

**Plenary Talk**

PV XIII Fri 9:45 e415

**Polaritons in two dimensional semiconductors** — ●ATAC  
IMAMOGLU — ETH Zurich

Reversible coupling of excitons and photons in intrinsic semiconductor quantum wells embedded inside a microcavity has been used to study non-equilibrium condensation and superfluidity of cavity polaritons. In this talk, I will present a new paradigm for polariton physics consisting of a charge tunable transition metal dichalcogenide monolayer embedded in an open fiber-cavity structure. Thanks to ultralarge

exciton binding and the associated strong cavity coupling, this system exhibits robust polariton modes even in the presence of a two dimensional electron gas. As the electron density is increased from zero, the oscillator strength determined from polariton splitting is gradually transferred from the exciton transition to the trion transition. The lineshape of the lower and upper trion-polaritons as well their dispersion deviate substantially from a simple coupled oscillator model that is applicable to the exciton transition. Our system constitutes a new regime for mobile quantum impurity problem and paves the way for investigation of polariton-electron Bose-Fermi mixtures.