

Photon, Phonon, and Electron Transitions in Coupled Nanoscale Systems

745. WE-Heraeus-Seminar

19 - 23 September 2022

hybrid

at the Physikzentrum Bad Honnef, Germany

**WILHELM UND ELSE
HERAEUS-STIFTUNG**



Program

Sunday, 18 September 2022

17:00 – 20:00 Registration

18:00 *BUFFET SUPPER and informal get-together*

Monday, 19 September 2022

07:30 *BREAKFAST*

08:30 Scientific organizers **Welcome words**

08:40 – 09:40 Matthias Krüger **Mesoscopic theory and phenomena of fluctuational electrodynamics**

09:40 – 10:40 Philippe Ben-Abdallah **Near-field heat transfer in many-body systems: from theory to applications**

10:40 – 11:10 *COFFEE & TEA*

11:10 – 11:30 Minggang Luo **Convection-type heat transfer behavior in the asymmetric nanoparticle chains via thermal photons**

11:30 – 11:50 Refet Yalcin **Dependent scattering in thick and concentrated colloidal suspensions**

11:50 – 12:50 **Poster flashes**

12:50 – 13:00 **Conference Photo** (in the front of the lecture hall)

13:00 *LUNCH*

Program

Monday, 19 September 2022

14:30 – 15:30	Mauro Antezza	Torque and energy transfer in periodic systems
15:30 – 16:30	Yannick De Wilde	Probing the infrared thermal radiation of plasmonic patch antennas and dielectric microspheres
16:30 – 17:00	<i>COFFEE & TEA</i>	
17:00 – 18:00	Sheila Edalatpour	Modeling radiative heat transfer at the micro/nanoscale using the thermal discrete dipole approximation
18:30 – 19:30	<i>DINNER</i>	
19:30 – 21:00	Poster session I	

Program

Tuesday, 20 September 2022

07:30	<i>BREAKFAST</i>	
08:30 – 09:30	Zhenghua An	Nanoscopic imaging of nonequilibrium electron transport by scanning near-field microwave and terahertz microscope
09:30 – 10:30	Fabian Pauly	Thermal conductance of single-atom and single-molecule junctions
10:30 – 11:00	<i>COFFEE BREAK</i>	
11:00 – 12:00	Dvira Segal	Theory of electronic noise and simulations of phonon transport in molecular-scale junctions
12:00 – 12:20	Pascal Gehring	Thermocurrent spectroscopy of Yu-Shiba-Rusinov states in single-molecule junctions
12:20 – 12:40	Yury Kosevich	tba
13:00	<i>LUNCH</i>	

Program

Tuesday, 20 September 2022

14:30 – 15:30	Pierre Oliver Chapuis	Near-field radiative heat transfer in thermophotovoltaics and thermophotonics
15:30 – 16:30	Pramod Sangi Reddy	Energy transfer and conversion in nanoscale gaps
16:30 – 17:00	<i>COFFEE BREAK</i>	
17:00 – 17:20	Karthik Sasihithlu	Extended Förster's theory to include dynamic effects in resonance energy transfer
17.20 – 17.40	Roman Anufriev	Phonon mean free path in Si and SiC nanostructures linked to their thermal conductivity
17.40 – 18.00	Jean Spièce	Thermal transport in twisted 2D materials
18:30 – 19.30	<i>DINNER</i>	
19.30 – 21.00	Poster session II	

Program

Wednesday, 21 September 2022

07:30	<i>BREAKFAST</i>	
08:30 – 09:30	Vera Musilova	Effect of superconducting transition on near field heat transfer
09:30 – 10:30	Bong Jae Lee	Near-field thermal radiation and photovoltaic energy conversion
10:30 – 11:00	<i>COFFEE BREAK</i>	
11:00 – 12:00	Shanhui Fan	Non-reciprocal thermal radiation and energy harvesting
12:00 – 12:20	Ivan Latella	Solid-state pyroelectric system for near-field energy conversion
12.20 – 12.40	Omar Jesús Franca Santiago	Quantum Friction near nonreciprocal media
13:00	<i>LUNCH</i>	
14:30 – 18:00	Excursion	
18:30	<i>DINNER</i>	

Program

Thursday, 22 September 2022

07:30	<i>BREAKFAST</i>	
08:30 – 09:30	Alejandro W. Rodriguez	Limits on light–matter coupling at the nanoscale
09:30 – 10:30	Nicolas Agrait	Measuring the thermal and electrical conductance of atomic contacts using a novel hotwire-thermocouple scanning probe microscope
10:30 – 11:00	<i>COFFEE BREAK</i>	
11:00 – 12:00	Karl Joulain	Thermal rectification in quantum systems
12:00– 12:20	Riccardo Messina	Coupling between conduction and near-field radiative heat transfer in tip-plane geometry
12:20 – 12:40	Florian Herz	Generalized coupled dipole method for thermal far-field radiation
13:00	<i>LUNCH</i>	

Program

Thursday, 22 September 2022

14:30 – 15:30	Elke Scheer	Nonmonotonous temperature dependence of the thermopower of gold atomic contacts
15:30 – 16:30	Samy Merabia	Phonon transport at interfaces: from Kapitza resistance to single molecule junctions
16:30 – 17:00	<i>COFFEE BREAK</i>	
17:00 – 17:20	Ilari Maasilta	Recent progress in the theory of acoustic phonon tunneling across a vacuum gap between piezoelectric crystals
17:20 – 17:40	Mauricio Gómez Vilorio	Heat transfer modelling in the crossover regime between conduction and radiation
17:40 – 18:00	Yangyu Guo	Atomistic simulation of phonon tunneling across metallic vacuum nanogaps
18:30	<i>HERAEUS DINNER</i> <i>(social event with cold & warm buffet with complimentary drinks)</i>	

Program

Friday, 23 September 2022

07:30	<i>BREAKFAST</i>	
08:30 – 09:30	Sebastian Volz	Surface phonon-polaritons as efficient heat carriers
09:30 – 10:30	Mika Prunnila	Phonon engineering for photodetectors and solid-state refrigerators
10:30 – 11:00	<i>COFFEE BREAK</i>	
11:00 – 12:00	Eli Zeldov	SQUID-on-tip nanoscale thermal imaging: Glimpse into dissipation in quantum systems down to atomic scale
12:00 – 12:20	Sergey Sobolev	Electron-phonon coupling in metals under ultrashort laser irradiation: two-temperature model
12:20– 12:40	Raul Esquivel-Sirvent	Non-Fourier time-harmonic photothermal heating by nanoparticles
12:40 – 12:50	Scientific organizers	Closing words
13:00	<i>LUNCH</i>	

End of the seminar and departure

NO DINNER for participants leaving on Saturday; however, a self-service breakfast will be provided on Saturday morning