

FAST Proposal Coverpage

Project Name:

Tracking the HI Gas near a Dark-Matter Deficient Galaxy Group

Project Summary:

We propose to measure the HI content in the field of the elliptical galaxy NGC 1052. This environment hosts several dark-matter deficient galaxies (DMDGs) such as NGC1052-DF2 and NGC1052-DF4. Both DMDGs are ultra-diffuse galaxies with the dark matter masses comparable or less to their stellar masses, surprisingly low considering that dwarf galaxy kinematics are usually dark matter dominated. These galaxies are believed to have little HI gas because of the hostile formation history to loss the dark matter and also their current shallow gravitational potential via dynamical stripping. Our simulation suggests that the lost HI gas clouds are distributed within the a couple hundred kpc neighborhood. This proposed experiment will examine this picture through the direct HI measurement with FAST. We will also obtain the deeper measurement to constrain HI contents in the DMDGs in the field for determining the total baryonic mass in these systems.