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THE MASSIVE STAR NEWSLETTER

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Editors: Philippe Eenens (University of Guanajuato) eenens@gmail.com

Raphael Hirschi (Keele University) http://www.astroscu.unam.mx/massive_stars

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News

Nomenclature of Galactic Wolf-Rayet stars

The nomenclature of Galactic Wolf-Rayet stars has been fixed since the 6th Catalogue (van der Hucht 1981), e.g. WR20. Subsequently discovered stars have been inserted via alphabetical identifications ordered by RA, as implemented for the 7th Catalogue and Annex (van der Hucht 2001, 2006), such as WR20a between WR20 and WR21.

Since the advent of efficient IR detectors the number of Galactic WR stars has greatly increased, necessitating a new scheme. A subset of the IAU Working Group for Massive Stars has been charged with new recommendations for the nomenclature for Milky Way WR stars, as follows:

1. All WR identifications up to 7th Catalogue/Annex remain unchanged since many are in widespread usage in the literature (e.g. WR20, WR20a).

2. All subsequent discoveries are switched from alphabetical (WRXXa, b) to numerical (WRXX-1, -2) identification, sorted by year/month of discovery, in RA order if multiple discoveries arise from a single source.

3. Multiple WR stars identified within a single source are indicated with CAPITAL letters (e.g. WR43a, b, c -> WR43A, B, C).

By way of example, three WR stars have been discovered since 2006 whose RA's are intermediate between WR20 and WR21. The first (discovered by Mauerhan et al. 2011) is assigned WR20-1, while two subsequent discoveries (from Roman-Lopez et al. 2011) are assigned WR20-2 and -3 (RA ordered). Since a few journal papers have referred to recently discovered stars using the former [alphabetical] scheme it is intended to retain such aliases, albeit solely for discoveries up to the end of Dec 2012 (WR20aa for WR20-2, WR20c for WR20-3).

Identifications for all known Galactic WR stars listed at the weblink have been updated to take into account these changes. Please contact Paul Crowther for advice on new additions.

Paul Crowther, Wolf-Rainer Hamann, Ian Howarth, Karel van der Hucht, Gregor Rauw

Dec 2012

Weblink: http://pacrowther.staff.shef.ac.uk/WRcat

Email: Paul.Crowther@sheffield.ac.uk

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Leonid Georgiev (1961 - 2012)

Leonid Georgiev, mexican astrophysicist and member of the Instituto de Astronomia of the Universidad Nacional Autonoma de Mexico, passed away on December 26, 2012. Born in 1961 in Lom, Bulgaria Leonid earned a PhD degree in Astronomy from the Faculty of Physics of Sofia University in 1992 with the thesis entitled: *The spectral variability of 11 single Wolf-Rayet stars and its nature and connection to their evolution*. This investigation was the prelude to what would become the central topic of his work throughout the rest of his life, and one which would lead him to become an expert in the observations and theoretical modeling of the spectroscopic characteristics of stars possessing stellar winds.

After graduation, Leonid Georgiev occupied a permanent position in the Department of Astronomy of Sofia University and then, in 1995, he traveled to Mexico for a 2-year postdoctoral visit at the Instituto de Astronomia. In 1998 he was offered a research position at this same Institute, where he remained for the rest of his life, becoming fully committed with teaching, observatory development and other institutional activities in addition to his research activities.

Most recently, he was tackling the problem of theoretically determining the observational properties of non-isotropic stellar wind configurations, such as occur in close binary systems where the interactions due to stellar winds and irradiation can lead to significantly asymmetric wind structures. He was also developing methods for the self-consistent analysis of circumstellar nebulae and the stellar atmosphere and wind of the associated central star, and, in addition, he was part of the team working on the robotization of the Observatorio Astronomico Nacional de San Pedro Martir 1.5m telescope and its use for detecting Gamma-ray burst optical counterparts.

Besides being an extremely skilled observational astronomer, Leonid was a wonderful colleague, always forthcoming with help, advice and insight on topics ranging from fundamental astronomy to galactic cluster evolution, on astronomical instrumentation and computational techniques. His warm and direct approach to treating people gained him the respect and admiration of students, colleagues and friends.

Leonid was a resourceful and tenacious researcher, admired teacher, and devoted to his family and friends. He will be missed greatly by us all.

Weblink:

Email: gloria@astro.unam.mx

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PAPERS

Abstracts of 12 accepted papers

A spectroscopic investigation of the O-type star population in four Cygnus OB associations. I. Determination of the binary fraction

L. Mahy(1), G. Rauw(1), M. De Becker(1), P. Eenens(2), C. A. Flores(2)

(1) Institut d'Astrophysique et de Géophysique, University of Liège, Belgium
(2)Departamento de Astronomia, Universidad de Guanajuato, Mexico

Context. Establishing the multiplicity of O-type stars is the first step towards accurately determining their stellar parameters. Moreover, the distribution of the orbital parameters provides observational clues to the way that O-type stars form and to the interactions
during their evolution.
Aims. Our objective is to constrain the multiplicity of a sample of O-type stars belonging to poorly investigated OB associations in the Cygnus complex and for the first time to provide orbital parameters for binaries identified in our sample. Such information is relevant to addressing the issue of the binarity in the context of O-type star formation scenarios.
Methods. We performed a long-term spectroscopic survey of nineteen O-type stars. We searched for radial velocity variations to unveil binaries on timescales from a few days up to a few years, on the basis of a large set of optical spectra.
Results. We confirm the binarity for four objects: HD193443, HD228989, HD229234 and HD194649. We derive for the first time the orbital solutions of three systems, and we confirm the values of the fourth, showing that these four systems all have orbital periods shorter than 10 days. Besides these results, we also detect several objects that show non-periodic line profile variations in some of their spectral lines. These variations mainly occur in the spectral lines, that are generally affected by the stellar wind and are not likely to be related to binarity.
Conclusions. The minimal binary fraction in our sample is estimated to be 21%, but it varies from one OB association to the next. Indeed, 3 O stars of our sample out of 9 (33%) belonging to CygOB1 are binary systems, 0% (0 out of 4) in CygOB3, 0% (0 out of 3) in CygOB8, and 33% (1 out of 3) in CygOB9. Our spectroscopic investigation also stresses the absence of long-period systems among the stars in our sample. This result contrasts with the case of the O-type stellar population in NGC 2244 among which no object showed radial velocity variations on short timescales. However, we show that it is probably an effect of the sample and that this difference does not a priori suggest a somewhat different star forming process in these two environments.

Reference: arXiv:1301.0500
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1301.0500

Comments: 22 pages, 26 figures, 5 tables (Table 2 only available on CDS)

Email: mahy@astro.ulg.ac.be

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Massive star evolution: Luminous Blue Variables as unexpected Supernova progenitors

Jose H. Groh, Georges Meynet, Sylvia Ekstrom

Geneva Observatory, Switzerland

Stars more massive than about 8 Msun end their lives as a Supernova (SN), an event of fundamental importance Universe-wide. Theoretically, these stars have been expected to be either at the red supergiant, blue supergiant, or Wolf-Rayet stage before the explosion. We performed coupled stellar evolution and atmospheric modeling of stars with initial masses between 20 Msun and 120 Msun. We found that the 20 Msun and 25 Msun rotating models, before exploding as SN, have spectra that do not resemble any of the aforementioned classes of massive stars. Rather, they have remarkable similarities with rare, unstable massive stars known as Luminous Blue Variables (LBV). While observations show that some SNe seem to have had LBVs as progenitors, no theoretical model had yet predicted that a star could explode at this stage. Our models provide theoretical support for relatively low-luminosity LBVs exploding as SN in the framework of single stellar evolution. This is a significant shift in paradigm, meaning that a fraction of LBVs could be the end stage of massive star evolution, rather than a transitory evolutionary phase. We suggest that type IIb SN could have LBV as progenitors, and a prime example could be SN 2008ax.

Reference: A&A, in press
Status: Manuscript has been accepted

Weblink:

Comments:

Email: jose.groh@unige.ch

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Discovery of X-ray emission from young suns in the Small Magellanic Cloud

L. M. Oskinova, W. Sun, C. J. Evans, V. Hénault-Brunet, Y.-H. Chu, J. S. Gallagher III, M. A. Guerrero, R. A. Gruendl, M. Güdel, S. Silich, Y. Chen, Y. Nazé, R. Hainich, J. Reyes-Iturbide

(1) University of Potsdam, Germany

We report the discovery of extended X-ray emission within the young star cluster NGC 602 in the Wing of the Small Magellanic Cloud (SMC) based on observations obtained with the Chandra X-ray Observatory. X-ray emission is detected from the cluster core area with the highest stellar density and from a dusty ridge surrounding the HII region. We use a census of massive stars in the cluster to demonstrate that a cluster wind or wind-blown bubble is unlikely to provide a significant contribution to the X-ray emission detected from the central area of the cluster. We therefore suggest that X-ray emission at the cluster core originates from an ensemble of low- and solar-mass pre-main-sequence (PMS) stars, each of which would be too weak in X-rays to be detected individually. We attribute the X-ray emission from the dusty ridge to the embedded tight cluster of the new-born stars known in this area from infrared studies. Assuming that the levels of X-ray activity in young stars in the low-metallicity environment of NGC 602a are comparable to their Galactic counterparts, then the detected spatial distribution, spectral

properties, and level of X-ray emission are largely consistent with those expected from low- and solar-mass PMS stars and young stellar objects (YSOs). This is the first discovery of X-ray emission attributable to PMS stars and YSOs in the SMC, which suggests that the accretion and dynamo processes in young, low-mass objects in the SMC resemble those in the Galaxy.

Reference: ApJ
Status: Manuscript has been accepted

Weblink: arXiv:1301.3500

Comments: Section 3: X-ray emission from massive stars in NGC602

Email: lida@astro.physik.uni-potsdam.de

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A detailed X-ray investigation of ζ Puppis III. A spectral analysis of the whole RGS spectrum

A. Hervé, G. Rauw, Y. Nazé

University of Liège

Context. Zeta Pup is the X-ray brightest O-type star of the sky. This object was regularly observed with the RGS instrument aboard XMM-Newton for calibration purposes, leading to an unprecedented set of high-quality spectra. Aims. We have previously reduced and extracted this data set and combined it into the most detailed high-resolution X-ray spectrum of any early-type star so far. Here we present the analysis of this spectrum accounting for the presence of structures in the stellar wind. Methods. For this purpose, we use our new modeling tool that allows fitting the entire spectrum with a multi-temperature plasma. We illustrate the impact of a proper treatment of the radial dependence of the X-ray opacity of the cool wind on the best-fit radial distribution of the temperature of the X-ray plasma. Results. The best fit of the RGS spectrum of Zeta Pup is obtained assuming no porosity. Four plasma components at temperatures between 0.10 and 0.69 keV are needed to adequately represent the observed spectrum. Whilst the hardest emission is concentrated between ~3 and 4 R*, the softer emission starts already at 1.5 R* and extends to the outer regions of the wind. Conclusions. The inferred radial distribution of the plasma temperatures agrees rather well with theoretical expectations. The mass- loss rate and CNO abundances corresponding to our best-fit model also agree quite well with the results of recent studies of Zeta Pup in the UV and optical domain.

Reference: A&A
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1301.5090

Comments:

Email: anthony.herve@univ-montp2.fr

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Variability in Optical Spectra of epsilon Orionis

Gregory B. Thompson (1), Nancy D. Morrison (2)

(1) Department of Physics, Adrian College
(2) Ritter Astrophysical Research Center, Department of Physics and Astronomy, University of Toledo

We present the results of a time-series analysis of 130 echelle spectra of epsilon Ori (B0 Ia), acquired over seven observing seasons between 1998 and 2006 at Ritter Observatory. The equivalent widths of Halpha (net) and He I 5876 were measured and radial velocities were obtained from the central absorption of He I 5876. Temporal variance spectra (TVS) revealed significant wind variability in both Halpha and He I 5876. The He I TVS have a double-peaked profile consistent with radial velocity oscillations. A periodicity search was carried out on the equivalent width and radial velocity data, as well as on wavelength-binned spectra. This analysis has revealed several periods in the variability with time scales of 2-7 d. Many of these periods exhibit sinusoidal modulation in the associated phase diagrams. Several of these periods were present in both Halpha and He I, indicating a possible connection between the wind and the photosphere. Due to the harmonic nature of these periods, stellar pulsations may be the origin of some of the observed variability. Periods on the order of the rotational period were also detected in the He I line in the 98-99 season and in both lines during the 04-05 season. These periods may indicate rotational modulation due to structure in the wind.

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Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1301.5368

Comments:

Email: gthompson@adrian.edu

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Exploring the origin of magnetic fields in massive stars: II.~New magnetic field measurements in cluster and field stars.

S.~Hubrig^1,
M.~Sch"oller^2,
I.~Ilyin^1,
N.~V.~Kharchenko^3,
L.~M.~Oskinova^4,
J.~F.~Gonz'alez^5,
N.~Langer^6,
A.~F.~Kholtygin^7, and
the MAGORI collaboration

1 - Leibniz-Institut f"ur Astrophysik Potsdam (AIP), An der Sternwarte~16, 14482~Potsdam, Germany;
2 - European Southern Observatory, Karl-Schwarzschild-Str.~2, 85748~Garching, Germany;
3 - Main Astronomical Observatory, 27~Academica Zabolotnogo Str., 03680~Kiev, Ukraine;
4 - Universit"at Potsdam, Institut f"ur Physik und Astronomie, 14476~Potsdam, Germany;
5 - Instituto de Ciencias Astronomicas, de la Tierra, y del Espacio (ICATE), 5400~San~Juan, Argentina;
6 - Argelander-Institut f"ur Astronomie, Universit"at Bonn, Auf dem H"ugel~71, 53121~Bonn, Germany;

7 - Astronomical Institute, Saint-Petersburg State University, Saint-Petersburg, Russia

heories on the origin of magnetic fields in massive stars remain poorly developed, because the properties of their magnetic field as function of stellar parameters could not yet be investigated. Additional observations are of utmost importance to constrain the conditions that are conducive to magnetic fields and to determine first trends about their occurrence rate and field strength distribution.
To investigate whether magnetic fields in massive stars are ubiquitous or appear only in stars with a specific spectral classification, certain ages, or in a special environment, we acquired 67 new spectropolarimetric observations for 30 massive stars. Among the observed sample, roughly one third of the stars are probable members of star clusters at different ages, whereas the remaining stars are field stars not known to belong to any cluster or association.
Spectropolarimetric observations were obtained during four different nights using the low-resolution spectropolarimetric mode of FORS,2 (FOcal Reducer low dispersion Spectrograph) mounted on the 8-m Antu telescope of the VLT. Furthermore, we present a number of follow-up observations carried out with the high-resolution spectropolarimeters SOFIN mounted at the Nordic Optical Telescope (NOT) and HARPS mounted at the ESO 3.6,m between 2008 and 2011. To assess the membership in open clusters and associations, we used astrometric catalogues with the highest quality kinematic and photometric data currently available.
The presence of a magnetic field is confirmed in nine stars previously observed with FORS,1/2: HD,36879, HD,47839, CPD$-$28,2561, CPD$-$47,2963, HD,93843, HD,148937, HD,149757, HD,328856, and HD,164794. New magnetic field detections at a significance level of at least 3$sigma$ were achieved in five stars: HD,92206c, HD,93521, HD,93632, CPD$-$46,8221, and HD,157857. Among the stars with a detected magnetic field, five stars belong to open clusters at high membership probability. According to previous kinematic studies, five magnetic O-type stars in our sample are candidate runaway stars.

Reference: A&A, accepted
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1301.4376

Comments:

Email: mschoell@eso.org

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Variable dust formation by the colliding-wind Wolf-Rayet system HD 36402 in the Large Magellanic Cloud

P. M. Williams (1), Y.-H. Chu (2), R. A. Gruendl (2), M. A. Guerrero (3)

(1) Institute for Astronomy, Royal Observatory, Edinburgh, (2) Department of Astronomy, University of Illinois at Urbana-Champaign, (3) Instituto de Astrofisica de Andalucia, Granada

Infrared photometry of the probable triple WC4(+O?)+O8I: Wolf-Rayet system HD 36402 (= BAT99-38) in the Large Magellanic Cloud (LMC) shows emission characteristic of heated dust. The dust emission is variable on a time-scale of years, with a period near 4.7 yr, possibly associated with orbital motion of the O8 supergiant and the inner P ~ 3.03-d WC4+O binary. The phase of maximum dust emission is close to that of the X-ray minimum, consistent with both processes being tied to colliding wind effects in an elliptical binary orbit. It is evident that Wolf-Rayet dust formation occurs also in metal-poor environments.

Reference: arXiv:1302.2002 [astro-ph.SR]
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1302.2002

Comments:

Email: pmw@roe.ac.uk

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The Rotation Rates of Massive Stars: The Role of Binary Interaction through Tides, Mass Transfer, and Mergers

de Mink, S. E.; Langer, N.; Izzard, R. G.; Sana, H.; de Koter, A.

AA(Space Telescope Science Institute, Baltimore, MD, USA ; Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD, USA), AB(Argelander-Institut für Astronomie der Universität Bonn, D-53121 Bonn, Germany), AC(Argelander-Institut für Astronomie der Universität Bonn, D-53121 Bonn, Germany), AD(Astronomical Institute Anton Pannekoek, University of Amsterdam, 1098 XH Amsterdam, The Netherlands), AE(Astronomical Institute Anton Pannekoek, University of Amsterdam, 1098 XH Amsterdam, The Netherlands; Astronomical Institute, Utrecht University, 3508 TA Utrecht, The Netherlands ; Institute of Astronomy, KU Leuven, B-3001 Leuven, Belgium)

Rotation is thought to be a major factor in the evolution of massive stars—especially at low metallicity—with consequences for their chemical yields, ionizing flux, and final fate. Deriving the birth spin distribution is of high priority given its importance as a constraint on theories of massive star formation and as input for models of stellar populations in the local universe and at high redshift. Recently, it has become clear that the majority of massive stars interact with a binary companion before they die. We investigate how this affects the distribution of rotation rates, through stellar winds, expansion, tides, mass transfer, and mergers.

For this purpose, we simulate a massive binary-star population typical for our Galaxy assuming continuous star formation. We find that, because of binary interaction, 20(+5 -10)% of all massive main-sequence stars have projected rotational velocities in excess of 200 km/s. We evaluate the effect of uncertain input distributions and physical processes and conclude that the main uncertainties are the mass transfer efficiency and the possible effect of magnetic braking, especially if magnetic fields are generated or amplified during mass accretion and stellar mergers. The fraction of rapid rotators we derive is similar to that observed.

If indeed mass transfer and mergers are the main cause for rapid rotation in massive stars, little room remains for rapidly rotating stars that are born single. This implies that spin-down during star formation is even more efficient than previously thought. In addition, this raises questions about the interpretation of the surface abundances of rapidly rotating stars as evidence for rotational mixing. Furthermore, our results allow for the possibility that all early-type Be stars result from binary interactions and suggest that evidence for rotation in explosions, such as long gamma-ray bursts, points to a binary origin.

Reference: The Astrophysical Journal, Volume 764, Issue 2, article id. 166, 17 pp. (2013)
Status: Manuscript has been accepted
Weblink: http://adsabs.harvard.edu/abs/2013ApJ...764..166D
Comments: Published: February 4, 2013; Accepted: December 19, 2012
Email: sedemink@gmail.com
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Far-Ultraviolet Detection of the Suspected Subdwarf Companion to the Be Star 59 Cygni

Geraldine J. Peters (1), Tiffany D. Pewett (2), Douglas R. Gies (2), Yamina N. Touhami (2), and Erika D. Grundstrom (3)

(1) Space Sciences Center and Department of Physics and Astronomy, University of Southern California, Los Angeles, CA
90089-1341, USA
(2) Center for High Angular Resolution Astronomy and Department of Physics and Astronomy, Georgia State University, P.O. Box 4106, Atlanta, GA 30302-4106, USA
(3) Physics and Astronomy Department, Vanderbilt University, 6301 Stevenson Center, Nashville, TN 37235, USA

We report on the detection of a hot subdwarf component in the Be binary system, 59 Cygni. The spectral signature is found in cross-correlation functions of photospheric model spectra with far-ultraviolet spectra obtained by the International Ultraviolet Explorer Satellite, and we used radial velocities from the cross-correlation functions to determine a double-lined spectroscopic orbit. The individual spectra of the binary components were extracted using a Doppler tomography algorithm. The flux of the system is dominated by the rapidly rotating Be star. However, the subdwarf contributes approximately 4% of the UV flux, and its spectrum bears a strong resemblance to that of the hot sdO star BD +75°325. Based on the appearance of the UV spectrum and the orbital elements, we present estimates for the stellar masses, radii, and temperatures. The presence of the hot companion causes excess emission from the outer part of the Be disk facing the companion. We present a set of red spectra that show the orbital phase variations of the He I λ6678 emission formed in the heated region of the disk, which probably occurs near the disk outer boundary. 59 Cygni, FY Canis Majoris, and phi Persei comprise the known set of Be binaries with detected hot evolved companions, which are the stripped down remains of mass transfer. Their properties demonstrate that some fraction of Be stars were spun up through angular momentum transfer by Roche lobe overflow.

Reference: ApJ, 765, 2, 2013 (March 1)
Status: Manuscript has been accepted

Weblink: at http://stacks.iop.org/0004-637X/765/2

Comments:

Email: gjpeters@mucen.usc.edu

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The temperatures of Red Supergiants

Ben Davies (Liverpool JMU), Rolf-Peter Kudritzki (Hawaii), Bertrand Plez (Montpellier), Scott Trager (Groningen), Ariane Lancon (Strasbourg), Zach Gazak (Hawaii), Maria Bergemann (MPA), Chris Evans (UKATC), Andrea Chiavassa (Nice)

Liverpool John Moores University

We present a re-appraisal of the temperatures of Red Supergiants (RSGs) using their optical and near-infrared spectral energy distributions (SEDs). We have obtained data of a sample of RSGs in the Magellanic Clouds using VLT+XSHOOTER, and we fit MARCS model atmospheres to different regions

of the spectra, deriving effective temperatures for each star from (a) the TiO bands, (b) line-free continuum regions of the spectral energy distributions (SEDs), and (c) the integrated fluxes. We show that the temperatures derived from fits to the TiO bands are systematically {it lower} than the other two methods by several hundred Kelvin. The TiO fits also dramatically over-predict the flux in the near-IR, and imply extinctions which are anomalously low compared to neighbouring stars. In contrast, the SED temperatures provide good fits to the fluxes at all wavelengths other than the TiO bands, are in agreement with the temperatures from the flux integration method, and imply extinctions consistent with nearby stars. After considering a number of ways to reconcile this discrepancy, we conclude that 3-D effects (i.e. granulation) are the most likely cause, as they affect the temperature structure in the upper layers where the TiO lines form. The continuum, however, which forms at much deeper layers, is apparently more robust to such effects. We therefore conclude that RSG temperatures are much warmer than previously thought. We discuss the implications of this result for stellar evolution and supernova progenitors, and provide relations to determine the bolometric luminosities of RSGs from single-band photometry.

Reference: Accepted for publication in ApJ
Status: Manuscript has been accepted

Weblink: http://xxx.lanl.gov/abs/1302.2674

Comments:

Email: b.davies@ljmu.ac.uk

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Phase-resolved ultraviolet spectroscopy of the magnetic Of?p star HD 191612

W. L. F. Marcolino, J. -C. Bouret, J. O. Sundqvist, N. R. Walborn, A. W. Fullerton, I. D. Howarth, G. A. Wade, A. ud-Doula

-

We present for the first time phase-resolved UV spectroscopy of an Of?p star, namely, HD 191612. The observations were acquired with the Space Telescope Imaging Spectrograph (STIS) on-board the Hubble Space Telescope (HST). We report the variability observed in the main photospheric and wind features and compare the results with previous findings for the Of?p star HD 108. We show that UV line strengths, H(alpha), and longitudinal magnetic field, vary coherently according to the rotational period (P = 537.6d), providing additional support for the magnetic oblique rotator scenario. The stellar and wind parameters of HD 191612 are obtained based on NLTE expanding atmosphere models. The peculiar wind line profile variations revealed by the new STIS data - not reproduced by 1D atmosphere models - are addressed through non-spherical MHD simulations coupled with radiative transfer. The basic aspects of the UV variability observed are explained and the structure of the dynamical magnetosphere of HD 191612 is discussed.

Reference: MNRAS
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1302.4708

Comments:

Email: wagner@astro.ufrj.br

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Polarimetric observations of $sigma$ Orionis E

Alex C. Carciofi, Daniel M. Faes, Richard H. D. Townsend, Jon E. Bjorkman

Instituto de Astronomia, Geof'isica e Ci^encias Atmosf'ericas, Universidade de S~ao Paulo, Rua do Mat~ao 1226, Cidade Universit'aria, 05508-900, S~ao Paulo, SP, BRAZIL
Department of Astronomy, University of Wisconsin-Madison, Sterling Hall, 475 N. Charter Street, Madison, WI 53706, USA
Ritter Observatory, Department of Physics & Astronomy, University of Toledo,Toledo, OH 43606, USA

Some massive stars possess strong magnetic fields that confine plasma in the circumstellar environment. These textit{magnetospheres} have been studied spectroscopically, photometrically and, more recently, interferometrically.
Here we report on the first firm detection of a magnetosphere in continuum linear polarization, as a result of monitoring of $sigma$,Ori,E at the Pico dos Dias Observatory. {The non-zero intrinsic polarization indicates an asymmetric structure, whose minor elongation axis is oriented $150fdg0$ east of the celestial north.}
A modulation of the polarization was observed, with a period of half of the rotation period, which supports the theoretical prediction of the presence of two diametrally opposed, co-rotating blobs of gas.
A phase lag of -0.085 was detected between the polarization minimum and the primary minimum of the light curve, suggestive of a complex shape of the plasma clouds.
We present a preliminary analysis of the data with the Rigidly Rotating Magnetosphere model, which could not reproduce simultaneously the photometric and polarimetric data. A toy model comprising two spherical co-rotating blobs {joined by a thin disk} proved more successful in reproducing the polarization modulation.
{With this model we were able to determine that the total scattering mass of the thin disk is similar to the mass of the blobs ($2M_{rm b}/M_{rm d}=1.2$) and that the blobs are rotating counterclockwise on the plane of the sky.}
This result shows that polarimetry can provide a diagnostic of the geometry of clouds, which will serve as an important constraint for {improving} the Rigidly Rotating Magnetosphere model.

Reference: Accepted by The Astrophysical Journal Letters
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1302.4684

Comments:

Email: carciofi@usp.br

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JOBS

2 PhD studentships on the theory of convection and evolution of stars

Raphael Hirschi
Keele University
Lennard-Jones Laboratories 2.09
Keele
ST5 5BG

Dr Raphael Hirschi has been awarded a European Research Council starting grant, that will fund a 5-year multi-disciplinary project entitled SHYNE (Stellar HYdrodynamics, Nucleosynthesis and Evolution). The grant will enable Dr Hirschi to build a team of two post-doctoral researchers and two PhD students, and to acquire a dedicated 1000-CPU computer cluster. The SHYNE team will collaborate with the Norwegian company Numascale, adding an inter-sectoral component to the project. More details on the SHYNE project are given here: http://www.astro.keele.ac.uk/shyne/.

1) Convection in stars: developing synergy between 1D and 3D models:
This PhD project will focus on convection and rotation in stars. The successful candidate will analyse results of 3D simulations using both numerical and theoretical frameworks in order to establish new prescriptions for convective boundary mixing to be used in 1D models.

2) Life and death of stars:
This PhD project will focus on calculating grids of stellar evolution models in order to determine the properties and fate of massive and intermediate-mass stars. The successful candidate will model the evolution of massive stars from birth till death using state-of-the-art 1D stellar evolution codes while studying the effects of rotation, magnetic fields and improved treatment of convective boundary mixing. In particular, the candidate will calculate progenitor models of core-collapse supernovae and more exotic explosions (gamma-ray bursts, electron-capture supernovae and pair-creation supernovae).

The successful candidates will learn key computing skills and be exposed to the industry, which will give them a strong skills set for both an academic and an industrial career.

These 4-year studentships are available to UK/EU students only (only partial funding available for non-EU students). Candidates must hold at least a first-class Bachelors degree or an appropriate Masters qualification in a physics related subject or its equivalent. In order to be considered for a studentship you must complete an application form for PhD study, please indicate ERC-SHYNE studentship ref EPSAM 2012-2 or 2012-3.

Details of the application procedure for study are on the Keele website
http://www.keele.ac.uk/pgresearch/howtoapply/ .

Attention/Comments: For informal enquiries, contact Dr Hirschi by email: r.hirschi@epsam.keele.ac.uk.

Weblink: http://www.keele.ac.uk/pgresearch/choosingaresearchdegree/studentships/

Email: r.hirschi@epsam.keele.ac.uk

Deadline: 28 February 2013

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MEETINGS

Putting A Stars into Context: Evolution, Environment, and Related Stars

June 3-7, 2013

Venue: Moscow, Russia

This is the third announcement for the upcoming conference:

Putting A Stars into Context: Evolution, Environment, and Related Stars,

June 3-7, 2013
Moscow, Russia

We remind all potential participants that the deadline for registration and submission of abstracts is April 1, 2013.

Registration

To register for the meeting and submit your abstract, please, point your browser to http://agora.guru.ru/astars2013/ and follow the instructions

The registration fee covers all regular meeting costs including abstract book, welcome party, coffee breaks, conference banquet, Moskva-river cruise tour, and classical music concert. Full conference registration costs 280 Euros (11 300 Rubles). Participants who pay the registration fee before April 1, 2013, benefit from a discount of 30 Euros. Payments can be made via credit card.

Program:

Overview introductory talk (John D. Landstreet)

Session 1: A-star formation

1a. Big clouds to open clusters
Invited talks:
1.1. Chemically peculiar tepid stars in the Milky Way and beyond (Martin Netopil)
1.2. Elemental abundances in open cluster A-type and related stars (Luca Fossati)

1b. Small clouds to stars
Invited talks:
1.3. Discs around A-type and related stars (Helmut Abt)
1.4. Accretion discs around magnetic stars (Caroline D'Angelo)
1.5. Planets around A stars (David Mkrtichian)
1.6. Distant sub-stellar companions of A-type and related stars
1.7. Multiplicity of A-type and related stars (Pierre North)

1c. Magnetic field generation
Invited talks:
1.8. Magnetic fields in Herbig Ae/Be stars (Evelyne Alecian)
1.9. Generation and evolution of stable stellar magnetic fields (Rainer Arlt)

1.10. The protostar merger scenario of Ap star magnetic field generation (Lilia Ferrario)

Session 2: Properties of A-type stars
Invited talks:
2.1. Determinations of fundamental parameters of (chemically peculiar) A stars through optical interferometry (Karine Perraut)
2.2. Recent results and current challenges in normal and chemically peculiar A-star model atmospheres (Denis Shulyak)
2.3. Simultaneous mapping of chemical abundances and magnetic field structure in Ap stars (Theresa Lueftinger)
2.4. Element spots in HgMn stars (Heidi Korhonen)
2.5. The origin of light variability in Ap stars (Jiri Krticka)
2.6. Vertical abundance gradients in Ap-star atmospheres (Tatyana Ryabchikova)

Session 3: Rotation and hydrodynamics of A-type and related stars
Invited talks:
3.1. Time-dependent diffusion and abundance stratification in A- and B-type stars(with and without mass-loss)
3.2. A-star rotation (Frederic Royer)
3.3. Ap stars with variable rotation periods (Zdenek Mikulasek)
3.4. Rotation and hydrodynamical processes in upper main-sequence stars (Stephane Mathis)

Session 4: Pulsation of A-type and related stars
Invited talks:
4.1. A- and B-type star pulsations in the Kepler and CoRoT era: observational results (Katrien Uytterhoeven)
4.2. A- and B-type star pulsations in the Kepler and CoRoT era: theoretical considerations (Hideyuki Saio)
4.3. Observational studies of roAp stars (Mikhail Sachkov)
4.4. Stochastic oscillations in A-type and related stars (Victoria Antoci)

Session 5: Magnetic fields from O to early F stars
Invited talks:
5.1. Magnetic fields in O stars
5.2. Magnetic fields in beta Cep, SPB and Be stars
5.3. Recent results and current challenges in observations of Ap/Bp star magnetic fields (Iosif Romanyuk)

5.4. Magnetic fields in A stars besides Ap stars (Oleg Kochukhov)
5.5. Non-pulsational variability of A- and B-type stars as observed by Kepler (Luis Balona)
5.6. X-ray emission of Ap stars and of other A stars (Jan Robrade)
5.7. Bp star magnetospheres (Asif ud-Doula)

Session 6: A-stars at post-main-sequence stages
Invited talks:
6.1. Descendants of magnetic and non-magnetic A-type and related stars
6.2. White dwarf magnetic fields (Gennady Valyavin)
6.3. A-type blue stragglers
6.4. Horizontal-Branch A stars
6.5. Non-LTE studies of A supergiants (Maria-Fernanda Nieva)
6.6. A supergiants in the Local Group of galaxies and beyond (Miguel Urbaneja)

Summary talk and closing discussion (Charles Cowley)

Invited Speakers (confirmed):

Helmut Abt, Evelyne Alecian, Victoria Antoci, Rainer Arlt, Luis Balona, Charles Cowley, Caroline

D'Angelo, Lilia Ferrario, Luca Fossati, Oleg Kochukhov, Heidi Korhonen, Jiri Krticka, John D. Landstreet, Theresa Lueftinger, Stephane Mathis, Zdenek Mikulasek, David Mkrtichian, Martin Netopil, Maria-Fernanda Nieva, Pierre North, Karine Perraut, Jan Robrade, Iosif Romanyuk, Frederic Royer, Tatyana Ryabchikova, Mikhail Sachkov, Hideyuki Saio, Denis Shulyak, Asif ud-Doula, Miguel Urbaneja, Katrien Uytterhoeven, Gennady Valyavin

Abstract submission

Contributed talks will be selected from the submitted abstracts, and there will also be a poster session.

Scientific Organizing Committee:

Gautier Mathys (chair), Maryline Briquet, Margarida Cunha, Oleg Kochukhov, Friedrich Kupka, Francis LeBlanc, Lyudmila Mashonkina, Richard Monier, Olga Pintado, Hiromoto Shibahashi, Kazimierz Stepien, Glenn Wahlgren

Weblink: http://agora.guru.ru/astars2013/

Email: astars2013@inasan.ru

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Massive Stars: From α to Ω

June 10-14, 2013

Venue: Rhodes, Greece

The 'Massive Stars' meetings have enjoyed more than 40 years of startling success since the first meeting in Argentina in 1971. Held every 4 to 5 years, these meetings aim to encapsulate the current state-of-the-art of our understanding of the physics of Massive Stars and their role in the Universe. For this 10th meeting in the Massive Stars series the Institute of Astronomy, Astrophysics, Space Applications and Remote Sensing of the National Observatory of Athens, invites you to the island of Rhodes, once home to one of the greatest astronomers of antiquity, Hipparchos, who is generally acknowledged as the founder of trigonometry, discoverer of precession and publisher of the first modern star catalog around 135 BC.

The conference will build on results from ongoing large-scale multi-wavelength surveys of massive stars which are being coupled with new theoretical advances dealing with stellar evolution and the processes which effect that evolution: mass-loss, rotation, convection, magnetic fields, multiplicity and environment. It will tackle important problems from birth, through main sequence evolution and until core collapse.

There will be a strong focus on relating the major theoretical uncertainties afflicting stellar evolution through these phases to the current observational picture. The impetus for this focus is derived from the realization that our understanding of massive star evolution is severely challenged by new observations powered largely by technological advances in telescopes and instrumentation. This has enabled new ways of looking at old long-standing problems enabling large-scale high-quality surveys of resolved stellar populations. As theoretical approaches try to keep pace with this increase in information the cracks in our assumptions concerning stellar evolution have become more apparent, even glaring. Whereas before it might have been possible to understand some of the stars some of the time it is now clear that understanding stellar populations is a considerable challenge and will require substantial efforts to resolve.

This is an exciting time as observations have revealed large gaps in understanding of the formation and

evolution of massive stars. The huge impact that massive stars have on their immediate environment, parent galaxies, and through the Universe, demands better understanding of massive star evolution from alpha to Omega.

Looking forward to seeing you in Rhodes!

Weblink: http://a2omega-conference.net

Email: a2omega@astro.noa.gr

DEADLINE FOR ABSTRACT SUBMISSION OF ORAL CONTRIBUTIONS: March 13!!

DEADLINE FOR EARLY REGISTRATION: April 20!!

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