

**OS2: The Third International Symposium on Integrated Flow Science II
Combustion Technology and Fundamentals**

November 10, 2025

EX-Hall-1A

- OS2-1 **On the Kinetics of 2,5-DMF Oxidation: Experiments and Modeling** (*Invited*)
13:30-14:00 Philippe Dagaut, Guillaume Dayma (CNRS, France)
- OS2-2 **Methane Pyrolysis at High Pressures in a Temperature Controlled Micro Flow Reactor**
14:00-14:18 Mohammad R. Razavi, Ömer L. Gülder (University of Toronto, Canada)
- OS2-3 **Automatic Generation of High-Temperature Kinetic Models for the Oxidation of Cycloalkanes**
14:18-14:36 Sirio Brunialti, S. Mani Sarathy (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)
- OS2-4 **Development of Isobutanol Skeletal Mechanism to Predict Ignition Delay and Laminar Flame Speed**
14:36-14:54 Yi-Cheng Liu, Anurag Dahiya, Jia-Syuan Lin, Kuang C. Lin (National Tsing Hua University, Taiwan), Hairong Tao (Beijing Normal University, China)
- 15:00-15:15 BREAK
- OS2-5 **Laminar Flame Speed Measurement and Kinetics Modeling Study of Tri-Methyl-Phosphate (TMP) Combustion - Toward P-Containing Fire Suppressants for Lithium-Ion Battery Electrolytes** (*Invited*)
15:15-15:45 Michael Nielsen, Salomé Vézilier, Olivier Mathieu (Texas A&M University, USA), Hisashi Nakamura (Tohoku University, Japan), Eric L. Petersen (Texas A&M University, USA)
- OS2-6 **On the Formation of HOMs during the Oxidation of Ethers and Alkanes**
15:45-16:03 Philippe Dagaut, Roland Benoit (CNRS, France)
- OS2-7 **Bis(2,2,2-TrifluoroEthyl) Methyl Phosphonate as Flame-Retardant for Safer Lithium-Ion Batteries**
16:03-16:21 Claire M. Grégoire, Darryl J. Mohr (Texas A&M University, USA), Pascal Diévert (Institut Polytechnique de Paris / CNRS, France), Laurent Catoire (Institut Polytechnique de Paris, France), Eric L. Petersen, Olivier Mathieu (Texas A&M University, USA)
- OS2-8 **Generating a Simplified Reaction Model for n -C₇H₁₆ Using a Genetic Algorithm**
16:21-16:39 Koyo Igusa, Hisashi Nakamura (Tohoku University, Japan)
- 16:45-17:00 BREAK
- OS2-9 **Carleman Linearization of Reacting Flow Problems toward Quantum Computing**
17:00-17:18 Takaki Akiba (The University of Tokyo, Japan), Youhi Morii (Tohoku University, Japan), Minhyeok Lee (The University of Tokyo, Japan), Kaoru Maruta (Tohoku University, Japan), Yuji Suzuki (The University of Tokyo, Japan)

- OS2-10
17:18-17:36 **Numerical Study on the Effect of Flame Stretch on Ball-Like Flames in an Extremely Low-Speed Counterflow Field Using Low-Lewis-Number Premixture**
Kaito Nishiyama (Tohoku University, Japan), Joel Daou (The University of Manchester, UK), Akira Tsunoda, Youhi Morii, Kaoru Maruta (Tohoku University, Japan)
- OS2-11
17:36-17:54 **The Solid Fuel of Different Shapes Burning in Microgravity**
Sheng-Chuan Hung, Sheng-Yen Hsu, Chih-Wei Huang (National Sun Yat-sen University, Taiwan)
- OS2-12
17:54-18:12 **The Pressure Effect on the PMMA Sphere Burning in Forced and Buoyant Flows**
Yu-Wen Chung, Sheng-Yen Hsu (National Sun Yat-sen University, Taiwan)
- OS2-13
18:12-18:30 **Developing of “Green” Hypergolic Propellants for Next Generation In-space Thruster**
Chih-Shin Chang, Ko-Lun Chang, Shih-Sin Wei, Jong-Shinn Wu (National Yang Ming Chiao Tung University, Taiwan)

November 11, 2025
EX-Hall-1A

- OS2-14
9:00-9:18 **Stability Modes of Non-Premixed Flames Formed on a Slot Burner with Low Reynolds Number Flows**
Ching-Kang Huang, Takuya Tomidokoro, Jun Hayashi (Kyoto University, Japan), Takahiro Sako (Osaka Gas Co., Ltd., Japan), Hiroshi Kawanabe (Kyoto University Japan)
- OS2-15
9:18-9:36 **Numerical Simulations on Premixed Methane-air Flame Propagation under Electric Fields in a Hele-Shaw Chamber**
Zhenhui Zhang, Xin Kang (Wuhan University of Technology, China)
- OS2-16
9:36-9:54 **Road Tunnel Fire Simulations Using a Combustion Reaction Model**
Shun Nemoto, Kazuya Seo (Kogakuin University, Japan), Kensuke Takahashi, Takashi Chihara (FITUT Laboratory Co., Ltd., Japan)
- OS2-17
9:54-10:12 **Investigation on the Combustion Behavior of Young Conifer Trees**
Sayaka Suzuki (Institute of Science Tokyo, Japan), Samuel L. Manzello (Reax Engineering, USA / Tohoku University, Japan)
- OS2-18
10:12-10:30 **Numerical Study on Flame Behaviors in a One-Step Sudden-Expansion Tube**
I-Ling Lin, Tzu-Hsien Chuang, Sheng-Yen Hsu (National Sun Yat-sen University, Taiwan)
- 10:30-10:45 BREAK
- OS2-19
10:45-11:15 **Incompletely Stirred Reactor Low-Order Modelling for Gas Turbine Combustors** (*Invited*)
Hazem S.A.M. Awad (University of Cambridge, UK), B. Harikrishnan (Cambridge Centre for Advanced Research and Education in Singapore, Singapore), Savvas Gkantonas (University of Cambridge, UK), Epaminondas Mastorakos (University of Cambridge, UK / Cambridge Centre for Advanced Research and Education in Singapore, Singapore)

OS2-20 11:15-11:33	Quantitative Measurement of Temperature using Two-Line Atomic Fluorescence (TLAF) in a Reactive Flow Impinging a Wall <u>Artémis Blondel</u> , Alexis Vandel, Saïd Idlahcen, Rayane Benadjaoud, Gilles Godard, Frédéric Grisch, Pradip Xavier (INSA Rouen Normandie, Univ Rouen Normandie, CNRS, Normandie Univ, CORIA, France)
OS2-21 11:33-11:51	Local Principal Component Transport for Reduced-order Reacting Flow Simulations <u>Rafi Malik</u> , Francisco E. Hernández-Pérez, Hong G. Im (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)
OS2-22 11:51-12:09	Combustion Modeling and Analysis of a Micro Gas Turbine with Biofuels <u>Muhammad Ihsan</u> , Hsin-Yi Shih (Chang Gung University, Taiwan), Is Bunyamin Suryo (Institut Teknologi Sepuluh Nopember, Indonesia)
12:15-12:30	BREAK
OS2-23 13:30-13:50	Canceled
OS2-24 13:50-14:10	Canceled
OS2-25 14:10-14:30	Numerical Simulation of Two-phase Detonation in a Reactive Particle-laden Flow using Compressible Multiphase Particle-in-cell Method (<i>Invited</i>) Jiahui He (Northwestern Polytechnical University, China), Baoqing Meng (Chinese Academy of Sciences, China), Baolin Tian (Beihang University, China), <u>Jianling Li</u> (Northwestern Polytechnical University, China)
OS2-27 14:30-14:50	Rayleigh Flow as a Platform for Examining General Behaviors of 1D Reactive Flows: From Theoretical Prediction to Stable Realization of Weak Detonations (<i>Invited</i>) <u>Youhi Morii</u> , Kaoru Maruta (Tohoku University, Japan)
15:10-15:20	BREAK
OS2-26 15:20-15:40	Initiation of Oblique Detonation Wave with Incoming Boundary Layer (<i>Invited</i>) Xinke Shao (The Hong Kong Polytechnic University, China), <u>Zijian Zhang</u> (Beijing Institute of Technology, China)
OS2-28 15:40-16:00	Re-Interpretation of Flame Structure Based on Flow Fields (<i>Invited</i>) <u>Kaname Matsue</u> (Kyushu University, Japan), Youhi Morii (Tohoku University, Japan)
OS2-30 16:00-16:20	Numerical Study on Detonation Initiation by Multiple Hot Spots (<i>Invited</i>) Jie Sun, <u>Zheng Chen</u> (Peking University, China)
OS2-31 16:20-16:38	1D DNS on Shock Formation and Detonation Transition Triggered by Reaction Wave Speed Exceeding the Subsonic CJ Speed <u>Haru Okada</u> , Youhi Morii, Akira Tsunoda, Kaoru Maruta (Tohoku University, Japan)
16:45-17:00	BREAK

- OS2-32
17:00-17:18 **Knocking Processes in NH₃/H₂ Engine**
Florian Hurault, Fabrice Foucher, Pierre Brequigny, Christine Mounaïm-Rousselle (Université Orléans, France), Hinata Moriyama, Toshihiro Fukaya, Youhi Morii, Kaoru Maruta (Tohoku University, Japan)
- OS2-33
17:18-17:36 **Theoretical Analysis on Flame Propagation with Chemically Unfrozen Preheat Zone: ZFK-FKPP Transition and Knock Onset**
Akira Tsunoda, Youhi Morii, Kaoru Maruta (Tohoku University, Japan)
- OS2-34
17:36-17:54 **1D DNS Analysis of Knocking in PRF₂₀/O₂/Ar Mixtures within a Constant Volume Chamber**
Shogo Miyazaki, Hinata Moriyama, Takuya Tezuka, Youhi Morii, Kaoru Maruta (Tohoku University, Japan)
- OS2-35
17:54-18:12 **The Effect of Fuel Lewis Number on the Behaviors of Highly Preheated Premixed Flames**
Toshihiro Fukaya, Hinata Moriyama, Youhi Morii, Kaoru Maruta (Tohoku University, Japan)
- OS2-36
18:12-18:30 **Validation of 1D DNS Knock-Onset Prediction Methodology Using CFR Engine Data**
Hinata Moriyama, Youhi Morii, Akira Tsunoda (Tohoku University, Japan), Yuki Yasutake, Katsuhiro Misono, Yoshikatu Suzuki, Taketora Naiki, Manabu Watanabe (ENEOS Corporation, Japan), Kaoru Maruta (Tohoku University, Japan)

November 12, 2025
EX-Hall-1A

- OS2-37
9:00-9:18 **Intrinsic Instabilities of Partially Cracked Ammonia/Air Flames**
Qizhe Wen, Yan Wang, Linlin Yang (Peking University, China), Thorsten Zirwes (University of Stuttgart, Germany), Shengkai Wang, Zheng Chen (Peking University, China)
- OS2-38
9:18-9:36 **Numerical Analysis of Boiling Liquid Expansion of Pressurized Hydrogen**
Mike Kuznetsov, Aleksander Lelyakin, Eugenio Torres de Ritter (Karlsruhe Institute of Technology, Germany)
- OS2-39
9:36-9:54 **On the Accuracy of Laminar Burning Velocity Measured from Spherically Expanding NH₃/air Flames**
Seif Zitouni (CNRS-INSIS / Université Orléans, France), Christian Schwenzer, Roman Glaznev, Raik Hesse, Heinz Pitsch, Joachim Beeckmann (RWTH Aachen University, Germany), Christine Mounaïm-Rousselle (Université Orléans / Institut Universitaire de France, France), Nabiha Chaumeix, Fabien Halter (CNRS-INSIS, France)
- OS2-40
9:54-10:12 **Enhancing Ammonia Ignition Using Combustion Products of Pre-Ignited Ammonia-Air, Hydrogen-Air and Methane-Air Mixtures: A Chemical Kinetics Study**
Ekenechukwu C. Okafor, Ryotaro Takao, Dai Matsuda, Toshiaki Kitagawa (Kyushu University, Japan)

- OS2-41
10:12-10:30 **Shock Tube Measurement of Ignition Delay Times for NH₃/O₂/Ar under High-Temperature and High-Pressure Conditions with a Constraint Reaction Volume Approach**
Apurba Sharma, Yuki Morimoto, Yuji Wakata (Hiroshima University, Japan), Akihiro Hayakawa, Hisashi Nakamura (Tohoku University, Japan), Yohei Fujimoto (Mitsubishi Heavy Industries Aero Engines, Japan), Shigeru Obayashi (Tohoku University, Japan), Daisuke Shimokuri (Hiroshima University, Japan)
- 10:30-10:45 BREAK
- OS2-42
10:45-11:15 **Liquid Ammonia Injection in Internal Combustion Engines: Droplet Sizing** *(Invited)*
Utkarsha Sonawame, Camille Hespel (University of Orléans, France), Christine Mounaïm-Rousselle (University of Orléans / Institut Universitaire de France, France), Keito Honda, Akihiro Hayakawa (Tohoku University, Japan)
- OS2-43
11:15-11:33 **Investigation on Combustion Characteristics of Lean NH₃/H₂/NO/O₂/Ar Mixtures Using a Micro Flow Reactor with a Controlled Temperature Profile**
Kanako Nishimura, Keisuke Kanayama, Masahiko Izumi, Takuya Tezuka, Hisashi Nakamura (Tohoku University, Japan)
- OS2-44
11:33-11:51 **Experimental Study on the Effect of a Preheated NH₃ Stagnation Flame on Ferrous Metals**
Keisuke Kanayama, Masahiko Izumi, Takuya Tezuka, Goro Miyamoto, Hisashi Nakamura (Tohoku University, Japan)
- OS2-45
11:51-12:09 **Exploring the Clean Potential of Next-Generation Internal Combustion Engines through Experimental Analysis**
Cho-Yu Lee, Hsin-Hao Chen (National Cheng Kung University, Taiwan), Po-Sen Chang (National Sun Yat-sen University, Taiwan)
- 12:15-13:30 BREAK
- OS2-46
13:30-14:00 **Non-equilibrium Plasma Assisted Catalytic Synthesis of Ammonia** *(Invited)*
Yijie Xu, Ziqiao Chang, Yiguang Ju (Princeton University, USA)
- OS2-47
14:00-14:18 **High Temperature Electrolyzer for Advancing Hydrogen and e-Fuels Production in KSA**
Aziz Nechache, S. Mani Sarathy (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)
- OS2-48
14:18-14:36 **DNS Study on the Blow-off Mechanism of Premixed Ammonia/Hydrogen Flames**
Takuya Tomidokoro (Kyoto University, Japan), Urbano A. Medina Martinez (King Abdullah University of Science and Technology (KAUST), Saudi Arabia), Jun Hayashi (Kyoto University, Japan), Hong G. Im (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)
- OS2-49
14:36-14:54 **Emission and Flame Structure of Intermediate-Cracking-Ratio Ammonia Premixed Flames**
Peng Ma, Jinzhou Li, Samir B. Rojas Chavez, Hao Hu, Shumeng Xie, Surendra Kumar Soni, Huangwei Zhang (National University of Singapore, Singapore)

November 13, 2025

EX-Hall-1A

- OS2-50
9:00-9:18 **Combustion and NO_x Formation Characteristics of CH₄/N₂O Opposed-jet Diffusion Flames**
Chun-Yi Liu, Hsin-Yi Shih (Chang Gung University, Taiwan)
- OS2-51
9:18-9:36 **Investigation on Extinction Stretch Rate and NO Formation for NH₃/Air Counterflow Premixed Flames at Elevated Temperature and Pressure**
Yuta Kitagawa, Hisashi Nakamura (Tohoku University, Japan), Hiroyuki Takeishi (Mitsubishi Heavy Industries, Ltd, Japan), Akihiro Hayakawa (Tohoku University, Japan)
- OS2-52
9:36-9:54 **Extinction and Differential Diffusion in KAUST Piloted Ammonia-Hydrogen Jet Flames: A Principal Component Transport Modeling Approach**
Suliman Abdelwahid, Ibraheem Trabulsi, Mohammed Bawazeer, Mohammad Rafi Malik, Junjun Guo, Francisco E. Hernández-Pérez, Hong G. Im (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)
- OS2-53
9:54-10:12 **Oxidation Characteristics of NH₃/Lower Hydrocarbon Mixtures Using a Micro Flow Reactor with a Controlled Temperature Profile**
Yoshito Ishida, Kenta Tamaoki, Keisuke Kanayama, Takuya Tezuka, Hisashi Nakamura (Tohoku University, Japan)
- OS2-54
10:12-10:30 **Numerical Simulation on the Stability (Combustion) and Emission Characteristics of Ozone-assisted Premixed NH₃/Air Swirl Flames**
Miaoyu Cai, Ming Zhai, Di Yang, Xun Zou, Li Guo (Harbin Institute of Technology, China)
- 10:30-10:45 BREAK
- OS2-55
10:45-11:03 **Generation of a Detailed NH₃ Combustion Mechanism Using Micro Flow Reactor Speciation Data**
Márton Kovács, Hisashi Nakamura (Tohoku University, Japan)
- OS2-56
11:03-11:21 **Staged Injection of Ammonia into Methane Flames for Emissions Reduction**
Hsin-Yi Wu, Lin-Hsiang Huang, Ming-Hsun Wu, Annas Fauzy, Fang-Hsien Wu (National Cheng Kung University, Taiwan), Wei-Dong Hsieh (China Steel Corporation, Taiwan)
- OS2-57
11:21-11:39 **Impacts of Thermochemistry on Model Prediction for NH₃ Oxidation**
Kenta Tamaoki, Hisashi Nakamura (Tohoku University, Japan)
- OS2-58
11:39-11:57 **Extinction Limits of Non-Premixed NH₃/H₂/N₂ Counterflow Flames: Effect of Oxidizer Preheating and Dilution**
Anand Shankar Singh, Keisuke Kanayama, Takuya Tezuka, Hisashi Nakamura (Tohoku University, Japan)
- OS2-59
11:57-12:15 **Partially Premixed Combustion of Ammonia-Hydrogen-Nitrogen Blends**
Samir B. Rojas Chavez, Surendra Kumar Soni, Peng Ma, Jinzhou Li, Huangwei Zhang (National University of Singapore, Singapore)