Superconducting Symmetries of Topological-Superconductor Candidate, Strontium Ruthenate

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It has been conjectured that strontium ruthenate’s superconducting gap symmetry is chiral p-wave, implying a topological fully gapped state that would support Majorana modes useful for quantum computing. In this talk, the experimental situation is reviewed and a first-principle’s calculation of possible pairing symmetries is presented. We find d-wave spin singlet close to magnetic instabilities. Away from these instabilities, where charge fluctuations increase, we find two time-reversal symmetry-breaking spin-triplets: an odd-frequency s-wave, and a doubly-degenerate inter-orbital pairing. Chiral p-wave is always subdominant.

This is joint work with Olivier Gingras (Université de Montréal), Reza Nourafkan (Université de Sherbrooke & Institut quantique), Michel Côté (Université de Montréal).


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