27TH EDITION

SIA Société des Ingénieurs de l'Automobile

VERSAILLES 2015

International conference & Exhibition

VERSAILLES 2015

SIA POWERTRAIN

The low CO_2 spark ignition engine of the future and its hybridization

Versailles, France

MAY 27 & 28, 2015

PROGRAMME

Major sponsor

FEV

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SIA POWERTRAIN CONFERENCES

WELCOME

Since the creation of automobiles, their propulsion has been dominated by internal combustion engines, controlled either through spark or compression ignition. However, the last few years have seen the emergence of alternative technologies, mostly based on hybridization or even full electrification of the motive power.

Worldwide environmental concerns have seen more and more stringent CO_2 emission regulations and the targets are increasingly difficult to achieve. Similarly, regulation of conventional IC engine pollutants (NOx, PM, HC and CO) has continued to be tightened, both through reduced emissions levels and by the adoption of new test cycles and procedures which are more and more severe.

Whilst important progress can still be made with the spark ignition engine by itself, which has seen significant evolution in the last decade, the key to meeting future challenges will be the successful combination of electrification with IC engine technology. By 2025, it is forecast that internal combustion engines will still power around 90% of the vehicle market, but it is expected that approximately 50% of these will have some level of electrification (Hybridization). Joint development of both thermal and electric vehicle technologies will therefore be decisive to making this large deployment become a reality.

WHAT'S NEW FOR THIS EDITION?

New content, more focus

SIA has decided to merge two successful events
The «Spark Ignition Engine» conference, formerly held in Strasbourg, and the one-day conference dedicated to powertrain electrification, which used to be organized with the support of IFP Energies Nouvelles.

New recurrence
SIA POWERTRAIN conferences are now the biggest gathering of experts in the powertrain field; there is now an SIA POWERTRAIN conference every year at the end of May (Diesel and Spark Ignition engines, alternately)

New exciting venue
SIA organization teams always strive to host attendees in the best possible way and we think the famous royal city of Versailles will be the perfect place for this event. Versailles region is also well-known as the prime area for French automotive research and development.

AND WE WILL IMPROVE THE KEY FACTORS OF OUR SUCCESS

- International representation with more than 400 participants
- Parallel sessions to cover all aspects of the Spark Ignition Powertrain field
- Panel discussion with executive participants from the automotive industry
- Several special moments dedicated to discussions and networking
- Students Forum to make the automotive industry an attractive environment for future engineers

COMMITTEES

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PROGRAMME

WEDNESDAY, MAY 27TH

All speeches, slides and papers will be in English
No simultaneous translation

08:00	**ATTENDEES REGISTRATION**		
09:00	Opening Address - Chairmen		
	KEYNOTE SPEECHES		
09:20	**Keynote speech#1** 2050 Energy and Transport Technology Transition: a French Case Study Dr Emmanuel Hache, Economic Engineer | **IFP Energies Nouvelles**		
09:40	**Keynote speech#2** A Thermodynamic Comparison of SI-engine Combustion Systems Dr Frank Altenschmidt, Development Engineer | **Daimler**		
10:00	**Keynote speech#3** In a Hybridized Future with Alternative Fuels: Is the SI Engine the Winning Concept? Dr Martin Wirth, Technical Specialist SI Engine Technologies & Strategy | **Ford**		
10:30	**COFFEE BREAK**		
	HYBRID STRATEGIES Denis Levasseur | Renault Vanessa Picron | Valeo	**INNOVATIVE IGNITION SYSTEMS** Hans Nuglisch | Continental Neville Jackson | Ricardo	**FRICTION & THERMAL MANAGEMENT** Marc Sens | IAV Geoffroy Martin | Mov'eo
11:00	**12V Electric Network, the First Step for Hybrid Functions** S. Potteau, Y. Wu, J.Chicot, Y.Jin, B. Rouleau, P. Maurel, D.Taccoen, K. Surbled | **Valeo**	**Cycle-by-cycle Variation of Flame Initiation and Development in GDI Engine: Numerical and Experimental Analysis** M. Costa, S. Merola, V. Rocco, U. Sorge, G. Valentino | **Istituto Motori**	**Optimum Thermal-management Strategies for Low Ambient Temperatures** J-Y Bérard, J. Lefebvre, G. Morin, H. Ben-Omrane, S. Ruby, A-S. Macabeo, N. Stekelorom | **Renault**
11:30	**Experimental Validation of Stop & Start Sailing Strategy for Real-world Driving Cycles** F. Di Gennaro, G. Brunetti, M. Cisternino | **General Motors Powertrain** F. Millo, R. Fuso | **Politecnico di Torino**	**Corona- vs. Spark-Ignition: A Fundamental Comparison for Varying Thermodynamic Conditions of Modern Turbocharged Gasoline Engines** M. Schenk, T. Wolf, M. Schröter, F. Zellinger, B. Klaus, D. Pfeiffer, H. Fischer | **BMW Group**	**How the Choice of Polyamide Type in Timing Chain Tensioner Systems affects the CO2 Emission and Fuels Economy of Internal Combustion Engines** J. van Ruiten | **DSM Engineering Powertrain**
12:00	**Small Gasoline Direct Fuel Injection Two-stroke Engines for Range Extender Applications** P. Duret | **IFP School** S. Venturi | **IFP Energies Nouvelles**	**Advanced Plasma and Variable Spark Ignition System** P. Kruger | **North West University South Africa**	**Integrated Layout of the Low Friction Piston Ring Package** T. Voncken, M. Plettenberg, J. Lehmann, M. Heinen, J. Dohmen, H. Baumgarten | **FEV**
12:30	**Design and Evaluation of an Automotive, Low cost, Gasoline, Two-stroke Engine** J. Lopez, J. Benajes, J. Valero-Marco | **CMT Universitat Politecnica de Valencia** G. Coma, F. Justet | **Renault**	**Multiple Spark Plug Approach: Potential for Future Highly Diluted Spark Ignited Combustion** M. Sens, A. Benz, M. Riess, F. G. X. Lage | **IAV** S. Bjerkborn, F. Mauss, M. Pasternak | **Loge Combustion AB**	**Towards 0W16 Grade in Europe - OEM Fuel Economy Tests** N. Nouvel | **Lubrizol** S. Crane, N. Obrecht | **Total**
13:00	**LUNCH BREAK**		

PROGRAMME

WEDNESDAY, MAY 27TH

	NEW BOOSTING SYSTEMS Sébastien Potteau | Valeo Jean-Christophe Lamodière | Kistler	EGR & EXHAUST RECOVERY Noureddine Guerrassi | Delphi Emmanuel Jean | Faurecia	SPRAY & PARTICULATE EMISSIONS Simona Merola | Istituto Motori Rémy Schmitt | Robert Bosch
14:30	**Optimized matching Process for EU6c/ EU7 Gasoline Engines** A. Rinaldi | **CRITT M2A** H. Tartoussi, S. Guilain | **Renault** J R. Serrano | **Universitat Politecnica de Valencia**	**Exhaust Heat Recovery System (EHRS): Application and Further Potentials** E. Barrieu | **Faurecia**	**Detailed Validation for Large Eddy Simulations of the Flow Field in the Valve Seat Region** P. Janas | **University of Duisburg-Essen**
15:00	**The Next Generation of Honeywell Small Gasoline Turbochargers to meet EU6,2** P. De Araujo, S. Pees, C. Wilkins, F. Daguin, M. Marques | **Honeywell**	**Design Parameters and Control Strategy for Different Power Couplings of an Organic Rankine Cycle Waste Heat Recovery System** S. Karl, R. Haller, A. Taklanti, M. Yahia, J-M Liu, S. Hammi | **Valeo**	**Influence of Charge Motion and Injection Pressure on the Particulate Emission of a Gasoline DI-SI Engine at High Engine Load** M. Bertsch, T. Koch, A. Velji | **Karlsruhe Institute of Technology**
15:30	**E-supercharging for Heavily Downsized Gasoline Engines** M. Bassett, J. Hall, P. Freeland | **Mahle** J. Servant, K. Gray | **Aeristech Limited**	**Condensation and Fouling Assessment in EGR Cooler of GTDI Engines with Different EGR Loop Configurations** Y. Bravo, C. Larrosa | **Valeo** J M. Lujan, H. Climent, M. Rivas-Perea | **CMT Universitat Politecnica de Valencia**	**Multi-dimensional Modeling of Soot Formation in DISI Engines Based on Detailed PAH Kinetics and Particle Dynamics Framework** J. Kim, K. Min | **Seoul National University**
16:00	**Electric Supercharging – New Opportunities with Higher System Voltage** R. Aymanns, T. Uhlmann, J. Scharf, C. Nebbia, M. Stapelbroek, H. Baumgarten | **FEV** B. Höpke, D. Lückmann, T. Plum | **RWTH Aachen University**	**Methodology for Optimization of VVT and LP-EGR Strategies in Gasoline Turbocharged Direct Injection Engine to reduce Fuel Consumption** H. Climent, J M. Lujan, B. Pla, M. Rivas-Perea | **CMT Universitat Politecnica de Valencia**	**GDI Spray Evolution and Sizing Characteristics in Flash-Boiling Conditions** L. Postrioti, M. Bosi | **Universita di Perugia** R. Di Gioia, G. Bonandrini | **Magneti Marelli**
16:30	**COFFEE BREAK**		

PANEL SESSION

17:00

Dirk Andriesse,
Program Manager for Advanced Powertrain Projects
Maserati

Christian Chapelle,
VP Powertrain and Chassis
PSA Peugeot Citroën

Alain Raposo,
Alliance Global Vice President, Powertrain & EV Engineering
Renault-Nissan Alliance

Toshifumi Takaoka,
General Manager of Advanced Engine Technology Development Division
Toyota

German OEM
To be confirmed

Moderator: **Laurent Meillaud,** Automotive Journalist

18:30 21:30	**NETWORKING DINNER-COCKTAIL in the exhibition**

PROGRAMME

THURSDAY, MAY 28TH

08:30	**OPENING**		
	HIGH PERFORMANCE POWERTRAIN Pierre-Yves Geels | AVL-LMM Omar Hadded | Tata Motors	**ABNORMAL COMBUSTION** Jean-Marc Boulard | IAV Nadim Andraos | FEV	**ALTERNATIVE AND BIO FUELS** Erwan Samson | PSA Peugeot Citroën Anne Jaecker | IFP School
09:00	**The Magma Engine Concept – A Downsized Turbocharged Gasoline Engine with High Compression Ratio** C. Rouaud, R. Osborne, K. Pendlebury, J. Stokes | **Ricardo**	**A Study of Pre-ignition Appearance in a Ultra Super-charged Gasoline Engine** Y. Moriyoshi, T. Kuboyama, K. Morikawa, T. Yamada | **Chiba University**	**Knock Investigations with Blends of Ethanol and Gasoline** G. Banzhaf, H. Kubach, T. Koch | **IFKM, Karlsruhe Institute of Technology** Altenschmidt, U. Schaupp | **Daimler**
09:30	**Maintaining High Efficiency from Extreme Downsized Gasoline Engines** P. Freeland, B. Hibberd | **MAHLE**	**Normal and Abnormal Combustion Investigations through UV-visible imaging in a DISI Boosted Engine Fuelled with Gasoline and PRFs** S. Merola, A. Irimescu, C. Tornatore, G. Valentino | **Istituto Motori**	**Numerical Simulation of CO_2 Benefit on Miller Cycle using E100 Opportunity** F. Turkovics, M. Airoldi | **PSA Peugeot Citroën** W. Gallo | **University of Campinas**
10:00	**Intake Air Temperature Reduction on Highly Charged SI Engines** V. Bevilacqua, E. Jacobs | **Porsche Engineering Services**	**How to perform Indicating Measurement under Pre-ignition Conditions?** R. Dolt, M. Haefner, JC. Lamodière | **Kistler**	**Natural Gas Direct Injection for Low CO_2 Spark Ignition Engines** JF. Preuhs, G. Hoffmann, J. Kirwann | **Delphi**
10:30	**COFFEE BREAK + STUDENTS POSTERS SESSION**		
	UNDERSTANDING AND CONTROLLING KNOCK Pierre Duret | IFP School Amin Velji | KIT	**ENERGY MANAGEMENT SIMULATION FOR HEV** Federico Millo | Politecnico di Torino Daniel Roettger | Ford	**EMISSIONS & MEASUREMENTS** Jérôme Mortal | Jaguar Land Rover Ali Mohammadi | Toyota
11:30	**Detailed Investigation of Knocking Combustion in Spark Ignited Engines by CFD Methods** P. Priesching, M. Bogensperger, A. Poredos | **AVL**	**Automatic Model-Based Generation of Optimal Energy Management Strategies for Hybrid Powertrains** A. Sciarretta, JC. Dabadie, G. Font | **IFP Energies Nouvelles**	**Model Based Methodologies supporting Real Driving Emissions Challenges** T. Zacharopoulou, A. Karvountzis, G. Koltsakis | **Aristotle University of Thessaloniki** D. Karamitros, T. Souliotis | **Exothermia**
12:00	**On the Dual Nature of Knock in a Highly Boosted, Downsized DISI Engine running a Variety of Gasoline and Alcohol based Fuels** K. Giles, C. Brace, A. Lewis, S. Akehurst | **University of Bath**	**Modeling and Control Optimization for Peugeot 3008 Hybrid4** Y. Cheng, L. Horrein, C. Dumand | **PSA Peugeot Citroën** C. Mansour | **Lebanese American University** A. Bouscayrol | **University of Lille**	**New Trend of Indicating on Vehicle: Impact of the Quality of the Engine Speed Measurement on Combustion Analysis** D. Bernou, S. Brenot | **PSA Peugeot Citroën** Y. Cohas, JC. Lamodière | **Kistler**
12:30	**Measurement of RON Requirements for Turbocharged SI Engines: One Step to the Octane on Demand Concept** G. Bourhis, JP. Solari, R. Dauphin | **IFP Energies Nouvelles**	**The Hybrid Powertrain: a Challenge for the Simulation** J. Cheng, M. Bargende | **University of Stuttgart** F. Altenschmidt, C. Ley | **Daimler**	**EVAP System Fluid-Dynamics and Chemistry Modeling for EMS Purge Control Development and Optimization** L. Smith, A. Hussain | **Jaguar Land Rover** E. Pautasso, E. Servetto, E. Graziano | **Powertech**
13:00	**LUNCH BREAK**		

PROGRAMME

THURSDAY, MAY 28TH

	FUTURE POWERTRAIN Christophe Charial | PSA Peugeot Citroën Philippe Bernet | Renault	
14:30	**Development Challenges of a Modern Flexfuel Turbocharged DI Engine** F. Gouzonnat, A. Lopez, L. Pottier, D. Juncker | **PSA Peugeot Citroën**	13:00 - 16:15 **STUDENTS FORUM** With the support of the IFP School (see details below)
15:00	**Combustion Technology to achieve Engine Thermal Efficiency of 40% for HVs Engine** D. Takahashi, K. Yoshihara, Y. Ohta, H. Nishiura | **Toyota**	
15:30	**Gasoline Engine 2020: 200 kW/l and 200 g/kWh?** G. Fraidl, P. Kapus M. Neubauer | **AVL**	
16:00	**Closing speech** Patrice Marez, Director of Powertrain System Design | **PSA Peugeot Citroën**	
16:15	**END OF CONFERENCE**	

Students FORUM

As usual, one of the first purposes of SIA is to make automotive industry attractive for young people and students. That's why we invite them to attend the congress and meet the experts and the companies that will be glad to share their knowledge and display their new technologies.

STUDENTS FORUM: 0 € IF YOU SEND YOUR CV!

On Thursday 28th of May afternoon: the companies of the exhibition will welcome you in their booth to discuss about the automotive industry careers and your expectations. You will have the opportunity to meet powertrain experts who will tell you how their jobs are like. Your CV will be given to our partner companies before the Students Forum, some of them are looking for interns.

With the support of the IFP School

EXHIBITION & SPONSORING

	Standard	Bronze	Silver	Gold	Platinum
RATES (exc. VAT)	2 700 €	4 200 €	6 200 €	10 000 €	**- SOLD -**
Fitted-out booth	6 sqm	9 sqm	12 sqm	18 sqm	-
Included invitations	2	4	5	8	-
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10 lines about your company on the congress website (www.sia.fr)		X	X	X	-
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Company leaflet or goodies enclosed in the conference bag					-
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Discount on extra badges*	0%	-10%	-20%	-30%	-
Extra space	600 € per square meter				

*As small firms and labos enjoy a lower rate, they can't benefit from this extra discount

RATES (Exc. VAT)	Back cover	Inside	Inside front cover	Inside back cover
Book of conference	1 300 €	950 €	-	1 100 €
Insertion of leaflet in the conference bags	1 000 €			
Cords and badges supply	1 000 €			
Conference bags supply	600 €			

NEW for exhibitors!

The exhibition will be opened to everybody on May 28th afternoon.

Invite your clients and colleagues...

it is free of charge!

Contact pauline.senis@sia.fr for further information about exhibition, sponsoring and advertising opportunities

VENUE

[PALAIS DES CONGRÈS]

10 rue de la Chancellerie - Versailles

PUBLIC TRANSPORTATION

- **From Roissy CDG Airport**, take RER B towards Paris and stop at "Saint-Michel Notre-Dame". Then, take another train RER C towards Versailles Rive-Gauche. Stop at "Versailles Rive-Gauche". The Palais des Congrès is 5 min by foot.
- **From Saint-Lazare station (Paris)**, take a SNCF train towards Paris "Versailles Rive-Droite". The Palais des Congrès is 20 min by foot.

HOTELS

List of recommended hotels on www.sia.fr

REGISTRATION FORM

Conference "SIA POWERTRAIN | Versailles 2015" - May 27 & 28, 2015
Ref: 2015-04

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Registration fees

☐ **1056 € VAT Incl.** (880 € VAT Excl.) - SIA Members
☐ **1188 € VAT Incl.** (990 € VAT Excl.) - Non Members
☐ **594 € VAT Incl.** (495 € VAT Excl.) - Co-authors* Researchers*, Labs* and Small Firms* (< 100 employees)
☐ **0 € VAT Incl.** - Speakers and Chairmen

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**Small firms, Researchers and laboratories must not come under the control of big firms (> 100 employees).*

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REGISTRATION CONDITIONS
- Registration fees include participation in the conference, proceedings, refreshment breaks, lunches and cocktails.
- Where it is not possible to send the payment together with the form, each registration should be accompanied by an official purchase order. Failing reception of an official purchase order or payment on the day of the congress, we regret that you will not be allowed entry to the congress.
- When we have received the registration form, we will send you a confirmation message and an invoice. Please indicate the accounts department address where necessary.
- In case of cancellation before April 27th, 2015, 30% of the registration fees will be retained.