Zernike Colloquium

April 4th, 2024
16:00h
5111.0022

Quantum Materials by Design

by Andrea Damascelli

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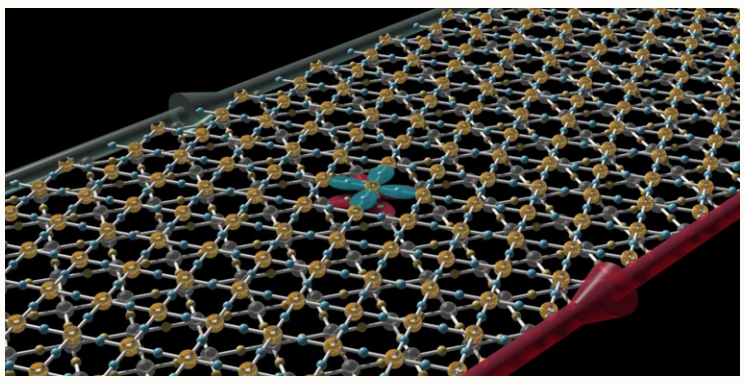
In most materials, electrons move around and scatter essentially independently of one another. In quantum materials, in contrast, electrons engage in highly correlated motions that resemble a complex dance. This gives rise to a wide range of astonishing electronic and magnetic properties that evoke the most profound questions challenging the field of condensed matter physics.

Research at the Quantum Matter Institute (QMI) at UBC seeks to unravel and exploit the complex phenomena that emerge in novel engineered materials — not only as a result of these strong electronic correlations, but also from other sources of extraordinary behavior, such as topological states or physical structures created artificially at the atomic scale.

In this talk, I will provide an overview of the ongoing Quantum Materials by Design effort at QMI, ranging from designing novel quantum phases in graphene via adatom decoration and strain engineering, to the possible realization of high-temperature topological superconductivity in twisted monolayer-thin layers of d-wave copper oxides.



Two monolayer-thin twisted d-wave superconductors may form a robust, fully gapped topological phase with spontaneously broken time-reversal symmetry and protected chiral Majorana edge modes.

Coffee from 15:30h
Drinks & Snacks after

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