Electronic Nematicity in Correlated Metals and Superconductors

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Nematic materials are those that break rotational symmetry spontaneously and develop directional properties below a certain temperature. They are common among soft matter such as liquid crystals, but are rare in the quantum realm. For long, scientists have speculated if electrons in a solid can become nematic due to their mutual Coulomb repulsion. And if yes, then what are the properties of such phase transitions and how to experimentally detect them. The question of detection is tricky because the atoms in the solid themselves can change shape and become directional. The Fe-based superconductors, which are celebrated for their high temperature superconductivity, are also ideal playgrounds to study the above questions related to electronic nematicity. In this talk I will provide an overview of the topic. In particular, I will discuss how nematic electronic phase transitions have unique characteristics that are due to electron-phonon interaction. I will finish by highlighting some of the open questions in the field.

Einführung: Prof. Dr. I. Eremin

Die Fakultät lädt alle Interessierten herzlich ein.