The Magellanic Clouds Newsletter
An electronic exchange on Magellanic Clouds research

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Contents

3 Abstracts of Refereed Papers 2
1 Abstract of a Non-Refereed Paper 4
1 Meeting Announcement 4
Recent astro-ph Listings 5

Letter from the Editor

Dear Colleagues,

The Magellanic Clouds Working Group is pleased to bring you issue 70 of the Magellanic Clouds Newsletter. This month, we present 4 submitted abstracts, an announcement for an upcoming conference, and a collection of recent astro-ph listings of interest to Magellanic Clouds researchers. As always, this month’s issue is available from the MCGW Website in a variety of formats (PDF, HTML, PostScript, and TEX). In addition, we’d like to remind you that the latest information on upcoming meetings and job listings can be found on the MC News website.

Best Wishes,
Bryan Dunne
Editor, MC News
Abstracts of Refereed Papers

Results of the ESO-SEST Key Programme on CO in the Magellanic Clouds X. CO emission from star formation regions in LMC and SMC

F.P. Israel (1), L.E.B. Johansson (2), M. Rubio (3), G. Garay (3) Th. de Graauw (4), R.S. Booth (2), F. Boulanger (5, 6), M.L. Kutner (7), J. Lequeux (8) and L.-A. Nyman (2, 9)

(1) Sterrewacht Leiden, The Netherlands
(2) Onsala Space Observatory, Onsala, Sweden
(3) Departamento de Astronomia, Universidad de Chile, Santiago, Chile
(4) Laboratorium voor Ruimteonderzoek, SRON, The Netherlands
(5) Radioastronomie, Ecole Normale Superieure, Paris, France
(6) Institut d’Astrophysique Spatiale, Université de Paris-XI, Orsay, France
(7) Astronomy Department, University of Texas at Austin, USA
(8) LERMA, Observatoire de Paris, Paris, France
(9) European Southern Observatory, Santiago, Chile

We present \(J=1-0\) and \(J=2-1\) \(^{12}\)CO maps of several star-forming regions in both the Large and the Small Magellanic Cloud, and briefly discuss their structure. Many of the detected molecular clouds are relatively isolated and quite small with dimensions of typically 20 pc. Some larger complexes have been detected, but in all cases the extent of the molecular clouds sampled by CO emission is significantly less than the extent of the ionized gas of the star-formation region. Very little diffuse extended CO emission was seen; diffuse CO in between or surrounding the detected discrete clouds is either very weak or absent. The majority of all LMC lines of sight detected in \(^{13}\)CO has an isotopic emission ratio \(I(^{12}CO)/I(^{13}CO)\) of about 10, i.e. twice higher than found in Galactic star-forming complexes. At the lowest \(^{12}\)CO intensities, the spread of isotopic emission ratios rapidly increases, low ratios representing relatively dense and cold molecular gas and high ratios marking CO photo-dissociation at cloud edges.

Comments:
WWW: http://www.strw.leidenuniv.nl/israel/recent.html
e-mail: israel@www.strw.leidenuniv.nl

The Faint Cepheids of the Small Magellanic Cloud: an evolutionary selection effect?

D. Cordier, MJ Goupil and Y. Lebreton

Paris-Mendion Observatory - France ENSC Rennes - France

Two problems about the faintest Small Magellanic Cloud (SMC) Cepheids are addressed. On one hand evolutionary tracks fail to cross the Cepheid Instability Strip for the highest magnitudes (i.e. I-mag 17) where Cepheids are observed; Mass-Luminosity relations (ML) obtained from evolutionary
tracks disagree with Mass-Luminosity relations derived from observations. We find that the above failures concern models built with standard input physics as well as with non-standard ones. The present work suggests that towards highest magnitudes, Cepheids stars undergo a selection effect caused by evolution: only the most metal poor stars cross the Instability Strip during the “blue loop” phase and are therefore the only ones which can be observed at low luminosity. This solution enables us to reproduce the shape of the lower part of the Instability Strip and improves the agreement between observed and theoretical ML-relations. Some issues are discussed, among them Beat Cepheids results argue strongly in favor of our hypothesis.

Comments: Accepted in A&A
e-mail: daniel.cordier@ensc-rennes.fr

OB Stellar Associations in the Large Magellanic Cloud: Survey of young stellar systems

D. Gouliermis (1), M. Kontizas (2), E. Kontizas (3) and R. Korakitis (4)

(1) Sternwarte der Universität Bonn, Bonn, Germany
(2) Department of Astrophysics Astronomy & Mechanics, Faculty of Physics, University of Athens, Athens, Greece
(3) Institute for Astronomy and Astrophysics, National Observatory of Athens, Athens, Greece
(4) Dionysos Satellite Observatory, National Technical University of Athens, Athens, Greece

The method developed by Gouliermis et al. (2000, Paper I), for the detection and classification of stellar systems in the LMC, was used for the identification of stellar associations and open clusters in the central area of the LMC. This method was applied on the stellar catalog produced from a scanned 1.2m UK Schmidt Telescope Plate in U with a field of view almost 6.5° × 6.5°, centered on the Bar of this galaxy. The survey of the identified systems is presented here followed by the results of the investigation on their spatial distribution and their structural parameters, as were estimated according to our proposed methodology in Paper I. The detected open clusters and stellar associations show to form large filamentary structures, which are often connected with the loci of HI shells. The derived mean size of the stellar associations in this survey was found to agree with the average size found previously by other authors, for stellar associations in different galaxies. This common size of about 80 pc might represent a universal scale for the star formation process, whereas the parameter correlations of the detected loose systems support the distinction between open clusters and stellar associations.

Comments: Accepted by Astronomy & Astrophysics
e-mail: dgoulier@astro.uni-bonn.de
Abstracts of Non-Refereed Papers

Mass Segregation in Young LMC Clusters

Richard de Grijs (1), Gerry F. Gilmore (1) and Rachel A. Johnson (2)

(1) Institute of Astronomy, University of Cambridge, Cambridge, UK
(2) European Southern Observatory, Santiago, Chile

We present the detailed analysis of Hubble Space Telescope observations of the spatial distributions of different stellar species in two young compact star clusters in the Large Magellanic Cloud (LMC), NGC 1805 and NGC 1818. Based on a comparison of the characteristic relaxation times in their cores and at their half-mass radii with the observed degree of mass segregation, it is most likely that significant primordial mass segregation was present in both clusters, particularly in NGC 1805. Both clusters were likely formed with very similar initial mass functions (IMFs). In fact, we provide strong support for the universality of the IMF in LMC clusters for stellar masses $m_* \geq 0.8 M_\odot$.

Comments: To appear in: "The Local Group as an Astrophysical Laboratory", STScI Symp., May 2003, Baltimore (USA), ed. Livio M.
e-mail: grijs@ast.cam.ac.uk

Meeting Announcements

Hawaii International Conference on Sciences

January 15-18, 2004
Honolulu, Hawaii USA

The 2004 Hawaii International Conference on Sciences will be held from January 15 (Thursday) to January 18 (Sunday), 2004 at the Renaissance Ilikai Waikiki Hotel in Honolulu, Hawaii. The conference will provide many opportunities for academicians and professionals from sciences and related fields to interact with members inside and outside their own particular disciplines. Cross-disciplinary submissions are welcome.

The Hawaii International Conference on Sciences encourages the following types of papers / abstracts / submissions for any of the listed areas:

- Research Papers - Completed papers
- Abstracts - Abstracts of completed or proposed research
- Student Papers - Research by students
- Poster Sessions/Research Tables - informal presentation of papers or abstracts
- Work-in-Progress Reports or Proposals for future projects
- Reports on issues related to teaching
• Panel Discussions, Practitioner Forums and Tutorials are invited
• Workshop proposals are invited

Submissions may be made electronically via e-mail or mailed. Electronic submissions are preferred. Submissions will be acknowledged within 48 hours. If submissions are mailed, submit two copies of your paper, report, abstract, proposal or study. Submissions imply that at least one author will register for the conference and be present at the time designated in the conference program. Submissions must be received by August 25, 2003.

Address:
Hawaii International Conference of Sciences
P.O. Box 75036
Honolulu, HI 96836, USA
Phone: 808-949-1542
FAX: 808-947-2420
E-mail: sciences@hicsciences.org
WWW: http://www.hicsciences.org

Recent astro-ph Listings

astro-ph/0305469:
Title: A deep survey of heavy element lines in planetary nebulae - I. Observations and forbidden-line densities, temperatures and abundances
Authors: Y. G. Tsamis (1), M. J. Barlow (1), X.-W. Liu (2), I. J. Danziger (3), P. J. Storey (1) ((1) Univ. College London, (2) Peking Univ. (3) Osservatorio Astronomico di Trieste)
Comments: 36 pages; 3 figures; to be published in MNRAS

astro-ph/0305307:
Title: A XMM-Newton observation of Nova LMC 1995, a bright supersoft X-ray source
Authors: Marina Orio, Wouter Hartmann, Martin Still, Jochen Greiner
Comments: Accepted to appear in the Astrophysical Journal

astro-ph/0305303:
Title: Fluorine Abundances in the Large Magellanic Cloud and Omega Centauri: Evidence for Neutrino Nucleosynthesis?
Authors: K. Cunha, V. V. Smith, D. L. Lambert, K.H. Hinkle
Comments: 19 pages, 2 tables, 4 figures. In press to the Astronomical Journal

astro-ph/0305276:
Title: Near-Infrared photometry of LMC cluster Reticulum
Authors: M. Dall’Ora, G. Bono, J. Strom, V. Testa, G. Andreuzzi, R. Buonanno, F. Caputo, V. Castellani, C.E. Corsi, S. Degl’Innocenti, G. Marconi, M. Marconi, M. Monelli, V. Ripepi
astro-ph/0305262:
Title: Mass Segregation in Young LMC Clusters
Authors: Richard de Grijs (IoA, Cambridge, UK), Gerry F. Gilmore (IoA, Cambridge, UK),
Rachel A. Johnson (ESO, Chile)
Comments: 5 pages LaTeX; to appear in "The Local Group as an Astrophysical
Laboratory", STScI Symp., May 2003, Baltimore (USA), ed. Livio M

astro-ph/0305257:
Title: A Quantitative Comparison of SMC, LMC, and Milky Way UV to NIR Extinction Curves
Authors: Karl D. Gordon, Geoffrey C. Clayton, K. A. Misselt, Arlo U. Landolt, Michael J.
Wolff

astro-ph/0305235:
Title: Giant Pulses from PSR B0540-69 in the Large Magellanic Cloud
Authors: Simon Johnston, Roger W. Romani
Comments: Accepted by ApJ Letters. 11 pages, 3 figures

astro-ph/0305222:
Title: Consistent distances from Baade-Wesselink analyses of Cepheids and RR Lyraes
Authors: G. Kovcs
Comments: 5 pages, 2 figures, 1 table; to appear in MNRAS (Pink Pages)

astro-ph/0305103:
Title: High resolution spectroscopy and emission line imaging of DEM L 71 with
XMM-Newton
Authors: K. J. van der Heyden, J. A. M. Bleeker, J. S. Kaastra, J. Vink
Comments: 8 pages, 8 figures, 2 tables, accepted by A&A

astro-ph/0305102:
Title: RR Lyrae Distance Scale: Theory and Observations
Authors: Giuseppe Bono (INAF - Rome Astronomical Observatory)
Comments: (Invited Review, 21 pages, 7 figures) To be published in "Stellar Candles",
ed. W. Gieren & D. Alloin, Lecture Notes in Physics

astro-ph/0305072:
Title: The Faint Cepheids of the Small Magellanic Cloud: an evolutionary selection
effect?
Authors: D. Cordier, MJ Goupil, Y. Lebreton
Comments: 13 pages, 8 figures

astro-ph/0305042:
Title: History of the Local Group
Authors: Sidney van den Bergh (Dominion Astrophysical Observatory, Herzberg
Institute of Astrophysics, National Research Council of Canada)
Comments: 22 pages. 2 figures. To be published in "The Local Group as an
Astrophysical Laboratory" Cambridge University Press 2003

astro-ph/0305017:
Title: H_2 absorption in a dense interstellar filament in the Milky Way halo
Authors: P. Richter, K. R. Senbach, J. C. Howk
Comments: 12 pages, 6 figures; accepted for publication in A&A

astro-ph/0305010:
Title: The Column Density Distribution Function at z=0 from HI Selected Galaxies
Authors: Emma Ryan-Weber (1), Rachel Webster (1), Lister Staveley-Smith (2) ((1)
University of Melbourne, (2) ATNF)
Comments: 13 pages, low resolution figures in the appendix, MNRAS accepted
astro-ph/0304522:
Title: Core radius evolution of star clusters
Comments: Accepted for publication in MNRAS

astro-ph/0304479:
Title: XMM–Newton observations of Nova LMC 2000
Authors: J. Greiner (MPF Garching, Germany), M. Orio (INAF Torino, Italy & Dept of Astronomy, Madison, USA), N. Schartel (XMM–Newton Science Operations Centre, ESA, Spain)
Comments: 8 pages AA style with 10 figures; accepted for publication in AA

astro-ph/0304464:
Title: Recent Microlensing Results from the MACHO Project

astro-ph/0304456:
Title: The Optical Gravitational Lensing Experiment. Eclipsing Binary Stars in the Large Magellanic Cloud
Authors: L. Wyrzykowski, A. Udalski, M. Kubiaik, M. Szymanski, K. Zebrun, I. Solzyński, P.R. Wozniak, G. Pietrzyński, D. Szewczyk
Comments: 20 pages. Figures 2,4 and 6 included in ’jpg’ format. Only one Appendix D included (two pages in ’jpg’ format). Full resolution pages of all Appendices (A-D) and photometric data presented in the paper are available from the OGLE Internet archive: this http URL or its US mirror this http URL

astro-ph/0304365:
Title: Searches for Giant Pulses from Extragalactic Pulsars
Authors: M. A. McLaughlin, J. M. Cordes
Comments: Submitted to ApJ

astro-ph/0304297:
Title: Lithium in LMC carbon stars
Authors: D. Hatzidimitriou, D. H. Morgan, R. D. Cannon, B. F. W. Croke
Comments: 10 pages, 8 figures, Latex; in press, MNRAS

astro-ph/0304296:
Title: J-type Carbon Stars in the Large Magellanic Cloud
Authors: D. H. Morgan, R. D. Cannon, D. Hatzidimitriou, B. F. W. Croke

astro-ph/0304213:
Title: Stellar Evolutionary Models for Magellanic Clouds
Authors: V. Castellani, S. Degl’Innocenti, M. Marconi, P.G. Prada Moroni, P. Sestito
Comments: 11 pages, 9 eps figures, AA accepted, evolutionary tracks and isochrones available at this http URL at the link ‘‘Pisa Evolutionary Library’’
astro-ph/0304163:
Title: Stellar Crowding and the Science Case for Extremely Large Telescopes
Authors: Knut A.G. Olsen (1), Robert D. Blum (1), Francois Rigaut (2) ((1) National Optical Astronomy Observatory, (2) Gemini Observatory)
Comments: 25 pages, 19 figures in 35 separate files, Astronomical Journal, accepted

astro-ph/0304143:
Title: Long Period Variables detected by ISO in the SMC
Comments: 14 pages, 10 figures, 5 tables (2 electronic), accepted for publication by A&A

astro-ph/0304123:
Title: Modelling the nova rate in galaxies
Authors: Francesca Matteucci (1), Agostino Renda (1), Antonio Pipino (1), Massimo della Valle (2), ((1) Dipartimento di Astronomia, Universita' di Trieste, Italy, (2) Osservatorio Astronomico di Arcetri, Italy)
Comments: 9 pages, 5 figures, Astronomy and Astrophysics accepted

astro-ph/0304073:
Title: Long-term Properties of Accretion Disks in X-ray Binaries: II. Stability of Radiation-Driven Warping
Authors: W.I.Clarkson, P.A.Charles, M.J.Coe, S.Laycock
Comments: 12 pages, 14 figures, Re-submitted to MNRAS after referee's comments

astro-ph/0304019:
Title: OB Stellar Associations in the Large Magellanic Cloud: Survey of young stellar systems
Authors: D. Gouliermis (Sternwarte Bonn), M. Kontizas (University of Athens), E. Kontizas (National Observatory of Athens), R. Korakitis (National Technical University of Athens)

astro-ph/0303666:
Title: Distance scale and variable stars in Local Group Galaxies: LMC and Fornax
Comments: 4 pages, 2 figures, uses mem.cls, in Stars in Galaxies, La Palma, March 2003