ISSN 1783-3426

THE M$^{\mathrm{A}}$S$^{\mathrm{S}}$I$^{\mathrm{V}}$E STAR NEWSLETTER

formely known as *the hot star newsletter*

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No. 113 2009 September-October

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editor: Philippe Eenens
http://www.astroscu.unam.mx/massive_stars
University of Guanajuato
ftp://ftp.sron.nl/pub/karelh/UPLOADS/WRBIB/

Contents of this newsletter

Accepted Papers

Spectroscopic study of the variability of three northern Of+ supergiants

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The transition from early Of stars to WN type objects is poorly understood. O-type supergiants with emission lines (OIf+) are considered to be intermediate between these two classes. The scope of this paper is to investigate the spectral variability of three Of+ supergiants. We constituted spectral time series of unprecedented quality for our targets ($\sim$ 200 spectra in total), essentially in the blue domain, covering time-scales from a few hours up to a few years. Time Variance Spectrum (TVS) and Fourier analyses were performed in order to characterize their spectral variability. We report on a correlated significant line profile variability in the prominent He II λ4686 and Hβ lines most likely related to the strong stellar winds. The variability pattern is similar for the three stars investigated (HD14947, HD15570 and HD16691), and the main differences are more quantitative than qualitative. However, the reported time-scales are somewhat different, and the most striking variability pattern is reported for HD16691. We did not find any clear evidence for binarity, and we focus mainly on an interpretation based on a single star scenario. We show that the behaviour of the three stars

investigated in this study present strong similarities, pointing to a putative common scenario, even though a few differences should be noted. Our preferred interpretation scheme is that of Large Scale Corotating Structures modulating the profile of the lines that are produced in the strong stellar wind.

Reference: To be phublished in The Astrophysical Journal

On the web at: `http://arxiv.org/abs/0909.0643`

Preprints from: `debecker@astro.ulg.ac.be`

On the presence and absence of disks around O-type stars

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As the favoured progenitors of long-duration gamma-ray bursts, massive stars may represent our best signposts of individual objects in the early Universe, but special conditions seem required to make these bursters. These are thought to originate from the progenitor's rapid rotation and associated asymmetry. To obtain empirical constraints on the interplay between stellar rotation and wind asymmetry, we perform linear Hα spectropolarimetry on a sample of 18 spectroscopically peculiar massive O stars, including OVz, Of?p, Oe, and Onfp stars, supplemented by an earlier sample of 20 O supergiants of Harries et al., yielding a total number of 38 O-type stars. Our study's global aim is to characterize the differences between, and similarities amongst, different classes of peculiar O stars and to establish in how far they differ from garden-variety O stars. Our linear (Stokes QU) spectropolarimetry data should be regarded a geometric counterpart to (Stokes I) spectral classification, setting the stage for circular (Stokes V) polarimetric searches for magnetic fields. Despite their rapid rotation (with v sin(i) up to $\sim$400 km/s) most O-type stars are found to be spherically symmetric, but with notable exceptions amongst specific object classes. We divide the peculiar O stars into four distinct categories: Group I includes the suspected young zero-age main sequence OVz stars and related weak-winds objects, of which the magnetic star θ^1 Ori C is the most famous member. These objects show no evidence for significant linear polarization. Group II includes the Of?p stars, in which one of its members, HD 191612, was also found to be magnetic. These objects show more linear polarization activity than those in group I. Group III includes the Oe stars, which have been suggested to be the more massive counterparts to classical Be stars, and Group IV concerns the Onfp stars. Objects from the latter two groups are on the high-end tail of the O star rotation distribution and have in the past been claimed to be embedded in disks. Here we report the detection of a classical depolarization "line effect" in the Oe star HD 45314, but the overall incidence of line effects amongst Oe stars is significantly lower (1 out of 6) than amongst Be stars. The chance that the Oe and Be datasets are drawn from the same parent population is negligible (with 95% confidence). This implies there is as yet no evidence for a disk hypothesis in Oe stars, providing relevant constraints on the physical mechanism that is responsible for the Be phenomenon. Finally, we find that 3 out of 4 of the group IV Onfp stars show evidence for complex polarization effects which are likely related to rapid rotation, and we speculate on the evolutionary links to B[e] stars.

Reference: Astronomy & Astrophysics (in press)
Comments: arXiv:0909.0888

On the web at: `http://arxiv.org/abs/0909.0888`
Preprints from: `jsv@arm.ac.uk`

A slitless spectroscopic survey for Hα emission-line objects in SMC clusters

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Context: A fair fraction of all single early-type stars display emission lines well before the supergiant phase. Very rapid rotation is necessary for such stars to form rotationally supported decretion disks. But it is unknown whether and which other parameters may be important.

Aims: This paper checks on the roles of metallicity and evolutionary age in the appearance of the so-called Be phenomenon.

Methods: Slitless CCD spectra were obtained covering the bulk (about 3 square degrees) of the Small Magellanic Cloud. For Hα line emission twice as strong as the ambient continuum, the survey is complete to spectral type B2/B3 on the main sequence. About 8,120 spectra of 4,437 stars were searched for emission lines in 84 open clusters. 370 emission-line stars were found, among them at least 231 near the main sequence. For 176 of them, photometry could be found in the OGLE database. For comparison with a higher-metallicity environment, the Galactic sample of the photometric Hα survey by McSwain & Gies (2005) was used.

Results: Among early spectral sub-types, Be stars are more frequent by a factor 3-5 in the SMC than in the Galaxy. The distribution with spectral type is similar in both galaxies, i.e. not strongly dependent on metallicity. The fraction of Be stars does not seem to vary with local star density. The Be phenomenon mainly sets in towards the end of the main-sequence evolution (this trend may be more pronounced in the SMC); but some Be stars already form with Be-star characteristics. In small sub-samples (such as single clusters), even if they appear identical, the fraction of emission lines stars can deviate drastically from the mean.

Conclusions: In all probability, the fractional critical angular rotation rate, W/Wc, is one of the main parameters governing the occurrence of the Be phenomenon. If the Be character is only acquired during the course of evolution, the key circumstance is the evolution of W/Wc, which not only is dependent on metallicity but differently so for different mass ranges. As the result, even if the Be phenomenon is basically single-parametric (namely omc), it takes on a complex multi-parametric appearance. The large cluster-to-cluster differences, which seem stronger than all other variations, serve as a caveat that this big picture may undergo significant second-order modulations (pulsations, initial angular momentum, etc).

Reference: A&A

On the web at: `http://hal.archives-ouvertes.fr/hal-00416129/fr/`

Preprints from: `Christophe.Martayan@eso.org`

Collective pulsational velocity broadening due to gravity modes as a physical explanation for macroturbulence in hot massive stars

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We aimed at finding a physical explanation for the occurrence of macroturbulence in the atmospheres of hot massive stars, a phenomenon found in observations since more than a decade but yet unexplained. We computed time series of line profiles for evolved massive stars broadened by rotation and by hundreds of low-amplitude nonradial gravity-mode pulsations which are predicted to be excited for evolved massive stars. In general, line profiles based on macrotubulent broadening can mimic those subject to pulsational broadening. In several cases, though, good fits require macroturbulent velocities that pass the speed of sound for realistic pulsation amplitudes. Moreover, we find that the rotation velocity can be seriously underestimated by using a simple parameter description for macroturbulence rather than an appropriate pulsational model description to fit the line profiles. We conclude that macroturbulence is a likely signature of the collective effect of pulsations. We provide line diagnostics and their typical values to decide whether or not pulsational broadening is present in observed line profiles, as well as a procedure to avoid an inaccurate estimation of the rotation velocity.

Reference: Accepted for publication in Astronomy & Astrophysics

On the web at: `http://adsabs.harvard.edu/abs/2009arXiv0909.3585A`

Preprints from: `conny@ster.kuleuven.be`

3D models of radiatively driven colliding winds in massive O+O star binaries - III. Thermal X-ray emission

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The X-ray emission from the wind-wind collision in short-period massive O+O-star binaries is investigated. The emission is calculated from three-dimensional hydrodynamical models which incorporate gravity, the driving of the winds, orbital motion of the stars, and radiative cooling of the shocked plasma. Changes in the amount of stellar occultation and circumstellar attenuation introduce phase-dependent X-ray variability in systems with circular orbits, while strong variations in the intrinsic emission also occur in systems with eccentric orbits. The X-ray emission in eccentric systems can display strong hysteresis, with the emission softer after periastron than at corresponding orbital phases prior to periastron, reflecting the physical state of the shocked plasma at these times. Furthermore, the rise of the luminosity to maximum does not necessarily follow a 1/D law. Our models further demonstrate that the effective circumstellar column can be highly energy dependent. We simulate Chandra and Suzaku observations, and fit these using standard XSPEC models. We find that the recovered temperatures from two or three-temperature mekal fits are comparable to those from fits to the emission from real systems with similar stellar and orbital parameters/nature. We also find that when the global abundance is thawed in the spectral fits, sub-solar values are exclusively returned, despite the calculations using solar values as input (abridged).

Reference: Accepted by MNRAS

On the web at: http://xxx.soton.ac.uk/abs/0909.4383

Preprints from: jmp@ast.leeds.ac.uk

Using population synthesis of massive stars to study the interstellar medium near OB associations

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Aims. We study the massive stars in OB associations and their surrounding interstellar medium environment, using a population synthesis code.

Methods. We developed a new population synthesis code for groups of massive stars, where we model the emission of different forms of energy and matter from the stars of the association. In particular, the ejection of the two radioactive isotopes 26Al and 60Fe is followed, as well as the emission of hydrogen ionizing photons, and the kinetic energy of the stellar winds and supernova explosions. We investigate various alternative astrophysical inputs and the resulting output sensitivities, especially effects due to the inclusion of rotation in stellar models. As the aim of the code is the application to relatively small populations of massive stars, special care is taken to address their statistical properties. Our code incorporates both analytical statistical methods applicable to small populations, as well as extensive Monte Carlo simulations.

Results. We find that the inclusion of rotation in the stellar models has a large impact on the interactions between OB associations and their surrounding interstellar medium. The emission of 26Al in the stellar winds is strongly enhanced, compared to non-rotating models with the same mass-loss prescription. This compensates the recent reductions in the estimates of mass-loss rates of massive stars due to the effects of clumping. Despite the lower mass-loss rates, the power of the winds is actually enhanced for rotating stellar models. The supernova power (kinetic energy of their ejecta) is decreased due to longer lifetimes of rotating stars, and therefore the wind power dominates over supernova power for the first 6 Myr after a burst of star-formation. For populations typical of nearby star-forming regions, the statistical uncertainties are large and clearly non-Gaussian.

Reference: A&A, in press

Comments: accepted for publication in A&A

On the web at: http://xxx.uni-augsburg.de/pdf/0907.5209

Preprints from: rod@mpe.mpg.de

Discovery of a magnetic field in the O9 sub-giant star HD 57682 by the MiMeS Collaboration

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We report the detection of a strong, organised magnetic field in the O9IV star HD 57682, using spectropolarimetric observations obtained with ESPaDOnS at the 3.6-m Canada-France-Hawaii Telescope within the context of the Magnetism in Massive Stars (MiMeS) Large Program. From the fitting of our spectra using NLTE model atmospheres we determined that HD 57682 is a 17^{+19}_{-9} $M_\odot$ star with a radius of $7.0^{+2.4}_{-1.8}$ $R_\odot$, and a relatively low mass-loss rate of $1.4^{+3.1}_{-0.95} \times 10^{-9}$ $M_\odot\,yr^{-1}$. The photospheric absorption lines are narrow, and we use the Fourier transform technique to infer $v \sin i = 15 \pm 3$ km s^{-1}. This $v \sin i$ implies a maximum rotational period of 31.5 d, a value qualitatively consistent with the observed variability of the optical absorption and emission lines, as well as the Stokes V profiles and longitudinal field. Using a Bayesian analysis of the velocity-resolved Stokes V profiles to infer the magnetic field characteristics, we tentatively derive a dipole field strength of 1680^{+134}_{-356} G. The derived field strength and wind characteristics imply a wind that is strongly confined by the magnetic field.

Reference: Accepted for publication in MNRAS Letters

Comments: 6 pages, 5 figures

On the web at: `http://arxiv.org/abs/0910.0214`

Preprints from: `Jason.Grunhut@rmc.ca`

Line-profile variability from tidal flows in α Virginis (Spica)

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We present the results of high precision, high resolution (R$\sim$68000) optical observations of the short-period (4d) eccentric binary system α Virginis (Spica) showing the photospheric line-profile variability that in this system can be attributed to non-radial pulsations driven by tidal effects. Although scant in orbital phase coverage, the data provide S/N>2000 line profiles at full spectral resolution in the wavelength range $\Delta\lambda$4000–8500Å, allowing a detailed study of the night-to-night variability as well as changes that occur on $\sim$2 hr timescale. Using an *ab initio* theoretical calculation, we show that the line-profile variability can arise as a natural consequence of surface flows that are induced by the tidal interaction.

Reference: ApJ, In Press

Preprints from: `dmh@ifa.hawaii.edu`

Massive binaries as the source of abundance anomalies in globular clusters

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Abundance anomalies observed in globular cluster stars indicate pollution with material processed by hydrogen burning. Two main sources have been suggested: asymptotic giant branch (AGB) stars and massive stars rotating near the break-up limit (spin stars). We propose massive binaries as an alternative source of processed material.

We compute the evolution of a 20 $M_{\odot}$star in a close binary considering the effects of non conservative mass and angular momentum transfer and of rotation and tidal interaction to demonstrate the principle. We find that this system sheds about 10 $M_{\odot}$of material, nearly the entire envelope of the primary star. The ejecta are enriched in He, N, Na, and Al and depleted in C and O, similar to the abundance patterns observed in gobular cluster stars. However, Mg is not significantly depleted in the ejecta of this model. In contrast to the fast, radiatively driven winds of massive stars, this material is typically ejected with low velocity. We expect that it remains inside the potential well of a globular cluster and becomes available for the formation or pollution of a second generation of stars.

We estimate that the amount of processed low-velocity material ejected by massive binaries is greater than the contribution of AGB stars and spin stars combined, assuming that the majority of massive stars in a proto-globular cluster interact with a companion and return their envelope to the interstellar medium. If we take the possible contribution of intermediate mass stars in binaries into account and assume that the ejecta are diluted with an equal amount of unprocessed material, we find that this scenario can potentially provide enough material to form a second generation of low-mass stars, which is as numerous as the first generation of low-mass stars, without the need to make commonly adopted assumptions, such as preferential loss of the first generation of stars, external pollution of the cluster, or an anomalous initial mass function.

Reference: Astronomy and Astrophysics Letters, in press
Comments: 4 pages, 2 figures http://arxiv.org/abs/0910.1086

On the web at: `http://www.phys.uu.nl/~mink/uploads/papers/0910.1086.pdf`

Preprints from: `S.E.deMink@uu.nl`

Spectroscopic determination of the fundamental parameters of 66 B-type stars in the field-of-view of the CoRoT satellite

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We aim to determine the fundamental parameters of a sample of B stars with apparent visual magnitudes below 8 in the field-of-view of the CoRoT space mission, from high-resolution spectroscopy. We

developed an automatic procedure for the spectroscopic analysis of B-type stars with winds, based on an extensive grid of FASTWIND model atmospheres. We use the equivalent widths and/or the line profile shapes of continuum normalized hydrogen, helium and silicon line profiles to determine the fundamental properties of these stars in an automated way. After thorough tests, both on synthetic datasets and on very high-quality, high-resolution spectra of B stars for which we already had accurate values of their physical properties from alternative analyses, we applied our method to 66 B-type stars contained in the ground-based archive of the CoRoT space mission. We discuss the statistical properties of the sample and compare them with those predicted by evolutionary models of B stars. Our spectroscopic results provide a valuable starting point for any future seismic modelling of the stars, should they be observed by CoRoT.

Reference: Accepted for publication in Astronomy & Astrophysics

On the web at: `http://arxiv.org/abs/0910.2851v1`

Preprints from: `Karolien.Lefever@aeronomie.be`

A *Spitzer Space Telescope* far-infrared spectral atlas of compact sources in the Magellanic Clouds. I. The Large Magellanic Cloud

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We present far-infrared spectra, λ=52–93 μm, obtained with the *Spitzer Space Telescope* in the Spectral Energy Distribution mode of its MIPS instrument, of a representative sample of the most luminous compact far-infrared sources in the Large Magellanic Cloud. These include carbon stars, OH/IR Asymptotic Giant Branch (AGB) stars, post-AGB objects and Planetary Nebulae, the R CrB-type star HV 2671, the OH/IR red supergiants WOH G064 and IRAS 05280−6910, the three B[e] stars IRAS 04530−6916, R 66 and R 126, the Wolf-Rayet star Brey 3a, the Luminous Blue Variable (LBV) R 71, the supernova remnant N 49, a large number of young stellar objects (YSOs), compact H II regions and molecular cores, and a background galaxy at a redshift $z \simeq 0.175$. We use the spectra to constrain the presence and temperature of cold dust and the excitation conditions and shocks within the neutral and ionized gas, in the circumstellar environments and interfaces with the surrounding interstellar medium (ISM). First, we introduce a spectral classification scheme. Then, we measure line strengths, dust temperatures, and IR luminosities. Objects associated with star formation are readily distinguished from evolved stars by their cold dust and/or fine-structure lines. Evolved stars,

including the LBV R 71, lack cold dust except in some cases where we argue that this is swept-up ISM. This leads to an estimate of the duration of the prolific dust-producing phase ("superwind") of several thousand years for both RSGs and massive AGB stars, with a similar fractional mass loss experienced despite the different masses. We tentatively detect line emission from neutral oxygen in the extreme RSG WOH G064, which suggests a large dust-free cavity with implications for the wind driving. In N 49, the shock between the supernova ejecta and ISM is revealed in spectacular fashion by its strong [O I] λ63-μm emission and possibly water vapour; we estimate that 0.2 $M_\odot$ of ISM dust was swept up. On the other hand, some of the compact H II regions display pronounced [O III] λ88-μm emission. The efficiency of photo-electric heating in the interfaces of ionized gas and molecular clouds is estimated at 0.1–0.3%. We confirm earlier indications of a low nitrogen content in the LMC. Evidence for solid state emission features is found in both young and evolved objects, but the carriers of these features remain elusive; some of the YSOs are found to contain crystalline water ice. The spectra constitute a valuable resource for the planning and interpretation of observations with the *Herschel Space Observatory* and the *Stratospheric Observatory For Infrared Astronomy* (SOFIA).

Reference: The Astronomical Journal

On the web at: `http://arxiv.org/abs/0910.3339`

Preprints from: `jacco@astro.keele.ac.uk`

X-ray emission from hydrodynamical simulations in non-LTE wind models

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Hot stars are sources of X-ray emission originating in their winds. Although hydrodynamical simulations that are able to predict this X-ray emission are available, the inclusion of X-rays in stationary wind models is usually based on simplifying approximations. To improve this, we use results from time-dependent hydrodynamical simulations of the line-driven wind instability (seeded by the base perturbation) to derive the analytical approximation of X-ray emission in the stellar wind. We use this approximation in our non-LTE wind models and find that an improved inclusion of X-rays leads to a better agreement between model ionization fractions and those derived from servations. Furthermore, the slope of the L_x-L relation is in better agreement with observations, however the X-ray luminosity is underestimated by a factor of three. We propose a possible solution for this discrepancy.

Reference: A&A, in press

On the web at: `http://xxx.lanl.gov/abs/0910.3430`

Preprints from: `krticka@physics.muni.cz`

The progenitor mass of the magnetar SGR1900+14

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Magnetars are young neutron stars with extreme magnetic fields (B $> 10^{14} - 10^{15}$G). How these fields relate to the properties of their progenitor stars is not yet clearly established. However, from the few objects associated with young clusters it has been possible to estimate the initial masses of the progenitors, with results indicating that a very massive progenitor star ($M_{prog} > 40 M_{\odot}$) is required to produce a magnetar. Here we present adaptive-optics assisted Keck/NIRC2 imaging and Keck/NIRSPEC spectroscopy of the cluster associated with the magnetar SGR 1900+14, and report that the initial progenitor star mass of the magnetar was a factor of two lower than this limit, $M_{prog} = 17 \pm 2 M_{\odot}$. Our result presents a strong challenge to the concept that magnetars can only result from very massive progenitors. Instead, we favour a mechanism which is dependent on more than just initial stellar mass for the production of these extreme magnetic fields, such as the "fossil-field" model or a process involving close binary evolution.

Reference: The Astrophysical Journal

On the web at: `http://xxx.lanl.gov/abs/0910.4859`

Preprints from: `b.davies@leeds.ac.uk`

Proceedings

Spectroscopy and hydrodynamics of dense stellar winds

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Analyzing the spectra from Wolf-Rayet stars requires adequate non-LTE modeling of their expanding atmosphere. The numerical schemes for solving the radiative transfer in the co-moving frame of reference have been developed by Mihalas and co-workers 30 years ago. The most elaborate codes can cope today with many hundred explicit non-LTE levels or super-levels and account for metal-line blanketing.

The limited agreement with observed spectra indicates that the model simplifications are still severe. One approximation that has to be blamed is homogeneity. Stellar-wind clumping on small scales was easily implemented, while "macro-clumping" is still a big challenge. First studies showed that macro-clumping can reduce the strength of predicted P-Cygni line profiles in O-star spectra, and largely affects the X-ray line spectra from stellar winds.

The classical model for radiation-driven winds by Castor, Abbot and Klein fails to explain the very dense winds from Wolf-Rayet stars. Only when we solved the detailed non-LTE radiative transfer consistently with the hydrodynamic equations, mass-loss rates above the single-scattering limit have been obtained.

Reference: "Recent Directions in Astrophysical Quantitative Spectroscopy and Radiation Hydrodynamics", proceedings of conference to honor 70th Birthday of D. Mihalas

On the web at: http://arxiv.org/abs/0909.0627

Preprints from: wrh@astro.physik.uni-potsdam.de

Close pairs: keys to comprehension of the evolution of star clusters

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In this review I first summarize why binaries are key objects in the study of stellar populations, key objects to understand the evolution of star clusters, key objects to understand galaxies and thus the universe. I then focus on 4 specific topics:

1. the formation (via binaries) and evolution of very massive stars in dense clusters and the importance of stellar wind mass loss. I discuss preliminary computations of wind mass loss rates of very massive stars performed with the Munich hydrodynamical code, and the influence of these new rates on the possible formation of an intermediate mass black hole in the cluster MGG 11 in M82

2. the evolution of intermediate mass binaries in a starburst with special emphasis on the variation of the SN Ia rate (the delayed time distribution of SN Ia). A comparison with SN ia rates in elliptical galaxies may provide important clues on the SN Ia model as well as on the evolution of the SN Ia progenitors

3. the evolution of the double neutron stars mergers in a starburst (the delayed time distribution of these mergers) and what this tells us about the suggestion that these mergers may be important production sites of r-process elements

4. the possible effect of massive binaries on the self-enrichment of globular clusters.

Reference: Summary of two reviews presented at the meeting Binaries key to comprehension of the universe, July 2009, Brno, Czech Republic, and at IAUS 266 at the GA in Rio, August 2009

Comments: 12 pages, 4 figures

On the web at: arXiv:0909.3431

Preprints from: dvbevere@vub.ac.be

Spectral Evolution Models for the Next Decade

Claus Leitherer

STScI

Spectral evolution models are a widely used tool for determining the stellar content of galaxies. I provide a review of the latest developments in stellar atmosphere and evolution models, with an emphasis on massive stars. In contrast to the situation for low- and intermediate mass stars, the current main challenge for spectral synthesis models are the uncertainties and rapid revision of current stellar evolution models. Spectral libraries, in particular those drawn from theoretical model atmospheres for hot stars, are relatively mature and can complement empirical templates for larger parameter space

coverage. I introduce a new ultraviolet spectral library based on theoretical radiation-hydrodynamic atmospheres for hot massive stars. Application of this library to star-forming galaxies at high redshift, i.e., Lyman-break galaxies, will provide new insights into the abundances, initial mass function and ages of stars in the very early universe.

Reference: IAU Symp. 262, Stellar Populations - Planning for the Next Decade, eds. G. Bruzual & S. Charlot

Comments: 8 pages, invited talk

On the web at: `http://xxx.lanl.gov/abs/0910.1327`

Preprints from: `leitherer@stsci.edu`

Jobs

Postdoctoral Position in Theoretical Stellar Astrophysics

Richard Townsend
Department of Astronomy University of Wisconsin-Madison 4402 Sterling Hall 475 N Charter St. Madison, WI 53706 USA

The Department of Astronomy at the University of Wisconsin-Madison is advertising a postdoctoral position in stellar astrophysics. The successful applicant will work with Prof. Richard Townsend in developing models for the impact of pulsational instabilities on the evolution of massive, luminous stars. This project will make extensive use of high-performance computer facilities available to the Department, and prior experience with programming in parallel environments will be looked upon favorably. The position is initially for two years with an optional third year. The nominal starting date is no later than September 1 2010.

Applicants must have a recent Ph.D. in astronomy or a related field. Applications should include a summary of research interests, a bibliography, a curriculum vitae, and three letters of recommendation sent to the address above. Applications received by December 31 2009 will be ensured full consideration.

Weblink: `http://www.astro.wisc.edu/~townsend/`

Email contact: `townsend@astro.wisc.edu`

Closing date: December 31 2009

Post-doc position in observational studies of massive stars at Universidad de Valparaiso, Chile

Michel Cutre
Departamento de Fisica y Astronomia Facultad de Ciencias, Universidad de Valparaiso Av. Gran

Bretana 1111, Casilla 5030, Valparaiso, Chile Tel. (+56 32) 2995519 Fax. (+56 32) 2508135

The Department of Physics and Astronomy of the Universidad de Valparaiso, Chile, invites applications for a postdoctoral position for an observational astronomer in the field of massive stars. The main goal of this project is to improve our knowledge related to the structure of circumstellar disks, formed from material ejected by massive and fast rotating stars, through an integrated observational plus theoretical approach in collaboration with Dr. Lydia Cidale (La Plata, Argentina) and Dr. M. Krauss (Ondrejov, Czech Republic). This work will focus on the analysis of the wind properties and the circumstellar geometry of objects showing the Be or B[e] phenomenon, using mainly data originating from the GEMINI-South facilities.

The position is for two years. The starting date should from March 1, 2010.

The successful candidate will have full access to the 10% of Chilean observing time at the international telescopes operating in Chile, as ESO (VLT and La Silla), APEX, Gemini South, SOAR, Magellan, and to the other telescopes at Cerro Tololo and Las Campanas observatories.

Valparaiso is, together with the neighboring town Via del Mar, the most important urban center of Chile, outside the capitalS antiago. It also hosts one of the largest concentrations of Universities in Chile. The Universidad de Valparaiso has recently created a rapidly growing research group in astrophysics which currently numbers seven professors (www.dfa.uv.cl).

Informal enquiries are welcomed and should be made to Professor Dr. Michel Cure (michel.cure@uv.cl)

Applicants should send, before Dec. 31, 2009, by e-mail, their CV, publication list, statement of research interests, and arrange for two letters of recommendation.

Weblink: `http://www.dfa.uv.cl`

Email contact: `michel.cure@uv.cl`

Closing date: Dec 31, 2009

Meetings

39th Liège International Astrophysical Colloquium: The Multi-Wavelength View of Hot, Massive Stars

5 - 9 July 2010
Liège, Belgium

http://www.ago.ulg.ac.be/PeM/Coll/Liac39/
E-mail: liac2010@misc.ulg.ac.be

First Announcement

With the advent of new, high-performance, ground-based and space-borne facilities, the multi-wavelength investigation of massive stars has definitely been transformed over the last decade. It is indeed nowadays possible to study these objects in all wavelength regions, all the way from radio to gamma-rays.

The aim of this four and a half day meeting, which will be organized in the well-known series of the Liège astrophysical colloquia, is to bring together astrophysicists from different backgrounds to discuss how this multi-wavelength approach is revolutionizing our view of massive stars and their surroundings in our Galaxy and beyond.

The colloquium will include five **thematic sessions**:
massive star formation, confronting theory and observation
evolution and interaction of massive stars with their environment
stellar winds, diagnostics across the electromagnetic spectrum
massive binaries: interaction and evolution
future instrumentation and its application to massive star research

Invited reviews will be presented on the following topics:
- Long-wavelength (mid-IR to mm) studies of massive star formation (Henrik Beuther, Heidelberg)
- The multi-wavelength view of massive star formation in massive clusters (Hans Zinnecker, Potsdam, TBC)
- Feedback from massive YSOs and massive main-sequence stars (You Hua Chu, Urbana-Champaign)
- Circumstellar Matter around evolved massive stars (Nathan Smith, Berkeley, TBC)
- Evolution of single massive stars with special emphasis on the LBV and RSG phase (André Maeder, Genève)
- Theory of stellar winds (Stan Owocki, Delaware, TBC)
- Radio observations of massive stars (Ronny Blomme, Brussels)
- X-rays, clumping and wind structures (Lida Oskinova, Potsdam)
- UV, optical and near-IR diagnostics of massive stars (Fabrice Martins, Montpellier)
- Theoretical models of interacting winds in massive binaries (Julian Pittard, Leeds)
- Results of the 2009 multi-wavelength campaign on eta Carinae (Mike Corcoran, GSFC)
- Results of the 2009 multi-wavelength campaign on WR140 (Peredur Williams, Edinburgh)
- Signatures of binary evolution processes in massive stars (Dany Vanbeveren, Brussels)
- Massive Star Research within the ELT era (Chris Evans, Edinburgh)

The proceedings of the conference will be **published electronically** as a special issue of the bulletin of the Liège Royale Scientific Society http://www.srsl-ulg.net/ which is an open-access, refereed publication.

Scientific Organizing Committee:
Ronny Blomme (Royal Observatory Belgium)
Rosie Chen (University of Virginia)
Michaël De Becker (Université de Liège)
Alex Fullerton (STScI)
Doug Gies (Georgia State University)
Eric Gosset (Université de Liège)
Damien Hutsemékers (Université de Liège)
Yaël Nazé (Université de Liège)
Gregor Rauw - co-chair (Université de Liège)
Gustavo Romero (Universidad de La Plata)
Dany Vanbeveren (Vrije Universiteit Brussel)
Peredur Williams - chair (Royal Observatory Edinburgh)

Local Organizing Committee: Denise Caro, Michaël De Becker, Alain Detal, Eric Gosset, Damien

Hutsemékers, Thierry Morel, Yaël Nazé, Gregor Rauw, Jean-Pierre Swings, Jean-Marie Vreux

Conference Milestones:
1 October 2009: First announcement, pre-registration opens
1 February 2010: Second announcement, registration opens
15 March 2010: Abstract submission deadline
15 April 2010: Announcement of the selection of contributed talks and posters.
15 May 2010: Deadline for early registration
15 June 2010: Conference registration closes
5 July 2010 : Conference starts
1 October 2010 : Deadline for contributions to the conference proceedings

Additional information can be found on the web page of the conference:
http://www.ago.ulg.ac.be/PeM/Coll/Liac39/

We look forward to seeing you in Liège,
Peredur Williams and Gregor Rauw on behalf of the SOC

Weblink: `http://www.ago.ulg.ac.be/PeM/Coll/Liac39/`

Email contact: `liac2010@misc.ulg.ac.be`

RAS Specialist Discussion Meeting: Mass-Loss and Galaxy Evolution

12th February 2010
Royal Astronomical Society, Burlington House, London, UK

This meeting concerns the subject of mass-loss from massive stars and the consequences of this phenomenon for galactic chemical evolution. A current major topic in the study of massive stars is the quest for their complete mass-loss history, accounting for wind inhomogeneity. These objects can have dramatic effects on chemical yields through winds and supernovae. We will address the effects of the stellar feedback cycle across a range of object types, cosmic epochs and metallicities, examining also the nature of the evolutionary end-points of stars that have undergone outflows.

Weblink: `www.homepages.ucl.ac.uk/~ucapmja`

Email contact: `mja@star.ucl.ac.uk`