

UCLA Department of Physics & Astronomy

COLLOQUIUM

Thursday, May 4 at 4 p.m.
1-434 PAB

Dark Matter Physics With Tiny Galaxies

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Dark matter accounts for one-quarter of the universe's energy budget, but we don't know what it is. The simplest paradigm for dark matter is that it is non-relativistic, stable, and barely interacting with itself or anything else — a paradigm we call cold dark matter. Many popular particle physics models of dark matter behave cosmologically as cold dark matter. In terms of how structures in our universe form and grow, one of the strongest predictions of the standard cold dark matter paradigm is that there exists a hierarchy of structure down to Earth-mass scales. Other models of dark matter deviate from these predictions on scales of small galaxies and below. However, individual self-bound structures of dark matter--"halos"--are difficult to detect directly. Instead, we use galaxies as lampposts for halos. By counting galaxies, we can measure the underlying population of dark matter halos. In this talk, I describe how we do this counting in practice, and how it leads to new insight into the physics of dark matter. I will show what my group is doing so far to address the problem, and what opportunities lie ahead in the wide-field surveys of the 2020's.

Refreshments at 3:30 p.m. on the PAB Patio. Undergraduates Welcome!