The evolution of Brightest Cluster Galaxies with BEAMS

Dr Rosalind Skelton, SAAO (ros@saao.ac.za)

Other collaborators:
Matt Hilton (UKZN), Ilani Loubser (NWU), Daniél Groenewald (SAAO), Moses Mogotsi (SAAO)

Co-supervision will be discussed, with registration possible at NWU, UKZN or UCT

Project Description:

We are carrying out a large SALT programme called BEAMS (PI: Matt Hilton) to explore the evolution of brightest cluster galaxies (BCGs) from $0.3 < z < 0.8$. The galaxies are selected from the Advanced ACT survey, which finds clusters using the Sunyaev-Zeldovich (SZ) effect, with a well-defined selection function that is relatively independent of cluster mass across a wide range of redshifts. We are using SALT spectroscopy to target the central galaxy in approximately 150 of these clusters, and data for most of the sample is already in hand. The clusters will also be observed by MeerKAT and some radio data has already been taken. By stacking the optical spectra in mass and redshift bins we will explore the evolution of the stellar populations and AGN feedback in massive galaxies in dense environments. We will determine what fraction of BCGs have nearby companions, with the aim of measuring the merger fraction and how much they grow in mass through mergers (see Groenewald et al. 2017). The SALT spectroscopy will help constrain what fraction of these companions are bound to the BCGs rather than projected as pairs, and together with the available multi-wavelength data, will allow us to study the properties of the BCGs in detail, correlating merger activity with star formation histories, the characteristics of the central AGN and the cluster environment.

Useful links:
BEAMS webpage https://astro.ukzn.ac.za/~beams/
ACT clusters, Hilton et al. 2018 http://adsabs.harvard.edu/abs/2018ApJS..235...20H
BCG growth through mergers, Groenewald et al. 2017
http://adsabs.harvard.edu/abs/2017MNRAS.467.4101G