

# Resultados del Concurso 2004A para Observaciones en Gemini-Sur

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## Propuesta: GS-2004A-Q-2

**Investigador Principal:** Dr. L. F. Barrientos (PUC)

**Título:** Spectroscopic Confirmation Of Rich Galaxy Clusters At  $z \sim 1.2$

**Resumen:** We propose to use Gemini+GMOS to study a new sample of high redshift clusters of galaxies obtained from the Red-Sequence Cluster Survey (RCS), a  $90 \text{ deg}^2$  two-color imaging survey in both hemispheres. We will obtain  $\sim 200$  galaxy spectra in the fields of 5  $z \sim 1.2$  galaxy clusters. The spectra will be used to (1) calibrate the cluster photometric redshifts to  $z \sim 1$ , and augment the value of the deep VLT IR and Magellan optical imaging already in hand; (2) determine the cluster masses and thus calibrate the  $B_{gc}$  richness parameter vs. velocity dispersion relation, to obtain masses for the rest of the sample; and (3) study the galaxy stellar populations by using line indices and principal component analysis.

**Tiempo asignado:** 35 horas

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**Propuesta:** GS-2004A-Q-14

**Investigador Principal:** Dr. P. Lira (UCh)

**Título:** N-band imaging of a complete sample of AGN

**Resumen:** We propose N-band observations to finish the study of a large and complete sample of obscured AGN using T-ReCS. This is part of a comprehensive study obtaining infrared data in the 1-10 micron range for targets drawn from an IR-selected sample, ensuring a wide and representative variation in the characteristics of the obscuring material around the central sources. We will determine the spectral energy distribution of the active nucleus in the near and mid-IR to a high accuracy. The results will be compared to theoretical predictions from dusty torus models to constrain the geometry and physical conditions of the central engines. We will also test the reliability of the 10 micron emission as an unbiased luminosity indicator.

**Tiempo asignado:** 17.0 horas

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**Propuesta:** GS-2004A-Q-15

**Investigador Principal:** Dr. J. Maza (UCh)

**Título:** The AGN-Galaxy Connection

**Resumen:** We propose to test the "Grand Unification" hypothesis, that AGN are a transient phase in the evolution of normal galaxies, by establishing whether AGN host galaxies lie on the same Fundamental Plane as normal early-type galaxies at similar redshift. This requires measuring the stellar velocity dispersions ( $\sigma$ ) in the bulges of AGN host galaxies, and combining with HST-derived morphological parameters,  $r_e$  (half-light radius) and  $\mu_e$  (surface brightness at  $r_e$ ). We have previously observed AGN host galaxies at  $0.1 < z < 0.3$ , and now propose with Gemini to address the more difficult  $z \sim 0.4-0.5$  range, for a carefully chosen sample of 6 AGN host galaxies, 3 for the 2004A. This subsample will complete our total target list of  $\sim 35$ , of which 22 are already observed or will be observed (2003B). The measured velocity dispersions, together with the tight  $M_{bh}$ - $\sigma$  correlation (observed for galaxies and a few AGN), also allow us to estimate the quasar black hole masses ( $M_{bh}$ ), a crucial parameter for understanding AGN physics. These masses can then be combined with already in-hand AGN SEDs to yield Eddington ratios. Our full AGN sample spans a sufficient range in luminosity to probe the possible relation of Eddington ratio or BH mass on either L or emission line strengths.

**Tiempo asignado:** 13.5 horas

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**Propuesta:** GS-2004A-Q-24 (Propuesta conjunta con UK y BR)

**Investigador Chileno:** Dr. S. Casassus (UCh)

**Título:** Crystalline silicate grains around post-AGB objects - disks or extended emission?

**Resumen:** The ISO mission revealed an array of sharp crystalline silicate emission features longwards of  $17\mu\text{m}$  in the spectra of many evolved sources. While some of these objects have O-rich exciting stars, as expected, a surprising number have C-rich exciting stars as well as strong PAH-like features shortwards of  $14\mu\text{m}$  - these have been dubbed dual-dust chemistry objects. Current interpretations point to binarity as being a key common thread, with previous evolutionary phases having resulted in the creation of compact disks or tori that harbour the cold crystalline silicates. To confirm this scenario and to distinguish it from alternatives in which the cold crystalline silicates are located in outflows or in Oort Clouds at much larger radii, high spatial resolution spectroscopy in the  $20\mu\text{m}$  region is required. Only an 8-m telescope can provide the required angular resolution. We request long-slit spectra and direct images with TReCS for a case study of NGC6302.

**Tiempo asignado:** 8.0 horas

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**Propuesta:** GS-2004A-Q-27

**Investigador Principal:** Dr. J. Borissova (PUC)

**Título:** Does The LMC Have A Halo?

**Resumen:** We propose to obtain intermediate resolution spectra of RR Lyrae stars in the inner regions of the LMC and two star clusters in the LMC, in order to measure their radial velocities and metallicities. Additional IR photometry will allow us to place the

stars in front or behind the LMC, accounting for reddening. The scientific goal is to measure the kinematics of the LMC metal-poor halo. This will indicate whether galaxies like the Milky Way and small galaxies like the LMC have similar early formation histories. This is important for Dark Matter studies, as well as for determining the stellar evolutionary age of the universe. These observations will also test ideas that microlensing of LMC stars is produced by tidal debris located in front of the LMC. This Chilean GeminiS spectroscopic proposal is linked to a Chilean CTIO4m IR photometry proposal.

**Tiempo asignado:** 15.0 horas