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News

Fundamental Research

Renewable energies



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bâtissent de nouveaux mondes



Lyon 1



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CNRS, ENS Lyon, IFP Energies nouvelles (IFPEN), Sorbonne University, Claude Bernard Lyon 1 University and the University of Strasbourg are pooling their expertise and know-how to create a [joint research laboratory \(LCR\)](#) called "**CARMEN**" to conduct a five-year program of research in the field of materials characterization for new energies. The aim is to **improve our understanding of molecular and/or colloidal transport in complex porous substrates and to develop new methodologies for the fine analysis of these porous materials** in order to support the development of innovations for energy transition.

Interesting porous materials for energy transition

The study and understanding of mesoporous or lamellar substrates, such as catalyst supports and soils, could greatly contribute to the energy transition. Indeed, these materials have many applications, notably in the fields of biomass catalytic conversion, adsorbents for contaminant reduction and renewable energy storage.

In order to optimize the use of these porous materials in the field of new energies, the relationships between their structural and chemical properties as well as their performance levels need to be identified. The research conducted by LCR CARMEN will therefore focus on the multi-scale characterization of their structure in operating conditions that are as close as possible to reality (known as in operando) in order to link these to their transport properties and their reactivity.

A partnership between excellence laboratories

By bringing together three research teams of excellence, from the Centre de résonance nucléaire à très hauts champs de Lyon [Centre for Magnetic Nuclear Resonance, Very High Fields] (CRMN, CNRS/ENS Lyon / Claude Bernard Lyon 1 University), the Institut de physique et chimie des matériaux de Strasbourg (Strasbourg Institute for physics and chemistry of materials (IPCMS, CNRS/University of Strasbourg) and the laboratoire de [Physicochimie des électrolytes et nanosystèmes interfaciaux](#) [the Physicochemistry Laboratory of Electrolytes and Interfacial Nanosystems] (PHENIX, CNRS/Sorbonne University) as well as the teams from the Research and Innovation Centre of IFP Energies nouvelles, [LCR CARMEN](#) represents a unique consortium at an international level.

The complementary skills of the different research teams and the pooling of their high-performance equipment represent major assets for the LCR. Merging these assets will make it possible to draw on several characterization techniques, including innovative in situ multi-scale approaches, such as low and high-field NMR and imaging techniques coupled with modeling.

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University of Strasbourg

Didier Houssin,
IFPEN

Antoine Petit,
CNRS

Frédéric Fleury,
Claude Bernard Lyon 1 University

Jean-François Pinton,
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With Antoine Petit signing on behalf of Jean Chambaz,
Sorbonne University.

To find out more

> www.lcr-carmen.fr

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*Interview with Ms Nathalie Schildknecht,
Director of the CARMEN joint research laboratory
and Director of the Physics and Analysis Division of IFPEN:*

*Interview with Ms Claire-Marie Pradier,
Deputy Scientific Director at the CNRS Institute of Chemistry,
about the creation of the CARMEN joint research laboratory*

*Interview with Mr Eric Heintzé,
Scientific Director of IFPEN at the time the
CARMEN joint research laboratory was created (July 2019)*

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[CARMEN focuses on energy transition materials](#)

Creation of a joint research laboratory to reinforce knowledge about materials for energy transition technologies

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