EDITORIAL

This is the 25th issue of SCYON, and the first of the new academic year. We hope everybody had a good break during the summer vacations. The present issue of SCYON includes 12 abstracts, two conference announcements, one other announcement, and a job offer at Lund Observatory (PhD). As usual, we wish to thank all who sent in their contributions.

Holger Baumgardt, Pavel Kroupa and Jean-Claude Mermilliod

CONTENTS

Editorial ................................................................. 1
SCYON policy .......................................................... 2
Mirror sites ............................................................... 2
Abstract from/submitted to REFEREED JOURNALS ..................... 3
Abstracts of CONFERENCE PROCEEDINGS .......................... 12
Ph.D. (dissertation) summaries ......................................... 13
Conference / announcements .......................................... 14
Jobs ................................................................. 17
SCYON POLICY

The SCYON Newsletter publishes abstracts from any area in astronomy which are relevant to research on star clusters. We welcome all contributions. Topics to be covered include

1. Abstracts from refereed articles
2. Abstracts from conference proceedings
3. PhD summaries

Concerning possible infringements to copyright laws, we understand that the authors themselves are taking responsibility for the material they send us. We make no claim whatsoever to owning the material that is posted at our url or circulated by email. The newsletter SCYON is a free service. It does not substitute for our personal opinions, nor does it reflect in any way the views of our respective institutes of affiliations.

SCYON will be published initially once every two months. If the number of contributions justifies monthly installments, we will move toward more frequent issues in order to keep the newsletter relatively short, manageable for us, and up-to-date.

Conference and journal abstracts can be submitted at any time either by web download, or failing this, we also accept abstracts typeset using the latest latex abstract template (available from the SCYON webpage). We much prefer contributors to use the direct download form, since it is mostly automated. Abstracts will normally appear on the website as soon as they are submitted to us. Other contributions, such as PhD summaries, should be sent to us using the Latex template. Please do not submit postscript files, nor encoded abstracts as e-mail attachments.

All abstracts/contributions will be processed, but we reserve the right to not post abstracts submitted in the wrong format or which do not compile. If you experience any sort of problems accessing the web site, or with the Latex template, please write to us at scyon@astro.u-strasbg.fr.

A “Call for abstracts” is sent out approximately one week before the next issue of the newsletter is finalised. This call contains the deadline for abstract submissions for that coming issue and the Latex abstract template.

Depending on circumstances, the editors might actively solicit contributions, usually those spotted on a preprint server, but they do not publish abstracts without the author’s consent.

We implicitly encourage further dissemination of the letter to institutes and astronomers who may benefit from it.

The editors

SCYON Mirrors

The official Scyon mirror site in Australia is hosted at the Centre for Astrophysics & Supercomputing of the University of Swinburne by Duncan Forbes and his team:

HTTP://ASTRONOMY.SWIN.EDU.AU/SCYON/
We present the results of an investigation of post-Main Sequence mass loss from stars in clusters in the Magellanic Clouds, based around an imaging survey in the L'-band (3.8 micron) performed with the VLT at ESO. The data are complemented with JHKs (ESO and 2MASS) and mid-IR photometry (TIMMI2 at ESO, ISOCAM on-board ISO, and data from IRAS and MSX). The goal is to determine the influence of initial metallicity and initial mass on the mass loss and evolution during the latest stages of stellar evolution. Dust-enshrouded giants are identified by their reddened near-IR colours and thermal-IR dust excess emission. Most of these objects are Asymptotic Giant Branch (AGB) carbon stars in intermediate-age clusters, with progenitor masses between 1.3 and about 5 Msun. Red supergiants with circumstellar dust envelopes are found in young clusters, and have progenitor masses between 13 and 20 Msun. Post-AGB objects (e.g., Planetary Nebulae) and massive stars with detached envelopes and/or hot central stars are found in several clusters. We model the spectral energy distributions of the cluster IR objects, in order to estimate their bolometric luminosities and mass-loss rates. The IR objects are the most luminous cluster objects, and have luminosities as expected for their initial mass and metallicity. They experience mass-loss rates in the range from a few $10^{-6}$ up to $10^{-4}$ Msun/yr (or more), with most of the spread being due to evolutionary effects and only a weak dependence on progenitor mass and/or initial metallicity. About half of the mass lost by 1.3–3 Msun stars is shed during the superwind phase, which lasts of order $10^5$ yr. Objects with detached shells are found to have experienced the highest mass-loss rates, and are therefore interpreted as post-superwind objects. We also propose a simple method to measure the cluster mass from L'-band images.
Constraining the IMF in Extreme Environments: Detecting Young Low Mass Stars in Unresolved Starbursts

Michael R. Meyer and Julia Greissl
Steward Observatory, The University of Arizona

We demonstrate the feasibility of detecting directly low mass stars in unresolved super–star clusters with ages < 10 Myr using near–infrared spectroscopy at modest resolution (R ~ 1000). Such measurements could constrain the ratio of high to low mass stars in these extreme star–forming events, providing a direct test on the universal nature of the initial mass function (IMF) compared to the disk of the Milky Way (Chabrier, 2003). We compute the integrated light of super–star clusters with masses of $10^6 \, M_\odot$ drawn from the Salpeter (1955) and Chabrier (2003) IMFs for clusters aged 1, 3, and 10 Myr. We combine, for the first time, results from Starburst99 (Leitherer et al. 1999) for the main sequence and post–main sequence population (including nebular emission) with pre–main sequence (PMS) evolutionary models (Siess et al. 2000) for the low mass stars as a function of age. We show that \( \sim 4\% \) to \( \sim 12\% \) of the integrated light observed at 2.2 \( \mu \)m comes from low mass PMS stars with late–type stellar absorption features at ages < 3 Myr. This light is discernable using high signal–to–noise spectra (\( > 100 \)) at R=1000 placing constraints on the ratio of high to low mass stars contributing to the integrated light of the cluster.

Accepted by: Astrophysical Journal
For preprints, contact mmeyer@as.arizona.edu
Also available from the URL http://xxx.lanl.gov/abs/astro-ph/0507646
or by anonymous ftp at ftp://
Globular Clusters in NGC 4365: New K-band Imaging and a Reassessment of the Case for Intermediate-age Clusters

Larsen, S. S., Brodie, J. P., Strader, J.
ESO / ST-ECF, UCO/Lick

We study the globular cluster (GC) system of the Virgo giant elliptical galaxy NGC 4365, using new wide-field VIK imaging. The GC colour distribution has (at least) two peaks, but the colours of the red GCs appear more strongly weighted towards intermediate colours compared to most other large ellipticals and the integrated galaxy light. The intermediate-color/red peak may itself be composed of two sub-populations, with clusters of intermediate colours more concentrated towards the centre of the galaxy than both the blue and red GCs. Nearly all intermediate-colour and red GCs in our sample show an offset towards red V-K and/or blue V-I colours compared to SSP models for old ages in a (V-K,V-I) diagram. This has in the past been interpreted as evidence for intermediate ages. We also combine our VIK data with previously published spectroscopy. The differences between observed and model colour-metallicity relations are consistent with the offsets observed in the two-colour diagram, with the metal-rich GCs being too red (by about 0.2 mag) in V-K and too blue (by about 0.05 mag) in V-I compared to the models at a given metallicity. These offsets cannot easily be explained as an effect of younger ages. We conclude that, while intermediate GC ages cannot be definitively ruled out, an alternative scenario is more likely whereby all the GCs are old but the relative number of intermediate-metallicity GCs is greater than typical for giant ellipticals. The main obstacle to reaching a definitive conclusion is the lack of robust calibrations of integrated spectral and photometric properties for stellar populations with near-solar metallicity. In any case, it is puzzling that the intermediate-colour GCs in NGC 4365 are not accompanied by a corresponding shift of the integrated galaxy light towards bluer colours.

Accepted by: Astronomy & Astrophysics
For preprints, contact slarsen@eso.org
or by anonymous ftp at ftp://
Detection of a young stellar population in the background of open clusters in the Third Galactic Quadrant

Giovanni Carraro (¹) Ruben Vazquez (²) Andre Moitinho (³) Gustavo Baume (²)
(¹) UChile/Yale (²) La Plata (³) Lisboa

We report the detection of a young stellar population ($\leq 100$ Myrs) in the background of nine young open clusters in the Third Galactic Quadrant. Deep and accurate UBVRI photometry allows us to measure model-independent age and distance for the clusters and the background population with high confidence. This population is exactly the same population (the Blue Plume) recently detected in 3 intermediate-age open clusters and suggested to be a $\leq 1$-2 Gyr old population belonging to the Canis Major (CM) over-density (Bellazzini et al. 2004, Martinez-Delgado et al. 2005). However, we find that the young population in those three and in six clusters of our sample follows remarkably well the pattern of the Norma-Cygnus spiral arm as defined by CO clouds, while in the other three program clusters it lies in the Perseus arm. We finally provide examples of open clusters which do not show any background population, demonstrating that this population is not ubiquitous toward CM.

Accepted by: Astrophysical Journal
For preprints, contact gcarraro@das.uchile.cl
Also available from the URL http://
or by anonymous ftp at ftp://

Photometry of neglected open clusters in the First and Fourth Galactic Quadrants

Giovanni Carraro(¹) Kenneth A. Janes (²) Jason D. Eastman (²)
(¹) UChile/Yale (²) Boston University

CCD $BVI$ photometry is presented for 8 previously unstudied star clusters located in the First and Fourth Galactic Quadrants: AL 1, BH 150, NGC 5764, Lynga 9, Czernik 37, BH 261, Berkeley 80 and King 25. Color magnitude diagrams of the cluster regions suggest that several of them (BH 150, Lynga 9, Czernik 37 and BH 261 and King 25) are so embedded in the dense stellar population toward the galactic center that their properties, or even their existence as physical systems, cannot be confirmed. Lynga 9, BH 261 and King 25 appear to be slight enhancements of dense star fields, BH 150 is probably just a single bright star in a dense field, and Czernik 37 may be a sparse, but real cluster superimposed on the galactic bulge population. We derive preliminary estimates of the physical parameters for the remaining clusters. AL 1 appears to be an intermediate age cluster beyond the solar circle on the far side of the galaxy and the final two clusters, NGC 5764 and Berkeley 80 are also of intermediate age but located inside the solar ring. This set of clusters highlights the difficulties inherent in studying the stellar populations toward the inner regions of the galaxy.

Accepted by: Monthly Notices of the Royal Astronomical Society
For preprints, contact gcarraro@das.uchile.cl
Also available from the URL http://
or by anonymous ftp at ftp://
CCD photometric search for peculiar stars in open clusters. VI.
NGC 1502, NGC 3105, Stock 16, NGC 6268, NGC 7235 and NGC 7510

E. Paunzen(1), M. Netopil(1), I.Kh. Iliev(2), H.M. Maitzen(1), A. Claret(3), O.I. Pintado(4)

(1) Institute for Astronomy, University of Vienna, Austria (2) Institute of Astronomy, National Astronomical Observatory, Smolyan, Bulgaria (3) Instituto de Astrofísica de Andalucia, Granada, Spain (4) Departamento de Fisica, Facultad de Ciencias Exactas y Tecnologia, Universidad Nacional de Tucuman, Argentina

Within the sample of six young open clusters (NGC 1502, NGC 3105, Stock 16, NGC 6268, NGC 7235 and NGC 7510) we have investigated 1753 objects using the narrow band, three filter Delta a photometric system resulting in the detection of eleven bona-fide magnetic chemically peculiar (CP) stars and five Be or metal-weak stars. The results for the distant cluster NGC 3105 is most important because of the still unknown influence of the global metallicity gradient of the Milky Way. These findings confirms that CP stars are present in open clusters of very young ages (log ≥ 6.90) at galactocentric distances up to 11.4kpc. For all programme clusters the age, reddening and distance modulus were derived using the corresponding isochrones. Some additional variable stars within Stock 16 could be identified by comparing different photometric studies.

Accepted by: Astronomy & Astrophysics

For preprints, contact Ernst.Paunzen@univie.ac.at
or by anonymous ftp at ftp://
A statistical analysis of chemically peculiar stars in open clusters


(1) Institute for Astronomy, University of Vienna, Austria (2) Institute of Astronomy, National Astronomical Observatory, Smolyan, Bulgaria (3) Departamento de Fisica, Facultad de Ciencias Exactas y Tecnologia, Universidad Nacional de Tucuman, Argentina

The chemically peculiar (CP) stars of the upper main sequence are excellent test objects to study the effects of diffusion, mass-loss, meridional circulation and global magnetic fields over a temperature range from 24000 to 6000K (9\(M_\odot\) > \(M\) > 1.5\(M_\odot\)). Due to the chemical peculiarity, the standard calibrations methods derived for apparent normal type stars often fail, or at least give erratic results for this group of objects. We have therefore chosen CP stars that are members of galactic open clusters because parameters like the age, distance, and reddening for open clusters can be determined in a statistic way for up to hundreds of members which minimizes the errors introduced by the chemical peculiarity. In total, 276 classified CP stars in 78 open clusters were found after a careful analysis of membership criteria based on kinematic data and all available color-color diagrams. The incidence and characteristics of the different subgroups are analyzed according to the temperature range, age, metallicity and location within the Milky Way.

Submitted to: Astronomy & Astrophysics

For preprints, contact netopil@astro.univie.ac.at
Also available from the URL
or by anonymous ftp at

Chemical Homogeneity in the Hyades

G.M. De Silva1, C. Sneden2, D.B. Paulson2, M. Asplund1, J. Bland-Hawthorn3, M.S. Bessell1, K.C. Freeman1

1Mount Stromlo Observatory, Australian National University, Weston ACT 2611, Australia; 2Dept of Astronomy, University of Texas, Austin, TX 78712; 3Anglo-Australian Observatory, Eastwood NSW 2122, Australia.

We present an abundance analysis of the heavy elements Zr, Ba, La, Ce, and Nd for Hyades cluster F-K dwarfs based on high resolution, high S/N ratio spectra from Keck/HIRES. The derived abundances show the stellar members to be highly uniform, although some elements show a small residual trend with temperature. The rms scatter for each element for the cluster members is as follows: Zr = 0.055 dex, Ba = 0.049 dex, Ce = 0.025 dex, La = 0.025 dex, Nd = 0.032 dex. This is consistent with the measurement errors, and implies that there is little or no intrinsic scatter among the Hyades members. Several stars thought to be non-members of the cluster based on their kinematics are found to deviate from the cluster mean abundances by about 2\(\sigma\). Establishing chemical homogeneity in open clusters is the primary requirement for the viability of chemically tagging Galactic disk stars to common formation sites, in order to unravel the dissipative history of early disk formation.

Accepted by: Astronomical Journal

For preprints, contact gayandhi@mso.anu.edu.au
Also available from the URL http://
or by anonymous ftp at ftp://
We explore whether we can constrain the shape of the initial mass distribution of the star cluster population in M82’s ∼1 Gyr-old post-starburst region “B”, in which the present-day cluster mass function (CMF) is closely approximated by a log-normal distribution. We conclude that the M82 B initial CMF must have had a mean mass very close to that of the “equilibrium” CMF of Vesperini (1998). Consequently, if the presently observed M82 B CMF has remained approximately constant since its formation, as predicted, then the initial CMF must have been characterized by a mean mass that was only slightly larger than the present mean mass. From our detailed analysis of the expected evolution of CMFs, we conclude that our observations of the M82 B CMF are inconsistent with a scenario in which the 1 Gyr-old cluster population originated from an initial power-law mass distribution. Our conclusion is supported by arguments related to the initial density in M82 B, which would have been unphysically high if the present cluster population were the remains of an initial power-law distribution.

Accepted by: MNRAS
For preprints, contact R.deGrijs@sheffield.ac.uk
Induced planet formation in stellar clusters - a parameter study of star-disk encounters

Ingo Thies (1) Pavel Kroupa (1) Christian Theis (2)
(1) University of Bonn, RSDN (2) University of Vienna

We present a parameter study of the possibility of tidally triggered disk instability. Using a restricted N-body model which allows for a survey of an extended parameter space, we show that a passing dwarf star with a mass between 0.1 and 1 $M_\odot$ can probably induce gravitational instabilities in the pre-planetary solar disk for prograde passages with minimum separations below 80-170 AU for isothermal or adiabatic disks. Inclined and retrograde encounters lead to similar results but require slightly closer passages. Such encounter distances are quite likely in young moderately massive star clusters (Scally & Clarke 2001; Bonnell et al. 2001). The induced gravitational instabilities may lead to enhanced planetesimal formation in the outer regions of the protoplanetary disk, and could therefore be relevant for the existence of Uranus and Neptune, whose formation timescale of about 100 Myr (Wuchterl, Guillot & Lissauer 2000) is inconsistent with the disk lifetimes of about a few Myr according to observational data by Haisch, Lada & Lada (2001). The relatively small gas/solid ratio in Uranus and Neptune can be matched if the perturbing fly-by occurred after early gas depletion of the solar system, i.e. when the solar system was older than about 5 Myr.

We also confirm earlier results by Heller (1993) that the observed 7 degree tilt of the solar equatorial plane relative to the ecliptic plane could be the consequence of such a close encounter.

Accepted by: Monthly Notices of the Royal Astronomical Society

For preprints, contact ithies@astro.uni-bonn.de


or by anonymous ftp at ftp://
Photometry and Spectroscopy of Old, Outer Disk Star Clusters: 
vdB-Hagen 176, Berkeley 29 and Saurer 1

Peter M. Frinchaboy(1), Ricardo R. Munoz(1), Randy L. Phelps(2), Steven R. 
Majewski(1), and William E. Kunkel(3)

(1) University of Virginia, (2) NSF, CSU Sacramento, (3) Las Camapans Observatory

It has been previously proposed that some distant open clusters in the Milky Way may have 
been accreted during a dwarf galaxy merger, perhaps associated with the same event that led to 
the formation of the Galactic anticenter stellar structure (GASS), also known as the “Monoceros 
Ring”. We have obtained VI and Washington+DDO51 photometric and medium resolution (R ∼ 
8000) multi-fiber spectroscopic data for the three distant old open clusters Berkeley 29, Saurer 1, and 
vdB-Hagen 176 (BH 176). These clusters are spatially coincident with GASS, but radial velocities 
and spectroscopic metallicities had not been available during previous studies of the GASS candidate 
cluster system. Similar data for the clusters Berkeley 20 and Berkeley 39 have been obtained for 
calibration purposes. We provide the first reliable radial velocity for BH 176 ($V_{\text{helio}} = 11.2 +/- 5.3$ 
km/s). We also find that $V_{\text{helio}} = +95.4 +/- 3.6$ and $+28.4 +/- 3.6$ km/s, for Saurer 1(A) and Berkeley 
29, respectively. We show that alpha-enhanced isochrones, while spectroscopically motivated, provide 
a poor fit to Be29 in contrast to previous findings. We find that the clusters Berkeley 29 and Saurer 1 
are consistent with the previously reported characteristics for GASS candidate clusters and the GASS 
stellar stream as derived from M-giant observations. However, the radial velocity and photometric 
metallicity ([Fe/H] ∼ 0.0 dex) for BH 176 suggests that a connection of this cluster with the putative 
GASS cluster system is unlikely. We reassess the age-metallicity relation for the most likely members 
of the GASS clusters system for which spectroscopic metallicities are now available.

Accepted by: Astronomical Journal

For preprints, contact pmf8b@virginia.edu
Also available from the URL http://
or by anonymous ftp at ftp://
The dark matter distribution of the Milky Way remains among the major unsolved problems about our home galaxy. The masses of other spiral galaxies can be determined from their rotation curves through long-slit spectroscopy. But for the Milky Way obtaining the complete rotation curve is a more complex problem. By measuring the 3-dimensional motions of tracer objects the rotation curve and Galactic mass distribution can be derived, even outside the solar circle where HI tangent point analysis is not possible. We present the first findings from a project to measure the motions of open clusters, both inside and outside the solar circle. From a nearly uniform sample of spectroscopic data for large numbers of stars in over 50 open clusters in the third and fourth Galactic quadrants, we derive the speed of Galactic rotation at the solar circle as $\Theta_0 = 214^{+6}_{-9} \text{ km s}^{-1}$. Future work will include clusters in the other Galactic quadrants and analysis of the local rotation curve.


For preprints, contact pmf8b@virginia.edu

Also available from the URL

or by anonymous ftp at
MODEST-6a meeting

A winter workshop on stellar clusters to be held at Lund Observatory 12-15 December, 2005

Modest-6a will take place at Lund Observatory, Lund, in southern Sweden, 12-15 December, 2005. We will have a small number of review talks and slots for other presentations (especially from PhD students and postdocs). Modest-6a will be run in the style of Aspen/ITP/Newton Institute meetings, with plenty of time for discussion.

A key aim of Modest-6a will be to foster and develop new collaborative ventures as well as to strengthen existing ones within the Modest community.

The format and venue for Modest-6a will limit the number of attendees to about 40-50, so please register early to avoid disappointment.

You can register by emailing Melvyn B. Davies (mbd@astro.lu.se). Lund is most easily reached by flying to Copenhagen and then taking the train to Lund from Copenhagen Airport (journey time about 1 hour). Other travel and accommodation information and a list of those already registered is provided on the Modest-6a webpage: http://www.astro.lu.se/melvyn/modest6a.html
We are planning a conference on globular cluster systems and related topics to be held in Concepción, Chile, March 6-10, 2006.

The conference will review and discuss the latest developments in the field including tidal tails, young massive clusters, ultracompact dwarfs, cluster formation in different environments, properties of cluster systems and their relation to galaxy formation, clusters as dynamical probes etc.


Invited speakers include:

More information is available at the web site http://www.astro-udec.cl/gcgg

Inquiries should be sent to: gcgg@astro-udec.cl

Concepcion lies at the Pacific Coast in the beautiful south of Chile near the Lake District, volcanoes, many national parks, and hot springs. March is generally a very nice month for tourist activities.
New catalogue of optically visible open clusters and candidates - version 2.5 (2005)

W. S. Dias¹, B. S. Alessi, A. Moitinho² and J. R. D. Lépine³

¹IP&D, UNIVAP, Av. S. Hifumi 2911, São José dos Campos, 12244-000, SP, Brazil, ²CAAUL, Observatório Astronómico de Lisboa, Tapada da Ajuda, 1349-018 Lisboa, Portugal, ³Universidade de São Paulo, Dept. de Astronomia, CP 3386, São Paulo 01060-970, Brazil,

We have compiled a new edition of the catalogue of open clusters and candidates which updates the previous edition published in 2002 (Dias et al. 2002). The number of clusters (1753) presently known represents an important increment relative to the 1987 edition of the Lynga catalogue.

In this new edition (version 2.5), we included 111 new open clusters or candidates in the database. Virtually all papers published after the version 2.4 of the catalogue were investigated, resulting in the inclusion of new fundamental parameters, mean proper motions, mean radial velocities and metallicities for various clusters.

The new informations are given in the link whatsnew and the references of the investigated papers are given in the file references.

This catalogue is being constantly updated and maintained in electronic form for widest possible accessibility. The latest version (2.5) can be accessed online at http://www.astro.iag.usp.br/~wilton

For preprints, contact wilton@usp.br or wilton@univap.br
Also available from the URL http://www.astro.iag.usp.br/~wilton
PhD Studentship Position
Lund Observatory

A PhD studentship is available at Lund Observatory, in Sweden.

Research will include theoretical and computational work concerning the evolution of stellar clusters and the exotic objects produced within them. Possible topics to be studied include the formation of massive black holes and the survivability of planetary systems within crowded stellar clusters.

To find out more about the position and how to apply, potential applicants should contact Melvyn B. Davies by email (mbd@astro.lu.se).

Application deadline is 7th November, 2005.