WELCOME to the 2018 CONVERGE European User Conference! This is our second annual European User Conference, following our very successful inaugural event in Vienna last year.

This conference features speakers and attendees from Europe and around the globe. Reacting flows are at the heart of what we do, and we are pleased to offer many engine-related presentations, including keynotes by research leaders from Cummins, Groupe PSA, and Porsche Engineering Services. In addition to engine simulations, CONVERGE's truly unique CFD approach is applicable to a wide variety of flow problems. This conference also includes presentations on diverse topics including pumps and compressors, fluid-structure interaction, gas turbines, aftertreatment systems, and fuel injectors.

While we call this event our "User Conference," you're much more than just a CONVERGE user. We believe that each of you is a collaborator, inspiring us to continue to push the limits in a way that best meets your CFD needs. As a way of saying thank you, our goal is to offer a unique, informative, and enjoyable conference. In keeping with CONVERGE UC tradition, we are pleased to offer free training courses after the conference. During the conference itself we have a variety of daytime and evening events so that you can network with colleagues and experience the beautiful country of Italy with a trip to the Ferrari Museum in Maranello and an evening of delicious food and drink in Bologna.

Thank you to all of our speakers for sharing their expertise with the CONVERGE community. Thank you to this year’s sponsors—we encourage you to visit their displays to learn more about their exciting products. On behalf of everyone at Convergent Science, thank you for attending the CONVERGE European User Conference and we hope you enjoy the week.

Rainer Rothbauer
Co-Owner & General Manager, Convergent Science GmbH
**SCHEDULE**

**OVERVIEW**

<table>
<thead>
<tr>
<th>MORNING</th>
<th>AFTERNOON</th>
<th>EVENING</th>
</tr>
</thead>
</table>
| **MONDAY** | Welcome Reception  
Garganelli Restaurant | Welcome Reception  
Garganelli Restaurant |
| **TUESDAY** | Gala Dinner  
Ferrari Museum | Gala Dinner  
Ferrari Museum |
| **WEDNESDAY** | Informal Dinner  
Osteria De’ Poeti | Informal Dinner  
Osteria De’ Poeti |
| **THURSDAY** | | |
KEYNOTE

20 March, 08:30

Diesel Engine Combustion System Analysis Led Design at Cummins

John M. Deur, Cummins Inc.

Dr. John Deur has over 30 years of combustion engineering experience in both R&D and program environments for a wide range of applications including solid rockets, gas turbines, pulse detonation engines (PDE), ramjets, internal combustion (IC) engines, and industrial processes. This includes over 25 years of experience in computational fluid dynamics (CFD), including both code development and application. In these fields, he has authored, co-authored, and/or presented over fifty technical papers. Dr. Deur has also developed and taught continuing education courses in solid rocket combustion instability and IC engine combustion analysis, as well as created and conducted training courses for commercial CFD and grid generation software. For the past nine years, he has been the Director of Combustion Research for Cummins Inc.

21 March, 08:20

How Combustion CFD Makes Design More Robust and Reduces Costs

Carlos Ferreira, Groupe PSA

Ing. Carlos Ferreira joined Groupe PSA in 1990 after earning a master's degree in mechanical engineering from the Pierre and Marie Curie University. At Groupe PSA, he has investigated diesel and gasoline engines via CFD, established guidelines for CFD use from simulation setup to analysis of results, optimized 3D engine parts, and led various 1D and 3D CFD simulation groups. Since 2015, Ing. Ferreira has been in charge of the CFD roadmap for the combustion team in the engine design department.
Challenges and Opportunities for Future Powertrain Development

Vincenzo Bevilacqua, Porsche Engineering Services GmbH

Ing. Vincenzo Bevilacqua is a senior expert in engine analysis at Porsche Engineering Services. In the last decade his group, aided by CFD simulation, has developed five internal combustion engines. He has published papers and given presentations on a host of topics, including knock tendency in highly-charged spark-ignited engines, combustion engine concepts for use in an electrified powertrain, and methodology for intake air temperature reduction on high-boosted gasoline engines. Ing. Bevilacqua earned a degree in mechanical engineering from Politecnico di Torino, where his final thesis was about fuel-spray injection for GDI engines. Prior to Porsche, Ing. Bevilacqua worked at GM Powertrain Europe, Politecnico di Torino, Fiat Research Center, and FKFS-Universitat Stuttgart.
Join us for complimentary food and drink at the Garganelli Restaurant (adjacent to Savoia Hotel). Unwind from a day of travel and connect with other CONVERGE users!

20:00   Welcome reception at Garganelli Restaurant (Savoia Hotel)
23:30

Join us for an evening of fun at the Ferrari Museum in Maranello, where you can feel the vibrant passion and history of this storied automotive and F1 brand. The entire museum has been reserved for CONVERGE User Conference attendees. Walk through the history of Ferrari and enjoy an unforgettable evening.

17:15   All meet in the Savoia Hotel lobby
17:30   Bus departs for Ferrari Museum Maranello
18:30   Guest arrival at Ferrari Museum
19:00   Ferrari Museum guided tour
20:00   Cocktails
20:30   Dinner at Ferrari Museum Convention Hall
23:00   Bus departs for Savoia Hotel
OSTERIA DE’ POETI

Join us for an evening of delicious Italian food and drink at the famed Osteria De’ Poeti in Bologna. Strike up lively conversations with colleagues in this intimate venue.

18:30  All meet in the Savoia Hotel lobby
18:45  Bus departs for Bologna city center
19:15  Informal dinner at Osteria de’ Poeti
22:30  First bus departs for Savoia Hotel
23:30  Second bus departs for Savoia Hotel

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• Advanced workflow automation
• Best-in-class support from our global team
• Unsteady visualization made easy
• Multi views synchronized in time
• Surface-to-surface differencing
### 20 March

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:30</td>
<td>REGISTRATION OPENS</td>
</tr>
<tr>
<td>08:15</td>
<td>Welcome, Rainer Rothbauer, Convergent Science</td>
</tr>
<tr>
<td>08:30</td>
<td>KEYNOTE</td>
</tr>
<tr>
<td>09:10</td>
<td>Validation of Numerical Simulation of Hyundai 2.0L Gasoline Engine In-Cylinder Flow, Minho Choi, Hyundai Motor Company</td>
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<tr>
<td>09:30</td>
<td>Using Numerical Simulations to Predict and Understand CCV, Prithwish Kundu, Argonne National Laboratory</td>
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<tr>
<td>09:50</td>
<td>SPONSOR</td>
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<tr>
<td>10:05</td>
<td>BREAK</td>
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<tr>
<td>10:35</td>
<td>Numerical Study of Knock Inhibition with Cooled Exhaust Gas Recirculation, Max Mally, RWTH Aachen University - Institute for Combustion Engines</td>
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<tr>
<td>10:55</td>
<td>Analysis of Water Injection Potential for Knock Mitigation, Federico Millo, Politecnico di Torino</td>
</tr>
<tr>
<td>11:15</td>
<td>Numerical Investigation and Sensitivity Analysis of Knock in Boosted GDI Engines, Maziar Khosravi, Ford-Werke GmbH</td>
</tr>
<tr>
<td>11:35</td>
<td>Computational Methodology for Knocking Combustion Analysis, Ricardo Novella, CMT-Motores Térmicos</td>
</tr>
<tr>
<td>11:55</td>
<td>SPONSOR</td>
</tr>
<tr>
<td>12:10</td>
<td>LUNCH</td>
</tr>
</tbody>
</table>
13:30 | VOF-LES Simulations of Primary Atomization and Near-Nozzle Spray Structure, Michele Battistoni, University of Perugia
13:50 | Investigation of an Air Compressor Performance with FSI Simulation, Cem Demirkesen, Ford Otosan
14:10 | FSI Simulation Study on a Mechanic Gas Stopper Movement at Different Pressures, Gokhan Coskun, Sakarya University
14:30 | SPONSOR | Intelligent Light
14:45 | BREAK
15:40 | Multiphase Modeling: Gearbox Power Losses, Oil Pump Cavitation, and Fuel Tank Sloshing, David Rowinski, Convergent Science

17:15 | All meet in the Savoia Hotel lobby
17:30 | Bus departs for Ferrari Museum Maranello
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19:00 | Ferrari Museum guided tour
20:00 | Cocktails
20:30 | Dinner at Ferrari Museum Convention Hall
23:00 | Bus departs for Savoia Hotel
21 March

07:45 REGISTRATION

08:00 Welcome Back + Combustion Modeling Development in CONVERGE, Eric Pomraning, Convergent Science

08:20 KEYNOTE | How Combustion CFD Makes Design More Robust and Reduces Costs, Carlos Ferreira, Groupe PSA

PARALLEL SESSION—SALA FALCO • SALA GLORIA

09:00 Low Temperature Dual Fuel Modeling Using Detailed Chemistry In Heavy-Duty Engine, Lorenzo Bartolucci, University of Rome Tor Vergata

09:20 Consideration of Turbulence-Chemistry-Interaction in Dual Fuel Combustion, Christoph Wieland, Technical University Munich

09:40 Modeling of Direct Gas Injection in Internal Combustion Engines, Abhishek Y. Deshmukh, RWTH Aachen University • Institute for Combustion Technology

10:00 BREAK

10:30 Combustion Modeling of a NG Engine Using Detailed Chemistry in CONVERGE, Lorenzo Testa, Politecnico di Torino

10:50 EGR-Diluted NG Combustion Simulation in a High-Performance SI Engine, Mirko Baratta, Politecnico di Torino

11:10 A Numerical Study on Charge Motion Effects in Ultra-lean Conditions, Nicolas Iafrate, IFP Energies nouvelles

11:30 Numerical Prediction of Abnormal Combustion in a Turbocharged GDI Engine, Muhammed Fayaz Palakunnual, London South Bank University

11:50 Turbulent Combustion Model Development at Argonne National Laboratory, Prithwish Kundu, Argonne National Laboratory

12:10 LUNCH

PARALLEL SESSION—SALA SAVOIA

10:00 Technical Update on Gas Turbine and Aftertreatment Applications, Scott Drennan, Convergent Science

10:20 Modeling and Simulation of Liquid Film Boiling—A New Feature in CONVERGE, Chaouki Habchi, IFP Energies nouvelles

10:40 Spray-Wall Interaction and Liquid Characteristics Near the Impingement Location, Roberto Torelli, Argonne National Laboratory

11:00 BREAK

11:30 Numerical Studies of Combustion Recession on ECN Diesel Spray A, XiaoHang Fang, University of Oxford

11:50 An Efficient Combustion Progress Variable (CPV) Approach for Engine Applications, Corinna Netzer, Brandenburg University of Technology

12:10 Assessment of Innovative Bowl Geometries Over Different Swirl Ratios/EGR Rates, Andrea Bianco, Powertech Engineering

12:30 Computational Optimization of DME Combustion using CONGO, Marius Zubel, RWTH Aachen University • Institute for Combustion Engines

12:50 SMART Optimization of Internal Combustion Models, Yann Caniou, Noesis Solutions NV
<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>13:30</td>
<td>KEYNOTE</td>
<td>Challenges and Opportunities for Future Powertrain Development</td>
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<tr>
<td>14:10</td>
<td>SPONSOR</td>
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<tr>
<td>14:25</td>
<td></td>
<td>Recent Progress in Simulations of Nozzle Flow and Ensuing Spray at Argonne</td>
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<td>14:45</td>
<td>SPONSOR</td>
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<tr>
<td>15:00</td>
<td>BREAK</td>
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<tr>
<td>15:30</td>
<td>Pre-Mixed Combustion Model for PFI Gasoline Engine</td>
<td>Chetan Tulapurkar, Robert Bosch Engineering &amp; Business Solutions Private Limited</td>
</tr>
<tr>
<td>15:50</td>
<td>LES of a Premixed Burner Using Thickened Flame Model and AMR</td>
<td>Cédric Mehl, IFP Energies nouvelles</td>
</tr>
<tr>
<td>16:10</td>
<td>Scavenging Efficiency of Semi-Open Ignition Chamber</td>
<td>Fabio Ciccatari, Finno Energy Oy Ltd.</td>
</tr>
<tr>
<td>16:30</td>
<td>What to Expect in CONVERGE Version 3.0</td>
<td>Keith Richards, Convergent Science</td>
</tr>
<tr>
<td>17:00</td>
<td>Closing Statements</td>
<td>Kelly Senecal, Convergent Science</td>
</tr>
</tbody>
</table>

18:30  | All meet in the Savoia Hotel lobby                                |
18:45  | Bus departs for Bologna city center                                |
19:15  | Informal dinner at Osteria de ‘Poeti                              |
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23:30  | Second bus departs for Savoia Hotel                                |
<table>
<thead>
<tr>
<th>Time</th>
<th>Winter Garden</th>
<th>Sala Romanov</th>
<th>Sala Sydney</th>
<th>Sale Borbone+Bonaparte+Tudor</th>
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</thead>
<tbody>
<tr>
<td>08:00–10:00</td>
<td>Advanced Topics in Internal Combustion Engine Modeling</td>
<td>Internal Combustion Engine Modeling in CONVERGE</td>
<td>Fluid-Structure Interaction Modeling</td>
<td>Steady-State Modeling</td>
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<tr>
<td>10:00–12:00</td>
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<td></td>
<td>User-Defined Functions</td>
<td>Advanced Surface Preparation Tools in CONVERGE Studio</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td>LUNCH</td>
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<tr>
<td>13:00–15:00</td>
<td>Gas Turbine Engine Combustion</td>
<td>Internal Combustion Engine Modeling in CONVERGE</td>
<td>Sealing</td>
<td>Post-Processing Tools in CONVERGE Studio</td>
</tr>
<tr>
<td>15:00–17:00</td>
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<td>Optimization and Model Interrogation</td>
<td>Heat Transfer Mapping</td>
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<tr>
<td>08:00–10:00</td>
<td>Emissions Modeling</td>
<td>Compressor and Pump Modeling</td>
<td>Conjugate Heat Transfer Modeling</td>
<td>Turbulence Modeling</td>
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<tr>
<td>10:00–12:00</td>
<td>Spray Modeling</td>
<td>Personalized Case Setup Assistance</td>
<td></td>
<td>Tools for SAGE Detailed Chemistry</td>
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<tr>
<td>12:00</td>
<td></td>
<td>LUNCH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00–15:00</td>
<td>Premixed Combustion Modeling</td>
<td>Volume of Fluid Modeling</td>
<td>Engine Aftertreament Modeling</td>
<td>Personalized Case Setup Assistance</td>
</tr>
<tr>
<td>15:00–17:00</td>
<td>Non-Premixed Combustion Modeling</td>
<td>CONVERGE + GT-SUITE Coupling</td>
<td></td>
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</table>
Microsoft Azure is the leading public cloud for HPC and Big Compute workloads. It features InfiniBand interconnects and GPUs for compute, AI, and remote visualization. Along with these capabilities, Azure provides services for managing workloads. Batch (including Batch AI and Batch Rendering) allow customers to build cloud-native compute applications. CycleCloud enables IT organization to provide simple, managed access to Azure infrastructure for their business users.

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Contact Information

Enrico Pautasso
Phone: +39 011 3167357
Email: e.pautasso@pwt-eng.com

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We can carry out both in-house projects as well as customer based projects.

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Join us 24–28 September, 2018 for the 2018 CONVERGE USER CONFERENCE–NORTH AMERICA in Madison, WI, USA. For more information and to register, please visit uc.convergecfd.com.

CONVERGENT SCIENCE

WORLD HEADQUARTERS
6400 Enterprise Lane
Madison, WI 53719

TEXAS
1619 E. Common Street
Suite 1204
New Braunfels, TX 78130

DETROIT
21500 Haggerty Road
Suite 120
Northville, MI 48167

EUROPE
Hauptstrasse 10
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