

# Resultados del Concurso 2008B para Observaciones en Gemini-Sur

**Propuesta:** G/2008B/8005

**Investigador Principal:** Mario Hamuy

**Título:** Late-time spectroscopic study of supernovae in the Local Universe by the Chilean Millennium Center for Supernova Studies

**Resumen:** In Chile we have recently founded the Millennium Center for Supernova Studies (MCSS) with the purpose to refine methods for extragalactic distances, study the origin of the dark energy, and to gain a deeper understanding of the physics of these cosmic explosions. Our observational goals consist of discovering nearby supernovae and establishing a high-quality optical/NIR spectroscopic database of ~80 supernovae ( $z < 0.07$ ) in the course of two 9-months observing campaigns between 2007-2009. For this purpose the MCSS has teamed up with the Carnegie Supernova Program whose main focus is to obtain optical/NIR light curves with facilities at the Las Campanas Observatory. In this collaboration one of the responsibilities of the MCSS is to secure late-time optical spectroscopic followup observations. With this proposal we request 1 dark-to-gray night per month between Aug-Jan with GMOS in classical mode with the aim to reach this goal. These data will allow us to improve our understanding of the late phase behaviour of all SNe types by providing important insight into the.

**Tiempo asignado:** 8

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**Propuesta:** G/2008B/8008

**Investigador Principal:** Pamela Arriagada

**Título:** RR Lyrae in the Galactic bulge: the Milky Way's oldest population?

**Resumen:** The RR Lyrae in the bulge have been proposed to be the oldest population in the Milky Way, tracers of the early stages of our Galaxy's life. We propose to obtain high S/N spectra of about 90 RR Lyrae in the Milky Way bulge using GMOS-S, in order to measure accurate radial velocities and abundances. The scientific goals are to measure the velocity dispersion, rotation, and abundance gradients of this population in three different fields, and compare them with properties of previously observed K giants in the same fields. Our sample of RR Lyrae taken from the OGLE and MACHO microlensing surveys contains excellent positions as well as photometry and light curve information.

**Tiempo asignado:** 21,2

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**Propuesta:** G/2008B/8010

**Investigador Principal:** Sergio Hoyer

**Título:** Search for unseen companions around 3 transiting planets using Transit Timing Variations.

**Resumen:** More than 30 exoplanets have been discovered to transit their parent star. The only technique that permits to measure accurate values for inclination and radii. Those measurements allows the determination of mass and density, critical parameters to constrain models necessary to understand the physics of exoplanetary interiors and their evolution. Until these days, searches of exoplanets by transit has detected just gaseous giant planets, i.e., Hot Jupiters. But it has been further realized that the analysis of the light curves of transiting planets can be use for the detection of planetary companions. In particular the presence of variations in the timing of transits (TTVs) can be attributed to the presence of otherwise undetectable Earth-like planets in the system. We propose to monitor transit events for OGLE planet candidates. Parameters obtained from transit events, together with those available in the literature, will allow to search for variations in the timing of the central transit, potentially discovering yet unseen companions.

**Tiempo asignado:** 22

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**Propuesta:** G/2008B/8009

**Investigador Principal:** Sebastian Lopez

**Título:** Probing cloustre galaxies with background QSOs

**Resumen:** We are conducting a spectroscopic survey of background QSOs close in projection to foreground clusters. One of the aims is investigating the effect of a dense environment on the statistics and physical conditions of MgII absorbers. This is the first time a search of this type has been conducted, mainly because of the lack of available samples of high-redshift clusters. Recently (LBLP et al., 2008 ApJ in press), we have found that the statistics (dN/dz and Line Equivalent Width distribution) of MgII in  $z = 0.3 - 0.9$  candidate galaxy clusters from the Red Sequence Cluster Survey is distorted with respect to the field distribution: while strong ( $W_0 > 1.0$  A) absorbers show a significant excess (up to 10x at the 3sigma level), weak ( $W_0 < 0.3$  A) absorbers conform to the field statistics. We have argued that this dichotomy could be explained if weak MgII cluster galaxies have their cold halos truncated as a consequence of environmental effects. With this second proposal we are building up a small control sample with the main goal of confirming cluster redshifts and characterize the contamination level of our sample. The main difference with the previous proposal is that these clusters do not show absorbers and thus we need only one mask per field.

**Tiempo asignado:** 13

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**Propuesta:** G/2008B/8007

**Investigador Principal:** Neil Nagar

**Título:** Tracing gas flows in Active Galactic Nuclei down to the innermost few parsecs

**Resumen:** In this continuing project we propose GMOS IFU emission-line spectroscopy of the extended H $\alpha$  gas in the inner kiloparsec of nearby active galactic nuclei (AGN) hosts, selected for having dusty nuclear spirals, in order to test the hypothesis that these spirals trace the channels through which the nuclear supermassive black hole is being fed. This study is motivated by the recent results obtained by our group for two nearby galaxies with LINER nuclei: NGC1097 and NGC6951. In these galaxies, the H $\alpha$  kinematics within the inner kiloparsec, besides being dominated by circular motions in the galactic plane, shows streaming motions towards the nucleus with speeds of up to 50 km/s which approximately delineate dusty spiral arms observed in images of the nuclear region. We may have found the long sought feeding mechanism of AGN, but this result needs to be confirmed in a larger sample of AGN's, covering a range of activity types. As the next step towards this goal, we propose to use Gemini/GMOS-IFU to map the gas kinematics in a sample of nearby Seyfert 2 galaxies which show nuclear spirals, all of which are more active than the LINERs so far observed.

**Tiempo asignado:** 15

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**Propuesta:** G/2008B/8006

**Investigador Principal:** Matthias Schreiber

**Título:** White dwarf-main sequence binaries as tracers of close binary evolution

**Resumen:** White dwarf, neutron star, and black hole binaries make up a wide variety of objects, including e.g. SNIa progenitors and X-ray binaries. Binary population studies of these objects suffer from poor understanding of the common envelope (CE) phase and subsequent orbital angular momentum loss, and from uncertainties in the initial mass ratio and orbital separation distributions. Significant progress in our understanding of compact binary evolution depends on novel observational input that will constrain and calibrate the models. White-dwarf plus main-sequence binaries are a prolific and intrinsically simple type of systems that are well-suited tracers of binary evolution. Our observations

**Tiempo asignado:** 12,5

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**Propuesta:** G/2008B/8001

**Investigador Principal:** Marcelo D. Mora

**Título:** The disk dynamics and mass loss history of some B[e] supergiants

**Resumen:** The evolution of massive stars is an unsolved problem, and especially so for rapidly rotating stars and stars in post main-sequence phases. Among the stars with these characteristics is the group of B[e]-supergiants that share their location in the HR diagram with the Luminous Blue Variables, indicating that they must have evolved from massive progenitors. Supergiant B[e] stars show evidence of equatorial flow formations, probably as consequence of the rapid rotation of these stars. These equatorial flow formations are interpreted as rotating disks. It is not clear if the disks follow Keplerian viscous disk behavior or out-flowing disk-forming wind behavior. Disentangling between these two behaviors will give insights of the equatorial stellar mass flux. This will be achieved by high resolution spectroscopy of the CO band emission in combination with theoretical disk models. The modeling of the CO band head intensities further constrains the temperature and density structure. The latter is essential for the determination of the equatorial stellar mass flux which is a major ingredient for the stellar evolution codes. This is a unique opportunity to better understand disk around supergiant B[e] stars.

**Tiempo asignado:** 10

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**Propuesta:** G/2008B/8002

**Investigador Principal:** Tom Richtler

**Título:** Is there dark matter in NGC7507?

**Resumen:** The dark matter content of elliptical galaxies still is a controversial issue. While some bright cluster galaxies have been found to have massive dark halos, more average ellipticals have shown little evidence for dark matter. The elliptical field galaxy NGC 7507 is a good example for this controversy. Previous dynamical studies, using integrated spectroscopy of its inner regions, arrived at different conclusions but new long-slit data support a low (if any) dark matter content. Conclusive results can only be obtained by probing radial regimes where the luminous matter is not longer dominant. We therefore propose measuring radial velocities of globular clusters in order to trace the mass profile of NGC 7507 out to larger galactocentric radii -- and to check the predictions of the CDM paradigm of galaxy formation.

**Tiempo asignado:** 25, 2

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