

# CONFERENCE AGENDA

BENGALURU + PUNE, INDIA  
14-17MAY, 2019



**CONVERGE**  
USER CONFERENCE  
— INDIA 2019 —

BENGALURU + PUNE

# WELCOME

**KELLY SENECAI**

CO-OWNER & VICE PRESIDENT  
CONVERGENT SCIENCE



**WELCOME** to the 2019 CONVERGE User Conference-India! We are thrilled to be hosting our inaugural Indian User Conference this year in Pune and Bengaluru.

India has a strong history of CFD research, showcased in the host of prestigious technical universities and institutes across the country and the rapidly growing commercial research and development efforts. We are delighted to expand our user conferences to a third continent and bring CONVERGE users from India and Southeast Asia together to share ideas and discuss the latest developments in CFD.

This conference features speakers and attendees from India and around the globe. Reacting flows are at the heart of what we do, and we are pleased to offer many presentations on combustion modeling, fuel injection, and internal combustion engines. In addition to engine-related presentations, we are excited to demonstrate how CONVERGE's truly unique CFD approach is applicable to a wide variety of flow problems.

While we call this event our "user conference," you're really much more than just a CONVERGE user. We believe that each of you is a collaborator, inspiring us to continue to innovate 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 User Conference tradition, we are offering free training courses throughout the week. During the conference, we have networking opportunities built into the presentation schedule and an engaging evening activity in Pune so you can connect with colleagues from around the world.

Thank you to all of our speakers for sharing your expertise with the CONVERGE community. We also thank this year's sponsor and invite you to visit their display to learn more about their exciting products. On behalf of everyone at Convergent Science, thank you for attending our conference and we hope you enjoy the week.

A handwritten signature in black ink, appearing to be 'K. Senecai', written in a cursive style.

# KEYNOTE



## **Prof. Avinash Kumar Agarwal**

PROFESSOR OF MECHANICAL ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY KANPUR

Prof. Avinash Kumar Agarwal earned a Ph.D. in energy from the Indian Institute of Technology Delhi. In 2001, he joined the Department of Mechanical Engineering at the Indian Institute of Technology Kanpur as an Assistant Professor, where he is currently serving as SBI Endowed Chair Professor.

At IIT Kanpur, Prof. Agarwal has worked in the areas of IC engines, combustion, conventional fuels, alternative fuels, methanol-fueled engine development, hydrogen, fuel sprays, lubricating oil tribology, optical diagnostics, laser ignition, HCCI, particulate and emission control, and large bore engines. He has developed laser-fired hydrogen and CNG engines in automotive sizes and developed the first locomotive engine equipped with an electronic fuel injection system for Indian Railways. Currently, Prof. Agarwal is involved in the development of methanol- and DME-fueled vehicles for the automotive sector.

Prof. Agarwal has published more than 270 peer reviewed international journal and conference papers, 35 edited books and 63 book chapters and has 7600+ Scopus and 11900+ Google Scholar citations. He is Editor-in-Chief of the *Journal of Energy and Environmental Sustainability* and Associate Editor of the *Journal of Energy Resources Technology* (Transactions of ASME), the *International Journal of Vehicle Systems Modelling and Testing*, and the *Journal of the Institute of Engineers* (Series C). He has edited the *Handbook of Combustion*, published by Wiley VCH, Germany, which is the most updated compilation on combustion in the world.

TUESDAY—14 MAY, 2019

# BENGALURU

**8:30 REGISTRATION**

**9:30 CONVERGE: A General Purpose CFD Solver**  
Ashish Joshi, *Convergent Science*

**9:45 Steady-State Simulations**  
Kelly Senecal, *Convergent Science*

**10:10 Turbulence Modeling**  
Tarique Shaikh, *Convergent Science*

**10:35 Fluid-Structure Interaction (FSI) Simulations**  
Ashish Joshi, *Convergent Science*

**11:00 BREAK**

**11:30 Volume of Fluid (VOF) Modeling**  
Eric Pomraning, *Convergent Science*

**11:55 Heat Transfer Simulations**  
Rainer Rothbauer, *Convergent Science*

**12:20 Radiation Modeling**  
Akshay Iyer, *Convergent Science*

**12:45 LUNCH**

**14:00 Demo of CONVERGE CFD Software**  
Tarique Shaikh, *Convergent Science*

**14:25 Pumps and Compressors Modeling**  
Geet Nautiyal, *Convergent Science*

**14:50 Gas Turbine Simulations with CONVERGE**  
Scott Drennan, *Convergent Science*

**15:15 BREAK**

**15:45 CONVERGE v3.0 and Beyond**  
Eric Pomraning, *Convergent Science*

**16:15 Closing Remarks**  
Ashish Joshi, *Convergent Science*

# CFD is complex.

Learning CFD software shouldn't be.

Convergent Science offers **free** introductory and advanced training sessions throughout the year at our offices in India, Europe, and the US.

## UPCOMING TRAINING DATES: PUNE, INDIA

---

26 June, 2019  
23-25 July, 2019  
28 August, 2019  
25 September, 2019  
23 October, 2019  
19-21 November, 2019  
18 December, 2019

---

For upcoming dates in all locations, please visit our website at [convergecf.com/training](http://convergecf.com/training)

Don't see a time that is convenient for you?  
Interested in on-site training?

### For India training, contact:

ashish@convergecf.com  
+91 727 683 2820



THURSDAY—16 MAY, 2019

# PUNE

## 8:00 REGISTRATION

### 9:00 **Welcome and Introduction to CONVERGE**

Ashish Joshi, *Convergent Science*

### 9:20 **Alive and Kicking: The Premature Burial of the Internal Combustion Engine**

Kelly Senecal, *Convergent Science*

### 9:45 **KEYNOTE**

Avinash Kumar Agarwal, *Indian Institute of Technology Kanpur*

### 10:25 **Modeling Soot Particle Size Distribution in Diesel Engines**

Pawan Duvvuri, *Indian Institute of Technology Bombay*

### 10:50 **Flow and Combustion Characteristics of a Spark-Ignition Engine Fueled with Bio-Methane**

Sachin Kumar Gupta, *Indian Institute of Technology Madras*

## 11:15 BREAK

### 11:45 **Capturing Pressure Oscillations in Numerical Simulations of Internal Combustion Engines**

Sreenivasa Rao Gubba, *General Electric*

### 12:10 **Effect of Direct Fuel Injection Strategy on Combustion, Performance and Emissions of a Port Fuel Injected Compressed Natural Gas Engine Using Simulation Tools**

Virendra Jagtap, *COEP-ARAI*

### 12:35 **Accelerating LES and URANS Cycle-To-Cycle Variation Studies via Concurrent Perturbation Method**

Eric Pomraning, *Convergent Science*

## 13:00 LUNCH

### TRACK 1

**14:00 Validation of Pre & Post Spray Impingement Parameters for Diesel Engine Based Exhaust Aftertreatment System Using CONVERGE 2.4**

Shirdi Chakkamadathil, *Cummins Emission Systems*

**14:25 Prediction of Primary Atomization of Urea Water Spray Using CONVERGE**

Swati Ajetrao, *Cummins Emission Systems*

**14:50 Exhaust Aftertreatment Modeling with CONVERGE**

Scott Drennan, *Convergent Science*

### TRACK 2

**Study on Direct Water Injection in a GDI Engine by Using CONVERGE**

Ankit Raut, *Indian Institute of Technology Madras*

**Intake, Exhaust Manifold and Mixer Optimization for Achieving Equal EGR Distribution to Each Cylinder Using 1D-3D Coupled Simulations Approach**

Samir Dhatkar, *FEV India Pvt., Ltd.*

**Influence of Break-Up Model Parameters & Injection Rate Shape in Diesel Spray Characteristics and Comparison of Biodiesel Blends Using CONVERGE**

Shirdi Chakkamadathil, *Vellore Institute of Technology*

## 15:15 BREAK

**16:00 Study of the Effect of Intake Ports in Charge Motion and Combustion Development for PFI & GDI Gasoline Engines**

N. Karthikeyan, *Mahindra & Mahindra*

**16:25 Fundamental Validation of SCR System Modeling Using CONVERGE**

Marua Mohanty and Ganesan Subramaniam, *Caterpillar India Pvt., Ltd.*

**16:50 CONVERGE v3.0 and Beyond**

Eric Pomraning, *Convergent Science*

**17:15 Closing Remarks**

Ashish Joshi, *Convergent Science*

# PUNE – CONVERGENT SCIENCE TRAINING

## MONDAY, 13 MAY

**9:00** Surface Preparation with CONVERGE Studio for IC Engines

**11:00** Surface Preparation with CONVERGE Studio for IC Engines (Cont.)

**13:00 LUNCH**

**14:00** Surface Preparation with CONVERGE Studio for IC Engines (Cont.)

**16:00** Surface Preparation with CONVERGE Studio for IC Engines (Cont.)

## TUESDAY, 14 MAY

Internal Combustion Engine Modeling in CONVERGE

Internal Combustion Engine Modeling in CONVERGE (Cont.)

**LUNCH**

Internal Combustion Engine Modeling in CONVERGE (Cont.)

Internal Combustion Engine Modeling in CONVERGE (Cont.)

## WEDNESDAY, 15 MAY

Internal Combustion Engine Modeling in CONVERGE (Cont.)

Internal Combustion Engine Modeling in CONVERGE (Cont.)

**LUNCH**

Internal Combustion Engine Modeling in CONVERGE (Cont.)

Internal Combustion Engine Modeling in CONVERGE (Cont.)



# HOLIDAY INN, PUNE, HINJEWADI

## FRIDAY, 17 MAY

GALILEO 1		GALILEO 2	
9:00	Advanced Topics in Internal Combustion Engine Modeling	Premixed Combustion Modeling	
11:00	Advanced Topics in Internal Combustion Engine Modeling (Cont.)	Non-Premixed Combustion Modeling	
13:00	<b>LUNCH</b>	<b>LUNCH</b>	
14:00	Turbulence Modeling	Emissions Modeling	
16:00	Spray Modeling	Tools for SAGE Detailed Chemistry	

  

ORION	APOLLO	CENTAURI	
9:00	Conjugate Heat Transfer Modeling	General Flow Modeling	Engine Aftertreatment Modeling
11:00	Conjugate Heat Transfer Modeling (Cont.)	General Flow Modeling (Cont.)	Engine Aftertreatment Modeling (Cont.)
13:00	<b>LUNCH</b>	<b>LUNCH</b>	<b>LUNCH</b>
14:00	Compressor and Pump Modeling	General Flow Modeling (Cont.)	Post-Processing Tools in CONVERGE Studio
16:00	Volume of Fluid Modeling	General Flow Modeling (Cont.)	Getting Started with Tecplot for CONVERGE

THURSDAY—16 MAY, 2019

# PUNE

## NETWORKING EVENT

18:00-22:00

HOLIDAY INN PUNE HINJEWADI

Connect with other CONVERGE users and kick back and relax at this evening social complete with complimentary food and drinks at the Holiday Inn Pune Hinjewadi.



# ***COMPLEX CHEMISTRY***

## JUST GOT EASIER

---

CONVERGE isn't just for CFD—CONVERGE is also your chemical kinetics solution.

- + Create and validate chemical mechanisms
- + Run 0D and 1D chemistry simulations
- + Build surrogate fuels
- + Accelerate detailed chemistry calculations



Learn more at [convergecf.com](https://www.convergecf.com)



# CONVERGE

## CFD SOFTWARE

**THANK YOU FOR JOINING US!**

### CONVERGENT SCIENCE

#### WORLD HEADQUARTERS

6400 Enterprise Lane  
Madison, WI 53719  
Tel: +1 (608) 230-1500

#### TEXAS

1619 E. Common Street  
Suite 1204  
New Braunfels, TX 78130  
Tel: +1 (830) 625-5005

#### DETROIT

21500 Haggerty Road  
Suite 120  
Northville, MI 48167  
Tel: +1 (248) 912-1001

#### EUROPE

Hauptstrasse 10  
4040 Linz, Austria  
Tel: +43 720 010 660

#### INDIA

Office #701  
Supreme Headquarters  
Mumbai-Bangalore Highway  
Baner, Pune, Maharashtra 411045  
Tel: +91 727 683 2820

For more information about **CONVERGE** and a list of worldwide distributors please visit [convergecf.com](http://convergecf.com) or email [contact@convergecf.com](mailto:contact@convergecf.com)

