



**POLITECNICO
MILANO 1863**

DIPARTIMENTO DI ENERGIA

**11-12
March
2024**

6th Two-Day Meeting

on Propulsion Simulations Using OpenFOAM Technology



DELIVERY STRUCTURE

Department of Energy – Politecnico di Milano

DURATION

Two Days: March 11th – 12th, 2024

LOCATION

Department of Energy, Politecnico di Milano
Via Lambruschini 4/A, Milano

HOW TO PARTICIPATE

Registration

In order to apply for this meeting please click on the link:

<https://www.polimi.it/en/programmes/specializing-masters-and-postgraduate-programmes/398>

and insert your application as requested. The deadline for the application is **March 01st 2024**. Admission to the meeting follows a first-come, first-served basis.

If the minimum number of participants is reached, the meeting will start as planned. If not, it will be postponed or cancelled. This communication will be sent to participants in due time.

REGISTRATION FEES

- Participants/Presenters: **€ 200**
- VAT is not applicable to the registration fees due to art. 10 DPR 633/26.10.72 and subsequent modifications.

Coffee break and light lunch are included.

CONTACTS

Specializing Master & Continuing Education Office –
Department of Energy

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SCIENTIFIC COMITEE

Prof. Gianluca D’Errico (Polimi, DENG)

Full professor at the Department of Energy at Politecnico di Milano.

Prof. Gianluca Montenegro (Polimi, DENG)

Full Professor at the Department of Energy at Politecnico di Milano.

Prof. Tommaso Lucchini (Polimi, DENG)

Associate professor at the Department of Energy at Politecnico di Milano.

Dott. Giovanni Gianetti (Polimi, DENG)

Assistant Professor at the Department of Energy at Politecnico di Milano.

Prof. Dr.-Ing. Christian Hasse (TU Darmstadt)

Full Professor at the Technical University of Darmstadt and head of the Institute for the Simulation of Reactive Thermo-Fluid Systems.

Prof. Dr. habil. Andreas Dreizler (TU Darmstadt)

Full Professor at the Technical University of Darmstadt.

Dr.-Ing. Holger Marschall (TU Darmstadt)

Head of Research Group "Computational Multiphase Flow".

*This offering is **not approved or endorsed** by OpenCFD Limited, the producer of the **OpenFOAM** software and owner of the **OPENFOAM** and OpenCFD trademarks.*

FINAL PROGRAM

March 11

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| 09:30 | Registration | |
| 10:00 | Welcome and greetings | |
| | Hydrogen and Alternative Fuels (part 1) | |
| 10:15 | Alessandro Ballatore (Eindhoven University of Technology) | LES-FGM of hydrogen jets including preferential diffusion |
| 10:40 | Gabriela Bracho (Universitat Politècnica de València) | Numerical investigation of the combustion behavior in a CI oxy-fuel engine fueled with OME3 for pollutant emissions reduction |
| 11:05 | Lorenzo Sforza (Politecnico di Milano) | Modeling of hydrogen-fueled spark-ignition engines for light-duty applications |
| 11:30 | Viktoria Kübler-Tesch (TU Darmstadt) | Modeling of preferential evaporation in iso-octane/ethanol sprays |
| 11:55 | Pietro De Palma (Politecnico di Bari) | Modelling hydrogen injection for internal combustion engines using WENO schemes in the OpenFOAM framework. |
| 12:20 | Angelo Onorati (Politecnico di Milano) | The Gasdyn code for 0D/1D simulations of IC Engines fed with renewable fuels |
| 12:45 | Lunch | |
| | Advanced IC Engine Concepts | |
| 14:00 | Max Hasenzahl (TU Darmstadt) | Investigation of near-wall processes in an optically accessible SI-Engine using wall-resolved Large Eddy Simulations |
| 14:25 | Gabriele Milano (Marmotors s.r.l.) | Combustion optimisation of a passive pre-chamber motorcycle engine and of an innovative rotary engine using OpenFoam |
| | Mesh Generation and Management | |
| 14:50 | Rajat Soni (LEC GmbH) | Automating the boring stuff: Mesh generation and simulation setup workflow |
| 15:15 | Éric Lendormy (Wärtsilä) | AATE (/ˈɑːteː/): Advanced Analysis Tool for Engines |
| 15:40 | Bishal Shrestha (Aalto University) | Simulation and validation of an internal combustion engine under motored condition using OpenFOAM |
| 16:05 | Giovanni Gianetti (Politecnico di Milano) | Full cycle IC Engine simulation methodology with flexible automatic mesh generation |
| 16:30 | Coffee Break | |
| | Exhaust After-Treatment Systems | |
| 17:10 | Augusto Della Torre (Politecnico di Milano) | CFD assessment of heating strategies of aftertreatment systems for the reduction of the catalyst light-off time |
| 17:35 | Lorenzo Pace (Emitec Technologies GmbH) | Full scale CFD simulation of an advanced exhaust after treatment. |
| 18:00 | Roberto Lange (TU Darmstadt) | Understanding Spray-Wall Interaction in SCR Systems based Reference Data Insights |

March 12

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| | Spray - Combustion Modeling (part 1) | |
| 09:00 | Magnus Kircher (STFS - TU Darmstadt) | Investigation of knocking combustion initiation based on multi-cycle engine LES |
| 09:25 | Francesco Duronio (Università degli studi dell'Aquila) | CFD Simulation of Injection Processes in OpenFOAM: Under-expanded Jets and Lagrangian Sprays |
| 09:50 | Andrea Di Matteo (Eindhoven University of Technology) | Effect of turbulent mixing on ignition behavior of high-pressure spray |
| 10:15 | Coffee Break | |
| | Spray - Combustion Modeling (part 1) | |
| 11:00 | Alberto Cuoci (Politecnico di Milano) | Accelerating CFD Simulations of Reactive Flows through Cell Agglomeration and Adaptive Chemistry Techniques |
| 11:25 | Hong G. Im (KAUST) | High fidelity volume-of-fluid simulations of multiple transient injection in diesel condition |
| 11:50 | Tommaso Lucchini (Politecnico di Milano) | Combustion models for hydrogen and ammonia operating under premixed and diffusive dual-fuel combustion modes |
| 12:15 | Lunch | |
| | Hydrogen and Alternative Fuels (part 2) | |
| 13:30 | Benjamin Boehm (TU Darmstadt) | Comprehensive validation data for IC engines: The Approach of the Darmstadt Engine Workshop for Hydrogen |
| 13:55 | Ludovico Viglione (Wärtsilä) | Numerical modelling of 2-stroke marine engines for future fuels applications: Ammonia and Methanol dual-fuel combustion system development |
| 14:20 | Michele Battistoni (University of Perugia) | Accelerating multi-phase flow simulations with neural network models in OpenFOAM for fuel-air mixing under transcritical conditions |
| 14:45 | Vinzenz Schuh (TU Darmstadt) | Modeling of turbulent hydrogen combustion |
| 15:10 | Coffee Break | |
| | BEV - Fuel Cells | |
| 15:50 | Margherita Bulgarini (Politecnico di Milano) | Application of a CFD Methodology for the Design of PEM Fuel Cells for propulsion applications |
| 16:15 | Francesco Clerici (Engys) | Progress on adjoint-CHT for the design of battery cooling plates |
| 16:40 | Gianluca Montenegro (Politecnico di Milano) | Development and Application of a CFD Framework for the Simulation of Fully Coupled Electromagnetic and Heat Transfer Process Inside Electric Motors |