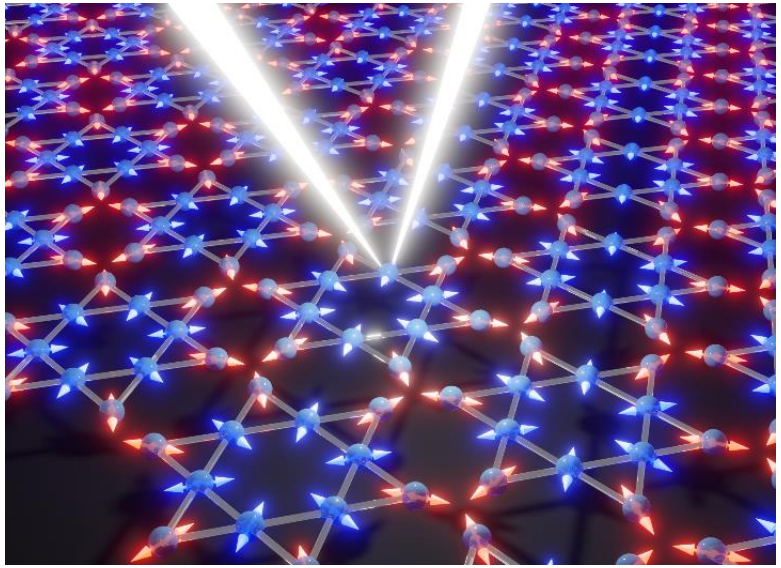
New Insights into Kagome Superconductors



In the Kagome lattice of (Cs,Rb)V3Sb5, blue and red arrows indicate motion of vanadium towards and away from the hexagon center upon formation of the CDW as observed by x-ray diffraction. The associated electronic band topology was observed by ARPES.

Scientific Achievement

Scientists revealed that the topological band structure in a Kagome superconductor can host an unconventional charge density wave.

Significance and Impact

This unconventional charge density wave (CDW) constitutes an emerging intertwined state that could provide a pathway towards using topological superconductivity for quantum computing.

Research Details

- Angle-resolved photoemission spectroscopy (ARPES) unveiled the quantum-interference-induced saddle point in the band structure of the material.
- X-ray diffraction revealed the superstructure formation caused by the bulk CDW in the material.
- ARPES and x-ray diffraction studies were done at the ESM and ISR beamlines, respectively, at NSLS-II.
- X-ray scattering studies were done at APS.
- Raman spectroscopy uncovered the softening of an electronic mode upon cooling towards the CDW.

H. Li, T. T. Zhang, T. Yilmaz, Y. Y. Pai, C. E. Marvinney, A. Said, Q. W. Yin, C. S. Gong, Z. J. Tu, E. Vescovo, C. S. Nelson, R. G. Moore, S. Murakami, H. C. Lei, H. N. Lee, B. J. Lawrie, and H. Miao, *Phys. Rev. X* ***11*** (**3**), ID