

## Editorial

In the first half of 2009 we have seen a multitude of activities in our network which have shown that EMMI can now stand on its own feet. This issue of our newsletter reports on the most important developments.

We have succeeded in creating a number of new projects which are described in this issue. Further efforts to create more projects are under way, notably in collaboration with our industry partners, who have taken an active role in the Industry Support Group.

Equally important is our project proposal for an **International Doctoral School in Functional Materials (IDS-FunMat)** in the framework of ERASMUS MUNDUS. **We have just received official confirmation that our proposal has been accepted.** This project will be an important cornerstone of future collaborations between our members and partners.

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## EMMI Industry Support Group

EMMI currently has five industry companies as Adherent Members:

Bosch GmbH (DE)

Corning SA (FR)

Merck KGaA (DE)

Rhodia SA (FR)

Schneider SA (FR)

The Industry Members are coordinating their activities in the EMMI Industry Support Group (ISG), which is chaired by Dr Peter Reynders from Merck. The ISG is thus the voice in EMMI for industry topics and interests, and a facilitator of collaborations and personnel exchanges between industry and academic members.

In order to identify topics for possible research collaborations, a series of meetings and telephone conferences were organized; starting with a joint meeting of the ISG with academic members in February 2009 in Darmstadt.

A short list of topics was identified by the ISG, and the academic research labs where then asked to identify their potential contributions to these topics.

A further meeting of the ISG with academic partners will take place at the Fraunhofer Institute in Würzburg on 1<sup>st</sup> of September, devoted to planning concrete projects; specifically in reply to the FP7 calls for projects published in 2009 by the European Commission.

## **Mario Maglione receives IKEDA Award for research work on ferroelectric materials**

On the occasion of the Ferroelectric Materials and Application annual meeting (FMA26), the IKEDA foundation of Japan has awarded on 28<sup>th</sup> of May its price to Mario Maglione from the ICMCB Bordeaux. The price is given annually for outstanding contributions in the research of ferroelectric materials.

Mario Maglione leads the research group 'ferroelectrics, ceramics and composites' of the ICMCB, and is also deputy director of the institute.

Among the recent research results of his group is the discovery of novel ferroelectric materials and composites. Charged interfaces in such materials have been very recently shown to induce effective coupling with an external magnetic field, opening the way to improved multifunctionality of electronic devices. It is the assessment of such charged interfaces in many different oxides which lead the IKEDA committee to its decision.

For further information please visit [http://www.icmcb-bordeaux.cnrs.fr/pages\\_chercheurs/spip.php?article9](http://www.icmcb-bordeaux.cnrs.fr/pages_chercheurs/spip.php?article9)

### **SCIENTIFIC MEETINGS**

#### **Lithium Batteries Discussion Workshop 2009**

**Arcachon (France) – Sept. 20-25, 2009**

**LiBD-4** will focus on discussions of all basic aspects of **positive and negative electrode materials for Li (ion) batteries**. It will also include topics related to interfaces and interfacial phenomena.

There will be invited lectures, short oral presentations with an associated poster for further details, and poster communications. All presentations will be organized in sessions on a given topic followed by an extended discussion. The organisation will make every effort to promote these discussions, which already made the success of the first three LiBD meetings.

For the full programme and registration please visit the website <http://www.icmcb-bordeaux.cnrs.fr/libd2009/index.htm>

#### **Third European School on Multiferroics - ESMF-3**

**Groningen – Sept. 7-11, 2009**

The emphasis of the school will be to combine a pedagogical introduction to the physics of magnetoelectric phenomena with a comprehensive overview of the most recent theoretical and experimental advances in this field of research. EMMI is sponsor of this school, which is a follow-up to the highly successful schools that took place under the auspices of the European Network of Excellence FAME in Grenoble (2007) and Girona (2008).

There are still a few places open for participants. For online registration and detailed information see the school website [www.rug.nl/fwn/esmf2009](http://www.rug.nl/fwn/esmf2009)

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## **Project METACHEM : Nanochemistry and self-assembly routes to metamaterials for visible light**

METACHEM is a European FP7 Collaborative Project starting in September 2009 and running for 4 years. Among the nine project partners are 4 EMMI Members/Partners, namely the CNRS, Université Catholique de Louvain, the Fraunhofer Society and Rhodia SA.

METACHEM is coordinated by Philippe Barois from the Centre de Recherche Paul Pascal (CRPP-CNRS) in Bordeaux.

METACHEM brings together for the first time European experts of three complementary fields, namely nanochemistry, self-assembly methods and

metamaterials science. The main goal is the design and synthesis of optically isotropic meta-materials with exotic and extreme properties, realized by simple and cheap chemical methods.

The spectral domain of visible light requires nano-scale patterns, typically around 50 nm in size or less. The project's strategy consists in designing and

synthesizing ad-hoc nano particles as optical plasmonic nano-resonators and organising them through self-assembly methods in 2 or 3 dimensional networks in order to produce dense highly ordered structures at a nano-scale level.

For further information please contact the coordinator under [barois@crpp-bordeaux.cnrs.fr](mailto:barois@crpp-bordeaux.cnrs.fr)

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## **Project OXIDES : Engineering Exotic Phenomena at Oxide Interfaces**

OXIDES is an FP7 collaborative project involving 7 partners, coordinated by Prof Philippe Ghosez from University of Liege.

OxIDES will (i) develop theoretical and simulation techniques to model the most relevant types of oxide interfaces and (ii) use them to design a new generation of layered materials with unique experimentally-confirmed properties. The theoretical work will combine first and second principles methods in a multi-scale approach.

Three types of interfaces will be investigated: insulating interfaces between insulating oxides, where novel couplings between structural instabilities can lead to unusual phenomena such as improper ferroelectricity; conducting interfaces between insulating oxides, where an interfacial 2-dimensional electron gas exhibits totally unusual properties; and interfaces between metallic and insulating oxides, for a deeper understanding of screening. All these are potentially interesting for use in microelectronic devices or energy harvesting.

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## **New Internationally Co-supervised PhD Projects initiated by EMMI**

The following PhD projects will be co-supervised by two universities from different countries, and will result in a double PhD degree. All will start in autumn 2009.

*A complete list of 'spin-off projects' and PhD theses can be found on the EMMI website under >> Research >> Projects*

### **Design of supported catalysts by a colloid-mediated approach**

New routes in heterogeneous catalysis will be explored in this project funded by the French Government, and co-supervised by Crystel Faure from the CRPP / Université Bordeaux 1 and Eric Gaigneaux from the Catalysis Lab of the Université Catholique Louvain.

### **New luminescent materials**

This project is a collaboration between ICMAB Barcelona, ICMCB Bordeaux and Rhodia. It is co-financed between Rhodia and the French Region Aquitaine. It is mainly aimed at development of new materials for white LEDs.

### **CO2 conversion**

The French region Aquitaine is funding this collaboration between Alain Demourgues from ICMCB Bordeaux and Wolfgang Donner from TU Darmstadt, Materials Department. New cerium and titanium based materials will be designed for CO2 capture and conversion into hydrocarbons, olefins, alcohols etc.

### **Project IDS-FunMat**

**Latest News:** EMMI has initiated an **International Doctoral School in Functional Materials (IDS-FunMat)** which has been selected for ERASMUS MUNDUS funding. The school will fund internationally co-supervised PhD projects from 2010.

## Job Offers in EMMI labs

### Post-doctoral position in nanobiosensors, Louvain

A Post-doctoral position is offered in nanobiosensors in the Institute of Condensed Matter and Nanosciences of the University of Louvain (in Louvain-la-Neuve, Belgium, EU)

This one-year position fits within a larger project aiming at developing new enzymatic biosensors based on nanopatterned conducting polymers.

The biosensors consist of conducting polymer nanowires functionalized by genetically-engineered enzymes able to recognize specific analytes. The nanowires are generated by nanolithography. The successful candidate will fabricate the nanowires and connect them to electrodes, graft the enzymes at the surface of the nanowires, and check the electrical response of the devices in water in the presence of analytes. An interest for nanofabrication, electrical measurements in water, biofunctionalization, surface chemistry and physical chemistry of solutions will be useful.

For more details please visit the News section of the EMMI website [www.emmi-materials.eu](http://www.emmi-materials.eu) or contact Prof. Alain M. Jonas (alain.jonas'at'uclouvain.be)

### University Liege: PhD Teaching and Research Fellowship

The University of Liege offers full funding for a teaching assistant in the department of Physics, starting September 2009. The position is either for a duration of 3 years for a PhD student, or one year, renewable, for a post-doc.

The candidate will carry out research in ab initio materials science, on either electron-phonon coupling in spintronics materials or high temperature and pressure phase transitions. (see EMMI website for a more detailed description)

### Post-doctoral position in nanocatalysis, Louvain

The Institute of Condensed Matter and Nanosciences of the University of Louvain, Belgium, offers a one-year postdoc position.

This position is part of a project aiming at fabricating - and studying properties of - flat catalytic nanoreactors on surfaces. These are built as one of the elements of a chemical nano-factory that is being developed in Louvain-la-Neuve.

The successful candidate will synthesize catalytic nanoislands consisting of metal/organic ligand complexes grafted on Si wafers by combining nanolithography with surface chemistry, and will monitor the reaction using fluorescence microscopy and atomic force microscopy. Parameters of interest are the catalytic rate, the diffusion of reagents to the nanoislands and of the products from the nanoislands. An interest for interdisciplinary research involving clean room technology (nanolithography), catalysis, microscopy, and physical chemistry is required. Although the synthesis of the reagents and ligands was performed in a previous phase of the project, a practical knowledge of organic chemistry will be useful.

For further details please contact Prof. Alain M. Jonas (alain.jonas'at'uclouvain.be)

He/She will also have teaching responsibilities (tutoring and problem classes). For this reason, a working knowledge of French is important, although high-quality proposals from non-native speakers are encouraged and will certainly be considered. A full CV and two letters of recommendation should be sent to Dr. Matthieu Verstraete

matthieu.jean.verstraete'at'gmail.com

**Updates on Job Offers** can be found on the EMMI website [www.emmi-materials.eu](http://www.emmi-materials.eu) under >> News >> Jobs

## First EMMI / FAME-Master Student Workshop

**Bordeaux 20-22 July 2009**

This student workshop brings together the first two years of the FAME Master students, some of EMMI's PhD students with international co-supervision, and representatives from industry and academia.

The students will present their thesis projects in oral and poster presentations. There will also be round-table discussions with industry, a scientific plenary lecture on

organic electronics, and an interactive workshop 'innovation'.

A main goal of the workshop is the presentation and discussion of different career paths, and specifically the value of doctoral studies.

The program will be completed by social events and an award ceremony for the Master students.

## Enhancements of the EMMI website

Our internet site [www.emmi-materials.eu](http://www.emmi-materials.eu) has been expanded in both content and functionality:

- A new database describing all 30 EMMI laboratories, their research fields, key personnel, web links etc. This complements the existing databases for people, projects and equipment.
- A global search function which now includes all sections including the add-on databases.
- New tutorials for Research Equipment and Tools (RET) were added, for example NMR and Mössbauer Spectroscopies. More will be added over time.

Note that some of the data are only accessible with login. Suggestions and comments from users are most welcome.

## Governing Board Meeting

The EMMI Governing Board will hold its next meeting on November 24 in Munich, Germany.

Representatives of the Full Members of EMMI will deliberate issues such as the annual budget, membership, new projects and other activities of EMMI.

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