



ALMA MATER STUDIORUM | DEPARTMENT
UNIVERSITÀ DI BOLOGNA | OF INDUSTRIAL ENGINEERING



ASME
TRANSPORTATION
SYSTEMS DIVISION

International ICE Forward Symposium

June 3-5, 2026 | Bologna

DETAILED PROGRAM





ICEFS 2026

VENUE

San Giovanni in Monte Complex
Piazza San Giovanni in Monte 1/2, Bologna

Registration, poster session, table-top exhibits, and all breaks (coffee and lunch) will take place in the **cloister** of the venue.

WICE MOVE & MUNER event, opening remarks, keynote lectures, technical panel, symposium wrap-up, and closing ceremony will take place in **Aula Prodi**.

MORE INFORMATION

Scan the QR code and visit the official event website
eventi.unibo.it/international-ice-forward-symposium-2026



Wednesday June 3, 2026

	Cloister
4.30 – 6 PM	Registration Poster Session
5 – 7 PM	WICE MOVE & MUNER – Networking for an Inclusive Environment

Thursday June 4, 2026

	Cloister		
8 AM - 7 PM	Registration Table-Top Exhibits		
	Aula Capitani	Aula Prodi	Aula Fumagalli
8 AM	Continental Breakfast		
8.30 AM	Welcome Remarks – Kelly Senecal , <i>ASME</i> – Tatiana Morosuk , <i>TU Berlin</i>		
8.45 AM	Keynote Lecture – Ioannis Kitsopaniadis , <i>Ferrari</i>		
10 AM	Coffee break		
10.15 AM	TA_01	TB_01	TC_01
11.30 AM	Coffee break		
11.45 AM	TA_02	TB_02	TC_02
1 PM	Networking Lunch		
2 PM	TA_03	TB_03	TC_03
3.30 PM	Keynote Lecture – Alberto Vassallo , <i>Dumarey Automotive Italia</i>		
4.45 PM	Coffee break		
5 PM	TB_05	TB_04	TA_04
6.30 PM	Transfer to Maranello		
7.45 PM	Ferrari Museum visit and banquet		

Friday June 5, 2026

	Cloister		
8 AM - 6 PM	Registration Table-Top Exhibits		
	Aula Capitani	Aula Prodi	Aula Fumagalli
8 AM	Continental Breakfast		
8.30 AM	Keynote Lecture – Davide Bizzarri , <i>Automobili Lamborghini</i>		
9.45 AM	Coffee break		
10 AM	TA_05	TB_06	
11.15 AM	Coffee break		
11.30 AM	Technical Panel – The New "ICE Age"		
12.30 PM	Networking Lunch Symposium Wrap-Up		
1.30 PM	Technical Tours – Company visit @ Ducati Motor (1 st group)		
3 PM	Technical Tours – Company visit @ Ducati Motor (2 nd group)		
6 PM	Symposium Concludes		

Wednesday June 3, 2026

**WICE MOVE & MUNER –
Networking for an
Inclusive Environment**

JUNE 3 | 5 PM | Aula Prodi

WICE MOVE & MUNER – NETWORKING FOR AN INCLUSIVE ENVIRONMENT

SPEAKERS

Stefania Esposito, *University of Bath – IAAPS*

Emily Bierman, *John Deere*

Elena Bassoli, *University of Modena and Reggio Emilia*

KEYNOTE SPEECH

The Gendered Powertrain. How Europe and the United States Are Rewriting the Economics of the Automotive Transition

Ulpiana Kocollari, *University of Modena and Reggio Emilia*

PANELISTS

Giorgia Carbone, *AVL Italy*

Cinzia Tornatore, *CNR STEMS*

Donatella De Vita, *Pirelli*

Serena Leonardi, *Dallara*

Antonella Gioia, *Lamborghini*

Barbara Zardin, *University of Modena and Reggio Emilia*

Thursday June 4, 2026

Technical Sessions

MODELING, KINETICS, AND CFD FOR LOW-CARBON FUELS

Physics-Based Optimization of Hydrogen–Methane Combustion Chemistry for CFD Applications

Rajivasanth Rajasegar, *Colorado School of Mines*; Dario Lopez-Pintor, *Sandia National Laboratories*; Fuqiong Lei, Kaylyn Buchanan, *Colorado School of Mines*

Evaluating CO₂ separation by distillation in oxy-fuel combustion exhaust gases

Pedro Piqueras, Francisco Javier García, José Ramón Serrano, Enrique José Sanchis, *Universitat Politècnica de València*

Development of a Reduced Gasoline Surrogate Kinetic Mechanism for Pre-chamber Combustion and Spark-Ignition Engine Modeling

Xinlei Liu, Rafael Menaca, *KAUST*; Fabio Santi Mortellaro, Massimo Medda, *Ferrari*; Hong G. Im, *KAUST*

Hydrogen Dual-Fuel Combustion as retrofit solution for 3-cylinder aspirated Compression-Ignition Engine

Ezio Mancaruso, *STEMS_CNR*; Salvatore Rossetti, *STEMS-CNR & University of Naples Federico II*

HYDROGEN INJECTION, JETS & DIAGNOSTICS

High Pressure Hydrogen Jet Dynamics of an Outward-Opening Injector under Engine Conditions

Alessandro Montanaro, Giovanni Meccariello, Daniele Piazzullo, *STEMS - CNR*

Wall Heat Flux Characterization in a Hydrogen-Fueled Reciprocating Engine Using Adaptive Harmonic Selection

Andrés Felipe Garzón Alzate, *KU Leuven - University of Melbourne*; Abdul Rahman Kodali, *KU Leuven*; Jingyu Pan, *University of Melbourne - KU Leuven*; Joshua Lacey, *KU Leuven*; Mohsen Talei, *University of Melbourne*

Development, Calibration, and Testing of Thin-Film Heat Flux Sensors for wall heat flux measurements of hydrogen and hydrogen-methane flames

Felix Leach, Tejo Jehart, Martin Davy, *University of Oxford*

Hydraulic Behavior of High-Pressure Fuel Injectors During Ballistic Operation

Stephen Mundy, Paulius Puzinauskas, *University of Alabama*

UNCONVENTIONAL POWERTRAINS

A Comparative Study of Hydrogen and Battery-Electric Solutions for Short-Haul Waterborne Sustainable Mobility in Venice

Pier Paolo Brancaleoni, *University of Parma*; Andrea Nicolò Damiani Ferretti, Enrico Corti, Vittorio Ravaglioli, *University of Bologna*

Performance Assessment of an Active Pre-Chamber Engine Boosted by Fuel Cell Gases: Focus on Typical Ferry Operations

Davide Scampamorte, Stefania Falfari, Giulio Cazzoli, Gian Marco Bianchi, Valerio Mariani, *University of Bologna*

Recent advances on research into Wankel rotary engines

Giovanni Vorraro, Jamie Turner, Hong Im, KAUST

Data-Driven Modeling of Exhaust Emissions in a Spark-Ignited Ammonia-Fueled Internal Combustion Engine

Matteo Piunti, *University of Bologna*; Pau Bares, Benjamin Pla, *Universitat Politècnica de València*; Vittorio Ravaglioli, *University of Bologna*

Experimental Assessment of Emission Reduction via Advanced Engine and Oil Thermal Management

Davide Di Battista, Marco Di Bartolomeo, Fabio Fatigati, Federico Di Prospero, Roberto Cipollone, *University of L'Aquila*

POWER SYSTEMS, SUSTAINABILITY AND FUEL PATHWAYS

Assessing the Potential of Hydrogen and Electrification in Off-Road Vehicles Under Future Energy Scenarios

Benedetta Peiretti Paradisi, Andrea Scalambro, Afanasie Vinogradov, Luciano Rolando, *Politecnico di Torino*

Techno-Economic Assessment of Imported Low-Carbon Fuels via Northwest European Ammonia Terminals for Mobility Application

Amira Korayem, Tatiana Morosuk, *Technische Universität Berlin Germany*

A Review of Hydrogen-Powered Internal Combustion Engine Development

Olasubomi Omowa, *Nigeria*

Emissions reduction from biofuels: provenance and combustion performance

Nick Molden, *Emissions Analytics*

HYDROGEN COMBUSTION PHYSICS & MODELING

An improved Turbulent Flame Speed Correlation for Hydrogen Combustion Modelling in a High-Performance Engine

Antonio Denny Baudone, Sebastiano Breda, Fabio Berni, *University of Modena and Reggio Emilia*

DNS analysis of turbulent flame speed in lean H₂ flames at engine relevant conditions

Giuseppe Anaclerio, Francesco Fornarelli, *University of Foggia*

A Chemical-Based Spark Model for H₂-Fuelled Prechamber Engines

Domenico Episcopo, G. Saponaro, *Polytechnic University of Bari*; P. Sementa, *STEMS-CNR*; F. Ferrante, *Isotta Fraschini Motori*; S. Camporeale, D. Laera, *Polytechnic University of Bari*

The role of platinum surface catalytic effects in hot-spot induced pre-ignition in a H₂-DI engine

Rajavasanth Rajasegar, Kaylyn Buchanan, Fuqiong Lei, *Colorado School of Mines*; Taesong Lee, Ales Srna, *Sandia National Laboratories*

Experimental analysis and 3D-CFD modeling of ultra-lean hydrogen combustion in a pre-chamber engine: effects of nozzle diameter and air-fuel ratio

Andrea Scalambro, Andrea Piano, Federico Millo, *Politecnico di Torino*; Kyupeli Shenol, Praveen Ramanujam Balakrishnan, Matteo D'Elia, *Convergent Science GmbH*; Paolo Sementa, Bianca Maria Vaglieco, *CNR Stems*

ENGINE AND COMBUSTION MODELLING AND CONTROL

A Computational Investigation of Trapping Valve Timing Effects in a Fuel-Flexible Two-Stroke Engine with Variable Compression Ratio

Mohammad Raghیب Shakeel, Giovanni Vorraro, James W.G. Turner, Hong G. Im, *KAUST*

A 0-D Versatile Chemical Kinetics Combustion Model for the Analysis of Advanced Combustion Concepts

Pier Paolo Brancaleoni, *University of Parma*; Davide Viscione, *Toyota Gazoo Racing Germany*; Enrico Corti, Vittorio Ravaglioli, *University of Bologna*

Development of a 0-D model to estimate the instantaneous torque delivered by an Internal Combustion Engine

Dario D'Orsi, Vittorio Ravaglioli, *University of Bologna*

Flex-fuel combustion modeling for auto-calibration of dual-fuel engines

Mats Versmissen, Frank Willems, *Eindhoven University of Technology*

Smart Ignition System with Integrated Diagnostics for ICES Combustion Control and Optimization

Massimiliano Avana, *University of Perugia*; Federico Ricci, Stefano Papi, *Champion Ignition – Tenneco*; Jacopo Zemi, Michele Battistoni, Carlo Nazareno Grimaldi, *University of Perugia*; Massimo Dal Re, *Champion Ignition – Tenneco*

HYDROGEN ENGINES: COMBUSTION, PERFORMANCE AND CHALLENGES

Impact of Exhaust Gas Recirculation on Performance, Combustion, and Emissions of a Heavy-Duty Hydrogen Engine with Low-Pressure Direct Injection

Mebin Panithasan, *King Abdullah University of Science and Technology*

Experimental study on the direct-injection compression-ignition hydrogen engine with Argon Power Cycle in a commercial engine

Domingos Varela Marreiros, Noud C.J. Maes, Michel C.M. Cuijpers, Yu Wang, *Eindhoven University of Technology*

Combustion anomalies in spark-ignited hydrogen engines – causes and mitigation measures

Erik Doosje, Xander Seykens, Jeroen Kamminga, *TNO*

Advanced Hydrogen Engine Systems: Comprehensive Experimental Analysis of Steady-State and Transient Performance and Emissions Across Multiple Engine Platforms, Including Rotary and Opposed-Piston Architectures, with Nanobubble-Enhanced Water Injection

Mohamed Mohamed, Xinyan Wang, Hua Zhao, *Brunel University London*

HCCI numbers for methanol and ethanol using hydrogen peroxide as ignition improver

Patrick Burkardt, Óscar Arino Pérez, *Technical University of Denmark*; Martin Tunér, *Lund University, Sweden*; Bengt Johansson, *Technical University of Denmark*

ENGINE SYSTEMS, EFFICIENCY & CONCEPTS

Thermal Efficiency Evolution Potential of HD Diesel Engines towards 56% for the upcoming decade – CAE-based Optimization paired with Engineering Expertise

Thomas Körfer, L. Virnich, H. Busch, *FEV Group*

Thermal efficiency improvement of a diesel engine by a novel heat release rate profile

Noboru Uchida, Teruo Machii, *New ACE Institute, Japan*

Redefining Methane HD Engines: The Next Generation of Piston Bowl Geometry

Carlo Beatrice, Davide Di Domenico, Pierpaolo Napolitano, Dario Di Maio, *CNR-STEMS*; Stefano Golini, Sergio Giordana, Nicola Rapetto, *FPT Industrial SpA*; Luca Vargiu, *FPT Motorenforschung AG*, Enzo Galloni, Davide Lanni, Gabriele D'Antuono, *University of Cassino*

Enhancing Efficiency and Emissions in Lean-Burn Marine Engines through Pre-Chamber Design and Miller Cycle

Cinzia Tornatore, Vincenzo Pennino, Luca Marchitto, Antonio Mariani; *STEMS CNR*; Francesco Accurso, Valentina Gorietti, Francesco C. Pesce, *Dumarey Automotive Italia S.p.A*; Fabio Ferrante, Angelo Giardino, *Isotta Fraschini Motori S.p.A*

Variable Valve Actuation-enabled Reactivity-Controlled Compression Ignition Load Extension in a Medium Speed Marine Engine

Jeyoung Kim, Amir Soleimani, *University of Vaasa*; Jacek Hunicz, *University of Vaasa, Lublin University of Technology*; Jari Hyvonen, *Wärtsilä Finland Oy*; Maciej Mikulski, *University of Vaasa*

Computational and experimental investigation of turbulent jet ignition for Wankel engines

Tommaso Lucchini, Lorenzo Sforza, Federico Ramognino, Gianluca D'Errico, *Politecnico di Milano*; Marco Buttitta, Luca Marmorini, *Marmotors s.r.l.*

HYDROGEN AND SUSTAINABLE FUELS

Experimental Performance Analysis and Model-Based Optimization of a Compression Ignition Engine Fuelled with HVO/DEGDEE Blends

Antonio Foglia, Davide Cervone, Cesare Pianese, *University of Salerno*;
Ivan Arsie, *University of Napoli "Parthenope"*

Experimental Evaluation of a Three-Way Catalyst for Exhaust Aftertreatment in an Ammonia-Fueled Engine

Will Northrop, Nathan Oakey, Alex Voris, *University of Minnesota*

Hydrogen Enriched Ammonia Spark Ignition Engine

Dardan Rustemi, Lionel Ganippa, Thanos Megaritis, *Brunel University of London*

Neural Network-Based Adaptive Controller for CA50 Management Under Multiple Constraints in H2ICEs

Pier Paolo Brancaleoni, *University of Parma*; Enrico Corti, *University of Bologna*; Alessandro Rossi; Vittorio Ravaglioli, Alessandro Brusa, Nicolò Cavina, *University of Bologna, Italy*

Development of a Hydrogen-Fuelled Active Pre-Chamber for a High-Speed Large Bore Size Engine Application

Richard Osborne, Andre Barroso, Richard Penning, *Ricardo UK*; Premysl Kuchar, Martin Kratky, Jaroslav Kepřta, Martin Krajicek, Filip Hromadnik, *Ricardo Czech Republic*

Optimization of e-heating strategies for ammonia slip catalysts under real driving operation

Pedro Piqueras, Sebastián Noriega, Joaquín de la Morena, Enrique José Sanchis, *Universitat Politècnica de València*

ALTERNATIVE FUELS: METHANOL, AMMONIA, DUAL-FUEL

Spray development and mixture formation in a direct-injected methanol-fueled CI engine

Abhinandhan Narayanan, Sanguk Lee, Rami Abboud, Dario Lopez Pintor, *Sandia National Laboratories*; Kenth Svensson, Jon Anders, Russ Fitzgerald, Yongli Qi, *Caterpillar Inc.*

Combustion and Reaction Pathway Analysis in a Methanol-Diesel Reactivity-Controlled Compression-Ignition (RCCI) Engine with Split Injection Strategies

Alireza Farkhondeh Abnoi, Yizhuo Feng, Hua Zhao, Xinyan Wang, *Brunel University of London*

Design of Experiments based optimization for extending load range in a heavy-duty OME/Methanol RCCI engine

Noud Maes, Yarne Schlösser, *Eindhoven University of Technology*, Netherlands; Zhongcheng Sun, *Chalmers University of Technology*; Michel Cuijpers, *Eindhoven University of Technology*; Peter de Vos, *Delft University of Technology*

Mass flow rate measurements of liquid ammonia injections

Felix Leach, Li Shen, Maruthi Malladi, Martin Davy, *University of Oxford*; Abdullah Bajwa, *SouthWest Research Institute*

Liquid ammonia spray and mixing behaviour with a gasoline direct injector under flash boiling conditions

Raghul Nagarajan, Shuo Dong, Yizhuo Feng, Abinash Biswal, Xinyan Wang, Hua Zhao, *Brunel University of London*

AMMONIA AND AMMONIA-HYDROGEN COMBUSTION SYSTEMS

Combined Experimental and CFD Study of Passive Turbulent Jet Ignition in Neat Ammonia Engines

Alessandro Nodi, Lorenzo Sforza, Tommaso Lucchini, *Politecnico di Milano*; Alex Voris, William Northrop, *University of Minnesota*

A Coupled 1D Jet-Reactor Framework for Simulating Ammonia and Ammonia-Hydrogen Jet Ignition in Hot Co-flow Conditions

Rajavasanth Rajasegar, *Colorado School of Mines*; Tyler Strickland, *Wisconsin Research Farm LLC*; Dario Lopez-Pintor, *Sandia National Laboratories*; Robert Dibble, *University of California*; Jose Maria Garcia-Oliver, *Universitat Politècnica de València*

Numerical and experimental evaluation of the ammonia-hydrogen combustion system in retrofitted spark-ignition engines

Jaime Martín, David González-Domínguez, José Manuel Lujan, Ricardo Novella, *Universitat Politècnica de València*

Effects of hydrogen peroxide in NH₃/H₂ homogeneous charge compression ignition engine

Fabio Anaclerio, Francesco Fornarelli, *University of Foggia*; Christine Mounaïm-Rousselle, *University of Orléans*

Computational Investigation of Hydrogen-Enriched Ammonia Combustion in a Direct-Injection Spark-Ignition Engine: Effects on Thermal Efficiency and NO_x Emissions

Yatharth Gohel, Illinois Mathematics and Science Academy

HYDROGEN ENGINES: COMBUSTION SYSTEMS & CONCEPTS

A Dedicated SI Combustion System for Heavy-Duty Hydrogen Engines

Richard Osborne, *Ricardo, UK*; Jan Hrach, *Ricardo, Czechia*; Richard Penning, *Ricardo, UK*; Lukas Valenta, Zbynek Tomiska, *Ricardo, Czechia*

Mixing and Combustion Dynamics in a Heavy-Duty Hydrogen Engine Equipped with an LPDI Injector

Rafael Menaca, Mebin Panithasan, Xinlei Liu, Abdullah Zaihi, James G. W. Turner, Hong G. Im, *KAUST*; Mickael Silva, Yuanjiang Pei, *Aramco Americas*; Emre Cenker, Yasser A. Qahtani, *Saudi Aramco*; Iltesham Syed, *Robert Bosch LLC*

Role of Injection Timing in Shaping Combustion Dynamics in a Hydrogen-Fueled Research Engine

Alessandro Brusa, *University of Bologna*; Stefania Esposito, *University of Bath*; Federico Omicini, *University of Bologna*; Sam Akehurst, *University of Bath*; Nicolò Cavina, *University of Bologna*

Preliminary Assessment of SI and CI Hydrogen Argon Power Cycle Engines for High Efficiency Zero Emission Applications

Jaime Martín, Roberto Pérez-Galdón, Josep Gomez-Soriano, Ricardo Novella, *Universitat Politècnica de València*

On the origin of cylinder-to-cylinder imbalance in a hydrogen-Diesel dual fuel engine: A multi-scale numerical study

Francesco Scrignoli, Davide Romani, *University of Modena and Reggio Emilia*; Salvatore Rossetti, *STEMS-CNR, University of Naples Federico II*; Ezio Mancaruso, *STEMS-CNR*; Carlo Alberto Rinaldini, *University of Modena and Reggio Emilia*

Friday June 5, 2026

Technical Sessions

DUAL-FUEL AND ALTERNATIVE FUEL COMBUSTION STRATEGIES

A Study on Hydrogen-Jet Fuel Dual-Fuel Combustion in a Variable Speed Generator

Shouvik Dev, David Stevenson, Kevin Austin, James Clarke, *National Research Council, Canada*; Shannon Farrell, Gisele Amow, *Defence Research Development Centre, Canada*

Systems-level analysis of an advanced hydrogen pre-chamber concept for high performance and motorsport applications

Nathan Peters, Alex Hoth, Michael Bunce, *Dumarey*

The Effects of Cyclo-alkanes on Compression Ignition Engine Combustion

Jim Cowart, Dianne Luning Park, *US Naval Academy*

Numerical Investigation of EGR and Diesel SOI Interactions on Combustion Characteristics and Emission in a Hydrogen-Diesel Dual-Fuel Engine Using Response Surface Methodology

Mohammad Alriyami, Nabeel Z. Al-Rawahi, Ahmed Elwardany, Afzal Hussain, Rashid S.H. Al-Hajri, Tasneem Pervez, *Sultan Qaboos University, Oman*

SPRAY, MIXTURE FORMATION & IN-CYLINDER FLOW

Lagrangian wall film model for spray-wall interaction in high-performance naturally aspirated SI engines

Giovanni Gianetti, Tommaso Lucchini, Mattia Pelosin, *Politecnico di Milano*; Simone Malaguti, Davide Frigeri, Claudiu Di Gaetano, *RSEngineering*

Evaluating Benefits of Peripheral Fuel Injection on Heat Loss and Emission over Low to Medium Load

Joshua Bittle, Spencer Hall, Ajay Agrawal, *University of Alabama*

AI-Assisted CFD Optimization of High-Tumble Intake Ports for a High-Performance V8 Hybrid Engine

Claudio Forte, Alfio Siliato, *NAIS Srl*; Davide Bizzarri, Giovanni Bonandrini, *Automobili Lamborghini SpA*

An Optical Investigation of Cold-Start Challenges within Ethanol-Fueled Active Prechambers: Evaporation Dynamics and Mitigation Strategies

Cole Engebretson, Casey Allen, *Marquette University*; Alex Hoth, *Dumarey Group*; Adam Dempsey, *University of Wisconsin Madison*

LeanCore: Conceptual Design and Gas-Dynamic Analysis of a Spark-Ignition Engine with Oscillating Rotary Valves

Gabriel Eze, Italy

Friday June 5, 2026

**TECHNICAL PANEL –
The New "ICE Age"**

JUNE 5 | 11.30 AM | Aula Prodi

TECHNICAL PANEL – The New "ICE Age"

PANEL MODERATOR

Kelly Senecal, *ASME Transportation Systems Division & Converge CFD*

PANELISTS

Pierpaolo Biffali, *FPT Vice President, Head of Powertrain Product Engineering*

Daire Corrigan, *Head of Powertrain at Bugatti Rimac*

Simone Di Piazza, *Head of Innovation, R&D Services – Ducati Motor Holding*

Carlo Beatrice, *Research Director, National Research Council – CNR-STEMS*

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