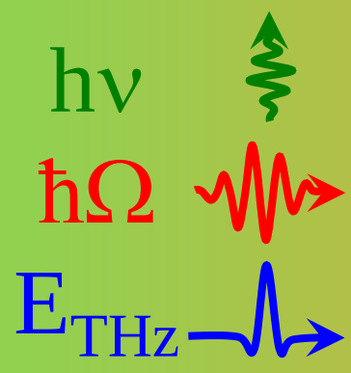
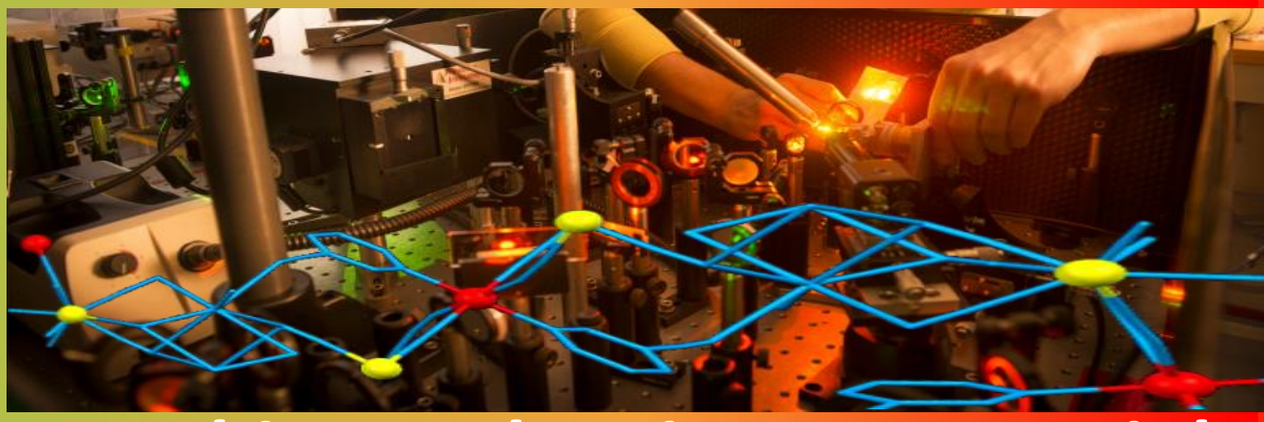
UCM2018

11th-14th June 2018 Rennes, France

International school and symposium on Ultrafast Control of Materials





Watching and acting on materials

Tokyo Tech

TOHOKU UNIVERSITY

UNIVERSITÉ DE NANTES

Le Mans Université

UNIVERSITÉ DE VERSAILLES ST-QUENTIN-EN-YVELINES

université PARIS-SACLAY

International school and symposium on

Ultrafast Control of Materials

https://ucm2018.sciencesconf.org/

Chair:

Eric Collet and Shin-ichi Ohkoshi

Scientific committee:

S. Koshihara
S. Ishihara
S. Iwai
S. Miyashita
K. Tanaka
L. Cario
P. Ruello
K. Boukheddaden

Organizing committee:

R. Bertoni
L. Guérin
M. Lorenc

Scope:

Ultrafast photoinduced phenomena
Non-linear phononics:
Electronic vs structural dynamics
Bistability and non-volatile memory and elastic field
Strong laser or electric field effects
Theory of ultrafast out-of-equilibrium transformations
Material Science
Ultrafast Techniques

Welcome

Dear Delegates, Dear Colleagues, Dear Friends,

We are very glad to welcome you to the first edition of "Ultrafast Control of Materials" school and symposium, which will be held in the new PNRB building on the Beaulieu campus of the University Rennes 1, in France, from Monday 11th to Thursday 14th June 2018.

UCM2018 aims at gathering experts interested in the study of the control of the physical properties of materials with a special focus on ultrafast science. Topics covered during this meeting will include recent advances in photoinduced phenomena, non-linear phononics, THz science, elastic cooperativity, strong electric field effects and X-FEL science. The goal of this meeting is to have intense and frank scientific exchanges in a very friendly atmosphere on the emerging topics appearing with new laser-based techniques for controlling and understanding materials at work.

Ultrafast control applies to a broad variety of materials, from hard-condensed matter to molecular materials, showing diverse changes of physical properties such as conductivity, magnetism, ferroelectricity, photochromism... The main topics are about:

- Ultrafast photoinduced phenomena and non-linear phononics: Electronic vs structural dynamics driving the switching of function
- Governing bistability in materials by photoinduced elastic field: Cooperative transformation and non-volatile memory
- Switching Correlated material by light or electric-field: Toward strong field physics
- Theory of ultrafast and out-of-equilibrium transformations
- Ultrafast techniques: X-FEL science, THz science, Pump-probe techniques

UCM2018 is supported by:

The international laboratory LIA IM-LED, the CNRS, the French Physical Society (SFP), the ANR, Rennes city, Rennes Métropole, the Université de Rennes 1, Université de Nantes, Université du Maine, Université de Versailles de Saint-Quentin-en-Yvelines, the University of Tokyo, the Tokyo Institute of Technology, the Tohoku University, and the Kyoto University.

Events

June 11th :

Welcome Reception: All participants are kindly invited to the welcome reception at 18:30 pm on June 11th in the hall of the PNRB building.

Poster session: it will start just after the welcome reception. We encourage participants to extend discussions around posters during lunch break.

June 12th :

Conference Photo: the conference photo will be taken during coffee break.

Reception at the city hall: all participants are kindly invited by:
N. Appéré, Mayor of Rennes, and
E. Couet, Président of Rennes Métropole,
to the reception organized at Rennes city hall at 18:30 pm.

June 13th :

Dinner: a friendly dinner will be organized at the "Cave à Flo". A bus will leave from the PNRB building to the "Cave à Flo" around 18h30 and will leave from "Cave à Flo" to Rennes around 21h00.

June 14th :

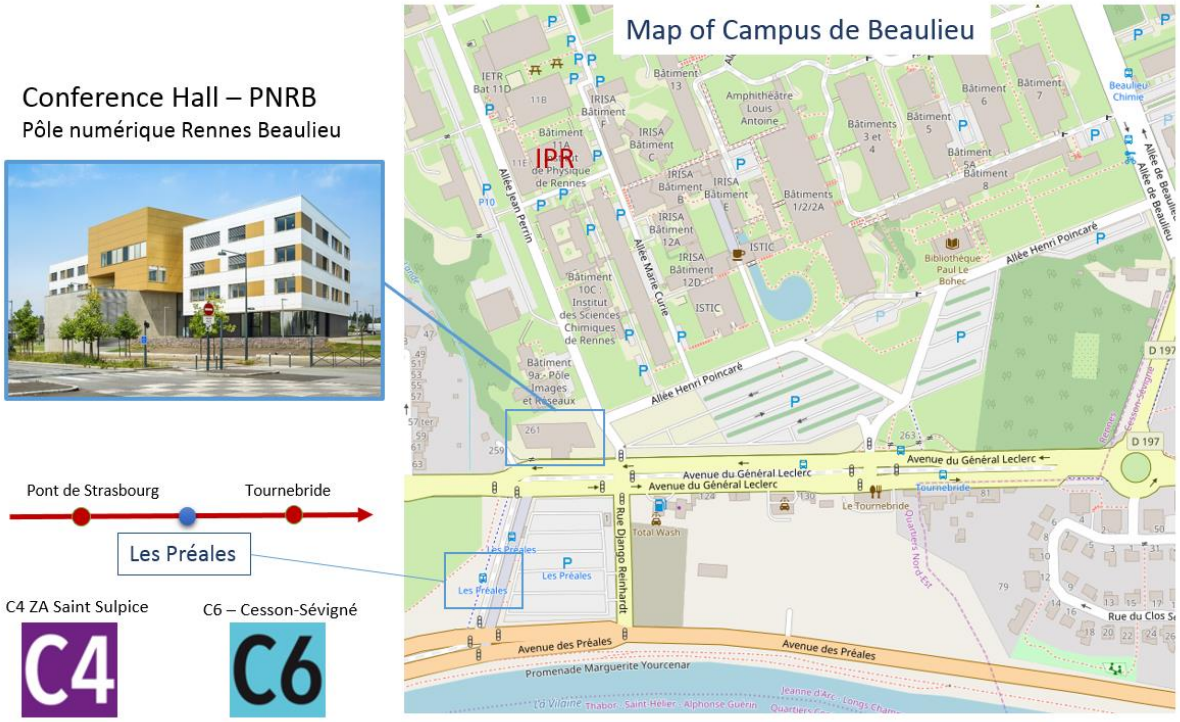
Excursion and conference banquet dinner: a lunch box will be delivered to participants before the bus departure at 13h30 for the excursion to Saint-Malo. Saint-Malo has considerable assets to satisfy your taste for discoveries as well as relaxing and physical activities, within the ramparts or along the coast. The city can boast a rich history, greatly related to the sea. The art of sailing, the spirit of explorers and corsairs, and the fishing port, exude a touch of adventure on its ramparts and so typical stones. You may also enjoy the beach and swimming in the sea. The Conference Banquet dinner will take place intra-muros 19h00 at at the "Café de l'Ouest" restaurant (4 place Chateaubriand, Saint-Malo, see map at the end of the booklet). The bus will return to Rennes at 22h30 and will arrive in Rennes around 23h30.

Lunch and Refreshments: for every participant, daily buffets will be available in the PNRB building hall. The cost is included in the registration fee. Refreshments drinks and snacks will also be provided at the coffee breaks and at the poster session.

Access :

The conference will be held at the amphitheatre TA Beaulieu in the PNRB (Pôle numérique Rennes Beaulieu) building located in the campus of Beaulieu of the University of Rennes 1.

To reach the PNRB, take the Bus C4 direction ZA Saint Sulpice or the bus C6 direction Cesson-Sévigné and stop at Les préales bus stop. Bus ticket is 1.50€. You can buy tickets directly with the bus driver or buy at ticket vending machines located in the republique subway station.



Internet access :

Wifi Acess to Eduroam network inside the campus of Beaulieu is available. Guest Wifi access is also available if necessary. Ask one of the organizer for more information, or at the reception desk.

Program of the School

Monday morning		
9:00 – 9:30	E. Collet & S. Ohkoshi: Welcome and introductory Comments	
9:30 - 10:30	H. Cailleau	Challenges in the Ultrafast Control of Materials
11:00 – 12:30	A. Subedi	Microscopic theory of nonlinear phononics
Tuesday morning		
9:00 – 10:30	M. Cammarata	XFEL Science
11:00 – 12:30	K. Tanaka	Terahertz Science – Application to Material Control
Wednesday morning		
9:00 – 10:30	S. Ishihara	Theoretical overview of transient nonequilibrium phenomena in correlated electron systems
11:00 – 12:30	L. Cario	Electric Mott transition and microelectronic applications of Mott insulators

Program of the Symposium

Monday afternoon		
14:00 – 14:30	S. Ohkoshi	Advanced spectroscopy and theoretical prediction of functional materials
14:30 – 14: 50	M. C. Richter	Bulk Half-metallicity in the Surface Electron Spin Dynamics: application to Fe3O4
14:50 – 15:10	A. Namai	Large coercive field and high frequency natural resonance phenomenon in metal-substituted ε-iron oxide nanomagnet
15:10 – 15:30	M. Yoshikiyo	First-principles phonon mode calculations of epsilon iron oxide
Coffee Break		
16:00 – 16:30	S. Ravy	Charge-density-waves as seen by time-resolved x-ray diffraction
16:30 – 16:50	M. Hada	Ultrafast time-resolved electron diffraction measurements to observe the structure and dynamics of organic molecules
16:50 – 17:10	D. Bresteau	ATTOLAB SE10: a versatile and integrated beamline for attosecond physics on gases and surfaces
17:10 – 17:30	H. Merdji	Amplification of high-order harmonics in semiconductor waveguides
17:30 – 18:00	B. Arnaud	Non-equilibrium atomic dynamics in laser excited bismuth from first principles
18:00 – 18:30		**Welcome**
18:30 – 20:30		**Poster session**

Tuesday afternoon

14:00 – 14:30	E. Abreu	Ultrafast modulation of ferroic order in TbMnO3 and Sn2P2S6
14:30 – 14: 50	E. Hertz	Harmonic generation from aligned and spinning molecules
14:50 – 15:10	D. Boschetto	Coherent phonon dynamics in misfit-layered chalcogenide LaVS3 crystal
15:10 – 15:30	N. Kirova	Theory of local phase transformations induced by femto-second pumping of excitons
Coffee Break and group photo		
16:00 – 16:30	Y. Okimoto	Ultrafast control of ferroelectric materials studied by time-resolved nonlinear spectroscopy
16:30 – 16:50	Y. Gueguen	Ultrafast photoinduced dynamics in chalcogenide glasses probed by femtosecond optical absorption
16:50 – 17:10	L. Rigutti	Investigation of the optical properties of non-metallic materials under high electric DC field using ultrafast laser assisted Atom Probe Tomography
17:10 – 17:40	K. Boukheddaden	Evidence of A New Type of Bistability in Spin-Crossover Solids Based on the Retroaction of the High Spin Low-Spin Interface with the Crystal Bending
17:50	Departure for the city Hall	
18:30 – 20:30	Reception at the City Hall	

Wednesday afternoon		
14:00 – 14:30	M. Schiro	Resonant thermalization of periodically driven strongly correlated electrons
14:30 – 15:00	S. Brazovskii	Modeling of formation and evolution of domain walls globules and networks observed under pumping in 1T-TaS_2.
15:00 – 15:30	I. Ciofini	Revealing the Origins of Mechanically-Induced Fluorescence Changes in Organic Molecular Crystals
Coffee Break		
16:00 – 16:30	C. Enachescu	Theoretical approach for elastic step in spin crossover compounds
16:30 – 16:50	R. Bertoni	Photo-induced dynamics in spin crossover materials: from molecular to material scale
16:50 – 17:10	H. Lemke	The SwissFEL Free Electron Laser: Design and first performance
17:10 – 17:30	K. Imoto	Multi-step spin-crossover and photomagnetism in a cyanido-bridged metal assembly
17:30 – 18:00	S. Miyashiya	Elastically driven expansion with various time scales
18:30	Departure for Cave à Flo	
19:00 – 21:00	Diner at Cave à Flo	
21:00	Bus to Rennes	
Thursday		

09:00 – 09:30	S. Haacke	Ultrafast excited state dynamics of NHC Fe(II) complexes lacking light-induced spin crossover
09:30 – 09:50	K. Onda	Structural Dynamics in Photofunctional Materials Studied by Time-resolved Infrared Spectroscopy
09:50 – 10:10	M. Sajadi	Nonlinear THz Spectroscopy of Liquids
10:10 – 10:30	K. Fukumoto	Imaging photogenerated electron dynamics in zero-gap to wide-gap semiconductors
Coffee Break		
11:00 – 11:30	S. Iwai	Ultrafast photonics in correlated metal & superconductor
11:30 – 11:50	C. Mariette	Real-time x-ray probing of the semiconductor to metal ultrafast phase transition in Ti_3O_5
11:50 – 12:20	E. Janod	Out-of-equilibrium Mott insulators to metal transitions under electric field
12:20 – 12:30	E. Collet & S. Ohkoshi : Closing remarks	
12:30 – 13:00	Lunch	

EXCURSION TO SAINT-MALO and conference banquet diner	
13:30	Bus departure to Saint-Malo
14:00 – 18:30	Free time and visit of Saint-Malo city and beach
18:30 – 21:30	Diner
21:30- 22:30	Bus return to Rennes

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	Monday 11	Tuesday 12	Wednesday 13	Thursday 14
9:00 10:30	Welcome E. Collet S. Ohkoshi Challenges **H. Cailleau**	X-FEL Science **M. Cammarata**	Theory ultrafast **S. Ishihara**	**S. Haacke** **K. Onda** **M. Sajadi** **K. Fukumoto**
11:00 12:30	Non linear phononics **A. Subedi**	THz science **K. Tanaka**	Mott and application **L. Cario**	**S. Iwai** **C. Mariette** **E. Janod** Conclusion E. Collet S. Ohkoshi
12:30 14:00	Lunch	Lunch & poster	Lunch & poster	Lunch
14:00 15:30	**S. Ohkoshi** **M. C. Richter** **A. Namai** **M. Yoshikiyo**	**E. Abreu** **E. Hertz** **D. Boschetto** **N. Kirova**	**M. Schiro** **S. Brazovskii** **I. Ciofini**	Excursion to Saint Malo, Visiting Saint-Malo
16:00 18:00	**S. Ravy** **M. Hada** **D. Bresteau** **H. Merdji** **B. Arnaud**	**Y. Okimoto** **Y. Gueguen** **L. Rigutti** **K. Boukheddaden** ***Departure for city Hall***	**C. Enachescu** **R. Bertoni** **H. Lemke** **K. Imoto** **S. Miyashita**	
18:30 →	Wine & cheese Posters	Reception at the city Hall	Dinner & beer	Conference dinner intra-muros at Saint-Malo