



## 4<sup>th</sup> Marseille Winter School on Multi-Scale Porous Materials

January 25-29 2016, Derrien theater, Polytech-AMU,  
Aix-Marseille University, Campus de Luminy, 13288 Marseille

Organized under the auspices of the LabEx ICoME<sup>2</sup>/CNRS/A\*Midex,  
M2UN-GdR-i/CNRS and Polytech-AMU

<http://polytech.univ-amu.fr/marseille-winter-school-on-multi-scale-porous-materials-4th-edition>

### Organizers:

- Dr. Roland Pellenq (Multi-Scale Material Science for Energy and Environment, <MSE><sup>2</sup>, the joint CNRS-MIT laboratory, CEE-MIT and Centre Interdisciplinaire des Nanosciences de Marseille, CINaM, AMU-CNRS): [pellenq@mit.edu](mailto:pellenq@mit.edu)
- Prof. Philippe Dumas (Polytech-AMU and Centre Interdisciplinaire des Nanosciences de Marseille, CINaM, AMU-CNRS): [philippe.dumas@univ-amu.fr](mailto:philippe.dumas@univ-amu.fr), [dumas@cinam.univ-mrs.fr](mailto:dumas@cinam.univ-mrs.fr)
- Dr. Christophe Bichara (Centre Interdisciplinaire des Nanosciences de Marseille, CINaM, AMU-CNRS): [bichara@cinam.univ-mrs.fr](mailto:bichara@cinam.univ-mrs.fr)
- Dr. Pierre Levitz (Physico-chimie des électrolytes et nanosystèmes interfaciaux, PHENIX, CNRS-Université Pierre et Marie Curie, Paris): [pierre.levitz@upmc.fr](mailto:pierre.levitz@upmc.fr)

### Lecturers (institution/contact info):

- Prof. Alain Baronnet (Centre Interdisciplinaire des Nanosciences de Marseille, CINaM, AMU-CNRS, Marseille): [baronnet@cinam.univ-mrs.fr](mailto:baronnet@cinam.univ-mrs.fr)
- Dr. Jérémie Berthonneau (UMI <MSE><sup>2</sup>, the joint CNRS-MIT laboratory, Cambridge, US): [jeremieb@mit.edu](mailto:jeremieb@mit.edu)
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- Dr Jean-Pierre Korb (LPMC, CNRS/Ecole Polytechnique, Palaiseau, France): [jean-pierre.korb@polytechnique.edu](mailto:jean-pierre.korb@polytechnique.edu)
- Prof. Franz Ulm (Dpt of Civil and Environmental Engineering, MIT and UMI <MSE><sup>2</sup>, the joint CNRS-MIT laboratory, Cambridge, US): [ulm@mit.edu](mailto:ulm@mit.edu)
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- Dr. Timm Weitkamp (SOLEIL Synchrotron, Gif/Yvette, France)  
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- Prof. John Williams (Dpt of Civil and Environmental Engineering, MIT, Cambridge, US): [jrw@MIT.EDU](mailto:jrw@MIT.EDU)
- Prof. Hubert Klein (Centre Interdisciplinaire des Nanosciences de Marseille, CINaM, AMU-CNRS, Marseille, pre-course on numerical methods):  
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- Prof. Bernard Bigot (ITER, the international experimental nuclear fusion reactor, Cadarache, France): [Bernard.Bigot@iter.org](mailto:Bernard.Bigot@iter.org)
- Prof. Edo Boek, (Dept. of Chemistry, University of Cambridge, UK):  
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## Program / Curriculum

- **Henri Van Damme:** Multi-Scale Porous Materials for Energy and Environment, setting up the stage
- **Alain Baronnet:** Electron microscopy for multi-scale porous materials, methods
- **Franz Ulm:** Mechanics of multi-scale porous materials, from elasticity to fracture: modeling and experiment (Parts I/II)
- **John Williams:** Meso-scale Modeling of particles: from bulk to flow properties in confined geometry
- **Emanuela Del Gado:** Soft Matter Physics; glass Physics, jamming transition and arrested dynamics, insights for numerical simulations (Parts I/II)
- **J r mie Berthonneau:** Electron microscopy for multi-scale porous materials, application to clays, cement, shale-gas...
- **Timm Weitkamp:** Tomography with Synchrotron light and the texture of multiscale porous materials
- **Pierre Levitz:** Multi-scale Porous and colloidal materials, texture and transport properties (Parts I/II)
- **Jean-Pierre Korb:** Transport properties of confined fluids from NMR relaxometry
- **Huber Klein:** Pre-course on numerical methods
- **Bernard Bigot:** Invited conference on nuclear fusion, the ITER project
- **Edo Boek:** Atomistic scale simulations of porous multiscale materials (Parts I/II)
- **Alice Dufresne:** Materials for nuclear energy

## Monday Jan. 25th:

**8h30-9h15:** Registration

**09h15-09h30:** Opening remarks, Roland Pellenq / Christophe Bichara / Philippe Dumas

**09h30-11h00:** Henri Van Damme, Multi-scale porous materials for energy and Environment, setting up the stage

**11h00-11h30:** Coffee break

**11h30-13h00:** Edo Boek, Statistical physics and computer simulation techniques over time and length scales (Part I)

**13h00-14h30:** Lunch (CROUS)

**14h30-16h30:** Emanuela Del Gado, Soft Matter physics; glass physics, jamming transition and arrested dynamics, the relevance to multi-scale materials insights from numerical simulations (Part I)

**16h30-17h00:** Coffee break

**17h00-18h30:** Alain Baronnet, Electron microscopy for multi-scale porous materials, methods

## Tuesday Jan. 26th:

**08h30-10h30:** Franz Ulm, Mechanics of multi-scale porous materials, from elasticity to fracture: modeling and experiment (Part I)

**10h30-11h00:** Coffee break

**11h00-12h30:** Emanuela Del Gado, Soft Matter Physics; glass Physics, jamming transition and arrested dynamics, insights from numerical simulations (Part II)

**12h30-14h00:** Lunch (CROUS)

**14h00-16h00:** Pierre Levitz, Multi-scale porous and colloidal materials, texture and transport properties (Part I)

**16h00-16h30:** Coffee break

**16h30-18h00:** Jérémie Berthonneau, Electron microscopy for multi-scale porous materials, application to clays, cement, shale-gas

### **Wednesday Jan. 27th:**

**08h30-10h30:** Franz Ulm, Mechanics of multi-scale porous materials, from elasticity to fracture: modeling and experiment (Part II)

**10h30-11h00:** Coffee break

**11h00-13h00:** Edo Boek, Statistical physics and computer simulation techniques over time and length scales (Part II)

**13h00-14h30:** Lunch (CROUS)

**14h30-16h30:** John Williams, Mesoscale modeling of particles, from bulk to flow in confined geometry (Part I)

**16h30-17h00:** Coffee break

**17h00-18h30:** Timm Weitkamp, Tomography with Synchrotron light and the texture of multiscale porous materials

### **Thursday Jan. 28th:**

**08h30-10h00:** Transfer by bus from Marseille Old Harbor, to the ITER reactor site, Cadarache

**10h00-15h00:** Visit of ITER / Alice Dufresne: Lecture on material science for nuclear energy (fusion / fission)

**15h00-16h30:** Transfer by bus to the Jardins du Pharo, Aix-Marseille University head quarter, 58 boulevard Charles Livon, 13284 Marseille, Cedex 7

**17h00-18h30:** Invited conferences by Bernard Bigot (ITER) on the challenges of Nuclear fusion, the ITER project

**18h30-20h00:** Cocktail reception

### **Friday Jan. 29th:**

**08h30-10h30:** Pierre Levitz, Multi-scale Porous and colloidal materials, texture and transport properties (Part II)

**10h30-11h00:** Coffee break

**11h00-12h30:** Jean-Pierre Korb, Transport properties of confined fluids from NMR relaxometry

**12h30-12h45:** Closing Remarks, Roland Pellenq / Christophe Bichara / Philippe Dumas

**12h45-14h00:** Lunch (CROUS)

## Useful tips

How to get to Luminy campus from Marseille old harbor area (Vieux Port) using Marseille public transportation system (RTM, a 40 min trip, [see map](#), ticket can be purchased from automatic machines or front desk):

- Go to metro station “Noailles (orange line/ Line #2)”
- Get on train, direction Bougainville/St Marguerite-Dromel
- Get off at Stade Vélodrome/Rond Point du Prado
- Get on bus #21 or Jet-bus
- Luminy is the final stop (campus entrance is straight ahead, go through the gates and straight on, ESIL Polytech School will be on your left after the immense “Faculté des Sciences” building, [see map](#))
- Follow the signs to Derrien theater

Or

- Go to metro station “Noailles (orange line/ Line #2)”
- Get on train, direction Bougainville/St Marguerite-Dromel
- Get off at Bougainville/St Marguerite-Dromel (last stop)
- Get on bus #24
- Luminy is the final stop (you’ll see campus entrance on your right, go through the gates and straight on, ESIL Polytech School will be on your left after the immense “Faculté des Sciences” building, [see map](#))
- Follow the signs to Derrien theater

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