

Application Form

First Name

Family Name

Affiliation

Address

Zip code City

Country

Phone Fax

E-mail

Payment

- By check to "SMAI CEMRACS"
- By bank transfer
- By order form (French institutions only)

Request for financial support

(young researchers only, see General information)

- Yes
- No

Date Signature

Please return this form filled to:

*Prof. Bertrand Maury
Cemracs'08 Organizing Committee
Département de Mathématiques
Bâtiment 425
Faculté des Sciences d'Orsay
Université Paris-Sud 11
F-91405 Orsay Cedex
France*

General Information

Fees for housing and meals:

- Single room (incl. breakfast): 45 EUR per day.
- Double room (incl. breakfast): 37 EUR per day.
- Lunch / dinner: 15 EUR per meal.

Summer School Registration Fees: 180 EUR, except for

- Smai members: 133 EUR.
- junior researchers: 115 EUR.
- junior Smai members: 99 EUR.
- participants to the Research Center: free.

Application Process (according to availability): to apply to Cemracs'08, please use rather the online application form available at the following address:

<http://smai.emath.fr/cemracs/cemracs08/>

Otherwise, use the included application form and send it to the aforementioned address.

Payments - only in Euros - for the registration fees should be made by sending a check or an order form to SMAI CEMRACS, or by bank transfer to:

**SMAI - Cemracs'08,
Institut H. Poincaré
11, rue Pierre et Marie Curie
F-75231 Paris Cedex 05, France
RIB (France):
30004-00042-00010009617-27
BNP Paribas Paris Jussieu
International bank account no.:
FR76-3000-4000-4200-0100-0961-727**

A copy of the bank transfer should be enclosed with the registration form.

Payments for the housing fees will be directly made during Cemracs'08.

Please note that:

- it is possible to only attend to the Summer School,
- young researchers attending the Research Session must also attend the Summer School.

Financial Support

Junior researchers coming for the whole period to work on a project should apply for a financial support covering the local expenses. In any case, junior researchers are invited to send a CV and a letter detailing their scientific experience and their motivations to the organizing committee.

CEMRACS'08

Centre d'Été de Mathématiques
et de Recherche Avancée en Calcul Scientifique

Modelling and Numerical Simulation of Complex Fluids

CIRM, Marseille, France
July 21st - August 29th, 2008

<http://smai.emath.fr/cemracs/cemracs08/>

Lectures (July 21st - July 25th)

- **G. Biro**s (Philadelphia)
- **D. Bonn** (Paris)
- **F. Dubois** (Montpellier)
- **E. Guazzelli** (Marseille)
- **J. Hinch** (Cambridge)
- **T. Lelièvre** (Marne-la-Vallée)
- **M. Naaim** (Grenoble)
- **T. Podgorski** (Grenoble)
- **J. Prost** (Paris)
- **M. Tucsnak** (Nancy)
- **P. Villedieu** (Toulouse)



Research Session (July 28th - August 29th)

- **Main Supports: CNRS, INRIA, SMAI.**
- **Junior Researchers Grants available.**

Contacts: Bertrand Maury (Orsay),
Chaouqi Misbah (Grenoble)
cemracs@smai.emath.fr



Presentation

The Summer Mathematical Research Center on Scientific Computing and its Applications (Cemracs) will host its thirteenth international session in post graduate courses and research in applied mathematics and scientific computing from July 21st to August 29th, 2008.

This research center is primarily aimed at promoting newest achievements in applied mathematics and scientific computing while stimulating interdisciplinary interactions. The goal is to lead the research effort of scientists coming from various fields and involved either in academic research or in technology development in order to perform significant achievements in the derivation and/or the validation of original numerical techniques within the frame of applied problems of vivid interest.

Scientific Goals

Cemracs'08 is the opportunity for mathematicians and physicists to address some of the challenges in scientific computing raised by the modelling of complex fluids for industrial applications. By developing high performance numerical tools to simulate the microscopic motion of such fluids, we aim at investigating the effect of small scale phenomena onto the macroscopic behaviour of complex mixtures, such as biological fluids (red and white cells, aerosols), vesicle suspensions, actin dynamics, polymer suspensions, food fluids, shampoo, colloidal glasses, snow flows, mudflows, lavas, up to their dry limits (granular flows), etc.

This year's topics include direct simulation of coupled problems, kinetic modelling and simulation of the solid phase inside the fluid, adaptation of numerical methods for coupled problems, integration of microscopic models in numerical schemes and analysis of the numerical results from direct simulation and comparison with macroscopic models, comparison between numerical and experimental results...

Partnership

Cemracs is a SMAI (French Society of Applied and Industrial Mathematics) scientific event.

<http://smai.emath.fr/>

Cemracs General Structure

Cemracs'08 will consist in two joint events:

- a summer school on the modelling and numerical simulation of complex fluids (July 21st - July 25th),
- an intensive five-week long research session (July 28th - August 29th). A one-hour talk will be given each day in the conference room. The remaining part of the day will be devoted to the research activity inside each project team.

Summer School (July 21st - July 25th, 2008)

Lectures will be given by confirmed speakers:

- **George Biros** (Penn Engng. - Univ. Pennsylvania, USA)
An efficient numerical method for simulations of fluid membranes in shear flows.
- **Daniel Bonn** (LPS - École Normale Supérieure)
Yield stress fluids, quicksand and quickclay.
- **Frédéric Dubois** (LMGC - CNRS Montpellier)
Numerical modelling of granular materials with multi physics coupling.
- **Elizabeth Guazzelli** (GEP - CNRS Marseille)
Some problems on particulate flows.
- **John Hinch** (DAMTP - Univ. Cambridge, UK)
Microstructural studies of suspensions to find constitutive equations.
- **Tony Lelièvre** (Cermics - ENPC)
Multiscale modelling of complex fluids: a mathematical initiation.
- **Mohammed Naaim** (Etna - Cemagref Grenoble)
Snow avalanches: rheometry, physical and numerical modelling.
- **Thomas Podgorski** (LSP - CNRS Grenoble)
Deformable vesicles in hydrodynamic flows: experimental and theoretical aspects.
- **Jacques Prost** (LPC - Inst. Curie, ESPCI & Acad. Sciences)
Some issues in biological physics.
- **Marius Tucsnak** (IECN & Corida - Univ. Nancy-I)
ODE based modelling and analysis for simple fluid-structure interactions.
- **Philippe Villedieu** (IMT - INSA Toulouse & ONERA)
Some aspects of gas-particle flow modelling.

Research Session (July 28th - August 29th, 2008)

Every participant will work in a team on a project proposed by an industrial or an academic partner. Each team is composed of two young researchers assisted by one or more senior researchers. The commitment for the young researchers is to be present for the whole period of Cemracs. The commitment for the senior researchers is to ensure the management of the project, including precise definition of the subject and supervision. Other visiting scientists, interested in the ongoing research, can be associated to the program for shorter periods.

The projects are posted on the Cemracs'08 website:

<http://smai.emath.fr/cemracs/cemracs08/>

Cemracs'08 Organizing Committee

- **J.-B. Apoung-Kamga** (Lab. Math. Orsay - Paris-XI)
- **L. Boudin** (LJLL - Paris-VI & Reo - INRIA)
- **M. Ismaïl** (LSP - Grenoble-I)
- **S. Martin** (Lab. Math. Orsay - Paris-XI)
- **B. Maury** (Lab. Math. Orsay - Paris-XI), chairman
- **C. Misbah** (LSP - CNRS), chairman
- **T. Takahashi** (IECN & Corida - INRIA)

Scientific Committee

- **P. Lascaux** (CEA)
- **P. Le Tallec** (École Polytechnique)
- **P.-L. Lions** (Collège de France)
- **Y. Maday** (Univ. Paris-VI)
- **É. Pardoux** (Univ. Aix-Marseille-I)
- **O. Pironneau** (Univ. Paris-VI & Acad. des Sciences)
- **P.-A. Raviart** (CNRS)
- **D. Talay** (SMAI & INRIA)

Venue

Cemracs'08 takes place at the International Center for Mathematical Meetings (CIRM), located in the Luminy area of Marseille, France. All the facilities of the CIRM center are available for the participants 24 hours a day, 7 days a week, including its computer rooms, its library and wireless connections.

For further information about CIRM, please visit:

<http://www.cirm.univ-mrs.fr/>

