

Designed Growth and Application of Meter-scale 2D Single Crystals

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Single-crystal materials have demonstrated to be one of the main driving forces to proceed the development of high-tech industry. From the first-generation semiconductor of silicon, the second-generation of gallium arsenide to the third-generation of gallium nitride, all of them have promoted significant improvements in the performances of the electronic and optoelectronic devices. Now we are entering a “post-Moore” era, and new single-crystal materials are highly desired to accelerate the development of technologies in the 21st. Quantum materials, including two-dimensional (2D) materials, topological materials, superconducting materials, etc., are novel single crystals that are expected to bring innovative applications and launch the next industrial revolution. In this talk, I will introduce our recent progress on the interfacial engineering of 2D materials growth, the manufacturing of meter-scale 2D single crystals, and the applications of 2D materials embedded optical fiber devices. The developed materials and technologies are expected to be applied to electronic circuitry, acoustic devices, photoelectric catalysis, thermal management and other fields.