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## **The quantized anomalous Hall effect and new progress**

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The quantum anomalous Hall (QAH) effect is a quantum Hall effect induced by spontaneous magnetization and occurs in two-dimensional insulators with topologically nontrivial electronic band structure which is characterized by a non-zero Chern number. It was first experimentally observed in thin films of magnetically doped (Bi,Sb)<sub>2</sub>Te<sub>3</sub> topological insulators (TIs) in 2013, more than thirty years after the discovery of the first quantum Hall effect by Klaus von Klitzing. In this talk, I report on some recent experimental progresses in this direction. By co-doping of Cr and V into (Bi,Sb)<sub>2</sub>Te<sub>3</sub> TI films, we are able to significantly increase the observation temperature of QAH effect. More interestingly, we can construct other topological states of matter such as axion insulator, quantum spin Hall insulator and QAH insulator of high Chern number by growing QAH insulator based heterostructures.