



**Universidad
de Valparaíso**
CHILE

Instituto de Física y Astronomía
Facultad de Ciencias, U. de Valparaíso



SEMINARIOS ASTROFISICOS

Lista de seminarios astrofísicos realizados para Profesores, Postdocs, alumnos de Postgrado y Pregrado

Auditorio 11-A, Facultad de Ciencias, Gran Bretaña 1111, Playa Ancha, Valparaíso.

Año 2007

Marzo 9, 2007, 14.00 hrs.

Tobias Schmidt, Yena University

"Adaptive Optics, applied to observations of young T Tauri stars"

Today several advanced telescopes use Adaptive Optics to increase the quality of their astronomical images. With this technique we now are able to compensate a lot of the atmospheric turbulence using mirrors which can be altered in their shape several times per second. In this talk I would like to present examples of AO applications used today by NACO at the ESO Very Large Telescope (VLT), as well as results of the work we recently did on the young T Tauri star TWA 5 in the TW Hydrae association, a very young association with an age of approximately 7 million years located in the southern hemisphere.

Mayo 4, 2007, 14.00 hrs.

Swetlana Hubrig, ESO, Chile

"Magnetic fields in massive stars"

I will mention Herbig, Be, Bp, SPB, and O stars.

Mayo 11, 2007, 14.00 hrs.

Rainer Schodel, Coeln University

"The (quite dark) stellar cluster around the supermassive black hole Sagittarius A* in the centre of the Milky Way"

The centre of the Milky Way is the nearest nucleus of a galaxy and offers a unique possibility to study the structure of a dense stellar cluster around a super-massive black hole. For this purpose we have analysed high-resolution seeing limited and adaptive optics near-infrared imaging observations of the stellar cluster within about one parsec of Sagittarius A*, the massive black hole at the centre of the Milky Way. We find that the stellar number counts and the diffuse light of the unresolved stellar population can be described very well by a stellar density function in the form of a broken-power law. Our observations agree well with theoretical predictions on the structure of a dynamically relaxed star cluster around a massive black hole. We also derive an estimate of the mass density of the extended cluster around Sagittarius A*. Mass densities larger than 107 solar masses per pc⁻³ are reached within 0.1 pc of the central black hole. Intriguingly, it appears that normal stars make up only about 50% of the total cluster mass. The remaining dark mass may be in the form of stellar mass black holes.

Junio 8, 2007, 14.00 hrs.

Ricardo Demarco, Johns Hopkins University

"Observaciones pancromaticas de cumulos de galaxias en el universo joven"

Cúmulos de galaxias son las estructuras gravitacionalmente ligadas, más grandes del universo. Ofrecen la oportunidad de estudiar en detalle el comportamiento de la materia en las regiones de mayor densidad de materia oscura. Su fuerte emisión en rayos X los hace detectables a un alto corrimiento al rojo del espectro, en épocas cuando el universo tenía solo un tercio de su edad actual. Usando el VLT y el Telescopio Espacial Hubble, entre otros, hemos realizado observaciones pancromaticas de cúmulos de galaxias con corrimientos al rojo cercanos a uno, permitiendonos hacer un estudio detallado no tan sólo de la distribución de materia oscura y bariónica en estas estructuras, sino que también de las propiedades de las galaxias que los componen. En esta oportunidad, presentaré los resultados obtenidos del estudio de dos de los cúmulos más masivos y distantes conocidos en el hemisferio sur celeste y discutiré sus implicancias sobre la formación de estructuras a gran escala y la formación y evolución de galaxias.

Julio 3, 2007, 14.00 hrs.

Markus Mugrauer, Yena University

"The multiplicity of planet host stars"

During the last decade more than two hundred planets were indirectly detected around stars in the solar neighborhood. Some of these so-called exoplanets were also found around stars which are themselves members of double or triple star systems. Today more than 30 of these stellar systems with exoplanets are known. A large fraction of them was revealed by us in a systematic imaging survey carried out during the last years mainly at La Silla observatory with the NTT (southern sky) and with UKIRT (northern sky) on Hawaii. In this talk I will summarize the detections of our imaging survey and discuss the impact of stellar multiplicity on the planet formation process in general. Furthermore, I will present apparent differences between the properties of exoplanets which revolve around single stars and those which reside in stellar systems.

Agosto 2, 2007, 14.00 hrs.

Stella Kafka del Observatorio Internacional Cerro Tololo

"Hyperactivity on the Secondary Star in Cataclysmic Variables"

Chromospheric Activity on the mass-losing secondary star in cataclysmic variables (CVs) is commonly invoked to explain sustained mass transfer caused by system angular momentum loss via a magnetized stellar wind. Such activity may also be responsible for the CV period gap, and for the widely differing mass transfer rates among CVs at the same orbital period. However there is a substantial lack of observational support for these scenarios because conventional activity indicators (such as X-rays, H-alpha emission, and flares) can also be produced by accretion. Here we present an extended spectroscopic monitoring campaign of a few magnetic CVs at times of reduced accretion. Unusual structures in the H-alpha line reveals magnetically-confined gas motions in large, long-lived loop prominences on the secondary star. Our work provides the first direct observational evidence of hyperactivity on the secondary star with a few surprises on its occurrence and duration, challenging our current understanding of prominence formation in low mass stars.

Agosto 3, 2007, 14.00 hrs.

John Southworth, University of Warwick, UK

"Satellite photometry of eclipsing binary stars and extrasolar planets"

Introduce the study of detached eclipsing binary stars, an area of research which has been going for over 100 years. I show how we can measure the stellar masses and radii to accuracies of

better than 1%, and discuss why we should bother. I present space-based light curves of eclipsing binaries obtained with the star tracker on board the WIRE satellite. The data are of remarkable quality, and indicate what we will get out of the forthcoming COROT and KEPLER missions. I apply this research to eclipsing binaries which are members of stellar open clusters. In these cases, we can measure the age, distance and chemical composition of the cluster directly from the eclipsing binary and without any use of main sequence fitting. Another application of light curve analysis is to transiting extrasolar planets, and this area will be more and more important as increasing numbers of transiting planets are discovered. I study HD 209458 and show what we can expect to get out of similar analyses.

Agosto 10, 2007, 14.00 hrs.

Valentin Ivanov, ESO

"Free floating planetary mass objects"

Many young brown dwarfs exhibit characteristics similar to classical T Tauri stars, including infrared excess from disks and emission lines related to accretion. Whether the same holds true for even lower mass objects, namely, those near and below the Deuterium-burning limit, is an important question. We carried out optical spectroscopy of planetary mass candidates in Chamaeleon II, Lupus I, and Ophiuchus star-forming regions, recently identified by Allers and collaborators to harbor substantial mid-infrared excesses. Our spectra show that four of the targets have spectral types in the ~M9-L1 range, and three of those also exhibit H-alpha. Their luminosities are consistent with masses of ~5MJ-15MJ according to models of Baraffe and coworkers, thus placing these four objects among the lowest mass brown dwarfs known to be surrounded by circum-substellar disks. Our findings bolster the idea that free-floating planetary mass objects could have infancies remarkably similar to those of Sun-like stars and suggest the intriguing possibility of planet formation around primaries whose masses are comparable to those of extrasolar giant planets. We identified a companion to the young planetary-mass brown dwarf Oph 162225-240515. This pair forms a resolved binary consisting of two objects with masses comparable to those of extrasolar giant planets. Models yield masses of ~14 and ~7 times the mass of Jupiter for the primary and the secondary object, respectively, at an age of ~1 million years. A wide (~240-astronomical unit) binary in the ultra-low-mass regime poses a challenge to some popular models of brown dwarf formation.

Agosto 27, 2007, 14.00 hrs.

Alberto Rebassa, University of Warwick, UK

"Post Common Envelope Binaries (PCEBs) with SDSS"

In this seminar I am going to provide an introduction of Post Common Envelope Binaries (PCEBs), essentially what they are, where they come from and why they are important. The main body of the talk, nevertheless, will be focused on

- (1) the identification of PCEBs from the Sloan Digital Sky Survey, and
- (2) the analysis of the stellar components (main sequence and white dwarf) of the sample.

Noviembre 21, 2007, 14.00 hrs.

Dr. Henny Lamers, Utrecht University, ESO

"The formation and destruction of star clusters in (interacting) galaxies"

Star clusters do not live forever. Within about 10 Myr after their birth out of giant molecular clouds, the remaining gas is expelled by stellar winds and supernova explosions. As a result, the majority of the clusters dissolve within about 10 ñ 20 Myr. This is called infant mortality. The clusters that survive infant mortality slowly dissolve on a very long time scale of Gyrs due to various internal and external effects such as two-body stellar encounters, the external tidal field, encounters with giant molecular clouds and shocks by galactic spiral arms. Recent studies,

based on HST images of large numbers of clusters in different galaxies, have shown that the survival times of clusters depends very strongly on the local conditions. It can differ by orders of magnitude between clusters in quiet galaxies, such as the Magellanic Clouds, or clusters in interacting galaxies, such as the Antenna galaxies. I will give a review of our present knowledge of the formation and destruction of star clusters in the Milky Way and in normal and interacting galaxies. I will discuss how we can measure the destruction rates of star clusters and the physical processes that are responsible for it. I will demonstrate some of these effects by movies based on numerical simulations. These studies help us to understand the populations of field stars in our galaxy and the difference between the Galactic open clusters and the globular clusters.

Noviembre 23, 2007, 14.00 hrs.

Alfredo Santillan, Universidad Aut noma de M xico

"Mexican Virtual Solar Observatory"

The Virtual Solar Observatory (VSO) concept contains software tools for searching, manipulating, and analyzing data from archives of solar data at many different observatories around the world (Hill 2000). The VSO not only provides fast and reliable access to the existing solar data, but also represents a powerful and unique machinery to perform numerical simulations for the evolution of a variety of different phenomena associated with the solar activity. Two Mexican Universities, Universidad Nacional Aut noma de M xico (UNAM) and the Universidad de Sonora (USON), are working together to create the Mexican Virtual Solar Observatory (MVSO) that will be part of a wider national effort. In this site we present a general description and advances obtained in the development of Graphical User Interfaces (GUI) to Remotely Perform Numerical Simulation of the Evolution of Coronal Mass Ejection in the Interplanetary Medium. This tool was developed by scientists and programmers of the Computer Center (DGSCA) & Instituto de Astronom a of the UNAM.