

Resultados del Concurso 2005B para Observaciones en Gemini-Sur

Propuesta: GS-2005B-Q-9

Investigador Principal: Dr. Dante Minniti (PUC)

Título: Millimagitude Photometry for Transiting Exoplanets.

Resumen: A lot of effort is being devoted to radial velocity follow-up of OGLE transit candidates. To complement these studies, here we propose to obtain optical GMOS images of extrasolar planets discovered in the OGLE fields during their transits. Our measurements will provide very precise amplitudes (0.0001 mag) and transit times (0.00001d), increasing the sample of extrasolar planets with accurately measured radii. The candidates would either be the confirmed planets, or would have already been screened for large velocity variations using low resolution spectra. The accurate photometry during the transits will allow us to: search for color variations, measure accurate radii and transit configuration (inclination, impact parameter, timing), stellar limb darkening, and search for asymmetries in the transits due to possible large moons or rings.

Tiempo asignado: 30.0 horas

Propuesta: GS-2005B-Q-22 (Conjunta con UK,GS)

Investigador Principal: Dr. Leopoldo Infante (PUC)

Título: A GMOS-IFU survey of E/S0 galaxies in the Fornax cluster

Resumen: The GMOS-IFU offers the unique capability to spectroscopically map the two-dimensional kinematics of stars and gas in the cores of nearby early-type galaxies at superb spatial sampling. We propose to continue a very successful Gemini SV program and observe a complete sample of 14 E/S0 galaxies in the Fornax cluster. The extensive data reduction, analysis and modelling machinery we have developed in the context of the northern SAURON IFU survey, together with our experience from the GMOS SV run, will allow us to date the last episode of star formation in the core, measure the M/L ratio, compare the kinematics of the gas and stars and ultimately combine our knowledge of the populations and dynamics to deduce the assembly history. This program is supported by existing long-slit spectra of the galaxies we propose to observe.

Tiempo asignado: 7.6 horas

Propuesta: GS-2005B-Q-28

Investigador Principal: Dra. Paulina Lira (U.Ch)

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

Resumen: Studies show that high-z, high-luminosity quasars present much larger accretion rates (\dot{M}) 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. Our aim is to measure M and \dot{M} for a large number of high-z quasars going down in the quasar luminosity function, thus probing an unknown regime. We started this programme in 2005A and expect to measure the rest frame luminosity

at 5100Å and the H_β FWHM for about 5 z~3.4 quasars during that semestre. Here we wish to complete a total sample of 15 z~3.4 objects during 2005B. We will follow this with a proposal in 2006A to study a sample of quasars at z~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: 15.0 horas

Propuesta: GS-2005B-Q-51

Investigador Principal: Dr. Sebastián López (U.Ch)

Título: An Integral Field Unit Search of Gas-rich Starforming Galaxies at z>2

Resumen: Damped Ly-alpha absorption systems (DLAs) contain roughly enough neutral gas at redshift z = 3.5 to form the bulk of the stars in present-day galaxies. Recent studies also suggest that these systems contribute an equal amount of star formation rate density at z~3 as the starburst population. However, little is known regarding the physical properties of the absorbing galaxies at high redshifts. We propose to conduct a search of DLA galaxies in emission using the Integral Field Unit (IFU) in GMOS on Gemini South. The IFU allows us to search for Ly-alpha emission from DLA galaxies at small angular distances to the sightline without prior knowledge of the impact orientation of the absorbing galaxies. It serves as a tunable narrow-band filter which, when centered at the known DLA trough, removes the glare of the background QSO. The IFU therefore offers a higher efficiency than traditional imaging/spectroscopic surveys of DLA galaxies. The scientific objectives of the project are (1) to examine the morphologies and impact geometry of DLA galaxies using the 2D emission-line features reconstructed from individual IFU elements, and (2) to obtain measurements (or upper limits) of the star formation rates of these galaxies based on emission-line strengths and compare with known properties of field galaxies at the same epoch.

Tiempo asignado: 31.5 horas

Propuesta: GS-2005B-Q-64 (Conjunta con US,CA)

Investigador Principal: Dr. Dante Minniti (PUC)

Título: Spectroscopic Follow-up of LMC Microlensing Candidates from the SuperMACHO Survey

Resumen: One of the foremost outstanding problems in the physical sciences is the nature and distribution of the "dark matter" that is the gravitationally dominant component of mass in all galaxies, including the Milky Way. A previous experiment to search for the transient brightening of background stars due to the gravitational lensing by foreground MACHOs has produced a peculiar result: while the detected rate of lensing events indicates that MACHOs comprise at most 20% of the dark matter halo, the number of events far exceeds that expected from known stellar populations. The nature of these excess lensing objects remains a mystery. We intend to determine the nature of this lensing population, which may outweigh all other known components of the Galaxy, by conducting a search with at least a tenfold improvement in the event detection rate. Our approved NOAO Survey will discover microlensing events in Oct - Dec of 2001 through 2005. The major source of contamination of microlensing events in the LMC is supernovae which occur in background galaxies. We propose to use Gemini GMOS-S to obtain spectra to separate the microlensing events from SNe and other transient "contaminants" and obtain important information on the SNe discovered (type, redshift, and age).

Tiempo asignado: 7.5 horas

Propuesta: GS-2005B-C-4

Investigador Principal: Dr. Daniel Christlein (UCh)

Título: The Extreme Outer Baryonic Disks of Early-Type 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. Very deep H-alpha spectroscopy can probe the gaseous disks of galaxies in regions inaccessible to other techniques, far beyond the stellar disk, and thus provide unique constraints on the dark matter halo density

profile and the angular momentum distribution. It also provides information on other important cosmological parameters, such as the strength of the cosmic ultraviolet background flux.

We have been conducting a successful program to measure the kinematics in the extreme outer disks of late-type, edge-on spiral galaxies with extremely deep long-slit spectroscopy. With this proposal, we would like to extend our studies towards early-type spirals and S0s. We will specifically focus on a subpopulation of blue, gas-rich early-type galaxies. There are two principal objectives: 1) We will measure the halo density profile in much more evolved systems and compare them to our sample of late-type galaxies. This will show whether the density profile has been altered (e.g., truncated), by past interactions or affected by the different baryon distribution in these systems. 2) We will search for unusual kinematics of the gas, such as counterrotation, at unprecedented radii. Such kinematics would be signatures of the hierarchical growth of galaxies, particularly the re-accretion of gas after a major perturbation, and confirm important hypotheses of current galaxy evolution models.

Tiempo asignado: 3 noches

Propuesta: GS-2005B-Q-53

Investigador Principal: Dr. Ronald Mennickent (UdC)

Título: Testing the evolutionary model for the Be star phenomenon

Resumen: Fabregat & Torrejón (2000) have suggested that the Be star phenomenon is an evolutionary effect appearing in the second half of the main sequence lifetime of a B star ($t > 10$ Myr). We plan to test this hypothesis, searching for Be stars in very young open clusters with ongoing stellar formation, where many emission line stars have been reported. We will search for emission bands characteristic of silicates and dust. If the aforementioned view is right, we expect to find these bands in a large fraction of our sample, probing that they are Herbig Ae/Be stars instead of classical Be stars, and hence getting an important piece of evidence supporting the Fabregat & Torrejón hypothesis. This service-mode proposal was granted for time last year but by technical problems could not be executed.

Tiempo asignado: 9.2 horas

Propuesta: GS-2005B-Q-55

Investigador Principal: Dr. Nelson David Padilla (PUC)

Título: Unveiling the End of the Childhood of Massive Spheroids in the Redshift Desert

Resumen: Using GMOS/Gemini South we intend to obtain spectra of massive star-forming galaxies in the redshift desert to unveil the missing link between massive elliptical galaxies in the present day and gas-enriched starbursts such as submm bright galaxies at $z > 3$. The targeted galaxies are selected with the SED analysis from the SXDS/SIRIUS field sample which was obtained in multiband photometry (B,V,R,i',z',J,H, and K_s) with the Subaru/Suprime-Cam and UH2.2m/SIRIUS. The proposed GMOS observation explores the following key issues related to the features of young massive spheroids; 1) What is the metal enrichment in the ISM of the young spheroids with Star Formation Rate (SFR) $\sim 100 M_{\odot}/\text{yr}$ at $z \sim 1-2$? 2) The star formation rate derived from the strong emitting nebula lines [OII] $\lambda 3727$ for the galaxies at $z < 1.6$. 3) The confirmation and determination of redshifts for not only the massive star-forming galaxies as young spheroids, but also diverged types of galaxies at $0.8 < z$ including Ly break galaxies at $z = 4$.

Tiempo asignado: 9.0 horas

Propuesta: GS-2005B-Q-56

Investigador Principal: Dra. Miriam Peña (UCh)

Título: Abundance Determination of Photoionized Regions in NGC6822, a Dwarf Irregular of the Local Group.

Resumen: We propose to use GMOS (multi-object) to derive simultaneously, the chemical abundances of some HII regions and PNe of the dIrr NGC 6822. The objects are distributed in different zones of the galaxy. Thus, we will

obtain the abundances of the present ISM (HII regions) and the corresponding values at the time of formation of the PNe. The chemical homogeneity of NGC6822 will be tested. The abundance pattern given by HII regions and PNe will be used as an observational constrain for computing chemical evolution models to infer the chemical history of NGC6822. This galaxy is well suited for this study because, due to its position in the Local Group, apparently it has not lost significant amount of gas by tidal effects, and its star formartion history is known. A well constrained chemical evolution model would help to decide on the controversy if O-rich galactic outflows have occurred in irregulars.

Tiempo asignado: 5.0 horas