CONVERGE
COMBUSTION
SUMMIT 2016

Radisson Blu, Nice, France

4 May, 2016

AGENDA

7:00 REGISTRATION & CONTINENTAL BREAKFAST

8:30 Welcome, Overview & Introductions
Rob Kackmarek, *Convergent Science*

TOPIC 1: COMBUSTION MODELING AND DETAILED CHEMISTRY

8:45 Combustion Modeling in Piston Engines: State-of-the-Art Models and Future Challenges
Olivier Colin, *IFPEN*

9:15 Importance of Chemistry in SI and Diesel Engine Combustion Modeling
Heinz Pitsch, *RWTH Aachen University*

9:45 Detailed Chemical Kinetic Models for Combustion Chemistry
Henry Curran, *NUI Galway*

10:15 BREAK

10:30 Large-Eddy Simulation for Engine Combustion: Potential, State-of-the-Art and Challenges
Christian Angelberger, *IFPEN*

11:00 Emissions Modeling
Fabian Mauss, *BTU Cottbus*

11:30 Computational Chemistry Consortium
Kelly Senecal, *Convergent Science*

12:00 OPEN FORUM

12:30 NETWORKING LUNCH

TOPIC 2: INDUSTRY PROCESSES AND NEEDS

13:30 FEV Approach of Charge Motion Design for Serial Production Gasoline Engine Development
Jens Ewald, *FEV*

14:00 BREAK

14:30 Review of the Combustion Modeling at Renault: Present and Future Needs
Frédéric Ravet, *Renault*

15:00 Combustion CFD to Improve PSA Peugeot Citroën Products
Clément Dumand, *PSA*

15:30 Combustion CFD for Engine Development at Volvo Cars
Mattias Ljungqvist, *Volvo Cars*

16:00 OPEN FORUM

17:30 Wrap-Up & Thanks
Rob Kaczmarek, *Convergent Science*

INDUSTRY

DR. OLIVIER COLIN
Engine Combustion Modeling
Research Engineer
IFPEN

After an engineering diploma in aeronautics from L'Ecole Centrale Paris in 1995, Dr. Colin received a PhD in Fluid Mechanics from Toulouse University (France) in 2000. His major field of expertise is the development of combustion models for both Large-Eddy Simulation (LES) and Reynolds Averaged Navier-Stokes (RANS) of piston engines and gas turbines. He actively participated in the development of the well-known AVBP code during his PhD through the development of the TFLES model.

Since 2000 he is employed in IFP Energies nouvelles' Powertrain and Vehicle Division. He took part to the development of ECFM3Z, AKTIM, TKI and ISSIM among other models, that are now used worldwide. He also initiated and actively took part to research projects on LES of piston engines and gas turbines (LESSCO2, TIMECOP, KIAI, ICAMDAC, MACDIL).

DR. CHRISTIAN ANGELBERGER
Expert on Engine Combustion Modeling
IFPEN

After an engineering diploma in aeronautics from Stuttgart University (Germany) in 1993, Dr. Angelberger received a PhD in Fluid Mechanics from Toulouse University (France) in 1997. His major field of expertise is the development and application of Large-Eddy Simulation (LES) to combustion engines. He actively participated in the development of the well-known AVBP code during his postdoc at CERFACS, with very first applications of LES to combustion instabilities in gas turbines.

Since 1999 he is employed in IFP Energies nouvelles' Powertrain and Vehicle Division. He initiated a number of breakthrough studies concerning the application of LES to non-cyclic phenomena in piston engines, and has organized the LES4ICE conference since 2008, a reference in the domain.

DR.-ING. JENS EWALD
Senior Engineer Gasoline Engines
FEV

Dr. Ewald studied Mechanical Engineering at RWTH Aachen University and UC Davis, California. He received his diploma in Mechanical Engineering, Energy Technology from RWTH Aachen University in 1999 and his PhD at RWTH Aachen University in 2006.

He was a Project Engineer at FEV from 2006-2008, Team Leader and Vice Department Manager at FEV from 2008-2015, and Senior Project Manager at FEV GmbH since January 2016.

Dr. Ewald has published several papers on Combustion Theory, and ICE fluid Simulation. Topics include reaction kinetic simulation for preignition and knock, as well as prediction of heat transfer on aerodynamic side for durability simulation.

Dr. Ewald is expert in Combustion System Layout and has led a group of CFD engineers. He also manages larger projects of IC engine development.

DR. FRÉDÉRIC RAVET
CFD Expert
Renault France

Frederic Ravet graduated from L'Ecole Polytechnique of Lille. In 1997 he obtained his PhD in pollutants and combustion modeling in aeronautic combustion chambers. He worked as a combustion research team leader for Snecma, a French aircraft engines supplier and in 2004 was employed by the French car maker Renault as a combustion research team leader. In 2012, he was appointed expert in CFD in charge of the development of numerical processes for designing engine applications.

DR. CLÉMENT DUMAND
Team Leader, Advanced Research
PSA Peugeot Citroën

Clément Dumand is team leader in the advanced research department of PSA Peugeot Citroën. He received his PhD in mechanical engineering in 2005. During his Ph.D, he developed combustion chambers for mini-drone applications. After graduation, Mr. Dumand joined PSA Peugeot Citroën as a specialist in thermodynamics and engine simulations. For 5 years he has led the team in charge of disruptive technologies analysis.

Mr. Dumand is involved in many collaborative projects aiming to improve simulation tools. His team has developed advanced methodologies to design innovative diesel and gasoline combustion systems.

DR. MATTIAS LJUNGQVIST
Manager, Engine CAE-Fluids
Volvo

Dr. Ljungqvist graduated from Chalmers University of Technology in 1993 and then continued with a PhD in the field of Chemical Engineering Design at the same University finishing in 1999. The same year he started his career at Volvo Cars as a Development Engineer at Advanced Engineering working with CFD simulations for combustion system development. He started working on gasoline engines but switched rather quickly to diesel engines. He focused on achieving a rapid method for piston and injector optimization which was used as an important part in the development of Volvo's I5D combustion system. Since 2014 Dr. Ljungqvist is responsible for engine related 1D and 3D CFD simulations as manager of Engine CAE – Fluids.

ACADEMIA

DR.-ING. HEINZ PITSCH
Director
Institute for Combustion Technology
RWTH Aachen University

Prof. Heinz Pitsch is a Professor at RWTH Aachen University and has been the Director of the Institute for Combustion Technology at RWTH Aachen University since 2010. He has been Assistant and Associate Professor at Stanford University from 2003 – 2013 after receiving his PhD from RWTH Aachen University in 1998 at UCSD and Stanford University. His main research interests are in the fields of combustion theory, combustion chemistry, turbulence, and multi-phase flows with application to technical combustion systems. Prof. Pitsch has published over 150 papers in archival journals. He is presently a member of the board of directors of the International Combustion Institute, on the editorial board of Combustion and Flame, and he is a fellow of the American Physical Society.

DR. HENRY CURRAN
Director
Combustion Chemistry Centre
NUI Galway

Prof. Curran received his PhD degree from the National University of Ireland, Galway (NUIG) in experimental and numerical studies of combustion kinetics in 1994 and a DSc. degree by research from the National University of Ireland in October 2011. He served as a postdoctoral research scientist from 1994 to 1997 and research scientist in combustion modelling with Dr. Charles Westbrook and Dr. William Pitz from 1997 to 1999 at Lawrence Livermore National Laboratory (LLNL). In 1999, he returned to Ireland to take an appointment as a lecturer in Physical Chemistry at Galway-Mayo Institute of Technology while continuing to consult with LLNL and performing collaborative research in kinetics with Prof. John Simmie at NUIG. He was appointed as an adjunct Lecturer at NUIG in 2001 and as a Lecturer in 2005. He is currently director of the Combustion Chemistry Centre at NUIG and is a member of the editorial boards of "Progress in Energy and Combustion Science" and the "Proceedings of the Combustion Institute". He is a founder member of the Irish Section of the Combustion Institute, a fellow of both the Institute of Chemistry of Ireland and the Royal Society of Chemistry and a member of the Royal Irish Academy, the Institution of Engineers Ireland, the American Society of Automotive Engineers and the Society of Automotive Engineers.

DR. FABIAN MAUSS
Professor
BTU Cottbus

Dr. Ewald studied Mechanical Engineering at RWTH Aachen University and UC Davis, California. He received his diploma in Mechanical Engineering, Energy Technology from RWTH Aachen University in 1999 and his PhD at RWTH Aachen University in 2006. He was a Project Engineer at FEV from 2006-2008, Team Leader and Vice Department Manager at FEV from 2008-2015, and Senior Project Manager at FEV GmbH since January 2016.

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CONVERGENT SCIENCE

WORLD HEADQUARTERS
6400 Enterprise Lane
Madison, WI 53719
+1 (608) 230-1500

TEXAS
1619 E. Common Street
Suite 1204
New Braunfels, TX 78132
+1 (830) 625-5005

DETROIT
21500 Haggerty Road
Suite 120
Northville, MI 48167
+1 (248) 444-7644

EUROPE
Hauptstrasse 10
4040 Linz, Austria
+43 720 010 660

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