

Resultados del Concurso 2005A para Observaciones en Gemini-Sur

Propuesta: GS-2005A-Q-9

Investigador Principal: Dr. René Mendez (UCh)

Título: Spectroscopy of RR Lyrae Variables in Halo Substructure.

Resumen: *Measurements of radial velocity and metallicity are proposed of faint RR Lyrae variables (RRLs) identified by the QUEST survey. These observations will determine the width of the Sgr stream in RRLs, which will be compared the width in M giants. Since the RRLs belong to a much older stellar population than the M giants, the spatial and velocity distributions of the RRLs may be better indicators of the shape of the Galaxy's gravitational potential than the streams of M giants, which according to recent models are too young dynamically to have experienced much dispersion under the influence of a non-spherical potential. The proposed observations will therefore provide unique constraints on models of the streams that assume different potential shapes. The target list also includes stars that may belong to new halo substructures that are unrelated to the Sgr dwarf. If any are confirmed, they would be important for documenting the merger history of the Milky Way. If these stars turn out to be simply a random sample of halo stars, they will still provide important information on the halo at a galactocentric radius of roughly 50 kpc, where very little is known about the halo.*

Tiempo asignado: 50.6 horas

Propuesta: GS-2005A-Q-28 (propuesta conjunta con CA)

Investigador Principal: Dr. Doug Geisler (UdC)

Título: The Age Distribution of Globular Clusters in the Merger Remnant NGC 5128

Resumen: *Globular cluster (GC) formation accompanies major star formation episodes in merger and starburst galaxies, so the age distribution function (ADF) of the GCs in a giant E galaxy should provide one of the clearest signatures of the galaxy's formation history that we can generate. NGC 5128 (Cen A) is a classic merger product and, at $d=4$ Mpc, is also the closest giant E galaxy; as such, it provides a unique opportunity to use GCs to study the assembly history of a giant elliptical. We propose to use GMOS in multislit mode to obtain very high-S/N spectra of 80 of its GCs, and to use these for simultaneous metallicity and relative age measurement with the standard set of Lick/IDS spectral indices. With 4 GMOS fields we will cover most of the inner bulge region of the galaxy, within which the GC age range should be the largest.*

Tiempo asignado: 4.4 horas

Propuesta: GS-2005A-Q-51

Investigador Principal: Dra. Paulina Lira (Uch)

Título: Black-hole mass and growth rate at high redshift

Resumen: *Studies show that high- z , high-luminosity quasars present much larger accretion rates ($M_{\dot{}}$) than those found at lower redshifts ($z < 2$). However, these studies have so far only probed systems with large black hole masses (M) and might give a biased picture of the growth and evolution of massive black holes (BH). Intermediate-luminosity systems could be less energetic because they have smaller BH-masses and/or lower accretion rates, a question with far reaching implications for the early evolution of BHs and their hosts. The aim of this proposal is to measure M and $M_{\dot{}}$ for a large number of high- z quasars going down in the quasar luminosity function, thus probing an unknown regime. We will use GNIRS in 2005A to measure the rest frame luminosity at 5100Å and the H_{β} FWHM for a sample of 15 $z \sim 3.4$ quasars to determine M and $M_{\dot{}}$. We will follow this with a second proposal in 2005B to study a sample of quasars at $z \sim 2.4$. This will enable us to determine the BH-mass growth rate in two redshift bands and test whether all systems, with large and small BH mass, grew faster at earlier times.*

Tiempo asignado: 21.5 horas

Propuesta: GS-2005A-Q-66 (propuesta conjunta con UK)

Investigador Principal: Dr Luis Campusano (U.Ch)

Título: The Galaxy Population Around a Possibly Forming Cluster at $z \sim 1.2$

Resumen: *The largest large-scale structures (super-LSSs, SLSSs) provide essential tests for models of structure formation and allow the very efficient study of large numbers of galaxies, clusters and other mass markers such as quasars. The epoch $z \sim 1$ has emerged as "special" for the evolution of galaxies, as indicated by the peak in the star formation rate and by the close peak in the space density of AGNs. Also, hierarchical formation models predict that $z \sim 1$ is the major epoch for galaxy-cluster assembly. We have identified two "parallel" > 20 -30 Mpc-scale structures at $z \sim 0.8$ and $z \sim 1.2$ (Haines, Campusano & Clowes, 2004), towards which we wish to direct a GMOS FOV pencil beam. The beam will be centered on a $z \sim 1.2$ cluster-pair (J104656.6 +054150), which is likely to be a merger in progress. Specifically, we propose complete spectroscopic follow-up of all the galaxies with $I-K > 3.0$ and to $K = 19.5$ within a $5' \times 5'$ field ($\sim 4 \times 4$ Mpc² at $z = 1.2$). This will allow us to: (1) measure spectroscopic redshifts of 140 galaxies belonging mainly to the SLSS at $z \sim 1.2$ but also including galaxies of the $z \sim 0.8$ SLSS; (2) estimate the mass of the $z \sim 1.2$ cluster and test the merger hypothesis; (3) characterise the environment of the $z = 1.233$ quasar (J104420.8 +055739), which is at the confluence of the two subclusters of J104656.6 +054150; (4) determine trends at $z \sim 1.2$ between star-formation rate (SFR) in galaxies and environment; and (5) estimate the epoch at which cluster environment begins to affect star formation in galaxies.*

Tiempo asignado: 21.0 horas

Propuesta: GS-2005A-Q-74

Investigador Principal: Dr Marcus Albrecht (UCN)

Título: First 3D spectroscopy of type-2 quasar narrow-line regions: Size, structure, and kinematics

Resumen: *We recently investigated the NLR of seven type-1 PG quasars with HST and found a size-luminosity relation for Seyferts and quasars which is of great interest as an independent black hole mass estimator. Now, a decent sample of SDSS type-2 quasar candidates is available allowing us to extend this study into largely unknown territory. The nature of type-2 quasars is still strongly debated: Are they subject to a simple inclination-based unified scheme with ionization cones as found for some Seyfert 2s? What determines the size of a quasar-2 NLR and how does it scale with luminosity? What can we learn from NLR sizes about quasar lifetimes? What is the origin of the NLR gas and how relevant are mergers for quasar fueling? To answer these questions, we propose to use GMOS/IFU to obtain the first 3D spectroscopy of quasar NLR as traced by the [OIII] and H β lines in a pilot study of three bright type-2 quasar candidates from the SDSS.*

Tiempo asignado: 9.2 horas

Propuesta: GS-2005A-C-4

Investigador Principal: Dr Daniel Christlein (UCh)

Título: Extent and Kinematics of the Extreme Outer Disks of Spiral Galaxies

Resumen: *The kinematics of gas on the extreme outskirts of galaxies provide unique constraints on the halo mass profile and the angular momentum distribution of the baryonic matter, both important outstanding questions in galaxy formation. However, the true outer edges of galaxy disks are inaccessible to conventional observational techniques, because optical line emission is extremely faint, and the outer parts of the baryonic disk are ionized and thus invisible in the 21 cm line. A novel probe of galaxy kinematics is to observe H-alpha emission at extremely large radii, caused by ionization by isolated star formation regions, nearby UV sources, or the cosmic background.*

Here, we propose to extend our successful efforts to detect H-alpha emission from the outer disks of late-type edge-on spiral galaxies using extremely deep long-slit spectroscopy. This project will pursue four goals: place new lower bounds on the radii of the disks, measure the rotation curve at unprecedented radii, provide spectroscopic information on possible star formation in an environment of low density and low metallicity, and provide constraints on the strength of the ionizing cosmic background radiation field at low redshifts.

Tiempo asignado: 30.0 horas

Propuesta: GS-2005A-C-6 (propuesta conjunta con BR)

Investigador Principal: Dra. Manuela Zoccali (PUC)

Título: Chemical abundances in metal-poor globular clusters of the Galactic bulge

Resumen: *The Galactic bulge is the least studied stellar population in our Galaxy. Very little data is available in terms of its detailed abundance pattern which could give important information of the formation and chemical enrichment of the bulge. In the framework of hierarchical clustering, it is predicted that the metal-poor bulge stars and globular clusters were among the very first objects which formed. We intend to observe 10 red giants in the metal-poor bulge globular clusters HP-1 and NGC 6558 using the Phoenix IR spectrograph. We have V and I colours obtained for these clusters with the NTT telescope, and also ESO Wide-Field photometry for NGC 6558. For one star of HP-1 and 4 stars of NGC 6558 we have obtained and analysed high resolution spectra obtained in the optical using VLT-UVES, and VLT-Flames. The IR is ideal for the purpose given the low impact of reddening and the small amount of line-crowding in the stellar spectra, which allow the measurement of very accurate element abundances. The very scarce abundance information available for metal-poor bulge stars to date suggest significant differences with the halo population of similar metallicity for unknown reasons, which we intend to investigate. The proposed observations will enable the determination of the abundances of oxygen using the OH lines, that is the main purpose of this proposal, besides C, N, Fe and the alpha-element Ti, which will provide important insight to the nucleosynthetic enrichment during the earliest phases of our Galaxy.*

Tiempo asignado: 5.0 horas