



Moiré excitons in a van der Waals heterostructure

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In van der Waals (vdW) heterostructures formed by stacking two monolayer semiconductors, lattice mismatch or rotational misalignment introduces an in-plane moiré superlattice. While it is widely recognized that a moiré superlattice can modulate the electronic band structure and lead to novel transport properties including unconventional superconductivity and insulating behavior driven by correlations, its influence on optical properties has not been investigated experimentally. I will present spectroscopic evidence for localized quantum-dot-like states arising from the moiré potential in a high-quality $\text{MoSe}_2/\text{WSe}_2$ heterobilayer with a small rotational twist. These results demonstrate the feasibility of engineering artificial excitonic crystals using vdW heterostructures for nanophotonics and quantum information applications.

Xiaoqin Li received her B.S degree from Beijing Normal University in 1997 and PhD in physics in 2003 from University of Michigan. She was a postdoc fellow at JILA, Colorado from 2003-2006. She started as an assistant professor at UT-Austin in 2007 and was promoted to full professor in 2018. Prof. Li has received a number of awards including the Presidential Early Career Award for Scientists and Engineers in the U. S. and a Sloan Fellowship. She held a Humboldt Fellowship in 2015-2016 when she visited the Technical University of Berlin. She is a fellow of the American Physics Society.