



Tutorials' timetable

October 14	
TIME	INSA Lyon - René Char   INSA Lyon - Chappe
08:00	Registration opening - Agora
09:00	<b>RAD-1</b> J-J. Greffet   <b>COND-1</b> J. Lukes
10:30	Break - Registration - Agora
11:00	<b>RAD-1</b> J-J. Greffet   <b>COND-1</b> J. Lukes
12:15	Lunch - Registration - Agora
13:30	<b>RAD-2</b> A. Kittel   <b>COND-2</b> O. Bourgeois
15:00	Break - Agora
15:30-16:45	<b>RAD-2</b> A. Kittel   <b>COND-2</b> O. Bourgeois
18:30-20:00	Ice breaker

Conference program

October 15		October 16		October 17		
TIME	ISC	ISC	ISC	ISC	ISC	
08:00	Registration cont'd		Registration cont'd			
08:30	Welcome address		Registration cont'd			
08:45	Welcome address		Registration cont'd			
09:00	<b>Keynote lecture 1</b> Chair: C. Sotomayor-Torres	D.G. Cahill	<b>Session 5</b> Constrictions and wires Chair: S. Merabia	V. Jean et al. X. Zianni J. Larroque et al.	<b>Session 10</b> Subwavelength radiation (2) Chair: M. Rubi	
09:20	<b>Session 1</b> Atomic simulations Chair: D. Lacroix	S. Xiong et al. E. Lampin et al. M.B. Zanjani et al.	Break		J. Mayo et al. R. Incardone et al. L. Tranchant et al. V. Kubyskyi et al. K. Joulain et al.	
09:40	<b>Session 2</b> Subwavelength radiation (1) Chair: Y. Ezzahri	P. Ben-Abdallah et al. A. Didari & M.P. Mengüç E. Blandre et al. D. Costantini et al.	<b>Poster session 2</b> (Work-in-Progress posters included)		Break	
10:00	Break - Registration		<b>Session 6</b> Surface modes Chair: K. Joulain	O. Lozan et al. S. Lang et al. J. Ordonez-Miranda et al.	<b>Keynote lecture 3</b> Chair: P-O. Chapuis	
10:20	Lunch		Lunch		Lunch	
10:40	Lunch		Lunch		Lunch	
11:10	<b>Session 3</b> Experimental heat conduction (1) Chair: S. Reparaz	M. Massoud et al. N. Zen et al. V. Lacatena et al. C. Quintero et al.	<b>Session 7</b> Experimental heat conduction (2) Chair: I. Maasilta	K. Kloppstech et al. J. Bodzenta et al. J. Jaramillo-Fernandez et al.	<b>Session 11</b> Phonons and vibrations Chair: S. Volz	
11:30	Break		<b>Session 8</b> Phonon simulations Chair: K. Termentzidis	J-P. Crocombette H. Han et al.	N. Köne et al. E. Chavez-Angel et al. S. Pailhes et al. M. Grossmann et al. B. Graczykowski et al.	
11:50	Break		Break		Closing remarks	
12:10	Break		Break		Break	
12:30	Break		Break		Break	
13:20	Break		Break		Break	
13:40	<b>Session 4</b> Numerical heat transfer Chair: E. Lampin	T. Puurtinen & I. Maasilta S. Merabia et al. K. Termentzidis & D. Lacroix J. Alotaibi & G.P. Srivastava	<b>Keynote lecture 2</b> Chair: R. Vaillon	S. Fan	G. Benenti & G. Casati I. Latella et al. R. Couderc et al. M. Shimizu et al.	
14:00	Break		Break		Break	
14:20	Break		Break		Break	
14:40	Break		Break		Break	
15:00	Break		Break		Break	
15:20	Break		Break		Break	
15:40	Break		Break		Break	
16:00	Break		Break		Break	
16:30	Break		Break		Break	
16:50	Break		Break		Break	
17:10	Break		Break		Break	
17:30	Break		Break		Break	
17:50-18:10	Break		Break		Break	
20:00-23:30	Break		Break		Break	
	Conference dinner		Conference dinner		Conference dinner	

Poster session 1	
PS1-01	J. Drevillon et al.
PS1-02	T.T.T. Nghiem et al.
PS1-03	S. Gluchko et al.
PS1-04	J. Randrianalisoa & N. Trannoy
PS1-05	W. Jaber et al.
PS1-06	N. Zhong et al.
PS1-07	H-C. Zhang et al.
PS1-08	A. Assy et al.
PS1-09	G. Kane et al.
PS1-10	M. Amara & A. Vossier
PS1-11	Y. Liu et al.
PS1-12	C.D.S. Brites et al.
PS1-13	S. Park
PS1-14	A. Bontempi et al.
PS1-15	A. Saci et al.

Poster session 2	
PS2-01	T. Stoll et al.
PS2-02	T.T.T. Nghiem & P-O. Chapuis
PS2-03	G. Okyay et al.
PS2-04	K. Horne et al.
PS2-05	Y. Ezzahri & K. Joulain
PS2-06	G. Degliame et al.
PS2-07	C. He et al.
PS2-08	E. Nefzaoui & P-O. Chapuis

Work in Progress posters	
WiP-01	B. Latour & Y. Chalopin
WiP-02	M. Nomura et al.
WiP-03	A. El Sachat et al.
WiP-04	S. Bhansali et al.
WiP-05	S. Reparaz et al.
WiP-06	S. Puupponen et al.
WiP-07	O. Vartia et al.
WiP-08	V. Mikkola et al.
WiP-09	P. Ferrando-Villalba et al.
WiP-10	A.F. Lopeandia et al.

## Conference program

**Tuesday, October 14<sup>th</sup>, 2014**

INSA de Lyon

**Introductory sessions:** concepts and state-of-the-art methods in nanoscale thermal radiation and heat conduction, both from the theory and modeling, and experimental points of view.

<b>RAD- 1</b>	<b>Jean-Jacques GREFFET</b> , Institut d'Optique, France
9h – 12h15 Coffee break: 10h30-11h	Nanoscale thermal radiation: theory and modelling

<b>COND- 1</b>	<b>Jennifer R. LUKES</b> , University of Pennsylvania, USA
9h – 12h15 Coffee break: 10h30-11h	Nanoscale thermal conduction: theory and modelling

<b>RAD- 2</b>	<b>Achim KITTEL</b> , Universität Oldenburg, Germany
13h30 – 16h45 Coffee break: 15h-15h30	Nanoscale thermal radiation: experimental methods

<b>COND- 2</b>	<b>Olivier BOURGEOIS</b> , Institut Néel, France
13h30 – 16h45 Coffee break: 15h-15h30	Nanoscale thermal conduction: experimental methods

# Conference program

**Wednesday, October 15<sup>th</sup>, 2014**

Institut des Sciences Cognitives

<b>Keynote lecture 1</b>	<b>David G. CAHILL</b> , University of Illinois at Urbana-Champaign, USA	
Chair: C. Sotomayor Torres		
9h-9h40	D.G. CAHILL, G.T. HOHENSEE and G.-M. CHOI	Coupling of heat and spin currents at the nanoscale in cuprates and metallic multilayers

<b>Session 1</b>	Atomic simulations	
Chair: D. Lacroix		
9h40-10h00	S. XIONG, Y.A. KOSEVICH, K. SÄÄKILÄHTI, Y. NI and S. VOLZ	Low thermal conductivity design with Si twinning superlattice nanowires
10h00-10h20	E. LAMPIN, P.L. PALLA, P.-A. FRANCIOSO and F. CLERI	Approach-to-equilibrium molecular dynamics: thermal properties from temperature transient
10h20-10h40	M.B. ZANJANI, A.R. DAVOYAN, A.M. MAHMOUD, N. ENGHETA and J.R. LUKES	One-way phonon transport in modulated acoustic waveguides

<b>Session 2</b>	Subwavelength radiation (1)	
Chair: Y. Ezzahri		
11h10-11h30	P. BEN-ABDALLAH, S.-A. BIEHS, K. JOULAIN and C. HENKEL	Superdiffusive heat transport in nanoparticle networks
11h30-11h50	A. DIDARI and M.P. MENGÜÇ	Near-field thermal emission between corrugated surfaces separated by nano-gaps
11h50-12h10	E. BLANDRE, P.-O. CHAPUIS, M. FRANCOEUR and R. VAILLON	Near-field thermal radiation absorbed by a flat film in the vicinity of a semi-infinite emitter
12h10-12h30	D. COSTANTINI, G. BRUCOLI, H. BENISTY, F. MARQUIER and J.-J. GREFFET	Thermal emission control with surface waves

<b>Session 3</b>	Experimental heat conduction (1)	
Chair: S. Reparaz		
14h00-14h20	M. MASSOUD, P.-O. CHAPUIS, B. CANUT, P. NEWBY, L.G. FRECHETTE and J.-M. BLUET	Thermal conductivity of porous silicon irradiated with swift heavy ions
14h20-14h40	N. ZEN, T.A. PUURTINEN, T.J. ISOTALO, S. CHAUDHURI and	Coherent control of thermal conduction in two-dimensional phononic crystals

	I.J. MAASILTA	
14h40-15h00	V. LACATENA, M. HARAS, J.-F. ROBILLARD, S. MONFRAY, T. SKOTNICKI, E. DUBOIS	Reduction of thermal conductivity in silicon thin film membranes by phononic engineering
15h00-15h20	C.M. QUINTERO, O. KRAIEVA, E.M. HERNÁNDEZ, F. CARCENAC, D. LAGRANGE, G. MOLNÁR and C. BERGAUD	Joule heated micro- and nanowires: A versatile platform for high spatial and temporal resolution thermal investigations

**Poster session 1**

15h20-16h30

J. DREVILLON, E. NEFZAOU, Y. EZZAHRI and K. JOULAIN	Radiative thermal rectification using superconducting materials
T.T.T. NGHIEM, J. SAINT-MARTIN and P. DOLLFUS	Analysis of thermal conductance of ballistic point contacts using Boltzmann Transport Equation
S. GLUCHKO, J. ORDONEZ-MIRANDA, L. TRANCHANT, Thomas ANTONI and S. VOLZ	Focusing of surface phonon-polaritons along conical and wedge polar structures
J. RANDRIANALISOA and N. TRANNOY	Modeling of heat transfer through gas molecules between a hot SThM probe and a cold sample surface
W. JABER, C. CHEVALIER and P.-O. CHAPUIS	Thermal conductances across silicon sub-mean free path sources measured with a four-probe electrical setup
N. ZHONG, S.J. GARCIA and S. VAN DER ZWAAG	Thermal conductivity restoration by disulfide-based self-healing polymers
H.-C. ZHANG, Y. ZHAO, H.-P. TAN, Y. LI and H.-Y. YU	Optimizing design of a thermal protection structure with PCs meta-material considering micro-scale transfer characteristics
A. ASSY, S. LEFEVRE, P.-O. CHAPUIS and S. GOMES	Heat transfer through the water meniscus at the tip-sample contact investigated with Scanning Thermal Microscopy
G. KANE, N. VAST and J. SJAKSTE	Thermoelectric coefficients: coupling transport equations and <i>ab initio</i> calculation
M. AMARA and A. VOSSIER	Thermal and electrical behavior of photon enhanced thermionic conversion
Y. LIU, D. TAINOFF, M. BOUKHARI, J. RICHARD, A. BARSKI, P. BAYLE-GUILLEMAUD, E. HADJI, A. ASSY, S. GOMES and O. BOURGEOIS	Thermal properties of a nanostructured Ge:Mn thin film for thermoelectricity
C.D.S. BRITES, P.P. LIMA, N.J.O. SILVA, A. MILAN, V.S. AMARAL, F. PALACIO and L.D. CARLOS	Heat transfer studies using Ln <sup>3+</sup> based nanothermometers
S. PARK	Xe-Arc Flash Lamp Crystallization of Amorphous Silicon Thin-Film for Large-Scale Displays
A. BONTEMPI, L. THIERY, D. TEYSSIEUX and P. VAIRAC	2 $\omega$ /3 $\omega$ SThM: improvements and perspectives
A. SACI, J.-L. BATTAGLIA, A. KUSIAK, R. FALLICA and M. LONGO	SThM measurement of thermal conductivity of a nanowire Sb <sub>2</sub> Te <sub>3</sub> crystal along the c-axis

<b>Session 4</b>	Numerical heat transfer	
Chair: E. Lampin		
16h50-17h10	T. PUURTINEN and I. MAASILTA	Calculation of ballistic and Casimir-limit phonon thermal conduction in thin membranes
17h10-17h30	S. MERABIA, J. LOMBARD, T. BIBEN and A. ALKURDI	Interfacial heat transport in liquids and nanobubble dynamics
17h30-17h50	K. TERMENTZIDIS and D. LACROIX	Thermal conductivity of modulated nanowires
17h50-18h10	J. AL-OTAIBI and G.P. SRIVASTAVA	A comparative study of the anharmonicity of the transverse optical phonons in lead chalcogenides

**Thursday, October 16<sup>th</sup>, 2014**

Institut des Sciences Cognitives

<b>Session 5</b>	Constrictions and wires	
Chair: S. Merabia		
9h00-9h20	V. JEAN, K. TERMENTZIDIS, S. FUMERON and D. LACROIX	Phonon transport through constrictions in silicon nanowires
9h20-9h40	X. ZIANNI	Heat transfer in modulated nanowires with variable thickness
9h40-10h00	J. LARROQUE, J. SAINT-MARTIN and P. DOLLFUS	Phonon transport in silicon nanowires using a full-band Monte Carlo approach

<b>Poster session 2</b>		
10h20-11h30		
T. STOLL, P. MAIOLI, A. CRUT, N. DEL FATTI and F VALLEE	Time-resolved measurements and quantitative analysis of the cooling dynamics of gold and gold-silica nanospheres in liquid environment	
T.T.T. NGHIEM and P.-O. CHAPUIS	Heat transfer through a triangular phononic crystal column	
G. OKYAY, Y. JOUMANI, C. BERTAIL and F. ENGUEHARD	Morphologies and radiative properties of soot particles issued from partial oxidation combustions	
K. HORNE, M. CHIRTOC, N. HORNY, T. ANTONI, S. VOLZ and H. BAN	Thermal properties of chirped superlattice structures through molecular dynamics and photothermal radiometry	
Y. EZZAHRI and K. JOULAIN	Vacuum phonon coupling through Casimir force between two solid dielectric materials	
G. DEGLIAME, N. TRANNOY, J-P. JOUART, M. DIAF, T. DUVAUT and D. CARON	Submicrometric scale thermometry: coupling of a thermal-resistive probe and a photoluminescent microcrystal	
C. HE, M. DANIEL, M. GROSSMANN, O. RISTOW, D. BRICK, M. SCHUBERT, M. ALBRECHT and T. DEKORSY	Coherent acoustic phonons in thin films of CoSb <sub>3</sub> and partially filled Yb <sub>x</sub> Co <sub>4</sub> Sb <sub>12</sub> skutterudites	
E. NEFZAQUI & P.-O. CHAPUIS	A comparative study of different numerical approaches to the Boltzmann Transport Equation for phonons	

Abstracts of the "**Work-In-Progress**" poster session are not part of the proceedings. They are provided separately.

<b>Session 6</b>	Surface modes	
Chair: K. Joulain		
11h30-11h50	O. LOZAN, M. PERRIN, B. EA-KIM, J.-M. RAMPNOUX, S. DILHAIRE and P. LALANNE	Ultrafast plasmon heat transfer around subwavelength structures
11h50-12h10	S. LANG, M. TSCHIKIN, S-A. BIEHS, P. BEN-ABDALLAH, A. PETROV and M. EICH	Large penetration depth in hyperbolic metamaterials

12h10-12h30	J. ORDONEZ-MIRANDA, L. TRANCHANT, T. ANTONI and S. VOLZ	Fresnel-like formulas for the reflection and transmission of surface phonon-polaritons at a dielectric interface
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<b>Session 7</b>	Experimental heat conduction (2)	
Chair: I. Maasilta		
14h00-14h20	K. KLOPPSTECH, N. KÖNNE and A. KITTEL	In-situ calibration of thermal sensors to measure absolute heat fluxes at the nano-scale
14h20-14h40	J. BODZENTA, M. CHIRTOC and J. JUSZCZYK	Quantitative thermal conductivity measurement by scanning thermal microscopy with nanofabricated thermal probes - methodology and modeling
14h40-15h00	J. JARAMILLO-FERNANDEZ, W. KASSEM, V. REMONDIERE, U. SOUPREMANIEN, E. OLLIER and S. VOLZ	Strain based thermal conductivity tuning on nanoscale polycrystalline AlN thin-films

<b>Session 8</b>	Phonon simulations	
Chair: K. Termentzidis		
15h00-15h20	J.-P. CROCOMBETTE	High temperature increase of the thermal conductivity of zirconium carbide explained by atomistic simulations
15h20-15h40	H. HAN, Y.A. KOSEVICH and S. VOLZ	Phonon interference and thermal conductance reduction in atomic-scale metamaterials

<b>Keynote lecture 2</b>	<b>Shanhui FAN</b> , Stanford University, USA	
Chair: R. Vaillon		
16h10-16h50	S. FAN, A. RAMAN, L. ZHU, M. ANOMA and E. REPHAELI	Nanophotonic control of thermal radiation: maximal violation of detailed balance, and experimental demonstration of daytime radiative cooling

<b>Session 9</b>	Energy conversion	
Chair: P. Ben Abdallah		
16h50-17h10	G. BENENTI and G. CASATI	Increasing thermoelectric efficiency: dynamical models unveil microscopic mechanisms
17h10-17h30	I. LATELLA, A. PÉREZ-MADRID, L.C. LAPAS and J.M. RUBI	Near-field thermodynamics and nanoscale energy harvesting
17h30-17h50	R. COUDERC, M. LEMITI and M. AMARA	Detailed analysis of heat generation in silicon solar cells
17h50-18h10	M. SHIMIZU, A. KOHIYAMA, F. IGUCHI and H. YUGAMI	Low concentration solar-thermophotovoltaic system using high-temperature photonics

**Friday, October 17<sup>th</sup>, 2014**

Institut des Sciences Cognitives

<b>Session 10</b>	Subwavelength radiation (2)	
Chair: M. Rubi		
9h00-9h20	J. MAYO, Y. TSURIMAKI, P.-O. CHAPUIS, J. OKAJIMA, A. KOMIYA, S. MARUYAMA, A. NARAYANASWAMY and R. VAILLON	Thermal radiation between two plates: regime map and analytical expressions for the net radiative heat flux from far to near field
9h20-9h40	R. INCARDONE, T. EMIG and M. KRÜGER	Heat transfer between anisotropic nanoparticles: enhancement and switching
9h40-10h00	L. TRANCHANT, J. ORDONEZ-MIRANDA, T. ANTONI and S. VOLZ	Far field diffraction of thermal Surface Phonon-Polaritons at the tip of micrometric glass tubes
10h00-10h20	V. KUBYTSKYI, S.-A. BIEHS and P. BEN-ABDALLAH	Radiative thermal memory
10h20-10h40	K. JOULAIN, Y. EZZAHRI and J. DREVILLON	Super Planckian thermal emission of subwavelength disks

<b>Keynote lecture 3</b>	<b>Bernd GOTSMANN</b> , IBM Research Zürich, Switzerland	
Chair: P.-O. Chapuis		
11h10-11h50	F. MENGES, P. MENSCH, S. KARG, A. STEMMER, H. RIEL and B. GOTSMANN	Nanoscale thermometry using scanning thermal microscopy

<b>Session 11</b>	Phonons and vibrations	
Chair: S. Volz		
13h20-13h40	N. KÖNNE, K. KLOPPSTECH and A. KITTEL	Experimental investigation of single molecule thermal conductance
13h40-14h00	E. CHÁVEZ-ÁNGEL, R.A. ZARATE, D. NAVARRO-URRÍOS, J. GOMIS-BRESCO, F. ALZINA and C.M. SOTOMAYOR TORRES	Modification of Akhieser mechanism in Si nanoresonators
14h00-14h20	S. PAILHES, V.M. GIORDANO, H. EUCHNER, R. DEBORD and M. DE BOISSIEU	The low thermal conductivity of clathrates: a phononic filter effect
14h20-14h40	M. GROSSMANN, M. KLINGELE, P. SCHEEL, O. RISTOW, M. HETTICH, C. HE, R. WAITZ, M. SCHUBERT, A. BRUCHHAUSEN, V. GUSEV, E. SCHEER and T. DEKORSY	Acoustic frequency combs as a tool for measuring adhesion in a thin two-layer system
14h40-15h00	B. GRACZYKOWSKI, J. GOMIS-BRESCO, F. ALZINA, J.S. REPARAZ, A. SHCHEPETOV, M. PRUNNILA, J. AHOPELTO and C.M. SOTOMAYOR TORRES	Acoustic phonon dispersion in ultra-thin Si membranes under static stress field