



Physical Sciences Seminar

Interacting gases of ultra-cold excitons and exciton-polaritons in 2D semiconductors

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The field of quantum gases owns its rapid development to the outstanding synergy of theory and experiment. A dilute interacting gas admits analytical perturbative treatment. On the experimental side, the crucial tool has been the technique of Feshbach resonance, which has allowed to test the predictions of the theory in controllable fashion. Excitons and exciton-polaritons addressed in this talk are elementary excitations in direct bandgap semiconductor heterostructures. In typical conditions these excitations form a dilute Bose gas, which (with some complementary effort) can be cooled and Bose-Einstein condensed. Important difference of the excitonic condensates from their atomic counterpart is their purely 2D character. Due to the properties of 2D kinematics, two-body interactions of ultra-cold excitons are generically weak. We shall discuss what could be an analog of the Feshbach resonance in this case and present possible evidence of the phenomenon in recent experiments. The associated many-body phases suggest intriguing applications, which can be realized on the basis of the existing semiconductor technology.

Tuesday, August 27, 2019 11:00am - 12:00pm

Heinzel Seminar Room / Office Bldg West (I21.EG.101)



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