

Thursday, August 22, 2024

Refreshments at 3:15pm outside PSF 101
Colloquium from 3:30pm - 4:30pm in PSF 101

Prospecting for Dark Matter in the Mountains of Arizona

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Abstract:

Observational anomalies from a variety of astrophysical & cosmological systems provide overwhelming evidence for dark matter. This missing mass in the Universe's energy budget does not arise from within the Standard Model of particle physics, as it is presently understood. Its identity remains a complete mystery, with proposals that span a shocking 75 orders of magnitude in mass. Nonetheless, the simple explanation that dark matter is a sort of "heavy neutrino" left over from the Big Bang remains viable and compelling. I will describe efforts to calculate the experimental predictions arising from this scenario, and efforts underway in the "indirect detection" program to observe it. My collaborators and I at the VERITAS telescope in southern Arizona have a new limit on simple, thermal-relic dark matter from our study of dwarf spheroidal satellite galaxies of the Milky Way.

Biography:

Dr. Matthew Baumgart is an Assistant Professor in the Department of Physics. He is a high energy theorist, interested in particle physics, cosmology, and gravity. His research employs effective field theory, a formalism that efficiently selects relevant degrees of freedom at an energy scale of interest. He applies it to topics in beyond the Standard Model particle physics and questions about cosmological spacetimes.