Hwihyun Kim

I have a set of JHK imaging data from Magellan+FourStar on NGC 7793, nearby star forming galaxy. The goal of the project for the visiting student will be to reduce the data using THELI, extract the stellar clusters, and do photometry. I have HST data for the same galaxy and the positions of star clusters extracted from the HST data. So the student will match the clusters extracted from the FourStar data to those from the HST data.

The scientific goal of the project is to study the older stellar populations in this galaxy with the near infrared images instead of the young massive populations that I study with the ultraviolet images from Hubble.

German Gimeno
Title: Study of star clusters in the Magellanic Clouds with GMOS MOS spectroscopy

Description: We propose to derive ages, metallicities and velocities, for red giants in star clusters in the Small Magellanic Cloud (SMC). The Ca triplet efficiently yields high quality velocities and metallicities, and CMDs from preimages provide ages. SMC clusters are and ideal laboratory for unlocking the secrets of cluster and galaxy formation, and are crucial testbeds for stellar evolution models and interpreting the integrated light of distant galaxies. We will compile a definitive dataset for the age-metallicity relation (AMR), metallicity distribution and gradients. We will investigate whether cluster formation has been continuous or bursty, and compare the AMR to models. A much larger sample of field giants will allow comparison of chemical evolution in clusters to the field. Velocities will yield the kinematics of both the clusters and field giants.

Ricardo Salinas

The SMBH -- N_GC relation in isolated ellipticals

The idea of a co-evolution of galaxies and their central super-massive black holes (SMBHs) is supported a series of scaling relations between the mass of the SMBH and properties of its host galaxy. The most surprising of these correlations is between the SMBH mass and the number of globular clusters in the galaxy. Even though this relation is very tight, the isolated elliptical galaxy NGC 1600 escapes the rule with a very poor globular cluster system (GCS) for its huge SMBH, prompting the question of the influence environment in this correlation. In this project we will revisit the GCS of NGC 1600 using new GMOS gi

data and archival MOSAIC-II data. If NGC 1600 remains as an outlier, it would indicate the SMBH - galaxy co-evolution is affected by the environment.

The extended metallicity gradient of elliptical galaxies

In the two-phase accretion model for galaxies, galaxies grow via minor mergers which deposit material in the outskirts of galaxies. Depending on the amount of accretion, the slope of the metallicity gradient will change. An accretion-dominated growth implies flat metal poor halos, while poor accretion would end up in steeper gradients. Metallicity gradients from direct imaging of RGB stars is limited to HST, and only to distances of ~15 Mpc. Metallicity measurements from spectra are also limited to high surface brightness, make them unable to explore galaxy halos. Globular clusters then can be used as the traditional beacons of galaxy halos, with the caveat that optical imaging gives only a poor metallicity sensitivity. In this project we will do FourStar K-band photometry of globular clusters in several elliptical galaxies; combining this photometry with existing optical photometry, age and metallicity gradients will be obtained out to very large radii.