Figure 1: Ultra-deep image of the Magellanic Clouds, taken by Yuri Beletsky in collaboration with David Martínez-Delgado and appearing in Besla et al. (2016).
Editorial

Dear Colleagues,

It is my pleasure to present you the 140th issue of the Magellanic Clouds Newsletter. One of the highlights was of course the detection of gravitational waves, possibly from somewhere behind the Large Magellanic Cloud!

Please check that the items you submitted appear in the newsletter. After a decade long service, the server of the Astrophysics group at Keele University finally died. This caused the newsletter database to be offline for about a week, with one further hiccup of the new server. Things are stable again, but if you tried to submit something during the times of troubles, it may not have entered the database and hence not appear in the newsletter (regardless of any e-mails suggesting you had succeeded). If this is the case, please just resubmit it, or contact me.

There are three job advertisements: postdocs and Ph.D. positions in Potsdam, and faculty positions in Chile.

If you’d like your results to feature on the front cover, just let me know. I’m sure you’ll have been impressed by the picture on the cover of this month’s issue!

The next issue is planned to be distributed on the 1st of June 2016.

Editorially Yours,
Jacco van Loon
We report the results of a kinematical Hα survey of the Large Magellanic Cloud (LMC) presented in the form of a kinematical and photometric catalogue of 210 HII regions. The observations have been obtained with a scanning Fabry–Perot interferometer that produced data cubes corresponding to 66 different pointings over this galaxy, each with a field of view of 38 arcmin, covering almost the whole extent of the LMC. We find a bimodal distribution of the Hα luminosity of LMC HII regions. We also derive the local star formation and star formation rate (SFR) per unit area of the nebulae, concluding that star formation in the LMC has proceeded until the present time at an average rate of roughly 0.11 M⊙ yr⁻¹. Also, we do not find any correlation between the SFR or ΣSFR with ∆V (full width at half-maximum for a single Gaussian profile and the difference in velocities for multiple-components velocity profiles), the diameter, the distance to the kinematical centre of the LMC and age of the nebulae. Over most of the LMC ∆V appears to be of the order of 30 km s⁻¹. However, in a few regions the ∆V of the velocity profiles is as large as 50–100 km s⁻¹, corresponding to identified supernova remnants and superbubbles undergoing expansion motions.

Published in MNRAS, 457, 2048 (2016)
Available from doi: 10.1093/mnras/stw054

A Dark Energy Camera search for missing supergiants in the LMC after the Advanced LIGO gravitational wave event GW 150914

James Annis¹ and 100+ authors

¹Fermilab, USA

The collapse of the core of a star is expected to produce gravitational radiation. While this process will usually produce a luminous supernova, the optical signature could be subluminous and a direct collapse to a black hole, with the star just disappearing, is possible. The gravitational wave event GW 150914 reported by the LIGO Virgo Collaboration (LVC) on 2015 September 16, was detected by a burst analysis and whose high probability spatial localization included the Large Magellanic Cloud. Shortly after the announcement of the event, we used the Dark Energy Camera to observe 102 deg² of the localization area, including a 38 deg² area centered on the LMC. Using a catalog of 152 LMC luminous red supergiants, candidates to undergo a core collapse without a visible supernova, we find that the positions of 144 of these are inside our images, and that all are detected – none have disappeared. There are other classes of candidates: we searched existing catalogs of red supergiants, yellow supergiants, Wolf–Rayet stars, and luminous blue variable stars, recovering all that were inside the imaging area. Based on our observations, we conclude that it is unlikely that GW 150914 was caused by the core collapse of a supergiant in the LMC, consistent with the LIGO Collaboration analyses of the gravitational waveform as best described by a high mass binary black hole merger. We discuss how to generalize this search for future very nearby core collapse candidates.

Submitted to ApJL
Available from arXiv:1602.04199
Spectral analysis of SMC X-2 during its 2015 outburst
Nicola La Palombara¹, Lara Sidoli¹, Fabio Pintore¹, Paolo Esposito¹, Sandro Mereghetti¹ and Andrea Tiengo¹,²,³

¹INAF–IASF Milano, Italy
²IUSS Pavia, Italy
³INFN Pavia, Italy

We report on the results of Swift and XMM–Newton observations of SMC X-2 during its last outburst in 2015 October, the first one since 2000. The source reached a very high luminosity ($L \sim 10^{38}$ erg s$^{-1}$), which allowed us to perform a detailed analysis of its timing and spectral properties. We obtained a pulse period $P_{\text{spin}} = 2.372267(5)$ s and a characterization of the pulse profile also at low energies. The main spectral component is a hard (photon index $\sim 0$) power-law model with an exponential cut-off, but at low energies we detected also a soft (with $kT \sim 0.15$ keV) thermal component. Several emission lines can be observed at various energies. The identification of these features with the transition lines of highly ionized N, O, Ne, Si, and Fe suggests the presence of photoionized matter around the accreting source.

Accepted for publication in MNRAS Letters
Available from arXiv:1602.02559

Low surface brightness imaging of the Magellanic System: imprints of tidal interactions between the Clouds in the stellar periphery
Gurtina Besla¹, David Martínez-Delgado², Roeland P. van der Marel³, Yuri Beletsky⁴, Mark Seibert⁵, Edward F. Schlafly⁶, Eva K. Grebel² and Fabian Neyer⁷

¹University of Arizona, USA
²Astronomisches Rechen-Institut, Zentrum für Astronomie der Universität Heidelberg, Germany
³Space Telescope Science Institute, USA
⁴Las Campanas Observatory, Chile
⁵Carnegie Observatories, USA
⁶Lawrence Berkeley National Laboratory, USA
⁷ETH Zurich, Switzerland

We present deep optical images of the Large and Small Magellanic Clouds (LMC and SMC) using a low cost telephoto lens with a wide field of view to explore stellar substructure in the outskirts of the stellar disk of the LMC ($r < 10^\circ$ from the center). These data have higher resolution than existing star count maps, and highlight the existence of stellar arcs and multiple spiral arms in the northern periphery, with no comparable counterparts in the South. We compare these data to detailed simulations of the LMC disk outskirts, following interactions with its low mass companion, the SMC. We consider interaction in isolation and with the inclusion of the Milky Way tidal field. The simulations are used to assess the origin of the northern structures, including also the low density stellar arc recently identified in the DES data by Mackey et al. (2015) at $\sim 15^\circ$. We conclude that repeated close interactions with the SMC are primarily responsible for the asymmetric stellar structures seen in the periphery of the LMC. The orientation and density of these arcs can be used to constrain the LMC’s interaction history with and impact parameter of the SMC. More generally, we find that such asymmetric structures should be ubiquitous about pairs of dwarfs and can persist for 1–2 Gyr even after the secondary merges entirely with the primary. As such, the lack of a companion around a Magellanic Irregular does not disprove the hypothesis that their asymmetric structures are driven by dwarf–dwarf interactions.

Submitted to ApJ
Available from arXiv:1602.04222
Radio planetary nebulae in the Small Magellanic Cloud

Howard Leverenz1, Miroslav D. Filipović2, I.S. Bojičić2, E.J. Crawford2, J.D. Collier2, K. Grieve2, D. Drašković4 and W.A. Reid4

1University of Southern Queensland, Toowoomba, Qld 4350, Australia
2University of Western Sydney, Locked Bag 1797, Penrith, NSW 2751, Australia
3Department of Physics, The University of Hong Kong, Pokfulam Road, Hong Kong, China
4Department of Physics and Astronomy, Macquarie University, Sydney, NSW 2109, Australia

We present ten new radio continuum (RC) detections at catalogued planetary nebula (PN) positions in the Small Magellanic Cloud (SMC): SMP S6, LIN 41, LIN 142, SMP S13, SMP S14, SMP S16, J 18, SMP S18, SMP S19 and SMP S22. Additionally, six SMC radio PNe previously detected, LIN 45, SMP S11, SMP S17, LIN 321, LIN 339 and SMP S24 are also investigated (re-observed) here making up a population of 16 radio detections of catalogued PNe in the SMC. These 16 radio detections represent \( \sim 15\% \) of the total catalogued PN population in the SMC. We show that six of these objects have characteristics that suggest that they are PN mimics: LIN 41, LIN 45, SMP S11, LIN 142, LIN 321 and LIN 339. We also present our results for the surface brightness – PN radius relation (\( \Sigma–D \)) of the SMC radio PN population. These are consistent with previous SMC and LMC PN measurements of the (\( \Sigma–D \)) relation.

Published in Astrophysics and Space Science
Available from arXiv:1602.03911

The VMC survey. XIX. Classical Cepheids in the Small Magellanic Cloud

V. Ripepi1, M. Marconi1, M.I. Moretti2, G. Clementini3, M.-R.L. Cioni4,5,6, R. de Grijs7,8, J.P. Emerson9, M.A.T. Groenewegen10, V.D. Ivanov11 and A.E. Piatti12,13

1INAF–Osservatorio Astronomico di Capodimonte, via Moiariello 16, 80131, Naples, Italy
2IAASARS, National Observatory of Athens, 15236 Penteli, Greece
3INAF-Osservatorio Astronomico di Bologna, via Ranzani, 40127, Bologna, Italy
4Universität Potsdam, Institut für Physik und Astronomie, Karl-Liebknecht-Str. 24/25, 14476 Potsdam, Germany
5Leibniz-Institut für Astrophysik Potsdam, An der Sternwarte 16, 14482 Potsdam Germany
6Centre for Astrophysics Research, School of Physics, Astronomy and Mathematics, University of Hertfordshire, College Lane, Hatfield, UK
7Kavli Institute for Astronomy & Astrophysics and Department of Astronomy, Peking University, Yi He Yuan Lu 5, Hai Dian District, Beijing 100871, China
8International Space Science Institute–Beijing, 1 Nanertiao, Zhongguancun, Hai Dian District, Beijing 100190, China
9School of Physics & Astronomy, Queen Mary University of London, Mile End Road, London E1 4NS, UK
10Koninklijke Sterrenwacht van België, Ringlaan 3, 1180, Brussel, Belgium
11European Southern Observatory, Karl-Schwarzschild-Straße 2, 85748 Garching bei München, Germany
12Observatorio Astronómico, Universidad Nacional de Córdoba, Laprida 854, 5000, Córdoba, Argentina
13Consejo Nacional de Investigaciones Científicas y Técnicas, Av. Rivadavia 1917, C1033AJJ, Buenos Aires, Argentina

The VISTA near-infrared YJKs survey of the Magellanic System (VMC) is collecting deep Ks-band time-series photometry of pulsating variable stars hosted by the two Magellanic Clouds and their connecting Bridge. In this paper, we present Y, J, Ks light curves for a sample of 4172 Small Magellanic Cloud (SMC) Classical Cepheids (CCs). These data, complemented with literature V values, allowed us to construct a variety of period–luminosity (PL), period–luminosity–color (PLC), and period–Wesenheit (PW) relationships, valid for Fundamental (F), First Overtone (FO) and Second Overtone (SO) pulsators. The relations involving V, J, Ks bands are in agreement with their counterparts in the literature. As for the Y band, to our knowledge we present the first CC PL, PW, and PLC relations ever derived using this filter. We also present the first near-infrared PL, PW, and PLC relations for SO pulsators to date. We used PW(V, Ks) to estimate the relative SMC–LMC distance and, in turn, the absolute distance to the SMC. For the former quantity we find a value of \( \Delta \mu = 0.55 \pm 0.04 \) mag, in rather good agreement with other evaluations based on CCs, but significantly larger than the results obtained from older population II distance
indicators. This discrepancy might be due to the different geometric distributions of young and old tracers in both Clouds. As for the absolute distance to the SMC, our best estimates are $\mu_{\text{SMC}} = 19.01 \pm 0.05$ mag and $\mu_{\text{SMC}} = 19.04 \pm 0.06$ mag, based on two distance measurements to the LMC, which rely on accurate CC and eclipsing Cepheid binary data, respectively.

Accepted for publication in Astrophysical Journal Supplement series
Available from arXiv:1602.09005

Tidally-induced offset disks in Magellanic spiral galaxies

Stephen A. Pardy\textsuperscript{1}, Elena D’Onghia\textsuperscript{1,2}, E. Athanassoula\textsuperscript{3}, Eric M. Wilcots\textsuperscript{1} and Kartik Sheth\textsuperscript{4}

\textsuperscript{1}Department of Astronomy, University of Wisconsin, 475 North Charter Street, Madison, WI 53706, USA
\textsuperscript{2}Alfred P. Sloan Fellow
\textsuperscript{3}Aix Marseille Université, CNRS, LAM (Laboratoire d’Astrophysique de Marseille) UMR 7326, 13388, France
\textsuperscript{4}National Aeronautics & Space Administration (NASA), USA

Magellanic spiral galaxies are a class of one-armed systems that often exhibit an offset stellar bar, and are rarely found around massive spiral galaxies. Using a set of $N$-body and hydrodynamic simulations we consider a dwarf–dwarf galaxy interaction as the driving mechanism for the formation of this peculiar class of systems. We investigate here the relation between the dynamical, stellar and gaseous disk center and the bar. In all our simulations the bar center always coincides with the dynamical center, while the stellar disk becomes highly asymmetric during the encounter causing the photometric center of the Magellanic galaxy disk to become mismatched with both the bar and the dynamical center. The disk asymmetries persist for almost 2 Gyrs, the time that it takes for the disk to be re-centered with the bar, and well after the companion has passed. This explains the nature of the offset bar found in many Magellanic-type galaxies, including the Large Magellanic Cloud (LMC) and NGC 3906. In particular, these results, once applied to the LMC, suggest that the dynamical center should reside in the bar center instead of the HI center as previously assumed, pointing to a variation in the current estimate of the north component of the LMC proper motion.

Submitted to ApJ
Available from arXiv:1602.07689

OGLE-ing the Magellanic System: Three-dimensional structure of the Clouds and the Bridge using classical Cepheids

Anna M. Jacyszyn-Dobrzeniecka\textsuperscript{1}, D.M. Skowron\textsuperscript{1}, P. Mróz\textsuperscript{1}, J. Skowron\textsuperscript{1}, I. Soszyński\textsuperscript{1}, A. Udalski\textsuperscript{1}, P. Pietrukowicz\textsuperscript{2}, S. Kozłowski\textsuperscript{3}, L. Wyrzykowski\textsuperscript{3}, R. Poleski\textsuperscript{1,2}, M. Pawlak\textsuperscript{1}, M.K. Szymański\textsuperscript{1} and K. Ulaczyk\textsuperscript{3}

\textsuperscript{1}Warsaw University Observatory, Poland
\textsuperscript{2}Department of Astronomy, Ohio State University, USA
\textsuperscript{3}Department of Physics, University of Warwick, UK

We analyzed a sample of 9418 fundamental-mode and first-overtone classical Cepheids from the OGLE-IV Collection of Classical Cepheids. The distance to each Cepheid was calculated using the period-luminosity relation for the Wesenheit magnitude, fitted to our data. The classical Cepheids in the LMC are situated mainly in the bar and in the northern arm. The eastern part of the LMC is closer to us and the plane fit to the whole LMC sample yields the inclination $i = 24.2 \pm 0.6$ deg and position angle P.A. = $151.4 \pm 1.5$ deg. We redefined the LMC bar by extending it in the western direction and found no offset from the plane of the LMC contrary to previous studies. On the other hand, we found that the northern arm is offset from a plane by about $-0.5$ kpc, which was not observed before. The age distribution of the LMC Cepheids shows one maximum at about 100 Myr. We demonstrate that the SMC has a non-planar structure and can be described as an extended ellipsoid. We identified two large ellipsoidal off-axis
structures in the SMC. The northern one is located closer to us and is younger, while the south-western is farther and older. The age distribution of the SMC Cepheids is bimodal with one maximum at 110 Myr, and another one at 220 Myr. Younger stars are located in the closer part of this galaxy while older ones are more distant. We classified nine Cepheids from our sample as Magellanic Bridge objects. These Cepheids show a large spread in three-dimensions although five of them form a connection between the Clouds. The closest one is closer than any of the LMC Cepheids, while the furthest one – farther than any SMC Cepheid. All but one Cepheids in the Magellanic Bridge are younger than 300 Myr. The oldest one can be associated with the SMC Wing.

Submitted to Acta Astronomica
Available from arXiv:1602.09141

Ages of LMC star clusters using ASAD$_2$

Randa S. Asa’$d^1$, Alexandre Vazdekis$^{2,3}$ and Sami Zeinelabdin$^1$

$^1$American University of Sharjah, Physics Department, P.O. Box 26666, Sharjah, UAE
$^2$Instituto de Astrofísica de Canarias (IAC), E-38200 La Laguna, Tenerife, Spain
$^3$Departamento de Astrofísica, Universidad de La Laguna, E-38205 Tenerife, Spain

We use ASAD$_2$, the new version of ASAD (Analyzer of Spectra for Age Determination), to obtain the age and reddening of 27 LMC clusters from full fitting of integrated spectra using different statistical methods ($\chi^2$ and K–S test) and a set of stellar population models including GALAXEV and MILES. We show that our results are in good agreement with the CMD ages for both models, and that metallicity does not affect the age determination for the full spectrum fitting method regardless of the model used for ages with log (age/year) < 9. We discuss the results obtained by the two statistical results for both GALAXEV and MILES versus three factors: age, S/N and resolution (FWHM). The predicted reddening values when using the $\chi^2$ minimization method are within the range found in the literature for resolved clusters (i.e. < 0.35), however the K–S test can predict $E(B–V)$ higher values. The sharp spectrum transition originated at ages around the supergiants contribution, at either side of the AGB peak around log (age/year) 9.0 and log (age/year) 7.8 are limiting our ability to provide values in agreement with the CMD estimates and as a result the reddening determination is not accurate. We provide the detailed results of four clusters spanning a wide range of ages. ASAD$_2$ is a user-friendly program available for download on the Web and can be immediately used at http://randaasad.wordpress.com/asad-package/.

Accepted for publication in MNRAS
Available from arXiv:1601.07669

The proper motion of HV 2112: A TZO candidate in the SMC

C. Clare Worley$^1$, Mike J. Irwin$^1$, Christopher A. Tout$^1$, Anna N. Żytkow$^3$, Morgan Fraser$^1$ and Robert G. Izzard$^1$

$^1$Institute of Astronomy, University of Cambridge, Madingley Rise, Cambridge CB3 0HA, U.K.

The candidate Thorne–Żytkow object ( TZO), HV 2112, is becoming a well-studied if enigmatic object. A key point of its candidacy as a TZO is whether or not it resides in the Small Magellanic Cloud (SMC). HV 2112 has detections in a series of photometric catalogues which have resulted in contradictory estimates of its proper motion and, therefore, its membership within the SMC. This letter seeks to resolve the issue of the SMC membership of HV 2112 through a reanalysis of extant photometric data. We also demonstrate the difficulties and downfalls inherent in considering a range of catalogue proper motions. We conclude that the proper motion, and associated ancillary radial velocity, positional and photometric properties, are fully consistent with HV 2112 being within the SMC and thus it remains a candidate TZO.

Accepted for publication in MNRAS
Available from arXiv:1602.08479
Thermal pressures in the interstellar medium of the Magellanic Clouds

Daniel E. Welty¹, James T. Lauroesch², Tony Wong³ and Donald G. York¹

¹University of Chicago, USA
²University of Louisville, USA
³University of Illinois at Urbana/Champaign, USA

We discuss the thermal pressures \((n_H T)\) in predominantly cold, neutral interstellar gas in the Magellanic Clouds, derived from analyses of the fine-structure excitation of neutral carbon, as seen in high-resolution HST/STIS spectra of seven diverse sight lines in the LMC and SMC. Detailed fits to the line profiles of the absorption from \(\text{C}_i\), \(\text{C}_i^*\), and \(\text{C}_i^{**}\) yield consistent column densities for the 3–6 \(\text{C}_i\) multiplets detected in each sight line. In the LMC and SMC, \(N(\text{C}_\text{tot})\) is consistent with Galactic trends versus \(N(\text{Na}_i)\) and \(N(\text{CH})\), but is slightly lower versus \(N(\text{K}_i)\) and \(N(\text{H}_2)\). As for \(N(\text{Na}_i)\) and \(N(\text{K}_i)\), \(N(\text{C}_\text{tot})\) is generally significantly lower, for a given \(N(\text{H}_\text{tot})\), in the LMC and (especially) in the SMC, compared to the local Galactic relationship. For the LMC and SMC components with well determined column densities for \(\text{C}_i\), \(\text{C}_i^*\), and \(\text{C}_i^{**}\), the derived thermal pressures are typically factors of a few higher than the values found for most cold, neutral clouds in the Galactic ISM. Such differences are consistent with the predictions of models for clouds in systems (like the LMC and SMC) that are characterized by lower metallicities, lower dust-to-gas ratios, and enhanced radiation fields – where higher pressures are required for stable cold, neutral clouds. The pressures may be further enhanced by energetic activity (e.g., due to stellar winds, star formation, and/or supernova remnants) in several of the regions probed by these sight lines. Comparisons are made with the \(\text{C}_i\) observed in some quasar absorption-line systems.

Accepted for publication in ApJ
Available from arXiv:1603.03801

Discovery of a loose star cluster in the Large Magellanic Cloud

Andrés E. Piatti¹,²

¹Observatorio Astronómico, Universidad Nacional de Córdoba, Laprida 854, 5000, Córdoba, Argentina
²Consejo Nacional de Investigaciones Científicas y Técnicas, Av. Rivadavia 1917, C1033AAJ, Buenos Aires, Argentina

We present results for an up-to-date uncatalogued star cluster projected towards the Eastern side of the Large Magellanic Cloud (LMC) outer disc. The new object was discovered from a search of loose star cluster in the Magellanic Clouds’ (MCs) outskirts using kernel density estimators on Washington CT1 deep images. Contrarily to what would be commonly expected, the star cluster resulted to be a young object \((\log(t/\text{yr}) = 8.45)\) with a slightly subsolar metal content \((Z = 0.013)\) and a total mass of 650 \(M_\odot\). Its core, half-mass and tidal radii also are within the frequent values of LMC star clusters. However, the new star cluster is placed at the Small Magellanic Cloud distance and at 11.3 kpc from the LMC centre. We speculate with the possibility that it was born in the inner body of the LMC and soon after expelled into the intergalactic space during the recent Milky Way/MCs interaction. Nevertheless, radial velocity and chemical abundance measurements are needed to further understand its origin, as well as extensive search for loose star clusters in order to constrain the effectiveness of star cluster scattering during galaxy interactions.

Accepted for publication in MNRAS Letters

Extended main sequence turn-offs in low mass intermediate age clusters

Andrés E. Piatti¹,² and Nate Bastian³

¹Observatorio Astronómico, Universidad Nacional de Córdoba, Laprida 854, 5000, Córdoba, Argentina
²Consejo Nacional de Investigaciones Científicas y Técnicas, Av. Rivadavia 1917, C1033AAJ, Buenos Aires, Argentina
³Astrophysics Research Institute, Liverpool John Moores University, 146 Brownlow Hill, Liverpool L3 5RF, UK

We present an imaging analysis of four low mass stellar clusters \((\lesssim 5000 M_\odot)\) in the outer regions of the LMC in
order to shed light on the extended main sequence turn-off (eMSTO) phenomenon observed in high mass clusters. The four clusters have ages between 1–2 Gyr and two of them appear to host eMSTOs. The discovery of eMSTOs in such low mass clusters – > 5 times less massive than the eMSTO clusters previously studied – suggests that mass is not the controlling factor in whether clusters host eMSTOs. Additionally, the narrow extent of the eMSTO in the two older (≈ 2 Gyr) clusters is in agreement with predictions of the stellar rotation scenario, as lower mass stars are expected to be magnetically braked, meaning that their CMDs should be better reproduced by canonical simple stellar populations. We also performed a structural analysis on all the clusters and found that a large core radius is not a requisite for a cluster to exhibit an eMSTO.

Accepted for publication in Astronomy & Astrophysics

**Star-formation history and X-ray binary populations: the case of the Large Magellanic Cloud**

Vallia Antoniou\textsuperscript{1} and Andreas Zezas\textsuperscript{2,3,1}

\textsuperscript{1}Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138, USA
\textsuperscript{2}Physics Department & Institute of Theoretical & Computational Physics, University of Crete, 71003 Heraklion, Crete, Greece
\textsuperscript{3}Foundation for Research and Technology–Hellas, 71110 Heraklion, Crete, Greece

In the present work we investigate the link between high-mass X-ray binaries (HMXBs) and star formation in the Large Magellanic Cloud (LMC), our nearest star-forming galaxy. Using optical photometric data, we identify the most likely counterpart of 44 X-ray sources. Among the 40 HMXBs classified in this work, we find 33 Be/X-ray binaries, and 4 supergiant XRBs. Using this census and the published spatially resolved star-formation history map of the LMC, we find that the HMXBs (and as expected the X-ray pulsars) are present in regions with star-formation bursts ≈ 6–25 Myr ago, in contrast to the Small Magellanic Cloud (SMC), for which this population peaks at later ages (≈ 25–60 Myr ago). We also estimate the HMXB production rate to be equal to 1 system per ≈ 23.0^{+1.8}_{-1.5} \times 10^{-3} M_\odot yr^{-1}, or 1 system per ≈ 143 M_\odot of stars formed during the associated star-formation episode. Therefore, the formation efficiency of HMXBs in the LMC is ≈ 17 times lower than that in the SMC. We attribute this difference primarily in the different ages and metallicity of the HMXB populations in the two galaxies. We also set limits on the kicks imparted on the neutron star during the supernova explosion. We find that the time elapsed since the supernova kick is ≈ 3 times shorter in the LMC than the SMC. This in combination with the average offsets of the HMXBs from their nearest star clusters results in ≈ 4 times faster transverse velocities for HMXBs in the LMC than in the SMC.

Accepted for publication in MNRAS

Available from arXiv:1603.08011

---

**Job Adverts**

**Faculty Positions in Astrophysics at Instituto de Astrofísica de Atacama**

Dear Colleagues,

The Instituto de Astrofísica de Atacama (IAA) at the Universidad De Atacama (UDA) in Copiapó (Chile) invites applications for two faculty positions to join the IAA team. The successful candidates will join a group of five faculty working on a broad range of research topics and will have access to the Chilean Time in a broad array of facilities, including ALMA, VLT, Gemini, Magellan, LSST, GMT and the E-ELT.

We are particularly interested in candidates with strong experience in one or more of these fields:
Origin, structure and evolution of planets, satellites, and minor bodies in the Solar System;

Extrasolar Planets;

Formation, structure and evolution of stars;

Milky Way: stellar populations, star clusters, variable stars, galactic structure;

Terrestrial Mars analogs;

Astrobiology.

The positions carry teaching duties in astronomy at the undergraduate level, with a load of 6h per week. The working language is English. While knowledge of Spanish is not required (teaching can be done in English), the successful candidates are expected to teach in Spanish within two years. The appointment at UDA will be for three years, with a first probation year, and the position is further extendable subject to performance.

Applicants should have a Ph.D. in astronomy or physics or related sciences completed at least 3 years prior to the starting day of the contract.

To receive full consideration, applications must be sent by Friday 18 of March 2016, although the position will remain open until filled. Start date is expected to be October 2016.

Applications must be submitted by e-mail to Mauro Barbieri (mauro.barbieri@uda.cl), and they should include:

1) Cover letter,
2) Curriculum Vitae,
3) List of publications,
4) Statement of recent research achievements (max. 2 pages),
5) An outline of future research (min. 2 pages, max. 10 pages),
6) The contact details of three referees (one needs to be the last employer, the others need to be aware of the recent work of the candidate).

Questions may be addressed to the previous e-mail address.

Relevant links:

Universidad de Atacama
http://www.uda.cl

Instituto de Astrofísica de Atacama
https://sites.google.com/site/grupoastrouda

Convocatoria Programa de Inserción de Investigadores en la UDA
http://www.vrip.uda.cl/frontend/noticia_completa/104

Best regards,
Mauro Barbieri

See also http://eas.unige.ch/jobs.jsp?id=671
Ph.D. in Astronomy on the Magellanic Clouds

The Leibniz Institute for Astronomy Potsdam (AIP) invites applications for a Ph.D. position in the Milky Way and Local Volume research group.

The candidate will work with Prof. Maria-Rosa Cioni on "Using the Magellanic Clouds to study the Interaction of Galaxies", a project funded by ERC Consolidator Grant number 682115-INTERCLOUDS.

The main goal of the Ph.D. work is to measure the proper motion of stellar populations across the Magellanic Clouds. The tools include near-infrared imaging data from the VISTA survey of the Magellanic Clouds system (VMC) and optical data from the Gaia astrometry space mission. The successful candidate will hold a master degree or equivalent in astrophysics, physics or related discipline. Candidates with previous experience in photometry of resolved stellar populations and with an interest in galaxy formation and evolution are strongly encouraged to apply.

The AIP is located in the beautiful Potsdam/Babelsberg area, at the southwest border of the Berlin metropolitan area. About 130 scientists work on a variety of astrophysical topics from solar physics to cosmology.

The AIP is an equal opportunity employer and particularly encourages applications from women. The AIP values diversity.

The appointment is for four years starting in October 2016 (but later arrangements are also possible). The salary is based on the German public service TV-L E13 scale at 75% level. Employer contributions to medical and dental insurance, maternity leave, and retirement benefits are included.

To apply please send a Curriculum Vitae, a one-page statement on research experience and interests, and two letters of reference to the e-mail address given below. Applications received by April 30th will receive full consideration, but the position remains open until filled.

Contact:
Prof. Dr. Maria-Rosa Cioni
Leibniz Institute for Astrophysics Potsdam (AIP)
An der Sternwarte 16, 14482 Potsdam
Germany
Tel. +49 331 7499 651
E-mail: mcioni@aip.de

See also http://www.aip.de/en/career/jobs/jobs-1/phd-in-astronomy-on-the-magellanic-clouds

Two postdoctoral positions on the Magellanic Clouds

The Leibniz Institute for Astrophysics Potsdam (AIP) invites applications for two postdoctoral positions in the Milky Way and Local Volume research group.

The candidates will work with Prof. Maria-Rosa Cioni on "Using the Magellanic Clouds to study the Interaction of Galaxies", a project funded by ERC Consolidator Grant number 682115-INTERCLOUDS.

The goal of the project is to quantify the effects of galaxy interactions by studying in detail the stellar populations of the Magellanic Clouds, extracting information from ongoing large-scale imaging surveys and preparing for spectroscopic observations with new wide-field spectrographs. One position is to work on the analysis of a unique combination of deep multi-band data to improve on the measurement of stellar population parameters. The other position is focused on the development of structural and dynamical models to interpret the distribution of stars and their kinematics.
Previous experience in these areas is welcome but not mandatory.

The AIP is located in the beautiful Potsdam/Babelsberg area, at the southwest border of the Berlin metropolitan area. About 130 scientists work on a variety of astrophysical topics from solar physics to cosmology.

The AIP is an equal opportunity employer and particularly encourages applications from women. The AIP values diversity.

Applicants should have a Ph.D. in astronomy, astrophysics, or a closely related field. Initial appointments will be made for three years starting in October 2016 (but later arrangements are also possible) with a possible extension of up to two additional years. The salary is based on the German public service TV-L scale. Employer contributions to medical and dental insurance, maternity leave, and retirement benefits are included.

To apply please send a CV including a list of publications, a two-page statement on research experience, one-page on future plans, and three letters of reference to the address given below. Applications received by April 30th will receive full consideration, but the positions remain open until filled.

Contact:
Prof. Dr. Maria-Rosa Cioni
Leibniz Institute for Astrophysics Potsdam (AIP)
An der Sternwarte 16, 14482 Potsdam
Germany
Tel. +49 331 7499 651
E-mail: mcioni@aip.de

See also http://www.aip.de/en/career/jobs/jobs-1/two-postdoctoral-positions-on-the-magellanic-clouds