GROUPE RENAULT

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ÉCOLE CENTRALE DE NANTES, RENAULT AND LMS, A SIEMENS BUSINESS LAUNCH AN INTERNATIONAL INDUSTRIAL CHAIR

The five-year Chair has been allocated a significant €4.5 million to explore innovative technologies for internal combustion engines

On January 29, 2013, Arnaud Poitou, director of Centrale Nantes, Claire Martin, director of the Renault Foundation, Rémi Bastien, director of Renault Innovation and Research, and Jan Leuridan, CEO of the software provider LMS, A Siemens Business inaugurated a Chair dedicated to researching new technologies for combustion engines.

The Chair will carry out research to advance our knowledge in modelling systems for the control and tuning of Renault's internal combustion engines.
It will also help to ensure that the education delivered to future engineers stays relevant and aligned with industrial projects in progress and to come.

Rémi Bastien, director of Renault Innovation and Research, said, "The goal of this Chair is to gain better control over our exploration of future powertrain, engine control and engine tuning technologies and to develop digital simulation so we can continue to curb CO2 emissions."

Arnaud Poitou, director of École Centrale de Nantes, said, "Centrale Nantes is very proud to be contributing to the innovative capacity of a large French manufacturing group like Renault. Developing innovation and helping economic growth are two important aims for Centrale Nantes. This Chair attests to the uniqueness of Centrale Nantes as a provider of both outstanding digital skills and large-scale test platforms."

"For LMS, A Siemens Business, this Chair will help to better adapt our 1D simulation suite – LMS Imagine.Lab AMESim – to engine control development processes. With this Chair and in conjunction with other partnerships, we can reinforce the development of our range of engine simulation tools," said **Jan Leuridan**, CEO of LMS, A Siemens Business.

Professor **Pascal Chesse**, the recipient of the new industrial teaching and research Chair, said, "This Chair combines high-level simulation and experimental characterisation capabilities. Its dual digital/testing expertise is the Chair's biggest value-added and will lead to major innovations in engine control and tuning." The Chair will also enable the school's thermodynamics and internal combustion engines (ICE) team to boost its research capacity in its area of expertise, namely the system modelling of complex energy processes. "What we are aiming to do is to increasingly use a digital engine for content and tuning. This digital engine is based on a system approach to simulation. Digital calibration will save time and costs in the tuning of the engine's electronic calculator. The innovation is not in the engine but in all the benefits that can be achieved by shortening manufacturing times."

Four doctoral theses are already being pursued as part of this industrial Chair, which has the potential to produce six or seven theses in all. The doctoral topics currently being explored are:

- **Modelling of polluting emissions**
- **Extrapolation of operating ranges of turbocharger turbines**
- **Enhancement of cylinder filling calculation models**
- **Fuel dilution in lubricating oil**

In addition, the thermodynamics and ICE research team – part of the hydrodynamics, energetics and atmospheric

environment laboratory (LHEEA) of Centrale Nantes – dedicated to the Chair is currently working in these four main areas:

1. Turbocharged engines
2. Air loops (air intake and exhaust circuits)
3. Innovative powertrains
4. Combustion in engines

This research team explores both digital simulation and experimental aspects, using the testing resources available to it.

The Chair will be funded for five years and has been allocated a budget of €4.5 million.

About École Centrale de Nantes

École Centrale de Nantes, a member of the "Groupe des Écoles Centrales" alliance (Lille, Lyon, Marseille, Nantes and Paris), educates and trains engineers for careers in industry. Founded in 1919, "Centrale Nantes", with its 40-acre campus, is attended by 2,050 students: 1,340 engineering students, 200 student-engineers in continued education or apprenticeship programs (ITII), 240 Ph.D. candidates and 270 Master program students. Centrale Nantes trains graduates, masters and doctors of engineering in the most recent scientific and technological developments and the best management practices.
For more information: www.ec-nantes.fr

About Renault

The Renault group has been making cars since 1898. Today it is an international multi-brand group, selling more than 2.5 million vehicles in 128 countries in 2012. It employs nearly 128,000 people and operates 38 production sites. To meet the major technological challenges of the future and continue its strategy of profitable growth, the Group is harnessing its international development and the complementary fit of its three brands, Renault, Dacia and Renault Samsung Motors, together with electric vehicles, the Alliance with Nissan, and its partnerships with AVTOVAZ and Daimler.

About LMS, A Siemens Business

LMS, A Siemens Business is a leading provider of test and mechatronic simulation software and engineering services in the automotive, aerospace and other advanced manufacturing industries.
As a business segment within Siemens PLM Software, LMS, A Siemens Business provides a unique portfolio of products and services for manufacturing companies to manage the complexities of tomorrow's product development by incorporating model-based mechatronic simulation and advanced testing in the product development process. LMS, A Siemens Business tunes into mission-critical engineering attributes, ranging from system dynamics, structural integrity and sound quality to durability, safety and power consumption.
With multi-domain and mechatronic simulation solutions, LMS, A Siemens Business addresses the complex engineering challenges associated with intelligent system design and model-based systems engineering. Thanks to its technology and more than 1250 dedicated people, LMS, A Siemens Business has become the partner of choice of more than 5000 manufacturing companies worldwide. LMS, A Siemens Business operates in more than 30 key locations around the world.

Media contacts:
Centrale Nantes - Laurence Louatron
+33 2 40 37 16 87 / laurence.louatron@ec-nantes.fr
Agence Noir sur Blanc - Christine Cassabois
+33 1 41 43 72 85 / ccassabois@noirsurblanc.com

LMS, A Siemens Business
Marie-Elodie Lauret
marie-elodie.lauret@lmsintl.com
+33 1 34 52 17 45

GROUPE RENAULT
PRESS OFFICE
Tel.: +33 (0)1 76 84 63 36
renault.media@renault.com

Sites web: www.media.renault.com - www.group.renault.com

Follow us on Twitter : **@Groupe_Renault**