

Resultados del Concurso 2009A para Observaciones en Gemini-Sur

Propuesta: G/2009A/015

Investigador Principal: Sebastian Lopez

Institución: Universidad de Chile

Título: Concerted Follow-up of Swift and Fermi GRBs (Gemini South)

Resumen: The Swift satellite has revolutionized the study of GRBs by providing unprecedented numbers of accurate real-time localizations. With rapid and automated access to GMOS-S, Gemini has emerged as the cornerstone facility of our group's GRB research efforts. This year, Swift has been joined in orbit by the Fermi Gamma-Ray Telescope with its GeV-photon sensitive LAT detector, which has already detected emission from several events. We aim to measure the redshifts of Fermi bursts so that the detection of ultra-high-energy GRB photons may be used for derivative science such as measuring GRB Lorentz factors and constraining theories of quantum gravity. We also seek to differentiate between high reddening and redshift when GRBs have suppressed optical afterglows. Constraining the number of "dark" GRBs at moderate-to-high redshift has important implications for understanding GRBs and for informing the role of future missions (eg. JDEM, LSST). GRB afterglows have proven to be a versatile and unique astrophysical probe in the study of the ISM of distant galaxies, the IGM at $z > 2$, and the end of the reionization epoch. To this end, our proposed semester 2009A ToO program also seeks to uncover a number of damped-Lyman alpha systems as well as improve the (very curious) statistics of strong intervening Mg II absorbers towards GRB sightlines.

Tiempo asignado: 3 horas

Propuesta: G/2009A/016

Investigador Principal: Felipe Barrientos

Título: Spectroscopy of Infrared Galaxies in Clusters to $z = 1$

Institución: Pontificia Universidad Católica de Chile

Resumen: We are conducting a multi-wavelength study of a unique sample of galaxy clusters over the redshift range $0.3 < z < 1.1$. A key component of this program is infrared imaging with the Spitzer Space Telescope at 24microns, which is sensitive to dust enshrouded star formation activity and active galactic nuclei (AGN). The initial results of this program indicate an increase in the number of infrared

Tiempo asignado: 7 horas

Propuesta: G/2009A/007

Investigador Principal: Andres Jordan

Institución: Pontificia Universidad Católica de Chile

Título: Environment and the Formation of Dwarf Elliptical Galaxies: A Unified Study of Field Stars, Stellar Nuclei and Globular Clusters.

Resumen: Dwarf elliptical galaxies (dEs) are the present-day representatives of a fundamental component of galaxy assembly, and studying their stellar populations is one of the only ways to understand the early formation of stars in low mass halos. Early-type dwarfs are locally most numerous in the nearby Virgo Cluster, and high resolution imaging from the ACS Virgo Cluster Survey has produced two surprising results: 1) The masses of stellar nuclei fall on the same scaling relation as that defined by supermassive black holes, and 2) The specific frequency of globular clusters (GCs) in dEs is higher toward the center of the galaxy cluster, suggesting that central dwarfs had rapid and intense early star formation. The formation of nuclear star clusters and GCs is intimately linked to the formation of the dwarfs themselves, and yet there has been no study that tie high-quality data on all three components into a unified picture of cluster dE formation. We propose to use the GMOS-S/IFU to obtain deep.

Tiempo asignado: 7 horas

Propuesta: G/2009A/003

Investigador Principal: Mario Hamuy

Institución: Universidad de Chile

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

Resumen: In Chile we have 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 (SNe) and establishing a high-quality optical/NIR database of ~ 80 events ($z < 0.07$) in the course of two 9-month 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 of these SNe with facilities at the Las Campanas Observatory. In this collaboration one of the responsibilities of the MCSS is to secure late-time optical spectroscopy. With

Tiempo asignado: 12 horas

Propuesta: G/2009A/013

Investigador Principal: Giuliano Pignata

Institución: Universidad de Chile

Título: Studying the local environment of Type Ia Supernovae

Resumen: In the past, decaying Type Ia Supernovae (SN Ia) have been extensively used as cosmological probes, but most of the SN Ia photometric and spectroscopic properties lack a solid theoretical interpretation. A key parameter that sheds light into the nature of the SN Ia progenitor is the time delay (TD) distribution of SNe Ia, which differs considerably between different theoretical progenitor scenarios and which forms the basis of galactic chemical enrichment models. Most observational studies of the TD have concentrated on properties averaged over cosmological distances or over individual galaxies, assuming that the TD are very long and that it is not possible to observe the stellar populations responsible for SNe Ia directly. However, recent studies suggest the existence of SN progenitors with TD's much shorter than those predicted by theory (about 100 Myr, Mannucci et al.

Tiempo asignado: 3 horas

Propuesta: G/2009A/012

Investigador Principal: Sergio Hoyer

Institución: Universidad de Chile

Título: Search for unseen companions around 4 transiting planets using Transit Timing Variations.(II)

Resumen: More than 50 exoplanets have been discovered to transit their parent star. This configuration provides the only means to accurately measure orbital inclination and planetary radii, to later infer mass and density, critical parameters to constrain the models necessary to understand the physics of exoplanetary interiors and their evolution. To this date, searches of exoplanets by transit have only detected gaseous giant planets, i.e., Hot Jupiters. But it has been further realized that the analysis of the light curves of these transiting planets can be used 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 these transit events, together with those derived

Tiempo asignado: 15 horas

Propuesta: G/2009A/004

Investigador Principal: Manuela Zoccali

Institución: Pontificia Universidad Católica de Chile

Título: Chemical abundances of highly obscured Bulge globular clusters

Resumen: We propose to exploit the PHOENIX facility to perform an IR spectroscopic screening of highly reddened globular cluster located in the inner Bulge, whose chemical composition has never been measured with high resolution spectra. As a first step, we propose to observe 4-6 stars in the globular clusters Terzan 1, Terzan 6, Terzan 9 and Djorgovski 2. The immediate goal of this project is to derive accurate chemical abundances and abundance ratios of Fe, C, O, Ti, and N, in order to trace the chemical enrichment time-scale of these poorly studied clusters. The long term goal is a systematic study of the globular clusters in the inner Galaxy, providing important clues on the formation scenario of the Milky Way Spheroid.

Tiempo asignado: 8 horas

Propuesta: G/2009A/009

Investigador Principal: Felipe Barrientos

Institución: Pontificia Universidad Católica de Chile

Título: Mass calibration and gas physics for ACT SZ clusters

Resumen: The Atacama Cosmology Telescope (ACT) is a prime facility that will scan a fraction of the southern hemisphere at submm wavelengths. This project will set constraints on the equation of state of the universe (represented by w) by studying the correlation function of the anisotropies in the CMB. In the process of characterizing the anisotropies, there will be a natural selection of other sources such as galaxy clusters and submm galaxies. The clear signature of the Sunyaev-Zel'dovich effect will be used to produce a unique sample of galaxy clusters defined only by a lower mass limit and essentially independent of distance. In this proposal we plan to start a pilot program for obtaining deep imaging and MOS spectroscopy for a sample of 4 clusters detected in the optical (and 3 of them in x-rays) present in the first year submm map area, and determine their masses by dynamics and weak lensing. The overall sample (of 30-40 clusters) will be used to calibrate the Y-mass (Y represents the SZ signature) scaling relation for using the whole sample of clusters for setting constraints on w

Tiempo asignado: 20 horas

Propuesta: G/2009A/010

Investigador Principal: Radostin Kurtev

Institución: Universidad de Valparaíso

Título: Brown Dwarfs with Companions

Resumen: The binarity of young ultracool brown dwarfs (BD) can help to constrain the models of their formation and evolution. Furthermore, no radial velocity planet has been discovered around a BD yet. Here we propose a radial velocity (RV) study of thirteen brown dwarfs that will use the telluric absorption in the near infrared as a natural iodine-like "cell" that has the potential of delivering RV measurements with accuracy of 300-600 m/s, allowing us to probe the BD companions down to the planet range.

Tiempo asignado: 20 horas

Propuesta: G/2009A/006

Investigador Principal: Jura Borissova

Institución: Universidad de Valparaíso

Título: A hidden population of Ofpe/WR stars in newly discovered clusters GLIMPSE 30 and [DBS2003] 179

Resumen: We propose to obtain high resolution Phoenix IR spectra of two Ofpe/WR stars recently discovered by us in the galactic young clusters Glimpse 30 and [DBS2003] 179 in order to perform a quantitative spectral analysis. The abundance determinations and the radial velocities will allow us to make the detailed comparison with the Galactic Center clusters Arches and Quintuplet, as well as very massive Westerlund 1 and NGC3603. We are planning to investigate the wind properties through strong emission lines of these stars and to check the possible binarity of these stars. Some of the known Ofpe/WN9 stars show the presence of nebular emission lines, indicating a surrounding nebulosity. If detected this will allow us to study the kinematics and ionization of an expanding shell associated with the star. It is important for the better understanding of the recent star formation and chemical evolution in the Galaxy and the massive star evolution.

Tiempo asignado: 14 horas

Propuesta: G/2009A/008

Investigador Principal: Matthias Schreiber

Institución: Universidad de Valparaíso

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.

Tiempo asignado: 12.50 horas

Propuesta: G/2009A/002

Investigador Principal: Matias Gomez

Institución: Universidad Andres Bello

Título: Globular Clusters in NGC 3379: A textbook Elliptical in the Leo I Group

Resumen: We propose to study the nearby textbook elliptical, NGC 3379, in the Leo I group, a mere 10 Mpc away to gain constraints on the galaxy formation process of elliptical galaxies. At this close distance, we have the best opportunity to study, in great detail, its globular cluster population from a normal, representative elliptical galaxy, which does not show any signs of recent merger/accretion events. Globular clusters, as single-aged, single-metallicity objects, have the ability to indicate when the major formation episodes occurred in their host galaxy, by maintaining their formation properties through their entire lifetime. From deep images, we will be able to obtain the largest, most homogeneous, and near-contaminate free list of globular cluster candidates to date, which will provide unprecedented insight into the formation history of NGC 3379. Not only can we obtain radial distribution, azimuthal symmetry, learn of any present mass-metallicity relation, search for faint fuzzies and ultra-compact dwarfs, measure the structural parameters of the globular cluster population, but we will also obtain a luminosity function that pushes two magnitudes below the proposed turnover, which is currently poorly constrained. Following this, we will derive the best specific frequency determination to date, which has been shown in previous studies to be surprisingly low compared to other normal ellipticals. With a strong candidate list, many future follow-up studies are possible to help constrain the formation history of NGC 3379. Following studies that our group has done with NGC 5128 (a nearby giant elliptical which has undergone a recent merger), we will obtain kinematics, ages, metallicities, and a mass profile based completely on the globular cluster.

Tiempo asignado: 7.50 horas
