

# KITP Conference: Quantum and Thermal Electrodynamical Fluctuations in the Presence of Matter: Progress and Challenges

(Jul 11-14, 2022)

Coordinators: Ricardo Decca, David Dean, Alejandro Rodriguez, Lilia Woods

---

## Monday, Jul 11, 2022

8:50am	Lars Bildsten (KITP)	<a href="#">Welcome[Video]</a>
9:00am	Rudi Podgornik (UCAS)	<a href="#">Qualitative chirality effects in the Casimir-Lifshitz torque in birefringent multilayer system[Video][CC]</a>
9:45am	Jeremy Munday (UC Davis)	<a href="#">Controlling the Casimir effect with novel materials and geometries[Video][CC]</a>
10:30am	<b>Morning break</b>	
11:00am	Bong Jae Lee (KAIST)	<a href="#">Experiments of near-field thermal radiation and energy conversion[Slides][Video][CC]</a>
11:45am	Yi Zheng (Northeastern)	<a href="#">Cost-effective multifunctional photonic metamaterial for energy applications[Video][CC]</a>
	<b>Lunch</b>	
2:00pm	Zhuomin Zhang (Georgia Tech)	<a href="#">Polarized thermal emission from metamaterials described by Stokes parameters based on fluctuational electrodynamics[Slides][Video][CC]</a>
2:45pm	Haokun Li (Berkeley)	<a href="#">Phonon Coupling &amp; Mechanical Stable Equilibrium through Quantum Fluctuations[Video][CC]</a>
3:30pm	<b>Afternoon break</b>	
4:00pm	Sheng Shen (CMU)	<a href="#">Nanoplasmonic thermal emission in near- and far-fields[Video][CC]</a>
4:45pm	Shanhui Fan (Stanford)	<a href="#">Aspects of thermal radiation: time-modulated system, and chemical potential for photons[Video][CC]</a>
5:30pm	<b>SHUTTLE TO BWSCI</b>	

## Tuesday, Jul 12, 2022

9:00am	Franco Nori (RIKEN)	<a href="#">Dynamical Casimir effect in superconducting circuits[Video][CC]</a>
9:45am	Gabriel Dutier (LPL / USPN)	<a href="#">Cold atoms for Casimir-Polder measurements[Video][CC]</a>
10:30am	<b>Morning break</b>	
11:00am	Sol Carretero Palacios (UAM)	<a href="#">Quantum levitation and optical resonators[Video][CC]</a>
11:45am	Victoria Esteso Carrizo (U de Sevilla)	<a href="#">Effect of the optical response of nanostructured materials on the Casimir-Lifshitz force[Video][CC]</a>
	<b>Lunch</b>	
2:00pm	All Participants	<a href="#">Poster highlights (1 slide/3 highlight for posters)[Slides][Video][CC]</a>
2:45pm	Carsten Henkel (U Potsdam)	<a href="#">Additional Boundary Condition and Entanglement of Fluctuations[Slides][Video][CC]</a>
3:30pm	<b>Afternoon break</b>	
4:00pm	Kim Milton (Oklahoma)	<a href="#">Quantum and Casimir friction: energetics and forces[Slides][Video][CC]</a>
4:45pm	Fernando Lombardo (U. Buenos Aires)	<a href="#">Traces of Quantum Friction in the Accumulated Geometric Phase[Slides][Video][CC]</a>

5:30pm **Reception**

6:00pm **Dinner**

8:00pm **Shuttle to BWSCI**

### **Wednesday, Jul 13, 2022**

9:00am Irina Pirozhenko (JINR) [QED quantum fluctuations in the presence of half-spaces filled with topological insulators](#)[\[Slides\]](#)[\[Video\]](#)[\[CC\]](#)

9:45am Maria Belen Farias (Luxembourg) [Casimir force between Weyl semimetals in a chiral medium](#)[\[Slides\]](#)[\[Video\]](#)[\[CC\]](#)

10:30am **Morning break**

11:00am Pramod Reddy (Michigan) Radiative Heat Transfer at the Nanoscale[\[Embargoed\]](#)

11:45am Philippe Ben-Abdallah (Inst. D'Optique) [Near field radiative heat transfer in many-body systems](#)[\[Slides\]](#)[\[Video\]](#)[\[CC\]](#)

**Lunch**

2:45pm Ricardo Decca (IUPUI) [Measurement of the Casimir interaction at large separations and development of new sensors](#)[\[Video\]](#)[\[CC\]](#)

3:30pm **Afternoon break**

4:00pm Gabriele De Chiara (Queen's Belfast) [A Bose-Einstein condensate thermal engine](#)[\[Video\]](#)[\[CC\]](#)

4:45pm Kanu Sinha (Arizona State) [Engineering Casimir-Polder Interactions in Nanophotonic Systems](#)[\[Video\]](#)[\[CC\]](#)

5:30pm **Reception**

6:00pm **Dinner**

8:00pm **Shuttle to BWSCI**

### **Thursday, Jul 14, 2022**

9:00am Galina Klimchitskaya (St. Petersburg Polytechnic U) [Electromagnetic response of graphene and role of evanescent waves in resolution of the Casimir puzzle](#)[\[Slides\]](#)[\[Video\]](#)[\[CC\]](#)

9:45am Umar Mohideen (UC Riverside) [Zero-point photon scattering in real materials: lessons from precision Casimir force measurements](#)[\[Video\]](#)[\[CC\]](#)

10:30am **Morning break**

11:00am Paulo Maia Neto (UFRJ) [Probing the screening of the Casimir interaction with optical tweezers](#)[\[Slides\]](#)[\[Video\]](#)[\[CC\]](#)

11:45am Jian Sheng Wang (National U of Singapore) [Non-equilibrium Green's function method for energy, momentum, and angular momentum transfer mediated by photons](#)[\[Video\]](#)[\[CC\]](#)

**Lunch**

2:00pm Francesco Intravaia (Humboldt U) [Assessing the effects of material-modified electromagnetic fluctuations](#)[\[Slides\]](#)[\[Video\]](#)[\[CC\]](#)

2:45pm David Bishop (BU) [Casimir Metrology and the Casimir Energy](#)[\[Video\]](#)[\[CC\]](#)

3:30pm **Afternoon break**

4:00pm Gang Chen (MIT) [Absorption at liquid-vapor interface: photomolecular evaporation](#)[\[Video\]](#)[\[CC\]](#)

4:45pm Zubin Jacob (Purdue)

[Pico-electrodynamics inside matter\[Video\]\[CC\]](#)

5:30pm **CONFERENCE END SHUTTLE TO BWSCI \*Also available to SB Airport and SB Airbus, Goleta location. (See Registration Desk BEFORE THURSDAY to sign up.)**