Researchers detect two-dimensional kagome surface states

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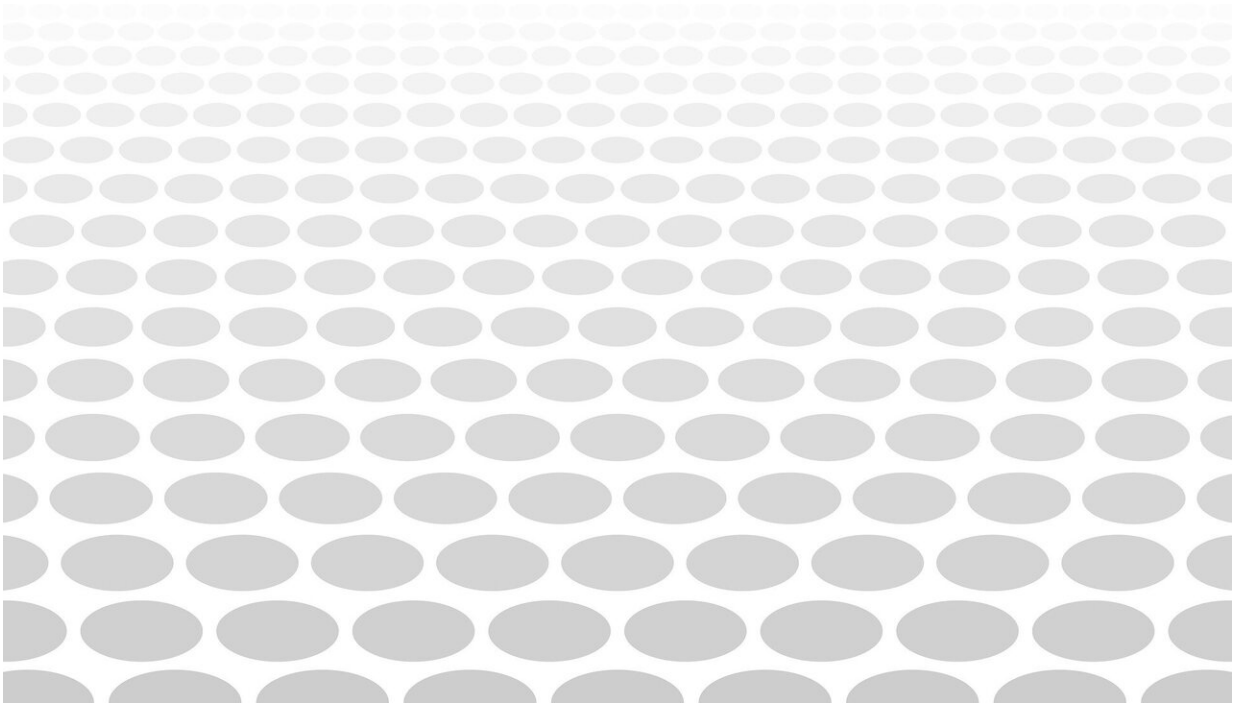

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Kogome lattices have become a new focus in the study of condensed matter physics for their novel features. However, due to the in-plane and interlayer interactions in materials, the intrinsic features of the 2D kogome lattices are often affected or even destroyed, causing the bulk states of the material to be inconsistent with its characteristic structure in theoretical calculation.

In a recent study, a research team led by Prof. He Junfeng and Prof. Qiao Zhenhua from the University of Science and Technology of China (USTC) of the Chinese Academy of Sciences and their collaborators, realized for the first time the detection for the surface states of kagome metal RV_6Sn_6 by angle resolved photoemission spectroscopy (ARPES) with real-space resolution. This work was published in *Physical Review Letters*.

Researchers studied RV_6Sn_6, the newly discovered material, which contained an independent 2D kagome lattice, by utilizing ARPES with a small beam spot.

In the experiment, the real-space mapping of the ARPES distinguished the electronic structures on different cleavage planes of RV_6Sn_6, realizing the detection for the 2D kagome surface states, and was further proved by density functional theory (DFT) calculations of its characteristic electronic structure.

This finding offers a new approach to investigating the intrinsic physics of kagome lattices.

More information: Shuting Peng et al, Realizing Kagome Band

Structure in Two-Dimensional Kagome Surface States of RV6Sn6 (R=Gd , Ho), *Physical Review Letters* (2021). DOI: 10.1103/PhysRevLett.127.266401