ASTROPHYSICS SEMINAR SERIES

Tuesday, March 19 - 12:30 pm - Rm 184 NSH

Michelle Berg, Graduate Student, University of Notre Dame

The Red Dead Redemption Survey: Cool Gas in the Halos of Massive Galaxies

Luminous red galaxies (LRGs) are some of the most massive objects and have been quiescent since z~1. According to the prevailing theory of galaxy evolution, any gas accreted into the circumgalactic medium (CGM) about these massive galaxies (log M_h ~ 13.4 M☉) should be shock-heated to very high temperatures. We put this theory to the test using a sample of 21 LRGs with QSO sightlines piercing their CGM out to a distance of 500 kpc (~Rvir). We measure the covering factor of cool (T~10^4 K) gas in their CGM to be ~30% using the limit of log(N_HI) ≥ 16. We also detect 4 Lyman limit systems (LLSs, 16 ≤ log(N_HI) ≤ 18.5 cm^-2); three of the absorbers are metal-rich ([X/H] > -1), and one is metal-poor ([X/H]≈-1.8). The metallicity distribution of the cool gas is not distinct from that found around lower-mass, star-forming galaxies at similar redshifts. While the high-metal gas could arise from condensation, the lowest metallicity gas hints that cold-mode accretion deep into the halos may be active.

Charlotte Wood, Graduate Student, University of Notre Dame

The Slowly Fading Light Echo Around Type Ia Supernova 2009ig

The light echo around Supernova 2009ig (SN2009ig) is the sixth known and most luminous around a type Ia supernova. Light echoes can provide information on the local environment around supernovae, which is particularly important for type Ias since they are used as standard candles. The presence of gas and dust in the local environment of a type Ia can affect the observed luminosity and could impact measurements of the Hubble constant. Using photometric data from the Large Binocular Telescope between 2010 and 2018, we present new observations of the SN2009ig light echo that confirm a slow fading of the echo over the past 6 years since its discovery in 2013. The fading is similar to that seen in the light echo of SN1991T and suggests that some of dust producing the echo may be local to the event.

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