Fantastical Dark Matter and Where to Find It

Only a small fraction of the universe is made from ordinary, visible matter. A much larger portion remains dark, its existence known to us only by its interactions through gravity. The first evidence of this dark matter originates from studies of celestial bodies in the late 1920s and early 1930s. Since that time, astrophysicists and astronomers have determined that it constitutes the bulk of matter in our universe. Despite this fact, the composition still remains unknown. In this talk, I will discuss the history of dark matter research and how scientists are trying to uncover the properties of this evasive matter.

Dr. Jodi Cooley is a Professor in the Department of Physics at SMU. She received a B.S. degree in Applied Mathematics and Physics from the University of Wisconsin in Milwaukee in 1997. She earned her Masters in 2000 and her Ph.D. in 2003 at the University of Wisconsin – Madison for her research searching for neutrinos from diffuse astronomical sources with the AMANDA-II detector. Upon graduation she did postdoctoral studies at both MIT and Stanford University. Dr. Cooley is a Principal Investigator on the SuperCDMS dark matter experiment. She has won numerous awards for her research, teaching and mentoring. In 2018 she was elected a fellow of the American Association for the Advancement of Science (AAAS) for her for contributions to the search for dark matter scattering with nuclei, particularly using cryogenic technologies.

Dr. Jodi Cooley

Professor of Physics
Chief Marshal of Academic Ceremonies
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In 2019 she was the recipient of the Klopsteg Memorial Lecture Award from the American Association of Physics Teachers (AAPT).

Dr. Cooley's current research interest is to improve our understanding of the universe by deciphering the nature of dark matter. The existence of dark matter was first postulated nearly 80 years ago. However, it wasn't until the last decade that the revolution in precision cosmology revealed conclusively that about a quarter of our universe consisted of dark matter. Dr. Cooley and her colleagues operate sophisticated cryogenic detectors. These detectors can distinguish between elusive dark matter particles and background particles that mimic dark matter interactions.