

# ISGD7

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## **Excitons in a moiré lattice: A new platform for supersolids**

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Supersolid, an elusive state of matter that is both solid- and superfluid-like, has evaded experimental detection for decades until its recent discovery in cold atom experiments. The emergence of moiré materials presents a new platform to realize supersolids in solid-state materials. In this talk, I will first discuss how to create an equilibrium exciton fluid in Coulomb-coupled moiré double layers by controlling the relative interlayer concentration of electrons. I will then discuss how to utilize the exciton-electron repulsion in a Bose-Fermi mixture to realize an excitonic density wave: An exciton fluid that spontaneously breaks the translational symmetry of the moiré lattice. The new state of matter promises future detection of excitonic supersolidity.