ISSN 1783-3426

THE MASSIVE STAR NEWSLETTER

formerly known as the hot star newsletter

*

No. 149 2015 September-October

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

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Talks from Sp7@EWASS2015 "Science with large spectroscopic surveys of Galactic OB stars: getting ready for Gaia" now available online

Dear friends,

For your interest, the talks from the Special Session "Science with large spectroscopic surveys of Galactic OB stars: getting ready for Gaia" held during the last EWASS are now available online in the link below. Thanks to all who participated in this meeting!

The organizers (S. Simón-Díaz & F. Martins)

Weblink: http://www.iac.es/proyecto/iacob/pages/sp7ewass2015.php

Email: ssimon@iac.es

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Athena Science Working Groups

Dear Colleagues,

ESA is currently studying the next generation X-ray observatory called Athena to be launched in 2028. Approximately 1 year ago the Athena Science Study Team (ASST) issued a call for membership of the Athena Working Groups who assist ESA in this exercise.

To ensure that all interested scientists, willing to dedicate some time to the preparation of Athena, have an opportunity to participate, ASST has recently re-opened the application process at the following web site:

http://fs6.formsite.com/ATHENA2028/form4/index.html

The Working Groups are divided into a number of sub-panels (Topical Panels) covering specific subject areas. In particular, Topical Panel SWG3.2 deals with "Star formation and evolution" and addresses the science relevant for massive stars research.
New candidates are expected to apply for membership of a single Topical Panel. In exceptional circumstances, you may request membership of two panels, but in this case you are asked to provide a justification.

The deadline for applications is 31 December 2015. Applications will be assessed soon after this with the aim to appoint new members in February 2016.

Thanks for your support.

Gregor Rauw, co-chair of topical panel SWG3.2

Weblink: http://fs6.formsite.com/ATHENA2028/form4/index.html

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Update on the Complementary Science Program of the ESA PLATO mission (PLATO-CS: launch 2024, 6 years of operations)

- 8% of the observing time will be used for PLATO-CS; this implies some 40,000 targets per pointing (there are 2 long pointings of 3&2 years each, and a step-and-star phase with several pointings of several weeks each);

- ESA will install a Guest Observer program with calls to the community to decide about the targets for PLATO-CS; successful Guest Observers will have 1 year proprietory rights. The GO programme is open to anyone interested;

- a Target-of-Opportunity (ToO) option has been accepted for the mission so that transient phenomena can be observed (reaction time to measure ToO is to be worked out with ESA);

PLATO has various observing modes, including 2-colour information for the brightest objects, downloading of imagettes, lightcurves computed onboard,

etc. Various sampling rates will be used, ranging from 2.5 to 600 seconds.

Registered participants will be updated on PLATO-CS and will be able to provide input on the definition and organisation of the GO procedures. New participants are welcome:

https://fys.kuleuven.be/ster/Projects/plato-cs/registration

PLATO-CS conferences will be organised on a regular basis as of 2017, with the aim to discuss the field and target selection, optimal observing strategies and analyses methods, etc. so as to ensure excellent science exploitation of the mission.

Best regards,
Conny Aerts, Coordinator PLATO-CS

Weblink: https://fys.kuleuven.be/ster/Projects/plato-cs/home

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PAPERS

Abstracts of 11 accepted papers

Shape and evolution of wind-blown bubbles of massive stars: on the effect of the interstellar magnetic field

Allard Jan van Marle^{1,2},
Zakaria Meliani^{3,4}, and
Alexandre Marcowith^5

1-Centre for mathematical Plasma-Astrophysics, University of Leuven;
2-Institute of Astronomy, University of Leuven;
3-LuTh, Observatoire de Paris;
4-APC, Universite Paris Diderot;
5-LUPM, Universite Montpellier;

The winds of massive stars create large (>10 pc) bubbles around their progenitors. As these bubbles expand they encounter the interstellar coherent magnetic field which, depending on its strength, can influence the shape of the bubble. We wish to investigate if, and how much, the interstellar magnetic field can contribute to the shape of an expanding circumstellar bubble around a massive star. We use the MPI-AMRVAC code to make magneto-hydrodynamical simulations of bubbles, using a single star model, combined with several different field strengths: B=5, 10, and 20 muG for the interstellar magnetic field. This covers the typical field strengths of the interstellar magnetic fields found in the galactic disk and bulge. Furthermore, we present two simulations that include both a 5 muG interstellar magnetic field and a 10,000 K interstellar medium and two different ISM densities to demonstrate how the magnetic field can combine with other external factors to influnece the morphology of the circumstellar bubbles. Our

results show that low magnetic fields, as found in the galactic disk, inhibit the growth of the circumstellar bubbles in the direction perpendicular to the field. As a result, the bubbles become ovoid, rather than spherical. Strong interstellar fields, such as observed for the galactic bulge, can completely stop the expansion of the bubble in the direction perpendicular to the field, leading to the formation of a tube-like bubble. When combined with a warm, high-density ISM the bubble is greatly reduced in size, causing a dramatic change in the evolution of temporary features inside the bubble. The magnetic field of the interstellar medium can affect the shape of circumstellar bubbles. This effect may have consequences for the shape and evolution of circumstellar nebulae and supernova remnants, which are formed within the main wind-blown bubble.

Reference: Astronomy & Astrophysics
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1509.00192

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Characterizing the Rigidly Rotating Magnetosphere Stars HD 345439 and HD 23478

J. P. Wisniewski(1), S. D. Chojnowski(2), J.R.A. Davenport(3), J. Bartz(4), J. Pepper(4), D. G. Whelan(5), S. S. Eikenberry(6), J. R. Lomax(1), S. R. Majewski(7), N.D. Richardson(8,9), M. Skrutskie(7)

(1) University of Oklahoma, (2) New Mexico State University, (3) University of Washington, (4) Lehigh University, (5) Austin College, (6) University of Florida, (7) University of Virginia, (8) CRAQ, (9) University of Montreal

The SDSS III APOGEE survey recently identified two new sigma Ori E type candidates, HD 345439 and HD 23478, which are a rare subset of rapidly rotating massive stars whose large (kGauss) magnetic fields confine circumstellar material around these systems. Our analysis of multi-epoch photometric observations of HD 345439 from the KELT, SuperWASP, and ASAS surveys reveals the presence of a ~0.7701 day period in each dataset, suggesting the system is amongst the faster known sigma Ori E analogs. We also see clear evidence that the strength of H-alpha, H I Brackett series lines, and He I lines also vary on a ~0.7701 day period from our analysis of multi-epoch, multi-wavelength spectroscopic monitoring of the system from the APO 3.5m telescope. We trace the evolution of select emission line profiles in the system, and observe coherent line profile variability in both optical and infrared H I lines, as expected for rigidly rotating magnetosphere stars. We also analyze the evolution of the H I Br-11 line strength and line profile in multi-epoch observations of HD 23478 from the SDSS-III APOGEE instrument. The observed periodic behavior is consistent with that recently reported by Sikora and collaborators in optical spectra.

Reference: Accepted in ApJL
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1509.00128

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Cold gas in hot star clusters: the wind from the red supergiant W26 in Westerlund 1

Jonathan Mackey (1,2), Norberto Castro (2), Luca Fossati (2), Norbert Langer (2)

(1) I. Physikalisches Institut, Universität zu Köln, Zülpicher Straße 77, 50937 Köln, Germany
(2) Argelander-Institut für Astronomie, Auf dem Hügel 71, 53121 Bonn, Germany

The massive red supergiant W26 in Westerlund 1 is one of a growing number of red supergiants shown to have winds that are ionized from the outside in. The fate of this dense wind material is important for models of second generation star formation in massive star clusters. Mackey et al. (2014) showed that external photoionization can stall the wind of red supergiants and accumulate mass in a dense static shell. We use spherically symmetric radiation-hydrodynamic simulations of an externally photoionized wind to predict the brightness distribution of Halpha and [N II] emission arising from photoionized winds both with and without a dense shell. We analyse spectra of the Halpha and [N II] emission lines in the circumstellar environment around W26 and compare them with simulations to investigate whether W26 has a wind that is confined by external photoionization. Simulations of slow winds that are decelerated into a dense shell show strongly limb-brightened line emission, with line radial velocities that are independent of the wind speed. Faster winds (>22 km/s) do not form a dense shell, have less limb-brightening, and the line radial velocity is a good tracer of the wind speed. The brightness of the [N II] and Halpha lines as a function of distance from W26 agrees reasonably well with observations when only the line flux is considered. The radial velocity of the simulated winds disagrees with observations, however: the brightest observed emission is blueshifted by 25 km/s relative to the radial velocity of the star, whereas a spherically symmetric wind has the brightest emission at zero radial velocity because of limb brightening. Our results show that the bright nebula surrounding W26 must be asymmetric, and we suggest that it is confined by external ram pressure from the extreme wind of the nearby supergiant W9. We obtain a lower limit on the nitrogen abundance within the nebula of 2.35 times solar. The line ratio strongly favours photoionization over shock ionization, and so even if the observed nebula is pressure confined there should still be an ionization front and a photoionization-confined shell closer to the star that is not resolved by the current observations, which could be tested with better spectral resolution and spatial coverage.

Reference: DOI:10.1051/0004-6361/201526159, arXiv:1508.07003
Status: Manuscript has been accepted

Weblink: http://adsabs.harvard.edu/abs/2015arXiv150807003M

Comments: Astronomy & Astrophysics, in press

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Accurate fundamental parameters and distance to a massive early-type eclipsing binary in the Danks 2 cluster

M. Kourniotis^{1,2}, A.Z. Bonanos^1, S.J. Williams^1, N. Castro^3, E. Koumpia^4, J.L. Prieto^{5,6}

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Zografos, Athens, Greece; 3 - Argelander-Institut für Astronomie der Universität Bonn, Auf dem Hügel 71, 53121, Bonn, Germany; 4 - SRON Netherlands Institute for Space Research, Landleven 12, 9747 AD Groningen, The Netherlands; Kapteyn Institute, University of Groningen, The Netherlands; 5 - Nucleo de Astronomia de la Facultad de Ingenieria, Universidad Diego Portales, Av. Ejercito 441, Santiago, Chile; 6 - Millennium Institute of Astrophysics, Santiago, Chile

We present a study of the properties of the O-type, massive eclipsing binary 2MASS J13130841-6239275 located in the outskirts of the Danks 2 cluster in the G305 star-forming complex, using near-infrared spectroscopy from VLT/ISAAC. We derive the masses and radii to be 24.5±0.9 M$_{\sun}$ and 9.2±0.1 R$_{\sun}$ for the primary and 21.7±0.8 M$_{\sun}$ and 8.7±0.1 R$_{\sun}$ for the secondary component. In addition, we evaluate the sensitivity of our parameters to the choice of the spectral features used to determine the radial velocities. Both components appear to be main-sequence O6.5-O7 type stars at an age of ~5 Myr, which is in agreement with the age of the cluster. A high visual extinction of A_{5495}=11.9±0.1 mag is reported, which is likely attributed to the cold molecular gas contaminating the north-east region of the cluster. By fitting the spectral energy distribution of the system to the available BVI_{c}JHK_{s} photometry, we determine a distance to the system of 3.52±0.08 kpc with a precision of 2%, which is the most well-determined distance to the Danks 2 cluster and the host complex reported in the literature.

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

Weblink: http://arxiv.org/abs/1508.05939

Comments: 13 pages, 9 figures, 6 tables.

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Magnetically Confined Wind Shocks in X-rays - a Review

Asif ud-Doula (1), Yael Naze (2)

1 - Penn State Worth. Scranton ; 2 - ULg

A subset ($\sim$ 10\%) of massive stars present strong, globally ordered (mostly dipolar) magnetic fields. The trapping and channeling of their stellar winds in closed magnetic loops leads to magnetically confined wind shocks (MCWS), with pre-shock flow speeds that are some fraction of the wind terminal speed. These shocks generate hot plasma, a source of X-rays. In the last decade, several developments took place, notably the determination of the hot plasma properties for a large sample of objects using XMM-Newton and Chandra, as well as fully self-consistent MHD modelling and the identification of shock retreat effects in weak winds. Despite a few exceptions, the combination of magnetic confinement, shock retreat and rotation effects seems to be able to account for X-ray emission in massive OB stars. Here we review these new observational and theoretical aspects of this X-ray emission and envisage some perspectives for the next generation of X-ray observatories.

Reference: accepted for publication by Advances in Space Research (special issue "X-ray emission from hot stars and their winds")
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1509.06482

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X-ray emission from interacting massive binaries: a review of 15 years of progress

Gregor Rauw, Yael Naze

University of Liege, Belgium

Previous generations of X-ray observatories revealed a group of massive binaries that were relatively bright X-ray emitters. This was attributed to emission of shock-heated plasma in the wind-wind interaction zone located between the stars. With the advent of the current generation of X-ray observatories, the phenomenon could be studied in much more detail. In this review, we highlight the progress that has been achieved in our understanding of the phenomenon over the last 15 years, both on theoretical and observational grounds. All these studies have paved the way for future investigations using the next generation of X-ray satellites that will provide crucial information on the X-ray emission formed in the innermost part of the wind-wind interaction.

Reference: Advances in Space Research, special issue on "X-ray Emission from Hot Stars and their Winds"
Status: Manuscript has been accepted

Weblink: arXiv:1509.06480

Comments:

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A Runaway Red Supergiant in M31

Kate Anne Evans (1,2) and Philip Massey (1,3)

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3 - Department of Physics and Astronomy, Northern Arizona University, Flagstaff, AZ 86011

A significant percentage of OB stars are runaways, so we should expect a similar percentage of their evolved descendants to also be runaways. However, recognizing such stars presents its own set of challenges, as these older, more evolved stars will have drifted further from their birthplace, and thus their velocities might not be obviously peculiar. Several Galactic red supergiants (RSGs) have been described as likely runaways, based upon the existence of bow shocks, including Betelgeuse. Here we announce the discovery of a runaway RSG in M31, based upon a 300 km/s discrepancy with M31's kinematics. The star is found about 21' (4.6 kpc) from the plane of the disk, but this separation is consistent with its velocity and likely age (~10 Myr). The star, J004330.06+405258.4, is an M2 I, with an absolute visual magnitude of -5.7, log(L/L(solar))=4.76, an effective temperature of 3700 K, and an inferred mass of 12-15 solar masses. The star may be a high-mass analog of the hypervelocity stars, given that its peculiar space velocity is probably 400-450 km/s, comparable to the escape speed from M31's disk.

Reference: Astronomical Journal (in press)
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1509.07251

Comments:

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Identification of dusty massive stars in star-forming dwarf irregular galaxies in the Local Group with mid-IR photometry

N. E. Britavskiy (1), A. Z. Bonanos (1), A. Mehner (2), M. L. Boyer (3), K. B. W. McQuinn (4)

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(2) ESO -- European Organisation for Astronomical Research in the Southern Hemisphere, Chile
(3) Observational Cosmology Lab, Code 665, NASA Goddard Space Flight Center, USA
(4) Minnesota Institute for Astrophysics, School of Physics and Astronomy, USA

Increasing the statistics of spectroscopically confirmed evolved massive stars in the Local Group enables the investigation of the mass loss phenomena that occur in these stars in the late stages of their evolution. We aim to complete the census of luminous mid-IR sources in star-forming dwarf irregular (dIrr) galaxies of the Local Group. To achieve this we employed mid-IR photometric selection criteria to identify evolved massive stars, such as red supergiants (RSGs) and luminous blue variables (LBVs), by using the fact that these types of stars have infrared excess due to dust. The method is based on 3.6 μm and 4.5 μm photometry from archival Spitzer Space Telescope images of nearby galaxies. We applied our criteria to 4 dIrr galaxies: Pegasus, Phoenix, Sextans A, and WLM, selecting 79 point sources, which we observed with the VLT/FORS2 spectrograph in multi-object spectroscopy mode. We identified 13 RSGs, of which 6 are new discoveries, also 2 new emission line stars, and 1 candidate yellow supergiant. Among the other observed objects we identified carbon stars, foreground giants, and background objects, such as a quasar and an early-type galaxy that contaminate our survey. We use the results of our spectroscopic survey to revise the mid-IR and optical selection criteria for identifying RSGs from photometric measurements. The optical selection criteria are more efficient in separating extragalactic RSGs from foreground giants than mid-IR selection criteria, however the mid-IR selection criteria are useful for identifying dusty stars in the Local Group. This work serves as a basis for further investigation of the newly discovered dusty massive stars and their host galaxies.

Reference: arXiv:1510.01340, A&A in press.
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1510.01340

Comments:

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Massive open star clusters using the VVV survey IV. WR 62-2, a new very massive star in the core of the VVV CL041 cluster

A.-N. Chené (1), S. Ramírez Alegría (2,3), J. Borissova (2,3), E. O'Leary (1), F. Martins (4), A. Hervé (4,5), M. Kuhn (2,3), R. Kurtev (2,3), P. Consuelo Amigo Fuentes (2,3), C. Bonatto (6), D. Minniti (3,7,8,9)

1 - Gemini Observatory, 2 - U. de Valparaíso, 3 - Millennium Institute of Astrophysics, 4 - U. Montpellier, 5 - Astronomical Institute of the ASCR, 6 - U. Federal do Rio Grande do Sul, 7- Pontificia Universidad Católica de Chile, 8 - Vatican Observatory, 9 - Universidad Andres Bello

Context The ESO Public Survey VISTA Variables in the V\'ia L\'actea (VVV) provides deep multi-epoch infrared observations for an unprecedented 562 sq. degrees of the Galactic bulge and adjacent regions of the disk. Nearly 150 new open clusters and cluster candidates have been discovered in this survey. Aims We present the fourth article in a series of papers focussed on young and massive clusters discovered in the VVV survey. This article is dedicated to the cluster VVV CL041, which contains a new very massive star candidate, WR 62-2. Methods Following the methodology presented in the first paper of the series, wide-field, deep JHKs VVV observations, combined with new infrared spectroscopy, are employed to constrain fundamental parameters (distance, reddening, mass, age) of VVV CL041. Results We confirm that the cluster VVV CL041 is a young (less than 4 Myrs) and massive (3 +/- 2 x 10^3 Msol) cluster, and not a simple asterism. It is located at a distance of 4.2 +/- 0.9 kpc, and its reddening is A_V = 8.0 +/- 0.2 mag, which is slightly lower than the average for the young clusters towards the centre of the Galaxy. Spectral analysis shows that the most luminous star of the cluster, of the WN8h spectral type, is a candidate to have an initial mass larger than 100 Msol.

Reference: A&A in press, arXiv:1510.02539
Status: Manuscript has been accepted

Weblink: http://adsabs.harvard.edu/abs/2015arXiv151002539C

Comments:

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The Impact of Enhanced Iron Opacity on Massive Star Pulsations: Updated Instability Strips

Ehsan Moravveji

Institute of Astronomy, KU Leuven

Recently, Bailey et al. (2015) made a direct measurement of the Iron opacity at the physical conditions of the solar tachocline. They found that the wavelength-integrated Iron opacity is roughly 75% higher than what the OP and OPAL models predict. Here, we compute new opacity tables with enhanced Iron and Nickel contributions to the Rosseland mean opacity by 75% each, and compute three dense MESA grids of evolutionary models for Galactic O- and B-type stars covering from 2.5 to 25 M_sun from ZAMS until T_eff=10 000 K after the core hydrogen exhaustion. We carry out non-adiabatic mode stability analysis with GYRE, and update the extension of the instability strips of heat-driven p- and g-mode pulsators, and the hybrid pulsating SPB - beta Cep stars.

We compare the position of two confirmed late O-type beta Cep and eight confirmed hybrid B-type pulsators with the new instability domains, and justify that ~75% enhancement, only in Iron opacity, is sufficient to consistently reproduce the observed position of these stars on the log T_eff versus log g plane. We propose that this improvement in opacities be incorporated in the input physics of new stellar models.

Reference: MNRAS Letters, in press
Status: Manuscript has been accepted

Weblink: http://adsabs.harvard.edu/abs/2015arXiv150908652M

Comments: All software to compute new opacity tables, the pre-compiled opacity tables and the new instability strips are freely available for download through the following URL: https://fys.kuleuven.be/ster/Projects/ASAMBA

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Properties of massive stars in four clusters of the VVV survey

A. Hervé^1,2, F. Martins^2, A.-N. Chené^3, J.-C. Bouret^4, J. Borissova^5,6,7

1 Astronomical Institute ASCR, Czech Republic
2 LUPM, Université de Montpellier, CNRS, Montpellier, France
3 Gemini Observatory, Hilo, Hawaii
4 Laboratoire d'Astrophysique de Marseille, France
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6 The Milky Way Millennium Nucleus, Santiago, Chile
7 Millenium Institute of Astrophysics, Valparaiso, Chile

The evolution of massive stars is only partly understood. Observational constraints can be obtained from the study of massive stars located in young massive clusters. The ESO Public Survey VISTA Variables in the Via Lactea (VVV) discovered several new clusters hosting massive stars. We present an analysis of massive stars in four of these new clusters. Our aim is to provide constraints on stellar evolution and to better understand the relation between different types of massive stars. We use the radiative transfer code CMFGEN to analyse K-band spectra of twelve stars with spectral types ranging from O and B to WN and WC. We derive the stellar parameters of all targets as well as surface abundances for a subset of them. In the Hertzsprung-Russell diagram, the Wolf-Rayet stars are more luminous or hotter than the O stars. From the log(C/N) - log(C/He) diagram, we show quantitatively that WN stars are more chemically evolved than O stars, WC stars being more evolved than WN stars. Mass loss rates among Wolf-Rayet stars are a factor of 10 larger than for O stars, in agreement with previous findings.

Reference: New Astronomy
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1510.07450

Comments:

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Abstracts of 2 conference proceedings

Massive star population synthesis with binaries

D. Vanbeveren and N. Mennekens

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We first give a short historical overview with some key facts of massive star population synthesis with binaries. We then discuss binary population codes and focus on two ingredients which are important for massive star population synthesis and which may be different in different codes. Population simulations with binaries is the third part where we consider the initial massive binary frequency, the RSG/WR and WC/WN and SNII/SNIbc number ratio's, the probable initial rotational velocity distribution of massive stars.

Reference: Review paper to appear in the conference proceedings of the June 2015 Potsdam WR workshop, edited by W.-R. Hamann, A. Sander, and H. Todt
Status: Conference proceedings

Weblink: arXiv: 1508.04282

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The True origin of Wolf-Rayet stars

Jorick S. Vink

Armagh Observatory

The Wolf-Rayet (WR) phenomenon is widespread in astronomy. It involves classical WRs, very massive stars (VMS), WR central stars of planetary nebula CSPN [WRs], and supernovae (SNe). But what is the root cause for a certain type of object to turn into an emission-line star? In this contribution, I discuss the basic aspects of radiation driven winds that might reveal the ultimate difference between WR stars and canonical O-type stars. I discuss the aspects of (i) self-enrichment via CNO elements, (ii) high effective temperatures (Teff), (iii) an increase in the helium abundance (Y), and finally (iv) the Eddington factor Gamma. Over the last couple of years, we have made a breakthrough in our understanding of Gamma-dependent mass loss, which will have far-reaching consequences for the evolution and fate of the most massive stars in the Universe. Finally, I discuss the prospects for studies of the WR phenomenon in the highest redshift Ly-alpha and He II emitting galaxies.

Reference: To appear in proceedings of International Workshop on Wolf-Rayet Stars (editors W.R. Hamann, A. Sander, and H. Todt) publisher Universitatsverlag Potsdam
Status: Conference proceedings

Weblink: astro-ph/1366754

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Job offers

Postdoctoral Position: Circumstellar Disks

John Wisniewski

University of Oklahoma
Department of Physics & Astronomy
440 W Brooks St
Norman, OK 73019 USA

Applications are invited for a postdoctoral research position in observational studies of circumstellar disks at the University of Oklahoma. The successful applicant will work with Dr John Wisniewski and will analyze ground- and space-based photometric and polarimetric observations of circumstellar disk systems.

Applicants must have a Ph.D. in Astronomy or Physics. Previous experience analyzing circumstellar disks or polarimetric imagery is highly desirable. The initial appointment will be for 1 year, renewable for additional years contigent on satisfactory performance and continued funding. The expected start date for the position is August 2016 or earlier.

To apply, send a curriculum vitae, bibliography, and statement of research interests to wisniewski@ou.edu with the subject line "Postdoc position: circumstellar disks". Pdf format is preferred. Applicants should also arrange for 3 letters of reference to be submitted. Applications received by December 15, 2015 will receive full consideration.

Weblink: http://jobregister.aas.org/job_view?JobID=51794

Email: wisniewski@ou.edu

Deadline: Dec 15, 2015

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Postdoctoral position in stellar astrophysics

Emily Levesque

University of Washington
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Seattle, WA 98195 USA

Applications are invited for a full time postdoctoral position in stellar astrophysics at the University of Washington. The candidate will work with Prof. Emily Levesque on observational and theoretical studies of massive stars. Of particular interest are postdoctoral candidates interested in the role of massive star populations in star-forming galaxies; progenitors and host galaxies of transient events; asteroseismology; or the late stages of massive star evolution. The successful candidate will have the opportunity to join existing projects and will also be encouraged to develop and pursue their own research program.

The position is initially for two years, with a possible extension for a third year subject to a performance review and availability of funds. The successful candidate must have a Ph.D. in Physics, Astronomy, or a related field by the start date of the position (nominally September 1, 2016).

To be considered for the position, please send the following application materials as a single PDF to Prof. Emily Levesque at emsque@uw.edu : 1) curriculum vitae, 2) list of publications, and 3) summary of previous and current research (no more than three pages). Applicants should also arrange for three letters of reference to be submitted to the same email address directly from the writers by the deadline. To receive full consideration, all application materials must be received by January 1, 2016.

University of Washington faculty engage in teaching, research and service. The University of Washington is an affirmative action and equal opportunity employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, protected veteran or disabled status, or genetic information.

Weblink: http://ap.washington.edu/ahr/academic-jobs/position/nn14451/

Email: emsque@uw.edu

Deadline: 1 January 2016

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(closed) Job offer

PhD Position on Quantitative Spectroscopy

Norbert Przybilla

Institute for Astro- and Particle Physics
University of Innsbruck
Technikerstr. 25/8
6020 Innsbruck
Austria

Applications are invited to a newly established doctoral programme in physics "Atoms, Light, and Molecules" at the University of Innsbruck. One of the PhD projects addresses quantitative spectroscopy of massive stars, with a focus on non-LTE modelling of light-matter interactions.

Attention/Comments: For additional information on the project contact
Norbert Przybilla, phone +43 512 50752100, email: norbert.przybilla@uibk.ac.at
Further information regarding the doctoral programme and the application procedure are outlined under the following weblink.

Weblink: http://www.uibk.ac.at/dk-alm/index.html.en

Email: norbert.przybilla@uibk.ac.at

Deadline: November 6, 2015

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MEETINGS

Supernova Remnants: An Odyssey In Space After Stellar Death

June 6-11, 2016

Venue: Chania, Crete, Greece

Background and Scientific Rationale

The meeting "Supernova Remnants: An Odyssey in Space after Stellar death" will explore the exciting recent observational and theoretical progress in the structure, evolution and physics of SNRs. The Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing of the National Observatory of Athens, invites you to the beautiful island of Crete, the home of many well known myths, i.e. of Deadalus and Icarus, Theseus and the Minotaur, the birth of Zeus.

The conference will build upon spectral and imaging observations from radio to gamma-ray wavelengths of SNR blast waves, pulsar wind nebulae and SN ejecta and their interpretation through models and numerical simulations. The goals of the meeting are understanding the evolution of SNRs and their interaction with interstellar gas, elucidating the physical processes that govern shock waves and relativistic plasmas, and inferring characteristics of supernova explosions from SNR observations.

We will focus on narrowing the gap between observations and theories with the help of powerful new instrumentation such as hard X-ray and gamma-ray satellites, large optical telescopes, and sub-mm and low-frequency radio arrays on the one hand, and increasingly detailed and realistic numerical simulations on the other. New understanding of the nature of supernova remnants and processes that occur there offers new insights into the role of SNRs in the structure and evolution of galaxies and the nature of supernova explosions.

Looking forward to seeing you in Crete!

Scientific Topics & Session Chairs

* Radiation studies from gamma-rays to radio in Galactic and Extragalactic SNRs (D. Green)
* The search for the binary companions of SN progenitors in SNRs (W. Blair)
* Pulsar winds nebulae (including Crab flares) (P. Slane)
* Magnetic fields in SNRs and PWNe (R. Kothes)
* Collisionless shock waves in SNRs (A. Decourcelle)
* Jets and Asymmetries in SNe and their Remnants (R. Fesen)
* SNRs as probes and drivers of galaxy structure (A. Rest)
* SNe and SNRs cosmic ray acceleration (T. Bell)
* SN ejecta – abundances, clumpiness (K. Borkowski)
* SNe and SNRs with circumstellar interactions (J. Raymond)

Invited Speakers (confirmed)
R. Chevalier (USA - Opening plenary talk), J. Vink (Netherlands – Summary plenary talk), E. Amato (Italy), C. Badenes (USA), G. Dubner (Argentina), P. Ghavamian (USA), W. Kerzendorf (Canada), S-H. Lee (Japan), M. Lemoine-Goumard (France), I. Leonidaki (Greece), L. Lopez (USA), R. McCray (USA), D. Milisavljevic (USA), D. Patnaude (USA), W. Reich (Germany), S. Reynolds (USA), S. Safi-Harb (Canada), N. Soker (Israel), T. Temim (USA), S. Van Dyk (USA), B. Williams (USA)

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