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Searching for MeV-scale Dark Matter at TESSERACT

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The TESSERACT experiment will perform direct-detection searches for MeV-scale dark matter using transition-edge sensors (TESs) and multiple cryogenic target materials. The target materials (superfluid helium-4, gallium arsenide, and polar sapphire) are complementary to dark matter searches in the MeV range, and each produces photon and quasiparticle signals. Comparing these signals will allow us to discriminate between electron and nuclear recoils. Finally, we will use multiple channels and other techniques to identify and mitigate low-energy-excess (LEE) events known to plague low-mass dark matter searches. I will describe the goals and objectives of the TESSERACT experiment, before discussing SPICE and HeRALD, and the above-ground R&D efforts being undertaken toward the goal of running dark matter searches with TESSERACT underground.

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