which mean coordinates ($\bar{\alpha}$,$\bar{\delta}$)=(110.8°,-32.0°), a radius of about 12' and mean proper motion components ($\bar{\mu}_\alpha cos\delta$,$\bar{\mu}_\delta$)=(9,4) mas/yr were obtained, in good agreement with the literature. The other two possible clusters have members fainter than magnitude 10.0 and they are not found in the literature. Related to Collinder 132, the low density of the data used in the area did not allow to detect it.

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ΔA OBSERVATIONS OF THREE GLOBULAR CLUSTERS: NGC 104, NGC 6205, AND NGC 7099

E. Paunzen[1,2], I. K. Illiev[2], and O. I. Pintado[3]

Globular clusters are main astrophysical laboratories to test and modify evolutionary models. Thought to be rather homogeneous in their local elemental distribution of members, new results suggest a wide variety of chemical peculiarities. The preselection of apparent peculiar stars for a detailed spectroscopic analysis is very important for globular cluster fields. Most regions are very dense and the target stars are, normally, very faint. Photometry could be one way out of the dilemma since it is very efficient. Up to now, only observations in the Johnson $UBV(RI)$ and Strömgren $uvby\beta$ systems are able The tool of Δa photometry is employed in order to detect chemically peculiar Population II stars. This three filter narrow band system measures the flux distribution in the region from 4900 to 5600Å in order to find any peculiarities around 5200Å. The first Δa observations for 3 globular clusters: NGC 104, NGC 6205 and NGC 7099, give very promising results, which will serve as a solid basis for follow-up observations including photometric as well as spectroscopic studies.

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GALACTIC EMBEDDED CLUSTERS WITH 2MASS INFRARED PHOTOMETRY

D. B. Pavani[1], P. P. De Araujo[1], E. Bica[1], and C. Bonatto[1]

Star clusters and associations are born in general embedded within giant molecular clouds. Because of this, during their formation and early evolution they are often only visible at infrared wavelengths, being heavily obscured by dust. In this work we employed the 2MASS photometric database together with WISE (NASA) images to analyze, for the first time, 10 Galactic embedded cluster candidates. WISE is fundamental owing to its sensitivity to dust emission, especially in the 12 μm and 22 μm bands. We followed the revised list of Dolidze clusters by M. Kronberger which was communicated to the DAML02 database (Dias et al. 2002). We selected interesting Dolidze objects from this list with additional inspections by one of us (E. B.). In the present study we show results for 4 candidates in view of determining their astrophysical parameters. We produced colour-magnitude diagrams (CMDs) and radial density profiles (RDPs). We employed the field decontamination method by Bonatto & Bica (2007, 2010) to obtain clean CMDs. We fit isochrones from PARSEC models (Bressan et al. 2012). This method has been systematically used in our publications and have shown how effective it is. All objects present a central concentration and extensions in RDPs. In certain cases, e.g. Dolidze 25, the profile distribution and central density are significant. The RDPs were important to define the extraction regions for the objects and their field decontamination areas. The isochrone fittings for Dolidze 5 show a clear Main Sequence (MS), while for Dolidze 25 a MS and Pre Main Sequence (PMS) are present. Dolidze 5 and Dolidze 25 appear to be physical systems, considering only the photometric data, while Dolidze 47 and Dolidze 55 resulted as field fluctuation.

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GALACTIC DYNAMICS: ORIGIN, HISTORY, PRESENT AND PROSPECT

B. Pichardo[1]

I present a travel through the history and main contributions to astrophysical development of the galac-

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tic dynamics discipline, passing by the most successful predictions and models, finishing with an integral vision of what is known from the Milky Way structure from it dynamics and the prospects with the new large scale surveys to understand it in the next decades.

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USING MASSCLEAN TO DESCRIBE STELLAR CLUSTERS FOUND IN THE VISTA VARIABLES IN THE VIA LACTEA (VVV) SURVEY

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The important parameters: age, mass and distance of resolved or partially resolved stellar clusters are better accurately determined by using color-magnitude diagrams (CMD). However, when the main sequence turnoff is not available or clearly identifiable, large errors in all parameters result when using simple isochrone fitting, particularly when observations are limited to near-infrared bands. We used the MASSCLEAN package to perform 5 million Monte Carlo simulations of stochastically sampled stellar clusters in order to generate CMD templates for a variety of cluster masses and ages and which mimic the observational photometric errors. This results in the creation of tens of thousands of n-dimensional stellar density maps (templates) in numerous color planes as a function of age and mass. We use these MASSCLEAN CMD templates to refine and sharpen traditional isochrone fitting to analyze the newly discovered stellar clusters/cluster candidates from the Vista Variables in the Via Lactea (VVV) Survey. Our MASSCLEAN templates are also being used to design and optimize search algorithms for stellar clusters in broad-band surveys.

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MASS EXTINCTIONS, GALACTIC ORBITS IN THE SOLAR NEIGHBORHOOD AND THE SUN: A CONNECTION?

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The orbits of the stars in the disk of the Galaxy, and their passages through the Galactic spiral arms, are a rarely mentioned factor of biosphere stability which might be important for long-term planetary climate evolution, with a possible bearing on mass extinctions. The Sun lies very near the co-rotation radius, where stars revolve around the Galaxy in the same period as the density wave perturbations of the spiral arms. Conventional wisdom generally considers that this status makes for few passages through the spiral arms. Controversy still surrounds whether time spent inside or around spiral arms is dangerous to biospheres and conducive to mass extinctions. Possible threats include giant molecular clouds disturbing the Oort comet cloud and provoking heavy bombardment; a higher exposure to cosmic rays near star forming regions triggering increased cloudiness in Earth's atmosphere and ice ages; and the destruction of Earth's ozone layer posed by supernova explosions. We present detailed calculations of the history of spiral arm passages for all 212 solar-type stars nearer than 20 parsecs, including the total time spent inside the spiral arms in the last 500 Myr, when the spiral arm position can be traced with good accuracy. We found that there is a large diversity of stellar orbits in the solar neighborhood, and the time fraction spent inside spiral arms can vary from a few percent to nearly half the time. The Sun, despite its proximity to the galactic co-rotation radius, has exceptionally low eccentricity and a low vertical velocity component, and therefore spends 30% of its lifetime crossing the spiral arms, more than most nearby stars. We discuss the possible implications of this fact to the long-term habitability of the Earth, and possible correlations of the Sun's passage through the spiral arms with the five great mass extinctions of the Earth's biosphere from the Late Ordovician to the Cretaceous-Tertiary.

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