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Emergent quantum states visualized by the cutting-edge ARPES instruments at BESSY II

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At three end stations at BESSY II with cutting-edge angle-resolved photoemission spectroscopy (ARPES) instruments, we are able to study various electronic properties of quantum materials due to the versatile functions of our end stations. ARPES 1^3 station provides the highest energy resolution (~1 meV) at ultimately low sample temperatures (~1 K). ARPES 1^2 station allows for a broad exploration of reciprocal space and has versatile sample handling and preparation facilities. The Spin-ARPES system can detect the three components of the spin polarization vector with high energy and momentum resolutions. Here, we give examples from our recent work on three different material systems done at BESSY II: 1. Superconducting gap in the kagome superconductor CsV3Sb5. 2. Magnetic gap at the Dirac point in the topological insulator heterostructure system of Bi2Te3/MnBi2Te4 3. New type of Fermi arc in the antiferromagnet NdBi.

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