

EUPHONON Workshop

**1- 4 september 2014,
Le Mans, France**

PROGRAM

Monday 1 September

16.30 - 18.00 Registration Museum Plantagenet

18.00 - 20.00 Welcome reception, Museum Plantagenet

Tuesday 2 September

9.00 - 9.15 Introduction from EUPHONON project partners

9.15 - 10.15 Session 1: phonons and Heat

9.15 - 9.45 M. Kazan (*American University of Beirut, Lebanon*): Boltzmann model for lattice thermal conductivity in nanostructures

9.45 - 10.15 A. Narayanaswamy (*Columbia University, New York, USA*): Measurement of photon and "phonon" transport using bi-material cantilevers

10.15 - 10.45 Coffee Break

10.45 - 11.25 Session 1 : Phonon and heat

10.45 - 11.05 D. Selli, S. E. Boulfefel, P. Schapotschnikow, D. Donadio, S. Leoni (*Max Planck Institute for Polymer Research, Mainz, Germany*): PbSe crystal grain boundaries as versatile phonon scatterers

11.05 - 11.25 J. Ordonez-Miranda, L. Tranchant, T. Antoni, S. Volz (*Ecole Centrale Paris, France*): Heat Transport along Nanofilms and Nanowires due to Surface Phonon-Polaritons

11.25 - 12.15 Session 2 : Phonon and biology

11.25 - 11.55 T. Dehoux, Y. Guillet, S. Ravaine, M-C Durrieu, B. Audoin (*Univ. Bordeaux, CNRS, UMR 5295, I2M, Talence, France*): Nanoscale probing of coherent phonons in single cells

11.55 - 12.15 Y. Chalopin (*CNRS-Ecole Centrale Paris, France*): Fluctuation and dissipation of heat in a complex biological environment

12.15 - 14.00 Lunch

14.00 - 15.40 Session 3 : Couplings between phonons, electrons and spin

- 14.00 - 14.30 P. Santos (*Paul-Drude-Institut, Germany*): Acoustically driven transport and manipulation of excitons and spins in semiconductor structures
- 14.30 - 15.00 M. Betz (*Experimentelle Physik 2, TU Dortmund, Germany*): Active Plasmonics with Surface Acoustic Waves
- 15.00 - 15.20 M. Prunnila (*VTT, Finland*): Semiconductor Microcoolers
- 15.20 - 15.40 N. D. Lanzillotti-Kimura, K. O'Brien, J. S. Rho, H. Suchowski, X. Yin, X. Zhang (*Univ. California Berkeley, USA - Lab. Photoniques, Nanostructures, Marcoussis, France*): Ultrafast acousto-plasmonics in complex nanostructures

15.40 - 16.10 Coffee Break

16.10 - 17.50 Session 4 : Phonon source, coherent phonons

- 16.10 - 16.40 A. J. Kent (*University of Nottingham, UK*): Towards generation and detection of sub-terahertz coherent phonons without the need for lasers
- 16.40 - 17.10 B. Perrin (*INSP-Univ. Pierre et Marie Curie, Paris, France*): Breakdown of Herring processes for subterahertz longitudinal acoustic phonons
- 17.10 - 17.30 A. Shchepetov (*VTT, Finland*), Ultra-Thin Free-Standing Membranes for Phononics
- 17.30 - 17.50 M. Großmann, M. Klingele, P. Scheel, O. Ristow, M. Hettich, C. He, R. Waitz, M. Schubert, A. Bruchhausen, V Gusev, E. Scheer, T. Dekorsy (*Univ. Konstanz Germany, CNEA Bariloche Argentina, Univ. Maine France*): Hypersonic frequency combs in silicon membranes

19.30 Dinner

Wednesday 3 September

9.00 – 9.45 Session 5 : Phonons - perspectives

- 9.00 - 9.45 Keynote lecture: Baowen Li (*National University of Singapore, Tongji University, Shanghai and University of California, Berkeley, USA*): Thermal diode: what else can it do besides rectifying heat flux by phonons?

9.45 - 10.15 Coffee Break

10.15 - 12.35 Session 6 : Optomechanics, phonons cavity

- 10.15 - 10.45 C. Baker, D. Parrain, W. Hease, B. Guha, D.T.Nguyen, E.Gil Santos, J.Restrepo, C.Ciuti, P. Senellart, A.Lemaître, S.Ducci, G.Leo, I. Favero (*Université René Diderot, Paris, France*): Gallium Arsenide Nano-Optomechanical Systems
- 10.45 - 11.15 F. Marquardt (*University of Erlangen-Nuremberg, Germany*): Photons and phonons in optomechanical arrays
- 11.15 - 11.45 B. Jusserand (*INSP-Univ. Pierre et Marie Curie, Paris, France*): Polaritonic resonances for optomechanics

11.45 - 12.15 A. Akimov (*The University of Nottingham, UK*), Lasing from optomechanical nanoresonators

12.15 - 12.35 E. Weig.TBA

12.40 - 14.00 Lunch

14.00 - 16.00 Session 7 : Phonons, Heat

14.00 - 14.30 M. Hussein (*University of Colorado Boulder, USA*) : Nanophononic metamaterial: Thermal conductivity reduction by mechanical vibrations

14.30 - 15.00 C. Carbogno (*Fritz Haber Institute of the Max Planck Society, Germany*): Thermal Conductivities at High Temperatures from First Principles

15.00 - 15.20 F. Alzina, E. Chávez-Ángel, J. Gomis-Bresco, D. Navarro-Urrios, M. R. Wagner, S. Reparaz, C. M. Sotomayor-Torres (*ICN, Univ. Autònoma de Barcelona, ICREA, Spain*): Reduced Thermal conductivity in Nanostructures and the Intrinsic Limit of the Q-factor in Nano-Mechanical Resonators

15.20 - 15.40 S. Neogi and D. Donadio (*Max Planck Institute for Polymer Research, Mainz, Germany*): Phononic thermal transport in nanostructured ultra-thin silicon membranes"

15.40 - 16.00 V. Shalagatskyi, O. Kovalenko, V. Shumylo, D. Mounier, T. Pezeril, V.E. Gusev, D. Makarov, V.V. Temnov (*Université du Maine, France*): Ultrafast electron-phonon dynamics in gold/cobalt structures

16.00 - 16.30 G. Verley, M. Esposito, T. Willaert and C. Van den Broeck_(*Université du Luxembourg*) : Efficiency fluctuations in small machines

16.30 Visit of Old Le Mans and dinner

Thursday 4 September

9.00 - 11.15 Session 8: Phonons - perspectives

9.00 - 9.45 Plenary talk: H. Maris (*Brown University, Boston, USA*): future directions for studies and applications of coherent and incoherent phonons

9.45 - 10.15 Coffee Break

10.15 - 11.15 Plenary talk: W. Van De Velde (*European Commission - Future and Emerging Technologies*)

11.15 - 12.45 Session 9 : Phonons and heat : theory

11.15 - 11.45 F. Mauri (*IMPMC- Univ. Pierre et Marie Curie, Paris, France*): Stochastic Self-Consistent Harmonic Approximation : Inverse Isotope Effect in Palladium Hydride superconductors

11.45 - 12.15 S. Lepri (*Istituto dei Sistemi Complessi, Consiglio Nazionale delle Ricerche, Sesto Fiorentino, Italia*): Anomalous diffusion of phonons in one dimension

12.15-12.45 M. Puligheddu, R. Dettori, K. Han, C. Melis, L. Colombo (*University of Cagliari, Italy*): Lattice

thermal conductivity and interface thermal resistance in SiGe nanosystems

12.45 - 14.30 Lunch

14.30 - 16.20 Session 10 : Phonon and heat

14.30 - 15.00 O. Bourgeois (*Institut Néel, CNRS & Univ. Grenoble Alpes, France*) : Low Temperature Nanophononics: manipulating heat at the nanoscale in the regime of ballistic phonon

15.00 - 15.30 A. Goni (*ICREA-CSIC Barcelona, Spain*): Tailoring thermal conductivity in multilayered Ge/Si nanostructures

15.30 - 16.00 A. Cepellotti (*EPFL, Switzerland*): Thermal Conductivity of Graphene and Graphite: Collective Excitations and Mean Free Paths

16.00 - 16.20 J. S. Reparaz, A. El Sachat, M. R. Wagner, F. Alzina, A. Shchepetov, M. Prunnila, J. Ahopelto, C. M. Sotomayor Torres (*ICN, Barcelona, ICREA, Spain, VTT, Finland*): Influence of size and roughness on the thermal conductivity of free-standing Si membranes investigated using 2-laser Raman thermometry

16.20 - 16.50 Coffee Break

16.50 - 17.50 Session 11 : Phonons source, coherent phonons

16.50 - 17.10 M. Schubert, M. Großmann, O. Ristow, M. Hettich, C. He, R. Waitz, A. Bruchhausen, V. Gusev, E. Scheer, T. Dekorsy (*Univ. Konstanz-Germany, CNEA Bariloche-Argentina, Univ. Maine-France*): Hypersonic lamb waves in silicon membranes

17.10 – 17.30 D. Veysset, A. A. Maznev, M. Hautefeuille, T. Pezeril, S. Kooi, A. M. Lomonosov, G. Saini, K. A. Nelson (*MIT, USA*): Acoustical breakdown of materials by focused surface acoustic waves generated by laser pulses

17.30 - 17.50 M. Lejman, G. Vaudel, I. C. Infante, P. Gemeiner, V. Gusev, B. Dkhil, and P. Ruello (*Université du Maine*): Ultrafast Photogeneration of Coherent Phonons in Ferroelectrics