.10	<b>Modeling Occupant Risk during Fire Growth and Evacuation using a System Dynamics Approach</b> <u>Dueñas Santana Julio Ariel</u> , Van Coile Ruben, Salzano Ernesto, Di Benedetto Almerinda 30	<b>Experimental and theoretical study on the explosion venting behaviors of ammonia/hydrogen/air in a large aspect ratio duct</b> <u>Yu Jialing</u> , Cheng Kaige, Wang Xishi 129
15.10/15.30	<b>A Comparative Analysis of Response Surface Methodology (RSM) and Artificial Neural Networks (ANN) for Predicting Detection Time in Ship Passenger Evacuation</b> <u>Pratama Tezar</u> , Sunaryo Sunaryo 93	<b>DDT in Hydrogen/methane/oxygen Mixtures</b> <u>Ciccarelli Gaby</u> , Chuanyu Pan, Xishi Wang 162
15.30/15.50		<b>Analytical Study of Developing Combustion to Explosion for Explosion Protection Decision Support Systems</b> Volkov Victor 107
16.45/19.00	Walking tour of ancient city	



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Time	THURSDAY, JUNE 19	
	Room Chiostro	
09.00/10.00	<b>PLENARY LECTURE</b> <i>Chair: Joachim Lundberg</i> <b>Early Stages of Flame Propagation and Physical Mechanisms of Tulip Flame Formation</b> Mikhail Liberman	
10.00/10.50	<b>HIGHLIGHTED PRESENTATIONS</b> <b>FUNDAMENTALS OF FIRES AND EXPLOSIONS</b> <i>Chair: Joachim Lundberg</i>	
10.00/10.25	<b>Combustion instabilities in mechanically ventilated enclosure with propane gas fire</b> <u>Pretrel Hugues</u> , Kondorkuzhi Bimal, Savino Arthur, Suard Sylvain 13	
10.25/10.50	<b>IR-Based Analysis of Flame Spread in Open and Ceiled Room Corner Fire Experiments</b> <u>Belt Alexander</u> , De Lannoye Karen, Fehr Marc, Arnold Lukas 133	
10.50/11.20	Coffee break and poster viewing	
	Room Chiostro	Room 1
11.20/13.00	<b>FUNDAMENTALS OF FIRES AND EXPLOSIONS II</b> <i>Chair: Wookyung Kim</i>	<b>FIRE SUPPRESSION AND MITIGATION SYSTEMS</b> <i>Chair: Frank Markert</i>
11.20/11.40	<b>Limiting Oxygen Concentrations for Flame Balls, Deflagrations and Detonations in Dry Hydrogen-Air Mixtures for Wide Temperature Range</b> <u>Kirilov Igor</u> , Plaksin Vadim 50	<b>A Machine Learning-Based Approach to Model Sprinkler Actual Delivered Density</b> <u>Han Dong</u> , Chen Shaoxuan, Gopala Yogish, Sienkiewicz Seth, Ditch Benjamin, Xin Yibing 21
11.40/12.00	<b>Physical mechanism of formation and evolution of tulip flames: the role of flame-pressure waves collisions and tubes aspect ratios</b> <u>Liberman Mikhail</u> , Qian Chengeng 4	<b>Experimental Study of Aerosol Fire Protection in Enclosure with Openings</b> <u>Zhou Xiangyang</u> , White James, Fuglsby Jason 22
12.00/12.20	<b>Neural network for real-time estimation of solid phase pyrolysis parameters</b> <u>Lázaro David</u> , Lázaro Mariano, Alvear Daniel, Jiménez Miguel A., Morgado Eugenia 61	<b>Inert Gas Extinguishing Systems: Emphasizing Extinguishment</b> <u>Zimak Jon</u> , Simeoni Albert 40
12.20/12.40	<b>Biohydrogen Production from Biowaste: Assessment of the Flammability of Bioreactors Gaseous Mixtures</b> <u>Russo Paola</u> , Lancia Maria Chiara, Lauri Roberto, Gottardo Marco, Valentino Francesco 150	<b>Full-Scale Experimental Design for Safety System Testing in Road Tunnels: preliminary procedure and pre-test results</b> <u>Berardi Davide</u> , Galuppi Marta, Lombardi Mara, Stantero Luca, Boffa Natalino, Bezzi Francesco 17
12.40/13.00		<b>Correlating Firefighting Foam Suppression Performance to Bench-scale Characterization</b> Parameswaran Manjunath, Islam Mehran, <u>Lattimer Brian</u> 151
13.00/14.00	Lunch	

	<b>Room Chiostro</b>	
14.00/14.50	<b>HIGHLIGHTED PRESENTATIONS</b> <b>HYDROGEN SAFETY</b> <i>Chair: Sergii Kashkarov</i>	
14.00/14.25	<b>Assessment of the distance of effects based on engineering models for a new design of hydrogen trailer</b> <u>Soubeyran Aurélien</u> , Bernard Laurence, Drean Virginie, Rengel Borja, Papin Philippe, Paris Laurent 64	
14.25/14.50	<b>An Experimental Study on the Effect of Equipment Hatch Size on Explosion during Deflagration of Hydrogen-Air Mixture in a Semi-Confined Space</b> <u>Yoon Unggi</u> , Kim Joonsik, Park Byungjik, Hwang Inju, Kim Wookyoung, Kim Yangkyun 57	
	<b>Room Chiostro</b>	<b>Room 1</b>
14.50/15.50	<b>HYDROGEN SAFETY III</b> <i>Chair: Nabiha Chaumeix</i>	<b>MATERIAL FLAMMABILITY AND FLAME RETARDANCY + FIRE TOXICITY</b> <i>Chair: Piergiacomo Cancelliere</i>
14.50/15.10	<b>Critical Diameter and Flame Stability in Hydrogen-Methane Mixtures</b> Kazemi Mina, Brennan Sile, <u>Molkov Vladimir</u> 62	<b>Advancing on the Flame Spread over electrical wires predictions by using Machine Learning with data categorization and augmentation strategies</b> <u>Rivera Jose</u> , San Martin Daniel, Fernandez-Pello Carlos, Gollner Michael J, Olson Sandra 23
15.10/15.30	<b>Numerical Study on Diffusion Characteristics of Leaked Hydrogen and Associated Safety in the Underground Space with Hydrogen Facilities</b> <u>Shin Hong-Cheol</u> , Hwang Inju, Seo Hyeonseok 124	<b>Experimental analysis of required ignition times of unattended incidents in kitchens</b> <u>Alonso Ipiña Alain</u> , Alvear Portilla Daniel, Lázaro-Urrutia Mariano 67
15.30/15.50	<b>Validation of FDS and FLACS-Fire Codes Against Radiation from Free Horizontal Hydrogen Jet Fires</b> <u>Rengel Borja</u> , Dréan Virginie, Paris Laurent, Guillaume Eric 36	<b>Pyrolysis of Pine in a Nitrogen Atmosphere using the Cone Calorimeter</b> Irshad Aysha, <u>Andrews Gordon</u> , Phylaktou Horodotos, Gibbs Bernard 123
15.50/16.10	<i>Coffee break and poster session</i>	
16.10/17.10	<b>CRITICAL AND TRANSIENT COMBUSTION PHENOMENA II</b> <i>Chair: Lucas Terrei</i>	<b>BATTERY SAFETY III</b> <i>Chair: Juan Cuevas</i>
16.10/16.30	<b>Measuring the External Heat Release Rate from a Large-Scale Fire Compartment using Computer Vision</b> Amin Rikesh, <u>Mitchell Harry</u> , Kotsovinos Panagiotis, Rein Guillermo 52	<b>Quantitative Investigation of Immersion Cooling Agents for Thermal Runaway Suppression</b> <u>Zhang Lei</u> , Liu Yanhui, Ye Congliang, Zhou Yuxin, Su Yanghan, Huang Xinyan 47
16.30/16.50	<b>Fire Behaviour of Biopolymer Soaked by Flammable solvents</b> <u>De Liso Benedetta Anna</u> , Pio Gianmaria, Salzano Ernesto 18	<b>Fire behaviour tests for lithium-ion batteries: a systematic review of battery characteristics, fire test conditions and fire properties</b> <u>Sanfeliu Melia Cristina</u> , Steen-Hansen Anne, Meraner Christoph 87
16.50/17.10	<b>Measurement of Hot Surface Ignition Temperature of Some Low Global Warming Potential (GWP) Refrigerants and Their Blends</b> <u>Imamura Tomohiko</u> , Sawayama Tomoki, Hayamizu Hiroki 53	<b>Measurement of total and temporal heat generation carried by ejected and non-ejected contents during thermal runaway of 18650 lithium-ion batteries</b> Garg Priya, <u>Xiong Gang</u> , Gagnon Lauren, Zeng Dong, Wang Yi, Barlow Robert 91
19.30/22.30	<i>Social Dinner</i>	



**XI INTERNATIONAL SEMINAR  
FIRE AND EXPLOSION HAZARDS**  
**ROME (ITALY)**  
**June 15 – 20, 2025**

Time	FRIDAY, JUNE 20	
	Room Chiostro	
09.15/10.15	<b>PLENARY LECTURE</b> <i>Chair: Franco Tamanini</i> <b>Field-scale Experiments of Wildfires for Fire Behavior</b> Albert Simeoni	
10.15/10.35	<b>Greetings and Introduction to the Activities of the Italian Fire Corps</b> Eros Mannino Chief of National Fire and Rescue Corps <i>Chair: Franco Tamanini</i>	
10.35/11.00	Coffee break	
	Room Chiostro	
11.00/11.50	<b>HIGHLIGHTED PRESENTATIONS BATTERY SAFETY</b> <i>Chair: Anne Steen-Hansen</i>	
11.00/11.25	<b>Insights on thermal runaway and fire propagation in a lithium-ion battery energy storage system</b> <u>Cuevas Juan</u> , Zeng Dong, Wang Yi 44	
11.25/11.50	<b>Investigating Heat Transfer to Surroundings from Flaming Batteries Using a Surrogate Fuel Model</b> <u>Lugaresi Francesca</u> , Restuccia Francesco 86	
	Room Chiostro	Room 1
11.50/12.50	<b>BATTERY SAFETY IV</b> <i>Chair: Anne Steen-Hansen</i>	<b>WILDLAND FIRES III</b> <i>Chair: Simone Arnold</i>
11.50/12.10	<b>Enhancing Safety in Lithium-ion Battery Recycling: Lessons from the Hunan Brung Explosion and Process Optimization</b> <u>Fang Zheng</u> , Wu Zhenwei, Bontempi Elza, Sun Jinhua, Wang Qingsong 63	<b>2D Gaussian Dispersion Model for Low-lying Smoke from a Wildfire Including Downwind Ground Effects</b> <u>Kalogeropoulos Nikolaos</u> , Castagna Alexander, Rein Guillermo 48
12.10/12.30	<b>Flammability properties of Lithium-ion battery vent gas under different initial conditions</b> Ubaldi Sofia, <u>Russo Paola</u> 121	<b>Laboratory Investigation of Smouldering Combustion of Boreal Peat from Thurso UK: Effect of Particle Size</b> <u>Mulyasih Hafizha</u> , Tarasi Dimitra, Voulgarakis Apostolos, Rein Guillermo 94
12.30/12.50	<b>Numerical Modeling of Premixed Combustion and Flame Acceleration of Li-ion Battery Thermal Runaway Gases</b> <u>Alison Paul</u> , Beccantini Alberto, Kudriakov Sergey, Bengaouer Alain, Tenaud Christian 35	<b>Ignition and Spread of Smouldering in Subantarctic Peat from Falkland Islands</b> <u>Walker-Ravena Carlos</u> , Mulyasih Hafizha, Elliott Andy, Rein Guillermo 108
	Room Chiostro	
12.50/13.30	<b>Closing Session</b> <b>Best Presentation/Poster Awards</b>	



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# POSTERS

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## POSTERS

POSTER SESSION JUNE 16 AND 17		
Board N.	Title	Authors
1	<b>171 - Development of a hydrogen fire burner for testing aircraft materials and components</b>	<u>Hidalgo Juan P.</u> , Dier Florence, Carrascal Jeronimo
2	<b>172 - Experimental study on reducing overpressure of hydrogen gas explosion using water mist</b>	<u>Park Byoungjik</u> , Kim Yangkyun, Yoon Unggi, Kim Joonsik
3	<b>173 - Experimental and Analytical Study on Hydrogen-air Deflagrations in Open Atmosphere</b>	<u>Yangkyun Kim</u> , Park Byoungjik, Yoon Woonggi, Kim JoonSik, Hwang In-Ju, Wookyoung Kim
4	<b>142 - Investigating the Thermal Hazard to the Immediate Surroundings of a Burning Electric Vehicle</b>	<u>Dehghani Parham</u> , DiDomizio Matthew, Sauer Nathaniel, Barowy Adam
5	<b>158 - Quantitative Analysis of Flames Generated by Li-ion Battery Thermal Runaway</b>	<u>Sponem Léa</u> , Bengaouer Alain, Dubourg Sébastien, Kawka Sébastien, Koudriakov Sergey, Reyrier Magali
6	<b>159 - A simplified methodology to enhance efficiency in numerical simulation of thermal runaway in Li-ion batteries for safety applications</b>	<u>Yhuel Emilie</u> , Bengaouer Alain, Kawka Sebastien
7	<b>156 - CFD-based Risk Analysis in Natech Scenarios for Hythane distribution infrastructure</b>	Capasso Elena
8	<b>160 - When Lightning Strikes: Risk Analysis of a Major Accident at the Matanzas Hydrocarbon Facility</b>	<u>Dueñas Santana J.A.</u> , Salzano E., Di Benedetto A., Van Coile R.
9	<b>126 - CFD Simulations of H<sub>2</sub>/CH<sub>4</sub>/H<sub>2</sub>S Dispersion and Consequences for the Risk Analysis of Large Scale H<sub>2</sub> Storage</b>	<u>Enicchiario Domenico</u> , Portarapillo Maria, Polidoro Franco, Di Benedetto Almerinda
10	<b>128 - Risk assessment of Integrated Fuel Cell Systems for Rail Transport</b>	<u>Portarapillo Maria</u> , Bellucci Sessa Augusto, Di Benedetto Almerinda
11	<b>143 - On Measurements, and Modeling of Diffusion Flames Temperatures Aboard the International Space Station</b>	Dehghani Parham
12	<b>176 - Lift-off and blowout behavior of non-premixed turbulent jet flames with hydrogen-blended natural gas under sub-atmospheric pressure</b>	<u>Tang Fei</u> , Zhu Nannan, Fan Xinyang, Peng Xinyu, Hu Longhua
13	<b>170 - Overpressure Resistance in Structures Subject to Energetic Materials Deflagrations</b>	<u>Paquet Frederick</u> , Paquet Mario
14	<b>165 - The Initiation and Suppression of Organic Peroxide Dust Explosion</b>	<u>Tsai Hsiao-Yun</u> , Peng Hsiang-Ching, Yeh Li-Yu, Huang Po-Hsun, Chen Jenq-Renn
15	<b>148 - Hydrogen release and dispersion in a underground car park under natural ventilation</b>	<u>Russo Paola</u> , Meo Maria Grazia, Nassi Luca

## POSTER SESSION JUNE 18 AND 19

Board N.	Title	Authors
1	<b>163 - Investigating the Soil Temperature in Wildfires</b>	<u>Arnold Simone</u> , Nagel M., Schultze T.
2	<b>167 - Estimation of Fuel Characteristics and Adaptation of Fuel Maps for the WRF-SFIRE Model in Tropical Peatlands</b>	<u>Katashima Kei</u> , Kobayashi Takuma, Takayama Naru, Segah Hendrik
3	<b>157 - Experimental study on the toxicity of different halogenated olefins to mice</b>	<u>Zong Ruowen</u> , Yao Fuyao, Wang Kaitao
4	<b>88 - Study on the spill fire behaviour and radiant characteristics of compartment fire with double openings under crosswinds</b>	<u>Zheng Yipeng</u> , Tang Fei, Fan Xinyang, Hu Longhua
5	<b>164 - Thermal analysis and dust explosion characteristics of terpene phenolic resin</b>	<u>Choi Yi-rac</u> , Lee Han-Hee, Seo Dong-Hyun
6	<b>106 - Analysis of vented dust explosions in large silos using CFD simulations</b>	<u>Varela Alejandro</u> , Tascón Alberto
7	<b>118 - High-Confinement Explosion Analysis in a Residential Building: A Comparative Study of TNO Model Estimates and Real Gas Consumption Data</b>	Puccia Vincenzo
8	<b>168 - Study on Personnel Evacuation from Ancient Pavilion Architectural Structures-Taking Yellow Crane Tower as an Example</b>	Zelin Zhang, <u>Yang Ling</u>
9	<b>175 - Educational Building Blocks for Analysis of Fire Dynamics Data</b>	<u>Arnold Lukas</u> , Arnold Simone, Bagemihl F., Baitsch M., Fehr M., Poetzsch M., Seipel S., Soennecken M.
10	<b>166 - Towards the application of Directional Water Mist Turbine in Lithium-Ion Battery Fire Scenarios: a Feasibility Study</b>	<u>Ciani Francesco Saverio</u> , Cancelliere P., Fritz F., Eppacher M.
11	<b>174 - Quantifying Open Parameter Effects in Cone Calorimetry Using Optical Techniques</b>	<u>Fehr Marc</u> , Belt Alexander, Arnold Lukas
12	<b>8 - Products of thermal decomposition of selected polymer flame retardants</b>	<u>Borucka Monika</u> , Przybysz Jan, Mizera Kamila, Gajek Agnieszka



## GENERAL INFORMATION

### SEMINAR VENUE

Faculty of Civil and Industrial Engineering  
Sapienza University of Rome  
Via Eudossiana, 18 Rome (Italy)

### REGISTRATION/ INFORMATION DESK AND SEMINAR SECRETARIAT

Location: Main Cloister, ground floor

#### Opening time:

**June 15<sup>th</sup>, 2025:** from h. 16.00 to 19.00

**June 16<sup>th</sup>, 2025:** from h. 08.30 to 17.30

**June 17<sup>th</sup>, 2025:** from h. 08.30 to 16.00

**June 18<sup>th</sup>, 2025:** from h. 08.30 to 17.30

**June 19<sup>th</sup>, 2025:** from h. 08.30 to 17.30

**June 20<sup>th</sup>, 2025:** from h. 09.00 to 13.30

### ONSITE REGISTRATIONS

**Delegate € 1300,00 VAT 22% included**

**Student\* € 1000,00 VAT 22% included**

**Accompanying person € 400,00 VAT 22% included**

*\*For participants born in 1990 or later.*

The registration fee for Delegate and Students includes:

- Admission to the technical sessions
- Name badge
- Conference kit
- Coffee breaks and lunches according to the technical program
- Welcome Cocktail on June 15
- River Boat Buffet Dinner on June 17
- Social Dinner on June 19

The registration fee for Accompanying persons includes:

- Welcome Cocktail on June 15
- River Boat Buffet Dinner on June 17
- Social Dinner on June 19

**Please note: For onsite registrations the availability of seats for the River Boat Buffet Dinner and the Social Dinner cannot be guaranteed.**

### Name Badge

For identification purpose and admission to the Seminar venue and to social events, badges are expected to be worn at all times during the conference.

### Internet Wireless

Connection is available at the Symposium venue and the account for login will be provided during the conference.

### Meals

Coffee breaks and lunches will be served according to the program schedule at the Seminar venue, Main Cloister, ground floor

### Dress Code

Smart casual is suggested for academic sessions.

Casual and light wear, hat and comfortable shoes are appropriate for the walking tour.

T-shirt, short pants, sandals are inappropriate for Welcome Cocktail, River Boat Dinner and Social Dinner.

### Electricity

The voltage is 220V in Italy.

### Tips & Tax

Tipping is welcome but not mandatory for taxi and restaurants

## PRESENTER INSTRUCTIONS

### Oral Presentations

Time allotted for oral presentations are as follows:

- **Highlighted presentations: 20 minutes + 5 minutes for discussion**
- **Oral presentations: 15 minutes + 5 minutes for discussion**

All screens are in widescreen (16:9) format. Each presenter is strongly encouraged to arrive at the assigned presentation room a minimum of 30 minutes before the commencement of the session to meet with the session chair.

Each speaker is requested to bring along with them the presentation on a USB pen and to upload the file in the speaker ready room (Room 3 ground floor) at least 1 hour before the session starts.

### Audio-Visual Equipment

Presentation rooms are equipped with projectors for computer-based presentations and PC (Office). Presentations should be prepared in PowerPoint or PDF. Presenters will be provided with a remote controller, with integrated laser pointer that can be used to advance slides in PowerPoint. Slides with movies (format .MOV or MP4) must be checked for playback on the laptop.

*For Mac users:* Power Point slides are normally compatible. If you use "Keynote" please take care that the file is converted in PDF.

**The use of one's personal Laptop is strongly discouraged.**





### Poster Sessions

Posters are to be printed at the cost of the author(s) and to be brought already printed (Format 70 cm width x 100 cm h.). Each participant for poster presentation will be provided with pins or self-adhesive tape. At least one author should be available to present the poster during the assigned session

### SCAN TO DOWNLOAD THE ABSTRACTS



## SOCIAL PROGRAM INFORMATION

### Welcome Cocktail June 15<sup>th</sup>

Time: 17:30-19:30

Venue: Main Cloister

Faculty of Civil and Industrial Engineering

**Sapienza University of Rome (Seminar Venue)**

Address: **Via Eudossiana, 18 - 00184 Rome (Italy)**

### River Boat Standing Aperitif Dinner June 17<sup>th</sup>

Time: 19:00-22:30

Venue: **Baja Roma**

Address: **Lungotevere Arnaldo da Brescia**

Transportation will not be provided. See the map for the best route from your Hotel.

Anyway, to facilitate the access to the Boat, we have arranged a **shuttle service from Piazzale Flaminio 10** (2 minutes walking distance from Metro Line A – Stop “Flaminio”) to the boat.

We encourage participants to take that metro line or reach Piazzale Flaminio 10 by other means in order to take advantage of the courtesy cars, which will be available from 19:00 to 20:30, with return service available until 22:30.

The cars will stop at Piazzale Flaminio 10 and will have a board with a sign with the congress Logo. A hostess with red dress will be there to assist you.

### Social Dinner June 19<sup>th</sup>

Time: 19:30-22:30

Venue: **Rome Marriott Grand Hotel Flora**

Address: **Via Vittorio Veneto, 191**

Transportation will not be provided

## EXCURSION

### Walking Guided Tour June 18<sup>th</sup>

**With ticket only**

Time: 16:45-19:00

Meeting point: Congress Secretariat

We'll start from San Pietro in Chains, built above a patrician domus dating back to the republican and imperial age, and above another large Domus, that was probably part of the Domus Aurea, which is mostly famous because, since 1545, it houses one of the masterpieces of Renaissance art: Michelangelo Buonarroti's Moses, the colossal statue, sculpted in 1513, to adorn the funeral monument of Julius II.

Then we will go down to the Colosseum valley, which in Nero's time was occupied by an artificial lake, and which nowadays is the seat of one of the symbols of the eternal city and one of the 7 wonders of the modern world.

Walking along via dei Fori Imperiali, we will be able to admire some of the impressive remains of what was for centuries the political, economic and legal heart of Rome: the Roman Forum and the subsequent Imperial Fora.



Our stroll will end in Piazza Venezia which takes its name from Palazzo Venezia, built by the Venetian Cardinal Pietro Barbo according to the dictates of the new Renaissance style. The square derives its shape from the remaking of the area, which took place at the turn of the 19th and 20th centuries, for the construction of the Monument to Vittorio Emanuele II, the First King of Italy. Its extraordinary dimension earned the monument unflattering nicknames including those of “typewriter” and “wedding cake”, its terrace however, offers one of the best views of Rome, ideal for taking pictures.

**SCAN TO VIEW THE MAP**



## SPONSORS

The organizers wish to thank the following Companies  
for their support to the organization of the Seminar



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**XI  
INTERNATIONAL  
SEMINAR  
FIRE AND  
EXPLOSION  
HAZARDS**

**ROME (ITALY)  
June 15 – 20, 2025**

**Faculty of Civil and  
Industrial Engineering  
*Sapienza University of Rome***

**ORGANIZING SECRETARIAT**

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EVENTI E CONGRESSI

Rione Sirignano, 5 - 80121 Napoli  
Ph. 081 7611085/081 668774  
[mcm@mcmcongressi.it](mailto:mcm@mcmcongressi.it)  
[www.mcmcongressi.it](http://www.mcmcongressi.it)