



INNER

Ideas Laboratory

on

Physics and chemistry of surfaces
and interfaces for energy
efficiency

November 8 to 12, 2008

La Villa Clythia - CNRS

Fréjus – France



IdeasLab - Objectives

The INNER ERA-Net, supported in the European Commission under the Sixth Framework Programme, is searching for ways to bridge the gap between advances in basic science and new energy research. Mining scientific information is known to be a difficult task so an attempt will be made to identify new ideas and approaches in the first “IdeasLab” organised as a joint action in the INNER-ERA-Net project.

This open call asks for extended abstracts on interesting research being carried out by chemists, physicists, biologists, mathematicians and engineers. The abstracts will be evaluated by experts and successful researchers will be invited to attend the “IdeasLab”. Here they will not only present their own research and its relevance to energy but will have to compete against other ideas. Groups of researchers will then work together on the most innovative and interesting approaches and, in a final round, will once more compete with the other groups to identify the most promising research applicable to energy.

This first **IdeasLab** will seek interesting research being carried out at universities and national laboratories on the “**physics and chemistry of interfaces which could be interesting for energy efficiency**”.

All aspects of physical, chemical and biological phenomena occurring at the interface (solid/liquid/gas) are addressed. Some examples of possible topics are listed below, but these are not exclusive.

IdeasLab – Possible Topics

- Capillarity
 - Nature and thermodynamics of interfaces
 - Surface films and liquid substrates
 - Humidity and oxygen barrier films
 - Aging of organic molecules (films) and synthesis of more robust molecules
 - Electrical aspects of surface chemistry
 - Mechanisms of electric conduction in organic films and intensification of charge mobility
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- Control of the position of energy levels in organic molecules
 - Long range forces
 - Interfacial transport and nanomaterials- Topology and mechanics of solid surfaces
 - Mechanics and deformation of soiled surfaces
 - Friction, lubrication and adhesion
 - Microscopy and spectroscopy of solid surfaces
 - Functional interfaces for thermal isolation: high Kapitza resistance nano-composites
 - Formation of new phase at the interface (nucleation and crystal growth)
 - Solid-liquid interface and contact angle
 - Wetting, flotation and detergency
 - Nano-hydrodynamics: giant electro-kinetic effects for energy conversion
 - Absorption from solution at solid-liquid interface
 - Emulsions, foams and aerosols
 - Macromolecular surface films, charged films, and Langmuir-Boldgett layers
 - Gas and vapour adsorption on solid surfaces
 - Chemisorption and catalysis
 - Catalytic reactions (Fischer Tropsch, combustion, biomass degradation..)
 - Atomization and sprays
 - Adsorption of CO₂ by solvents and membranes
 - Reactions in porous media (chemical reaction in geological layers, CO₂ storage in geological layers.)
 - Enzymatic electrocatalysis of hydrogen oxidation
 - Electrode supports for stability, protection, activity and strong surface concentration of enzymes
 - Design and production of enzymes for the transformation of vegetal walls in biological production of hydrogen
 - New materials for lighting
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IdeasLab - Project assessment

Topics for the IdeasLab cover a wide area in the basic disciplines. It is up to the participants to support their contribution to the event by providing written evidence of the following criteria, which will be used by the jury to assess the applications:

- originality and creativity of the idea
- its well established scientific basis and its consistency with the basic laws of the corresponding discipline
- skill, care and thoroughness in carrying out the study
- reasoning and clarity in the interpretation of the results
- relevance of the subject and the idea to energy and the contribution of the idea to one or several energy supply means

IdeasLab - Who can take part?

All very active, communicative scientists and technologists can apply to participate in the IdeasLab. Candidate selection will be made based on the personality of the applicant as well as the scientific quality of his or her contribution. Successful candidates must fulfil both conditions. The final choice will be made by the Director of the Ideas Laboratory.

Parallel to proposal submission potential candidates should submit a two page curriculum vitae.

Candidate selection will be made based on the following criteria:

- Personality (communicative, willing to collaborate, challenge seeking, risk taking..)
- Scientific quality of his/her contribution
- Gender and experience balance

There are no age or degree restrictions but candidates with a Ph.D. degree and a few years of research experience are encouraged to participate.

The number of selected participants for the final event is limited to 15 persons.

To apply please refer to the application form: [PDF-file](#)
or to the application form : [MSWord-file](#)

IdeasLab - Jury

The Jury is composed of 6 members of international reputation. They will carry out their duties as individuals and not as representatives of an institution or country. Members of the Jury are selected on the basis of scientific criteria; they are drawn from both academia and industry. They are appointed by the INNER committee, based on the proposal of the Ideas Lab Director, who will ensure an appropriate geographical balance when constituting the Jury.

Ideas Lab - The prizes

The contestants compete for the CNRS-ADEME Prize (€5000) based on their previous work and the ideas developed through the brain storming during the Ideas Lab. In addition, two “front runner” awards will be presented to successful contestants.

IdeasLab - Where?

Ideas Laboratory will be held in La Villa Clythia of CNRS at Fréjus located in Provence, France.

Fréjus is easy to access:

- By railways: TGV to Saint Raphaël (3 km – 2 miles) and bus or shuttle service to Fréjus/Valescure.
- By roads: Michelin road [maps](#) n° 84 and n° 245. A8 leave Fréjus, head for Cannes (N7 and N98).
- By plane: Nice (70 km – 45 miles), Toulon (90 km – 55 miles), Marseille (140 km – 85 miles)



Fréjus

IdeasLab – Costs

Participation to the IdeasLab is free of charge. Travel expenses of the participants will be the responsibility of the INNER representative of their home country where

reimbursement will follow national laws and regulations. Other expenses will be paid for by CNRS (Centre National de la Recherche Scientifique – France).

IdeasLab - How to apply?

Interested individuals are requested to submit a four page abstract of their contribution, a CV and the application form by mail simultaneously to:

H. Peerhossaini – Ideas Lab Director (hassan.peerhossaini@univ-nantes.fr) and R. Lopez – secretariat (carnot@univ-perp.fr).

IdeasLab - Dates

- Deadline for submission of abstracts, CV and application form: September 14, 2008
- Notification of acceptance and invitation for participation: October 15, 2008
- IdeasLab Contest: November 8-12, 2008