

Particle View in Crystals

Prof. Qian NIU

University of Science and Technology of China

Date: 02/02/2024; Time: 15:00 – 16:00; Venue: N23-4018

The speaker will present a particle view of electrons in crystals based on semiclassical dynamics and describe how Berry curvatures modify thermodynamic and transport properties. He will then discuss more recent work on deformed crystals using a geodynamic language, and obtain Hall viscosity, flexoelectric and flexomagnetic responses. When the results are extended to 4d spacetime crystals, the geodynamics becomes greatly simplified and unified, allowing a fresh look of table-top general relativity.



Professor Qian NIU, Chair Professor at USTC, earned his bachelor's degree from Peking University in 1981 and his Ph.D. from the University of Washington in 1985. He worked as a postdoctoral researcher at University of Illinois and UC Santa Barbara between 1985 and 1990, then joined the faculty at The University of Texas at Austin. In 2001, he was honored with the Trull Centennial Chair Professor and later, in 2019, he was appointed the Sid W. Richardson Foundation Regents Chair Professor. Since 2021, Professor Niu is an outstanding Chair Professor at the University of Science and Technology of China. Professor Niu's research interests include quantum transport, Berry phase, spin Hall effect, cold atoms in optical lattices, and spintronics in semiconductors, among others. His prolific academic contributions include over 280 publications, including 3 Science, 6 Nature and its subjournals, 81 Physical Review Letters, 1 Reviews of Modern Physics. Over 30,000 citations with an h-index 81. He has been a fellow of the American Physical Society since 1999.