CONVERGE CFD Conference

October 29-31, 2024 | ONLINE

convergecfd.com/cfd24

CONVERGE
CFD SOFTWARE

CONFERENCE
SCHEDULE - DAY ONE
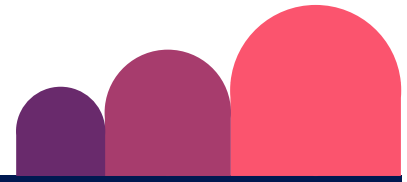
7:55 **Welcome**
Kelly Senecal | *Co-Founder and Owner of Convergent Science*

8:00 **KEYNOTE | The Essential Role of CFD in Developing Next-Gen Hydrogen Internal Combustion Engines**
Federico Millo | *Professor, Politecnico di Torino, Italy*

8:40 **Ultra-Lean Mixture Formation and Combustion of a Hydrogen-Fuelled High-Performance DI-SI Engine: An Experimental and Numerical Study**
Fabio Santi Mortellaro | *Ferrari*

9:05 **Heavy Duty H2-ICE Combustion System Development Using CONVERGE**
Amer Avdić | *Daimler Truck AG*

9:30 **Heat Load Estimations for Durability Assessment of H2 Combustion Systems**
Rafig Babayev | *Volvo Group Trucks Technology*

9:55 **Break**

10:15 **Advanced Hydrogen Combustion Simulations in IC Engines Utilizing RANS Modeling and a Thickened Flame Model**
Ricardo Novella | *CMT-Clean Mobility & Thermofluids, Universitat Politècnica de València*

10:40 **ICE Development for H2 Fuel**
Vincent Giuffrida | *IFP Energies nouvelles*

11:05 **Numerical Investigation of Backfire Mitigation Techniques in a Hydrogen Port-Fuelled Internal Combustion Engine**
Isuru Wickramaarachchi | *University of Moratuwa*

11:30 **Modeling Turbulent Combustion of Lean Hydrogen-Air Mixture Flames Under Internal Combustion Engine Conditions**
Benjamin Traut | *Technische Universität Darmstadt, Institute for the Simulation of Reactive Thermo-Fluid Systems (STFS)*

11:55 **Sponsor Talk - Tecplot. Inc.**

12:15 **Lunch**

13:00 **Validation and Convergence Study of LES of a Spark Ignition Engine Fueled With H2**
Julien Steib | *IFP Energies nouvelles*

13:25 **Advanced G-Equation Modeling Framework for Hydrogen-Fueled SI Engine Combustion Systems**
Josep Gomez-Soriano | *CMT-Clean Mobility & Thermofluids, Universitat Politècnica de València*

13:50 **Turbulent Jet Ignition Engine - Combustion Characterization and Pre-Chamber Optimization Through 3D-CFD Simulations**
Andrea Scalambro | *Politecnico di Torino*

14:15   Numerical Investigation of the Combustion Process in a Heavy-Duty Diesel Engine Featured With Multi-Pulse Fuel Injection

Harsimran Singh | *Argonne National Laboratory*

14:40   Break

15:00   Investigating the Combustion Performance of Dual Fuel Combustion With Diesel and Port Injected Hydrogen in a Large Bore Locomotive Engine

Patrick O'Donnell | *Argonne National Laboratory*

15:25   Computational Diagnostics and Characterization of Combustion Recession in Diesel Sprays

Frans Joseph Arguelles | *University of Calgary*

15:50   Large-Eddy Simulations of n-Heptane/Ammonia Dual-Fuel Spray Flames

Harsimran Singh | *University of Illinois at Chicago*

16:15   Multi-Dimensional CFD Modeling of a H2-Fueled Off-Road Internal Combustion Engine

Yiqing Wang | *Argonne National Laboratory*

Wednesday, October 30, 2024 | CDT

CONFERENCE
SCHEDULE - DAY TWO

7:55   Welcome Back

Kelly Senecal | *Co-Founder and Owner of Convergent Science*

8:00   KEYNOTE | Fighting Thermal Propagation — Methodology and Technologies

Marc Sens | *Senior Vice President, Technology & Research, IAV GmbH*

8:40   Thermal Runaway CAE for xEV Packs — Success and Challenge

Oana Nitulescu | *Toyota Motor North America, Inc.*

9:05   Numerical Simulations of Water Mist Cooling for Thermal Runaway Mitigation and Fire Suppression in Li-Ion Cells

Mohammed Parhizi | *UL Research Institutes*

9:30   Advances in CONVERGE Battery Modeling Tools

Kislaya Srivastava | *Convergent Science*

9:55   Break

10:15   Application of a UDF-Based Electro-Chemistry Module in PEM Fuel Cell Flow Field Development

Novid Beheshti | *Intelligent Energy*

10:40   Numerical Simulations of Direct Liquid Cooling of the End-Windings of an Electric Machine

Adèle Poubeau | *IFP Energies nouvelles*

11:05   Thermal Management of EV Motors Using CONVERGE

Ameya Waikar | *Convergent Science*

11:30   Steady-State Modeling With CONVERGE 4

Sameera Wijeyakulasuriya | *Convergent Science*

11:55   Sponsor Talk - Oracle

12:15   Lunch

13:00   Model-Based Optimization of Mono-Fuel DICI Hydrogen ICE
Rohan Verma | *FEV*

13:25   Safety Industrial Simulation Using Thickened Flame Model
Cédric Mehl | *IFP Energies nouvelles*

13:50   Numerical Study of a Partially Premixed Hydrogen/Air Swirled Burner: Impact of the Injection System
Karine Truffin | *IFP Energies nouvelles*

14:15   Flame Acceleration and Deflagration to Detonation Transition in a Micro-Channel With Catalytic Nickel Walls
Suryanarayan Ramachandran | *University of Minnesota, Twin Cities*

14:40   Break

15:00   Modeling Reacting Flows With Real-Fluid Equations of State in Liquid Rocket Engines
David Rowinski | *Convergent Science*

15:25   Fundamental Insights Into Enstrophy Dynamics During Thermoacoustic Combustion Instability in a
High-Pressure Rocket Combustor Using Large Eddy Simulation With Detailed Chemistry
Veeraraghava Raju Hasti | *University of Central Florida*

15:50   CFD Modeling for Sustainable Aviation Fuels
Debolina Dasgupta | *Argonne National Laboratory*

16:15   Analysis of Mixing and Reacting Flow Features During Wave Mode Transition in a Hydrogen-Fueled Rotating
Detonation Engine Combustor
Steven Thompson | *University of Central Florida*

16:40   Large-Eddy Simulation Study of Flow and Combustion Dynamics in a Full-Scale Hydrogen-Air Rotating
Detonation Combustor-Stator Integrated System
Pinaki Pal | *Argonne National Laboratory*

Wednesday, October 31, 2024 | CDT
CONFERENCE
SCHEDULE - DAY THREE

7:55   Welcome Back
Kelly Senecal | *Co-Founder and Owner of Convergent Science*

8:00   KEYNOTE | On the Cutting Edge: Challenges and Opportunities in CFD
Keith Richards | *Co-Owner & Vice President, Convergent Science*

8:40   CONVERGE Horizon Workshop: Harness the Power of Cloud Computing
Josh Dariano | *Convergent Science*

9:55   Break

10:15   **Predicting Performance of Air Pollution Control Devices Using CFD Simulations**

Ramakrishna Doddapaneni | *Clair Engineers Pvt Ltd*

10:40   **C3MechV4: An Update on the C3 Mechanism**

Henry Curran | *University of Galway*

11:05   **Is Turbulence Affecting the Wake Development in Floating Wind Turbines? A Preliminary Assessment**

Leonardo Pagamonci | *Università degli Studi di Firenze*

11:30   **A Near-Wall Model for Heat Transfer Prediction in Laminar Flows at High Prandtl Number: Application to Liquid Jet and Film Cooling**

Adrien Ingles | *IFP Energies nouvelles*

11:55   **Concentric Rotary Compressor Called SARC: Its Performance & Benefits**

Savvas Savvakis | *The SARM Project*

12:15   **Lunch**

13:00   **Multi-Physics and Multi-Scale Modeling Approach Using GT-SUITE and CONVERGE**

Gowtham Chandrasekharan Parameswaran | *Gamma Technologies*

13:25   **High Order Flux Reconstruction Scheme Development Coupled With AMR in CONVERGE**

Romaric Simo Tamou | *IFP Energies nouvelles*

13:50   **Rapid Optimization Using Machine Learning in CONVERGE**

Dan Probst | *Convergent Science*

14:15   **Analysis of Flow, Heat Transfer, and Phase Change Characteristics in Microchannel Condensers Using Computational Fluid Dynamic (CFD) Simulations**

Katherine Asztalos | *Argonne National Laboratory*

14:40   **Break**

15:00   **Using Kinetic Method for Octane Number Calculation in Fuel Surrogate Optimization**

Shuaishuai Liu | *Convergent Science*

15:25   **High-Fidelity CFD Modeling of Ice Crystal Nucleation and Growth in Aviation Contrails Using an Eulerian-Lagrangian Framework**

Samuel Whitman | *Argonne National Laboratory*

15:50   **Phy-ChemNODE: A Physics-Enhanced Neural Ordinary Differential Equations Approach for Accelerating Stiff Chemical Kinetic Computations**

Tadbhagya Kumar | *Argonne National Laboratory*