

## Waves in complex media

Waves are all around us and we know that in many situations, “all waves behave in a similar way” (citation from L. Brillouin). This includes such phenomena as interference, diffraction, or scattering that can be observed with light, sound, seismic and matter waves. The universality of wave phenomena can be even stronger in complex environments where new phenomena emerge due to scattering from disorder, underlying symmetries of the system, or nonlinearity of the medium response. But it can also be lost because of peculiarities of a particular wave equation that turns out to be crucial in a specific complex environment. Our research group (*groupement de recherche*, GDR) MesoImage is aimed at the study of universal and nonuniversal aspects of wave propagation in complex environments with focus on applications for imaging and, more generally, noninvasive probing of complex media. In this spirit, the announced workshop will continue the tradition of interdisciplinary meetings that GDR organizes with participation of physicists (theoreticians and experimentalists), mathematicians, and geophysicists.

The workshop will start on Wednesday, December 11, 2013 in the morning (the first talk will be scheduled at 10:30) and end on Friday, December 13, 2013 (around 16:30). The program will include talks that will cover all GDR topics. A poster session and a social dinner will be organized on Thursday, December 12.



<http://50anscampus.alpes.cnrs.fr/>

## List of speakers

- Alexandre Aubry (Paris)  
*Recurrent scattering and memory effect at the Anderson transition*
- Denis Basko (Grenoble)  
*Disordered Josephson junction chains : Anderson localization of normal modes and impedance fluctuations*
- Matthieu Bellec (Nice)  
*Edge states in strained honeycomb lattices: a microwave experiment*
- Yann Capdeville (Nantes)  
*Homogenization methods in seismology*
- David Carpentier (Lyon)  
*Topological insulators*
- Iacopo Carusotto (Trento)  
*Exotic wave propagation phenomena in optical microdevices: from Dirac cones to Hofstadter butterflies*
- Nicolas Cherroret (Paris)  
*How interactions challenge the Anderson transition in 3D disordered atomic systems*
- Matthieu Davy (Rennes)  
*Densities of states and intensity profiles of transmission eigenchannels inside opaque media*
- Julien de Rosny (Paris)  
*Green's function retrieval and passive imaging from correlations of wideband thermal radiations*
- Marcel Filoche (Palaiseau)  
*The localization network in a disordered or random potential*
- Josselin Garnier (Paris)  
*Role of scattering in correlation-based imaging*
- Sylvain Gigan (Paris)  
*Optical imaging in scattering media*
- Vincent Josse (Palaiseau)  
*Anderson localization of matter waves*
- Geoffroy Lerosey (Paris)  
*Manipulating waves with resonant scatterers in electromagnetism and acoustics*
- George Papanicolaou (Stanford)  
*Correlation based imaging and applications*
- Francesco Riboli (Florence)  
*Engineered confinement in strongly scattering 2D photonic media*
- Alberto Rodriguez Gonzalez (Freiburg)  
*Exploiting multifractal fluctuations to characterize the Anderson transition*

- Patrick Sebbah (Paris)  
*Random laser control*
- Igor Sokolov (Saint-Petersburg)  
*Light in dense atomic gases*
- Laurent Stehly (Nice & Grenoble)  
*Distribution of sources contributing to the correlation of ambient noise in seismology*
- Kevin Vynck (Bordeaux)  
*Polarization and spatial coherence of electromagnetic waves in disordered media*
- Kees Wapenaar (Delft)  
*Seismic interferometry and beyond*
- Frédéric Wintzenrieth (Paris)  
*Light and sound in bubble polycrystals*

## Talk schedule

### Wednesday December 11, 2013

09:00 – 10:15      [Arrival & registration – Conviviality hall, Néel Institute](#)  
[Coffee](#)

**Session 1.      Grand amphitheatre of the CNRS Alpes Division**

Chair: Sergey Skipetrov

10:15 – 10:30      Welcome remarks

10:30 – 11:15      Sylvain Gigan

11:15 – 12:00      Geoffroy Lerosey

[12:00 – 14:00      Lunch – H2 restaurant](#)

**Session 2.      Auditorium Nevill Mott D420, Néel Institute**

Chair: Nicolas Cherroret

14:00 – 14:45      Iacopo Carusotto

14:45 – 15:30      Patrick Sebbah

[15:30 – 16:00      Coffee break – Maison des Magistères](#)

16:00 – 16:30      Matthieu Davy

16:30 – 17:00      Francesco Riboli

17:00 – 17:30      Kevin Vynck

17:30 – 18:00      Matthieu Bellec

### Thursday December 12, 2013

**Session 3.      Grand amphitheatre of the CNRS Alpes Division**

Chair: Ludovic Margerin

09:00 – 09:45      George Papanicolaou

09:45 – 10:30      Josselin Garnier

[10:30 – 11:00      Coffee break – Conviviality hall, Néel Institute](#)

11:00 – 11:45      Alberto Rodriguez Gonzalez

11:45 – 12:30      Marcel Filoche

[12:30 – 14:00      Lunch – H2 restaurant](#)

**Session 4.      Grand amphitheatre of the CNRS Alpes Division**

Chair: Kevin Vynck

14:00 – 14:45      Vincent Josse

14:45 – 15:15      Denis Basko

15:15 – 15:45      Nicolas Cherroret

15:45 – 16:15      Alexandre Aubry

[16:15 – 16:45      Coffee break – Conviviality hall, Néel Institute](#)

16:15 – 18:15      Poster session – Conviviality room, Néel Institute

[20:00      Workshop dinner at “Caffè Forté”](#)

## Friday December 13, 2013

### Session 5. Grand amphitheatre of the CNRS Alpes Division

Chair: Alexandre Aubry

- 09:00 – 09:45 Kees Wapenaar  
09:45 – 10:30 Yann Capdeville  
10:30 – 11:00 Coffee break – Conviviality hall, Néel Institute  
11:00 – 11:30 Julien De Rosny  
11:30 – 12:00 Frédéric Wintzenrieth  
12:00 – 14:00 Lunch – H2 restaurant

### Session 6. Grand amphitheatre of the CNRS Alpes Division

Chair: Denis Basko

- 14:00 – 14:45 David Carpentier  
14:45 – 15:30 Igor Sokolov  
15:30 – 16:15 Laurent Stehly  
16:15 – 16:45 Coffee break – Maison des Magistères  
16:45 Departure
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## List of posters

Manutea Candé (Grenoble)

*Bipartite entanglement through a random medium*

Matthieu Dupré (Paris)

*Using subwavelength gratings to design open electromagnetic cavities*

Nadège Kaina (Paris)

*Wave propagation control at the deep subwavelength scale in ordered and disordered metamaterials*

Nadège Kaina (Paris)

*Recycling radio waves with smart walls*

Amaury Badon (Paris)

*Correlations of optical noise*

Benoît Gérardin (Paris)

*Study and control of acoustic wave propagation through disordered media*

Jérémie Richard (Palaiseau)

*Ultracold atoms in disorder: 3D Anderson localization and coherent backscattering*

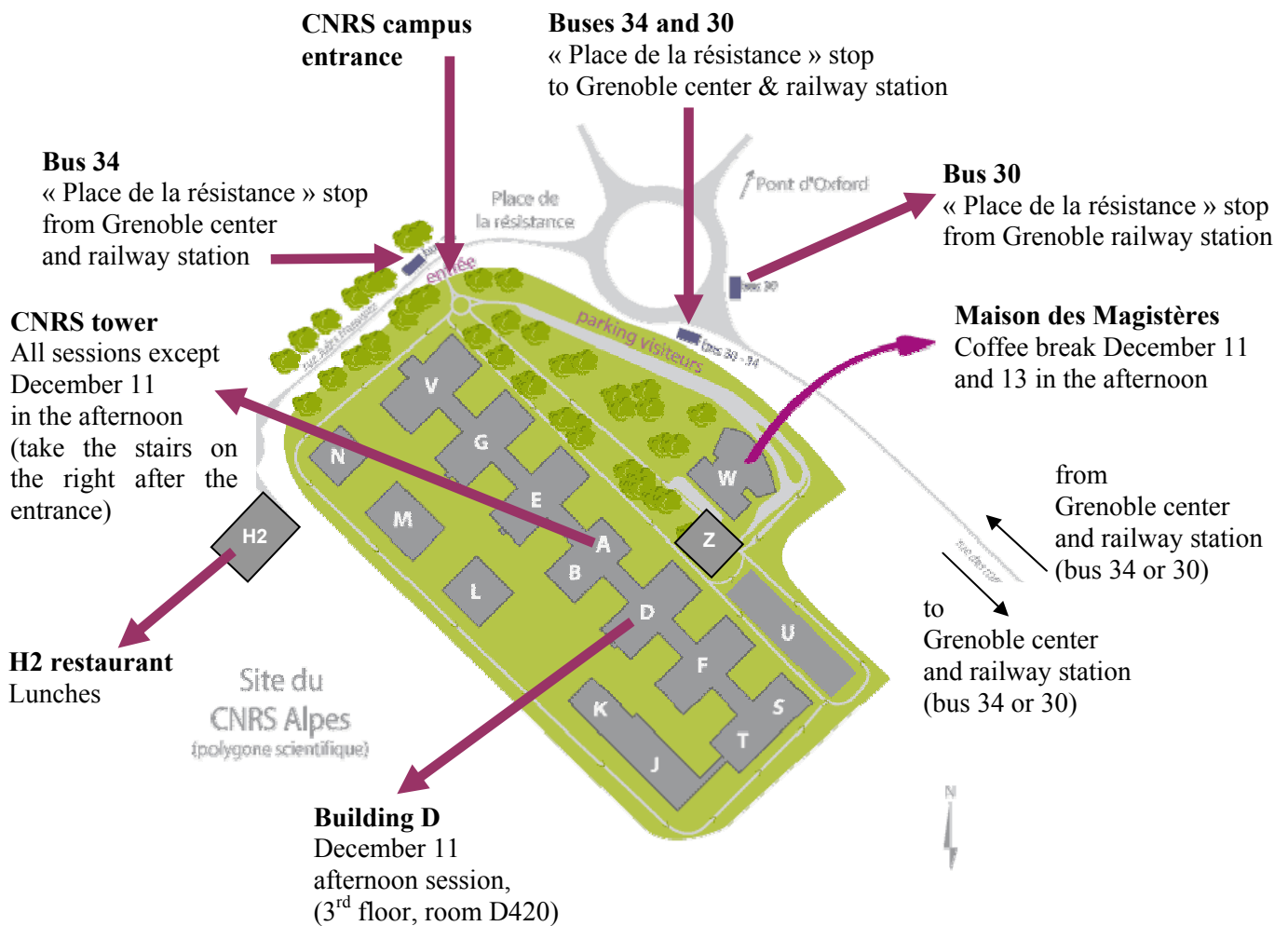
## List of registered participants

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## Directions to the workshop site

25 rue des Martyrs, 38042 Grenoble



## Directions to the restaurant « Caffè Forté »

4 place Lavalette, 38000 Grenoble. Tel.: 04.76.03.22.83

