THE PHYSICS COLLOQUIUM

Thursday 2 May 2024, 4:00 p.m.
Nijenborgh 4, Lecture Hall 5111.0080

Kagome: From Basket Weaving to Josephson Diodes

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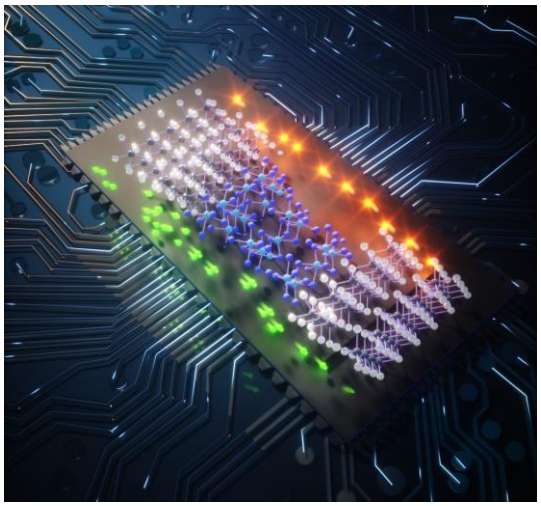

So-called Kagome (Japanese for "basket eyes") materials are those which host a 2D Kagome net, aka trihexagonal tiling, in their crystal structure. Kagome nets are formed from corner-sharing triangles of atoms and are known for hosting multiple traits: topological band structures, strong correlations, and geometric frustration.

In this platform, which often includes exfoliatable van der Waals (VdW) compounds, many exotic behaviors have been found including topological semimetal behavior, unconventional superconductivity, and even possible quantum spin liquid states.

In this talk, we will first build up the bandstructure of the Kagome net from the arrangement of the atoms and orbitals in space. We will then discuss some of the observed properties in VdW Kagome metals like the AV3Sb5 (A = K, Rb, Cs) family, where the interplay of the three traits from the Kagome net has lead to the existence of nematic superconductivity, topological surface states, and a giant extrinsic anomalous Hall effect.

We will also discuss the triangularly distorted (a.k.a. "Breathing Mode") Kagome net in the Nb3X8 family (X = Cl, Br, I); how this distortion creates a Kagome Insulator that is believed to be strongly correlated, and how it was used in creating non-reciprocal superconductivity (the Josephson Diode).

Join us for coffee starting 3:30 p.m. Refreshments will be served after the lecture.

For more information contact the host: Antonija Grubisic-Cabo (a.grubisic-cabo@rug.nl)
Website: http://www.rug.nl/research/vsi/colloquia/