Scientific Achievement

Scientists observed, for the first time, an emergent flat band electronic structure in the vanadium diselenide (VSe\textsubscript{2}) bismuth selenide (Bi\textsubscript{2}Se\textsubscript{3}) heterostructure.

Significance and Impact

Topological materials could be a path to future quantum devices; however, to fully harness their potential, researchers need to understand which materials exhibit a flat band structure that can be controlled for use in devices. This study discovered a flat band structure that could be used to boost the onset temperature for superconductivity.

Research Details

- The observed emergent character of the flat band is thickness & photon energy dependent; hence, it is dependent on the interface between the layers.
- Used the ARPES and XPEEM stations of the ESM beamline at NSLS-II & the STM and TEM at the CFN to reveal the nature of the electronic structure.