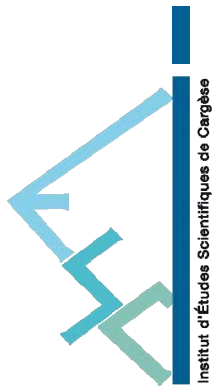


Summer school – Ecole thématique du CNRS



Waves and disorder

July 1 – 11, 2014

Institut d'Études Scientifiques de Cargèse, France

Scientific directors:

Sergey Skipetrov, Frank Scheffold and Diederik Wiersma

The School will be focused on fundamental and applied aspects of wave propagation in disordered media. Its main distinctive feature will be the common view on the problems concerning different types of waves: light, sound, elastic and matter waves.




The subject of wave propagation in disordered media is strongly interdisciplinary because in the presence of disorder all waves behave in a similar way. Widely known examples of this universality in behavior are diffusive propagation (Ohm's law for conductors), universal conductance fluctuations (observed for electrons, light, and microwaves), Anderson localization (studied with electronic, optical, micro- and matter waves). The School will introduce in detail the theoretical concepts developed for the description of random wave propagation and then will illustrate their application in a variety of modern research domains spanning from laser physics and acoustics to biomedical optics.

The community of physicists and engineers working in this field has realized the advantage of analyzing these problems in an interdisciplinary context and previous summer schools and conferences on this topic have demonstrated the success of such an approach.

The program of the School will be composed of 2-hour lectures given by world-recognized experts and providing pedagogical introductions in particular subjects, 40-min invited talks by leading, actively working researchers that will ensure a panorama of the recent research activity in the field covered by the School, and 20-min contributed talks by selected participants. All participants will have an opportunity to present a poster.



Time table – first week

	TUESDAY 01/07	WEDNESDAY 02/07	THURSDAY 03/07	FRIDAY 04/07	SATURDAY 05/07	SUNDAY 06/07	
08:45	Opening						Institute closed. Free time
	Chairperson: Skipetrov	Chairperson: Mosk	Chairperson: Muskens	Chairperson: Leonetti	Chairperson: Vynck		
09:00	Van Tiggelen 1	Van Tiggelen 2	Cao 1	Cao 2	Mason 1		
10:00	Tourin 1	Carminati 1	Delande 1	Mosk 1	Josse 1		
11:00	Coffee break						
11:30	Tourin 2	Carminati 2	Delande 2	Mosk 2	Josse 2		
12:30	Lunch (at the Institute)						
	Outdoor poster session* / Informal discussions						
16:00	Coffee						
	Chairperson: Wiersma	Chairperson: Miniatura	Chairperson: Carminati	Poster session	Chairperson: Froufe-Perez		
16:20	Froufe-Perez	Chabanov	Leonetti		Kroha		
17:00	Miniatura	Muskens	Yamilov		Zacharakis		
17:40	Marqués	Vynck	Lefebvre		Gérardin		
18:00		Bachelard	Boguslawski				
18:20		Płodzień	Zakeri				
18:40		Richard	Tanguy				
19:00		Concert					
20:00	Welcome reception	Dinner in town (on your own)					

* Posters are supposed to be put on Tuesday, July 1 and remain accessible during the whole duration of the School

Time table – second week

	<i>MONDAY</i> <i>07/07</i>	<i>TUESDAY</i> <i>08/07</i>	<i>WEDNESDAY</i> <i>09/07</i>	<i>THURSDAY</i> <i>10/07</i>	<i>FRIDAY</i> <i>11/07</i>	<i>SATURDAY</i> <i>12/07</i>	
	Chairperson: Scheffold	Chairperson: De Rosny	Chairperson: Rotter	Chairperson: Cao	Chairperson: Basko	Departure	
09:00	Mason 2	Scheffold 1	Scheffold 2	Kaiser 1	Kaiser 2		
10:00	Florescu 1	Page 1	Saenz 1	Vignolini 1	Durduran 1		
11:00	Coffee break						
11:30	Florescu 2	Page 2	Saenz 2	Vignolini 2	Durduran 2		
12:30	Lunch (at the Institute)						
Outdoor poster session* / Informal discussions							
16:00	Coffee						
	Chairperson: Tourin	Chairperson: Chabanov	Poster session	Chairperson: Yamilov	Chairperson: Saenz		
16:20	Wiersma	Basko 1		Basko 2	Sapienza		
17:20	Toninelli	Aegerter		Rotter	De Rosny		
18:00	Fink	Frank		Bakman	Tanzi		
18:20			Fink Special lecture	Dubois	Sokolov		
18:40	Muller	Espinha		Pasek	Damasceno		
19:00							
20:00	Dinner in town (on your own)		BBQ	Dinner in town (on your own)			

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Lectures

Denis Basko (Grenoble)	<i>Anderson localization in the presence of nonlinearity</i>
Hui Cao (Yale)	<i>Random lasers : physics and applications</i>
Remi Carminati (Paris)	<i>Near-field interactions, coherence and polarization in multiple scattering</i>
Dominique Delande (Paris)	<i>Kicked rotator and Anderson localization with cold atoms</i>
Turgut Durduran (Barcelona)	<i>Biomedical imaging with diffuse light</i>
Marian Florescu (Surrey)	<i>Hyperuniform disordered photonic solids</i>
Vincent Josse (Palaiseau)	<i>Anderson localization of matter waves</i>
Robin Kaiser (Nice)	<i>Multiple scattering of light by cold atoms</i>
Thomas Mason (Los Angeles)	<i>Optical microrheology</i>
Allard Mosk (Twente)	<i>Focusing light through disordered media</i>
John Page (Winnipeg)	<i>Probing Anderson transition with elastic waves</i>
Juan Jose Saenz (Madrid)	<i>Random matrix and related approaches to multiple scattering</i>
Frank Scheffold (Fribourg)	<i>Correlated disorder in photonic materials</i>
Bart van Tiggelen (Grenoble)	<i>Multiple wave scattering and Anderson localization</i>
Arnaud Tourin (Paris)	<i>Multiple scattering of ultrasound</i>
Silvia Vignolini (Cambridge)	<i>Photonic structures in nature</i>
Diederik Wiersma (Florence)	<i>Disordered materials for photovoltaic applications</i>

Special lecture

Mathias Fink (Paris)	<i>How to create 4 start-up companies from basic physics concepts?</i>
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Invited talks

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| Christof Aegerter (Zurich) | <i>Probing Anderson localization of light by weak non-linear effects</i> |
| Andrey Chabanov (San Antonio) | <i>The single-channel regime of transport through random media</i> |
| Mathias Fink (Paris) | <i>From water waves to electromagnetic wave control</i> |
| Regine Frank (Tubingen) | <i>Strong localization of light in complex random 3D finite-sized media</i> |
| Luis Froufe-Perez (Fribourg) | <i>Light emission statistics in correlated random photonic nanostructures</i> |
| Julien de Rosny (Paris) | <i>Green's function retrieval and fluctuations of cross-density of states in multiple-scattering media</i> |
| Hans Kroha (Bonn) | <i>Anderson localization of strongly interacting Bose-Einstein condensates in an optical lattice: Mott phase, superfluidity and Bose glass</i> |
| Marco Leonetti (Rome) | <i>Observation of Anderson localization of light in nonlinear nonlocal media</i> |
| Christian Miniatura (Nice & Singapore) | <i>Dynamics of localized waves in 1D random potentials: statistical theory of the coherent forward scattering peak</i> |
| Otto Muskens (Southampton) | <i>Mesoscopic light transport by very strong collective multiple scattering in nanowire mats</i> |
| Stefan Rotter (Vienna) | <i>An invariance property of wave scattering through disordered media</i> |
| Ricardo Sapienza (London) | <i>Light emission in random media, from single molecules to natural silk random lasing</i> |
| Constanza Toninelli (Florence) | <i>Single-molecule study for a graphene-based nano-position sensor</i> |
| Alexey Yamilov (Missouri) | <i>Wave localization in open random media as position-dependent diffusion: Analytical, numerical and experimental results</i> |
| Giannis Zacharakis (Heraklion) | <i>Novel photonic methods for in vivo molecular imaging</i> |

Contributed talks

Nicolas Bachelard (Paris)	<i>Adaptive pumping of random lasers</i>
Alexandra Bakman (Haifa)	<i>Effects of interactions on the dynamics of driven cold atoms</i>
Martin Boguslawski (Münster)	<i>Light in complex and defect-provided photonic structures</i>
Pablo Damasceno (Michigan)	<i>What the bees know and what they do not know</i>
Marc Dubois (Paris)	<i>Time driven subwavelength focusing with negative refraction</i>
André Espinha (Madrid)	<i>Reprogrammable two-dimensional surface patterns using multifunctional polymers</i>
Benoît Gérardin (Paris)	<i>Full transmission of waves through a maze of disorder</i>
Gautier Lefebvre (Paris)	<i>Flexural waves in plates structured with blind-hole resonators</i>
Manuel Marqués (Madrid)	<i>Effect of long-range spatial correlations on the lifetime statistics of an emitter in a two-dimensional disordered lattice</i>
Nicolas Muller (Fribourg)	<i>Fabrication and characterization of titanium dioxide photonic crystals with a nearly complete band gap</i>
Michael Pasek (Singapore)	<i>Network models of photonic Floquet topological insulators</i>
Marcin Płodzień (Krakow)	<i>Matter-wave analogue of an optical random laser</i>
Jérémie Richard (Palaiseau)	<i>Ultracold atoms and disorder: Study of a coherent propagation phenomenon, the coherent backscattering</i>
Fabrizio Sgrignuoli (Florence)	<i>Coupling between disordered photonic structure and DBT molecule: Possible chain of hybridized localized modes</i>
Sergei Sokolov (Twente)	<i>Local resonance control of high-Q coupled cavities</i>
Anne Tanguy (Lyon)	<i>Disorder and acoustic properties: Vibrations as predictors for plastic damage in glasses</i>
Luca Tanzi (Florence)	<i>One-dimensional disordered bosons from weak to strong interactions</i>
Kevin Vynck (Bordeaux)	<i>Coherence properties of polarized light in disordered media</i>
Sepideh Zakeri (Florence)	<i>Localization in one-dimensional structures with power-law correlated disorder</i>

List of participants

ACKERMANN Mirco	FRANK Regine	PARK Jongchan
AEGERTER Christof	FROUFE-PEREZ Luis	PASEK Michael
BACHELARD Nicolas	GAIO Michele	PATTELLI Lorenzo
BADON Amaury	GERARDIN Benoit	PIERRAT Romain
BAKMAN Alexandra	GIL HERRERA Luz	PLODZIEN Marcin
BASKO Denis	Carime	RICHARD Jérémie
BIBERGER Markus	GHOSH Sanjib	ROTTER Stefan
BOGUSLAWSKI Martin	GILBOA Doron	SAENZ Juan Jose
BRAKE Sebastian	HO Chih-Hua	SAPIENZA Riccardo
BRUEGGER Georges	JOSSE Vincent	SCHEFFOLD Frank
CAIXEIRO Soraya	KAISER Robin	SGRIGNUOLI Fabrizio
CAO Hui	KERHERVE Sébastien	SHCHEBLANOV Nikita
CARMINATI Rémi	KOHN Jos	SKIPETROV Sergey
CAZE Alexandre	KROHA Hans	SOKOLOV Sergei
CHABANOV Andrey	KWONG Chang Chi	TANGUY Anne
COBUS Laura	LANOY Maxime	TANZI Luca
CONTI Claudio	LEFEBVRE Gautier	TIWARI Anjani Kumar
CORTESE Lorenzo	LEPOUTRE Steven	TONINELLI Constanza
DAMASCENO Pablo	LESEUR Olivier	TOURIN Arnaud
DE AGUIAR Hilton	LI Dayan	VAN TIGGELEN Bart
Barbosa	LUIS HITA Jorge	VARTABI KASHANIAN
DE ROSNY Julien	MARMODORO Alberto	Samir
DEAN BEN Xose Luis	MARQUES Manuel	VAZQUEZ CANDANEDO
DELANDE Dominique	MARRUZZO Alessia	Omar
DI BATTISTA Diego	MASON Thomas	VIGNOLINI Silvia
DO Khanh-Van	MICHL Josef	VYNCK Kevin
DUBOIS Marc	MINIATURA Christian	WIERSMA Diederik
DURDURAN Turgut	MOSK Allard	YAMILOV Alexey
ESPINHA André	MOUNAIX Mickael	ZACHARAKIS Giannis
FAZIO Barbara	MULLER Nicolas	ZAKERI Sepideh
FINK Mathias	MUSKENS Otto	
FLORESCU Marian	PAGE John	