Spring 2025 Physics Colloquium

Friday, March 28th

3:00 PM

PAS 201 or Zoom

(https://arizona.zoom.us/j/86395646910)

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Questioning Altermagnetism in RuO2?

Abstract: Altermagnets (AMs) represent a new class of magnetic materials that exhibit properties common to both antiferromagnets (AFMs) and ferromagnets (FMs). Like AFMs, AMs have zero net magnetization, while also displaying spin band splitting, a characteristic of FMs. However, unlike the global spin band splitting in FMs, AMs exhibit momentum-dependent splitting along specific crystalline directions. This unique combination of traits enables AMs to offer superior performance compared to FMs in various applications. A prominent example of an AM candidate is metallic RuO2, where the spin band splitting arises from the 90°-rotated crystal fields between neighboring Ru atoms in the rutile structure. Experimental evidence supporting this includes spin-torque ferromagnetic resonance, laser-induced THz emission, and earlier neutron scattering data. However, more recent neutron and muon experiments suggest that Ru atoms do not carry a magnetic moment. In this presentation, we confirm that RuO_2 is not an altermagnet based on our latest experimental findings from laser-induced THz emission, magneto-Kerr rotation, and neutron scattering experiments.

**** Refreshments served in PAS 218 at 2:30 PM – 3:00 PM ****

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