26. Deutsche Physikerinnentagung

German Conference of Women in Physics

Contribution ID: **116**   Type: **Talk**

Observing Dark Matter in Galaxy Clusters with Strong Lensing and MUSE Spectroscopy

Saturday, November 26, 2022 10:00 AM (15 minutes)

Galaxy clusters are the most massive gravitationally-bound objects in the universe, and analysis of their structure can yield many fascinating answers and equally fascinating questions about the nature of the physics that holds them together. The presence of dark matter in galaxy clusters is one of the most pressing of these fascinating questions, and there are many techniques that are currently being used to study everything from the 'core-cusp' tension in cluster cores to the exact distribution of DM throughout the clusters. One of these techniques is called strong gravitational lensing, which effectively allows us to use massive objects -like galaxy clusters- as natural 'cosmic telescopes' to study highly magnified background sources. Lensing can also be used to study cluster substructure and model the dark matter distribution in these clusters. In this talk, I will discuss the use of lensing to model the mass distribution of several galaxy clusters observed with the Hubble Space Telescope (HST), which is used to identify lensed background sources, and with ground-based IFU spectroscopy from the MUSE instrument at the Very Large Telescope (VLT), which is used to measure 2-D galaxy kinematics. I will use these models to discuss how we can effectively constrain the shape of the density profiles in galaxy clusters with strong lensing, and I will additionally comment on what implications these profiles have for our overall understanding of the nature of dark matter.

Category

Particle / Astroparticle / Cosmology (Experiment)

Authors: CERNY, Catherine (Durham University); Dr JAUZAC, Mathilde (Durham University); Dr LAGAT-TUTA, David (Durham University); Dr MASSEY, Richard (Durham University); Dr EDGE, Alastair (Durham University)

Presenter: CERNY, Catherine (Durham University)

Session Classification: Physics Talks - Astroparticle Physics

Track Classification: Physics talks