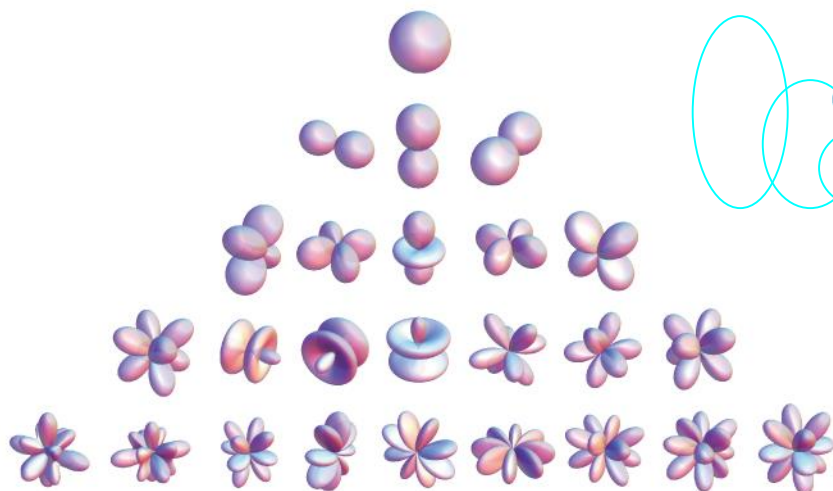


COLLOQUIUM



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Observation of Multipoles in the Solid State by Means of Ultrasound

Abstract

Ultrasonic measurement are a unique and powerful technique to probe anisotropic local charge distributions and fluctuations in solids. The principle of the ultrasonic measurement in solids is simple. (1) Ultrasonic waves propagate in a solid as elastic waves, inducing local elastic strains on the lattice. (2) The elastic strain couples to the local charge distributions via electron-phonon coupling. (3) The elastic response can be observed as a sound-velocity change. In some strongly correlated electron systems, these electric degrees of freedom cause a spontaneous symmetry breaking and induce lattice instabilities in the crystal. I briefly introduce recent progress in ultrasonic studies on rare-earth and actinide compounds under high-magnetic field and hydrostatic pressure which show an exotic multipolar orderings at low temperatures.

3:00-4:30 p.m., Friday, September 8th in McLane 162