



Seminarankündigung

**Mittwoch, 9. Mai 2018
14:30 Uhr**

WSI, Seminarraum S 101

“Cryogenic dissipation in nanoscale optomechanical cavities”

Cavity optomechanics, a field which studies the interplay between the photonic and phononic modes of an optical cavity, has seen rapid progress over the past decade. Micro/nano-scale optomechanical cavities have demonstrated potential for use in technologies such as quantum-limited metrology and transduction, as well as probes for exploring the fundamental nature of quantum mechanics. In such applications, however, dissipative coupling to the environment introduces thermal noise, causing the fragile quantum states of these resonators to decohere. It is therefore crucial to understand these dissipation mechanisms, especially at low temperatures where quantum mechanical effects become relevant. In my talk, I will discuss how we have met this challenge by constructing an optomechanical coupling apparatus on the base plate of a dilution refrigerator, capable of addressing on-chip devices at temperatures as low as 10 mK. I will detail how we have used this system to study dissipation inherent to nanoscale optomechanical systems due to intrinsic material defects. Treating these defects as two-level systems allows us to accurately model and understand the cryogenic damping of the studied devices, providing insight towards engineering future low-dissipation mechanical resonators.

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