Resolving the Baryon Cycle within Nearby Galaxies

Dr. Kathryn Kreckel

Max-Planck-Institut für Astronomie, Universität Heidelberg

To understand galaxies, we must understand the physical processes and local conditions that drive their buildup of stellar mass through star formation. This evolution is regulated through the baryon cycle, the transformation of gas into stars and eventual ejection and recycling of that material to form the next generation of stars. The relevant physics occurs on the scales of individual molecular clouds, star forming HII regions and supernova remnants, only now accessible in a diverse sample of external galaxies, and ultimately requires us to map the internal ionization structure of star-forming regions, directly linking stars and gas. In this talk, I will introduce the major open questions in our study of the baryon cycle, and present recent observational results that shed light on the physical processes regulating this cycle.