finite-difference numerical code is developed in order to solve the so-called Grad-Shafranov equation describing the equilibrium of these configurations, and some properties of the equilibria obtained are briefly discussed.

[1] Instituto de Astrofísica, Facultad de Física, Pontificia Universidad Católica de Chile, Av. Vicuña Mackenna 4860, 782-0436 Macul, Santiago, Chile.
[2] Departamento de Física, Facultad de Ciencias, Universidad de Chile, Casilla 653, Santiago, Chile.
[3] Argelander Institut für Astronomie, Universität Bonn, Auf dem Hügel 71, D-53121, Bonn, Germany.
* cyarmaza@uc.cl

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OWN SURVEY: RESULTS AFTER SEVEN YEARS OF HIGH-RESOLUTION SPECTROSCOPIC MONITORING OF SOUTHERN O AND WN STARS

R. Barbá[1], R. Gamen[2], J. I. Arias[1], N. Morrell[3], N. R. Walborn[4], J. Maíz Apellániz[5], A. Sota[5], and E. Alfaro[5]

We describe briefly the main results of the high-resolution spectroscopic monitoring survey of southern Galactic O- and WN-type stars. The high-resolution spectroscopic monitoring survey of O and WN stars (*OWN Survey*, Barbá et al. 2010) has completed seven years of sustained campaign, using observational facilities in Chile and Argentina. The selected sample corresponds to those stars for which there is no indication of multiplicity in the Galactic O-star Catalog (Maíz Apellániz et al. 2004) and the VII Catalogue of Galactic WR stars (van der Hucht 2001). We have collected almost 5000 spectra of about 240 O and WN stars. From that sample of 190 O-type stars, we have discovered 146 stars showing radial variations greater than 10 km/s, including 108 new systems, being 56 single-lined spectroscopic binaries, 43 double-lined spectroscopic binaries, and 9 multiple-lined binaries. The new orbital periods spanning from 1.5 to 2200 days. In this work, we present the main result of "OWN Survey": the determination of orbits for over fifty O-type spectroscopic binary systems, and the analysis of the spectral-type, luminosty, period, eccentricity, and mass-ratio distributions. This result is unprecedented in the context of massive binary stars, since we are almost doubling the number of Galactic O-type star systems with known orbits.

[1] Departamento de Física, Universidad de La Serena, Cisternas 1200 N, La Serena, Chile (rbarba@dfuls.cl).
[2] Instituto de Astrofísica de La Plata, Argentina.
[3] Las Campanas Observatory, Chile.
[4] Space Telescope Science Institute, USA.
[5] Instituto de Astrofísica de Andalucía-CSIC, Spain.

COLLISIONS BETWEEN GLOBULAR CLUSTERS

D. T. Belloni[1] and H. J. Rocha-Pinto[1]

The study of globular clusters (GC) plays an important role in our understanding of the Universe since these systems are true laboratories for theories of stellar dynamics and evolution. We are interested in studying a globular cluster formed by a collision between two different GC with NBODY6 (Aarseth, 2003). Firstly, in order to understand this code, we analyse how tidal streams form from a globular cluster in a circular orbit (on the disk) around the center of the Milky Way. In the next stage of this work we will study that collision. The stellar escape or capture from globular cluster can be understood with the Restricted Three Body Problem. These stars escape in a chaotic orbit, and in some cases may return (again in a chaotic orbit) to the cluster due to the Galactic potential. In most cases, such stars quickly alter their escape chaotic orbits to orbits that are similar to the parent cluster's orbit. Our results show an agglomeration of stars in a normal direction related to the direction towards the center of the Milky Way, forming thus a stream. We can explain this considering that a circular orbit around the dominant potential is the most likely orbit, since it requires minimum energy. In this coordinate systems, the tidal tails (or streams) rotates around the cluster center with the same mean motion associated to cluster around the Milky Way center.

[1] Observatório do Valongo, Universidae Federal do Rio de Janeiro, Ladeira Pedro Antonio 43, 20080-090 Rio de Janeiro, Brazil (diogo06@astro.ufrj.br).

SEARCHING FOR CYCLICAL PERIOD VARIATIONS IN CATACLYSMIC VARIABLE STARS

B. W. Borges[1], R. Baptista[2], and A. S. Oliveira[3]

Cataclysmic variables (CVs) are close binary systems where the late-type star (the secondary) overfills its Roche lobe and transfers matter to a white dwarf

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(the primary) via an accretion disc. In this poster we report the first results of long-term project to study cyclical period variations in CVs. The observations were done from 2008 to 2013 at Observatório do Pico dos Dias (OPD/LNA, Brazil). Times series of high speed CCD photometry were obtained using the 0.6 m and 1.6 m telescopes at OPD. We measured new white-dwarf mid-eclipse timings and combined them with published measurements to construct updated observed-minus-calculated (O-C) diagrams. The UU Aqr O-C diagram covers 24 years of observations and presents a 26 yr modulation with semi-amplitude of 47 s. The V2051 Oph data cover 35 years of observations and the new timings show significant deviations from the published linear plus sinusoidal ephemeris (22 yr modulation with a semi-amplitude of 17 s), indicating that the variation is not strictly periodic. We discuss the observed modulations in context of the two current explanations for the phenomenon: magnetic activity in the secondary star and the presence of a third body in the system.

[1] Universidade Federal de Santa Catarina, Campus Araranguá, Rua Pedro João Pereira, 150, CEP88905-120, Araranguá, Brasil (bernardo.borges@ufsc.br).
[2] Departamento de Física, Universidade Federal de Santa Catarina, Campus Trindade, Florianópolis, Brasil.
[3] Instituto de Pesquisa & Desenvolvimento, Universidade do Vale do Paraíba, São José dos Campos, Brasil.

NEWLY DISCOVERED OLD OPEN CLUSTERS IN THE VVV SURVEY

J. Borissova[1], S. Ramírez Alegría[1], A. N. Chené[2], R. Kurtev[1], and VVV star cluster team

We report the discovery and fundamental parameters of 20 infrared open clusters projected in the inner disk and bulge area covered by the ESO public survey VISTA Variables in the Via Láctea (VVV). The most interesting candidates are as follow: The color-magnitude diagrams of VVV CL119, VVV CL143 and VVV CL150 show well defined red giant branch, some red clump and main sequence stars. They are projected at 6.8; 9.2 and 6.98 kpc respectively, are 5-10 Gyr old, intermediate metal poor, and could be classified as old open clusters. However, these objects in the inner few kpc from the Galactic center are quite unusual, because they should be rare in the inner Galaxy. Thus, these are promising candidates for new globular clusters in the galactic bulge. The open cluster candidates VVV CL124, VVV CL160 and VVV CL161 show well defined sequence of evolved and main sequence stars and are classified as old open clusters. They are projected at 5.0; 5.5 and 8.7 kpc respectively. The cluster candidates VVV CL139 and VVV CL140, are projected very close each to other, show similar radial velocities and distance modulus of 3.8 kpc. The age of CL139 is estimated around 80 Myr, while CL140 is older (1.3 Gyr). Both clusters are relatively metal rich, and are good new cluster pair candidate. And finally, two cluster candidates from our sample, namely VVV CL117 and VVV CL130 show typical color-magnitude diagrams of red supergiant clusters, but more data are necessary to confirm their nature. In summary, 15% of new cluster candidates from our sample have ages between 100 Myr and 1 Gyr and 50% are older than 1 Gyr. All clusters are very reddened, reaching A_V=28 mag in some of the cases.

[1] Departamento de Física y Astronomía, Universidad de Valparaíso, Av. Gran Bretaña 1111, Playa Ancha, Casilla 5030, Chile (jura.borissova@uv.cl.)
[2] Gemini Observatory, Northern Operations Center, 670 N. A' ohoku Place Hilo, HI 96720, USA.

UNVEILING TYPE IIB SUPERNOVA PROGENITORS: SN 2011HS FROM A SUPERGIANT STAR

F. Bufano[1]

Type IIb Supernovae are the final evolutionary stage of massive stars that were able to retain only a thin ($\lesssim$1 $M_\odot$) H/He external envelope at the time of the explosion. The mechanism of mass-loss that made such final structure possible and the nature of such progenitor stars are still open issues. We present the results obtained from the study of a sample of Type IIb SNe, in particular, of SN 2011hs (Bufano et al., 2013, MNRAS submitted). SN 2011hs was a relatively faint (M_B = -15.6 mag) and red Type IIb SN, characterized by a narrow light curve shape. Its spectral evolution showed the metamorphosis typical of this class of SN, from spectra dominated by H I lines to spectra where He I features dominate, but with broad absorption line profiles indicating high expansion velocities. Modeling the light curve of SN 2011hs and its velocity evolution with hydrodynamical calculations, we estimated that the SN is consistent with the explosion of a 3–4 $M_\odot$ He-core star, from a main sequence mass of 12–15 $M_\odot$, ejecting a ^{56}Ni mass equal to 0.04 $M_\odot$ and characterized by an explosion energy of $E \approx 8.5 \times 10^{50}$ erg s^{-1}.