

**Plenary Talk**

PLV III Mon 14:00 HSZ/0002

**Simulating the Hubbard model with moiré semiconductors —**

•JIE SHAN — Max Planck Institute for the Structure and Dynamics of Matter — Cornell University

The Hubbard model is a simple theoretical model of interacting quantum particles in a lattice. It is believed to capture the essential physics of many strongly correlated phenomena, such as high-temperature superconductivity, magnetism, and metal-insulator transitions, but has proved difficult to solve accurately except in one dimension. Physical

realizations of the Hubbard model therefore have a vital role to play in the study of correlation physics. Moiré materials, formed by overlaying two van der Waals materials of slightly different orientations or lattice constants, have recently emerged as a promising Hubbard model simulator. In this talk, I will review the recent experimental progress on the realization of both the triangular and honeycomb lattice Hubbard models, and how the electronic phase diagram evolves with the  $U/W$  ratio (where  $U$  and  $W$  denote the onsite Coulomb repulsion and the moiré bandwidth, respectively).