Seminar/Talk

Quantum Colloquium (Title: Searching for topological superconductors using ultrasound)

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Host: Kim Modic

Superconductors come in many varieties: we typically classify them based on the symmetry of their superconducting gap, such as s, p, or d-wave. This classification, however, does not tell the entire story because the superconducting gap can also have topological structure. One route to topological superconductivity is to find a superconductor with a multi-component order parameter, such as the famed px + i py state in 3He. Multi-component order parameters can have "twists" in momentum space, forming a topological superconducting state. Finding such a superconductor, however, has proven challenging, in part due to the lack of experimental tools available. I will discuss how we use ultrasound to measure the strain susceptibility of the superconducting gap. By comparing the shear and compression susceptibilities, we can distinguish between one-component and multi-component superconductors. I will discuss our surprising discovery that Sr2RuO4 may harbour a unique, multi-component state, despite px + i py being ruled out by NMR. I will then show new data on UTe2, which has been claimed to have a multi-component order parameter that gives rise to two superconducting transitions and time reversal symmetry breaking. By performing ultrasound on samples of UTe2 with both one and two superconducting transitions, we clarify the nature of the superconducting state and are able to make crisp, symmetry-based statements about the potential multi-component gap.

Tuesday, October 10, 2023 11:00am - 12:00pm
Office Bldg West / Ground floor / Heinzel Seminar Room (I21.EG.101)

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.
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https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.