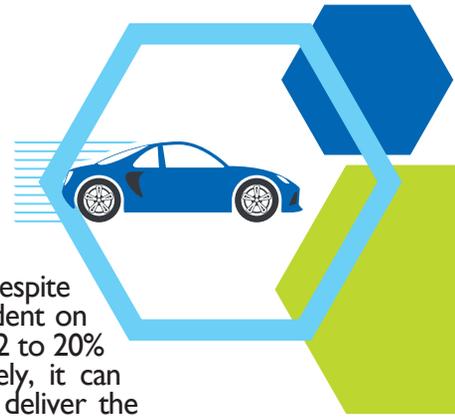


International Workshop

21st Jan 2020 h. 9.00 - 17.00

Energy Center - Via P. Borsellino 38/16 - Torino

Does the internal combustion engine have a future?



“Never before has the vehicle outlook been so uncertain and dynamic. For example, despite the personal vehicle and fuels market being a multi-trillion dollar industry and dependent on reliable forecasts into the ten-year timeframe, learned experts project anywhere from 2 to 20% (or more) battery electric vehicles (BEVs) only five years out, in 2025. Alternatively, it can reasonably be argued that low-carbon fuels are a cheaper alternative than BEVs to deliver the needed CO₂ reductions over the next 20 years. However, battery developments have exceeded recent forecasts on performance and cost, and auto companies and others are shifting billions of dollars in resources from internal combustion engines to electric vehicles.” (Tim Johnson, Corning Inc.)

“An important objective ... is to appeal to young talent, and to show that the internal combustion engine is highly unlikely to become a stranded technology in the foreseeable future. Indeed, some potential students and researchers are being dissuaded from seeking careers in IC engine research due to disparaging statements made in the popular press and elsewhere that disproportionately blame IC engines for increasing atmospheric GHGs. Without a continuous influx of enthusiastic, well-trained engineers into the profession, the potential further benefits that improved IC engines can still provide will not be realized.” (from “The Future of the Internal Combustion Engine”, International Journal of Engine Research Editorial, 2019).

This initiative is intended to provide a balanced perspective based on recently presented and published studies, with specific reference to the competitiveness and effectiveness of the IC engine as a power unit for modern and sustainable vehicles, within either a conventional or a hybrid powertrain. The workshop will thus contribute to give a sound, science and facts based answer to the question “Does the internal combustion engines have a future?”, through a series of keynotes by world-renowned experts and OEM top managers.

Speakers from FCA, General Motors, Renault, Porsche and other major OEMs have already been confirmed, and will be engaged in a final roundtable.

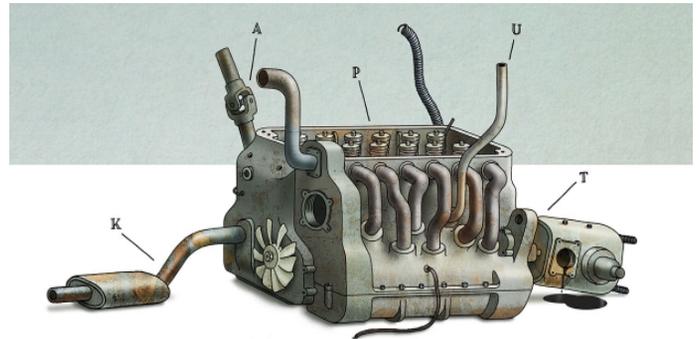


Fig.1 The Internal Combustion Engine

The Economist

The death of the internal combustion engine

It had a good run. But the end is in sight for the machine that changed the world

Opening keynote speaker will be dr. Kelly Senecal, co-founder of Convergent Science.

He is one of the original developers of CONVERGE, the industry-leading computational fluid dynamics software for reacting flow simulations. Senecal is a Fellow of the Society of Automotive Engineers, a member of the executive committee of the American Society of Mechanical Engineers, and the recipient of the 2019 ASME Internal Combustion Engine Award.

In addition to his role at Convergent Science, Senecal is an adjunct professor at the University of Wisconsin-Madison and the director and co-founder of the Computational Chemistry Consortium (C3). Senecal has authored more than 100 research papers, which have garnered over 3,000 citations. He speaks to audiences around the globe about how high-performance computing can help engineers design cleaner, more efficient propulsion systems for transportation.

Dr. Kelly Senecal



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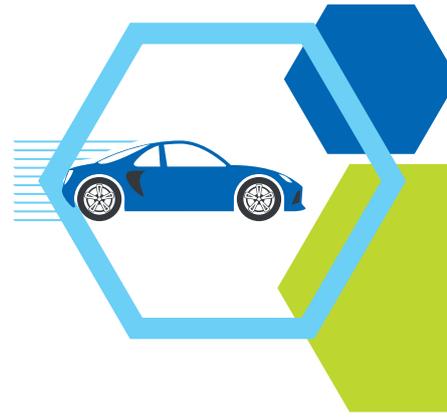
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International Workshop - Agenda

21st Jan 2020 h. 9.00 - 17.00

Energy Center - Via P. Borsellino 38/16 - Torino

Does the internal combustion engine have a future?



- 09.00-09.15 **Welcome Address**
Marco Perino - Energy Department, Director
Stefano Paolo Corgnati - Vice Rector Research
- 09.15-10.00 **Opening Keynote**
Kelly Senecal - Convergent Science, Owner & Vice President:
“Does the internal combustion engine have a future?”
- 10.00-10.30 **Paolo Pallotti - Fiat Chrysler Automobiles**, EMEA Region, Head Powertrain Engine Engineering
“ICE3: Internal Combustion Engine Evolution towards Electrics”
- 10.30-11.00 **Gianmarco Boretto - GM Global Propulsion Systems**, Director Diesel Engine Hardware Engineering,
“Electric Propulsion and Internal Combustion Engines: Peaceful Coexistence!”
- 11.00-11.30 **Coffee Break**
- 11.30-12.00 **Carlo Beatrice - Istituto Motori - Consiglio Nazionale delle Ricerche**, Senior Scientist,
“Technology review for ICE-based powertrains with 50% brake thermal efficiency”
- 12.00-12.30 **Thomas Körfer - FEV GmbH**, Vice President, Business Unit Diesel Powertrains,
“FEV Diesel EMotion – Future Electrified Diesel Powertrains for Heavy Light-Duty Vehicle Applications”
- 12.30-13.15 **Round Table**
Moderator **Giovanni Cipolla** - Automotive Engineering Consultant
- 13.15-14.30 **Lunch Break**
- 14.30-15.00 **Vincenzo Bevilacqua - Porsche Engineering Services GmbH**, Senior Expert Engine Analysis:
“Development of a Concept to Achieve Euro 7 Standards for a High-Performance Spark Ignition Engine”
- 15.00-15.30 **Frederic Ravet - Renault Center Lardy**, Expert in CFD powertrain
“New challenges for combustion development in electrified powertrain”
- 15.30-16.00 **Pierre-Jean Tardy - Renault Sport Racing**, Team leader - Expertise & Support
“How can Formula 1 contribute to ICE evolution?”
- 16.00-16.30 **Roberto Bruno-Bossio - Ricardo Italia**, Executive Vice President
“New challenges and opportunities for ICEs”
- 16.30-16.50 **Internal Combustion Engines PhD Research at Polito Highlights**
- 16.50-17.10 **Closing Remarks**

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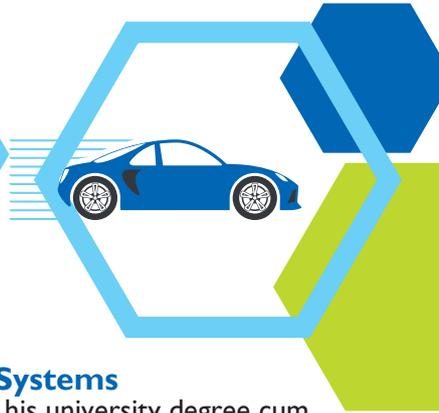


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International Workshop - Speakers' Biographies

Paolo Pallotti Fiat Chrysler Automobiles

Mr. Paolo Pallotti graduated in 1991 in Mechanical Engineering at Politecnico of Turin, he started his career in FCA in 1993. Since then he was appointed team leader, project responsible, and Manager in the field of engine development. Author of many papers related to Internal Combustion Engines with focus on combustion, structural and vibrational-acoustic analysis.



Gianmarco Boretto GM Global Propulsion Systems

Gianmarco Boretto received his university degree cum laude in Materials Engineering at Politecnico di Torino in 1997. Mr. Boretto began his professional career at Centro Ricerche Fiat in 1998. Since 2005, he works in General Motors, where he has covered responsibility positions in the engine development sector. He is currently Director Diesel Engine Hardware Engineering. He is author and co-author of more than 25 publications and patents.



Carlo Beatrice Istituto Motori - CNR

Carlo Beatrice is senior scientist and team leader of the research group on advanced powertrain systems at Istituto Motori of CNR. Principal areas of activity are thermal, hybrid and advanced powertrains, experimental and numerical methodologies for powertrain development. He is co-author of more than 100 publications on international journals, and is/was scientific responsible of several EU research projects in the framework FP6, FP7 and H2020, and coordinator or responsible of several national projects, as well as projects funded by automotive Manufacturers.



Thomas Körfer FEV GmbH

Thomas Körfer graduated in Mechanical Engineering at Technical University of Aachen, Germany in 1991. He started working as Project Engineer at FEV Motorentechnik GmbH, performing advanced HSDI Diesel engine research and development projects. He became Chief Engineer for Diesel Combustion Systems in 2005. He is Group Vice President Diesel Powertrains at FEV since 2014.



Giovanni Cipolla Automotive Engineering Consultant

Mr. Giovanni Cipolla is founder, owner and Director of the DECET company, which offers automotive engineering consultancy, rooted on more than 40 years of industrial experience on automotive propulsion systems in FIAT and GM Groups. Mr. Cipolla also does an academic activity at PoliTo and UniNa-Fed II (Italy) and at FH Zwickau (Germany).



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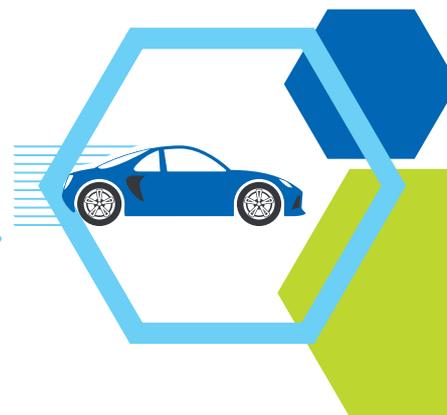
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International Workshop - Speakers' Biographies

Vincenzo Bevilacqua Porsche Engineering Services GmbH

Vincenzo Bevilacqua graduated cum laude in Mechanical Engineering at Politecnico di Torino in 2003. He started doing research activity in the engine field at Fiat Research Center, at Politecnico di Torino and at GM Powertrain Europe. Since 2007 Mr. Bevilacqua is Senior Expert for Engine Analysis in Porsche Engineering Services GmbH (Bietigheim-Bissingen, Germany), where he coordinates the team that is responsible for the mechanical and fluid-dynamic simulation activities. The projects mainly cover the optimization of gas exchange and mixture preparation, air path and turbocharger design.



Frederic Ravet Renault Center Lardy

Dr. Frederic Ravet got the Master Degree from the Ecole Polytechnique de Lille and made his PhD on combustion and pollutant emission modeling on aeronautic engines. After having worked in Aeronautic field for ten years, and being involved in relevant projects in partnership with Fiat AVIO, Dr. Ravet started working in Renault in 2004, as leader of the combustion research team in charge to explore new concepts of combustion chambers for highly efficient engines. Since 2012 he is expert in fluid dynamics applied to powertrain, developing methodologies for design application concerning combustion, injection, aerodynamics, hydrodynamics, lubrication.



Pierre-Jean Tardy Renault Sport Racing

Pierre-Jean Tardy joined Renault Sport Racing in 1995, after receiving his Master of Science from ENSAM and IFP School, and mostly worked on Formula 1 programs since then. He started his carrier as reliability engineer, then took in charge performance related simulations (acoustics and CFD) on V10 and V8 engines, and was appointed in 2006 project leader for different projects including the development from a blank sheet of the new generation of Hybrid Power Units. Since 2014 he is responsible for a team called "Expertise & Support", gathering experts in Simulation and Materials, aiming at supporting both Design Office and Reliability Department.



Roberto Bruno Bossio Ricardo

Roberto Bruno Bossio graduated in Mechanical Engineering in 1983 at University of Rome "La Sapienza", where he also got a PhD in Energetica in 1991. After spending 5 years as research fellow at the same University, he firstly joined Iveco as product development manager, to then become Engineering Director at Ruggerini Motori. Since 24 years ago he has been covering different positions in Ricardo, where he is currently Key Account manager for Italian OEMs.

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