

Webinar

Ultracold atoms and molecules for exploring Quantum Physics

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I will talk about experiments and related theoretical analyses that were done with ultracold atoms and molecules. Ultracold molecules are one of the candidates for making a quantum simulator. However, the effect of decoherence will hinder the operation of such a quantum simulator. Hence, exploring ways to minimize this decoherence is one of the aims for the current generation of experiments. In this talk, I will discuss how the trapping laser that traps our ultracold molecules adds decoherence in the system and report our experimental results of reducing it using electric and magnetic fields.

Due to their high degree of control and flexibility, ultracold atom systems are ideal candidates to simulate some aspects of quantum thermodynamics. Here, I will present the results from one of our experiments that studied the dissipative creation of super-critical Bose-Einstein Condensate (BEC). Such a BEC is not in phase equilibrium with its thermal environment. I will also briefly talk about a proposal to build a single atom quantum heat engine on which we are currently working.

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4:00 PM