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Editors: Jacco van Loon, Ambra Nanni and Albert Zijlstra

Editorial

Dear Colleagues,

It is a pleasure to present you the 237$^{\rm th}$ issue of the AGB Newsletter.

Some of us have just returned from a fantastic meeting on super-AGB stars – or the transition from AGB stars to supernovæ – in the Rome observatory organised by Paolo Ventura. Super-AGB stars are the ugly duckling, the family member no-one talks about, the bad smell in the room... skirted and avoided. Comprising a marginal mass range, even more so for their possible electron-capture demise, one may wonder "why should we care?" Hence this month's Food for Thought – please keep the discussions going, so that after another nine years since the previous such meeting (here: London 2008) we will not only have learnt a lot more about AGB stars, supernovæ and white dwarf mass functions but also about the enigmatic super-AGB stars themselves.

Check out the announcements of meetings in Japan and Sweden – and if you really want to go to Sweden why not apply for the postdoctoral position in Uppsala.

The next issue is planned to be distributed around the 1$^{\rm st}$ of May.

Editorially Yours,
Jacco van Loon, Ambra Nanni and Albert Zijlstra

Food for Thought

This month's thought-provoking statement is:

Super-AGB stars matter

Reactions to this statement or suggestions for next month's statement can be e-mailed to astro.agbnews@keele.ac.uk (please state whether you wish to remain anonymous)

Refereed Journal Papers

Period estimation for sparsely-sampled quasi-periodic light curves applied to Miras

Shiyuan He[1], *Wenlong Yuan*[1], *Jianhua Huang*[1], *James Long*[1] *and Lucas Macri*[1]

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We develop a non-linear semi-parametric Gaußian process model to estimate periods of Miras with sparsely-sampled light curves. The model uses a sinusoidal basis for the periodic variation and a Gaußian process for the stochastic changes. We use maximum likelihood to estimate the period and the parameters of the Gaußian process, while integrating out the effects of other nuisance parameters in the model with respect to a suitable prior distribution obtained from earlier studies. Since the likelihood is highly multimodal for period, we implement a hybrid method that applies the quasi-Newton algorithm for Gaußian process parameters and search the period/frequency parameter over a dense grid.
A large-scale, high-fidelity simulation is conducted to mimic the sampling quality of Mira light curves obtained by the M 33 Synoptic Stellar Survey. The simulated data set is publicly available and can serve as a testbed for future evaluation of different period estimation methods. The semi-parametric model outperforms an existing algorithm on this simulated test data set as measured by period recovery rate and quality of the resulting Period–Luminosity relations.

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The M 33 Synoptic Stellar Survey. II. Mira variables

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We present the discovery of 1847 Mira candidates in the Local Group galaxy M 33 using a novel semi-parametric periodogram technique coupled with a Random Forest classifier. The algorithms were applied to $\sim 2.4 \times 10^5$ I-band light curves previously obtained by the M 33 Synoptic Stellar Survey. We derive preliminary Period–Luminosity relations at optical, near- & mid-infrared wavelengths and compare them to the corresponding relations in the Large Magellanic Cloud.

Accepted for publication in AJ
Available from https://arxiv.org/abs/1703.01000

Asymmetries on red giant branch surfaces from CHARA/MIRC optical interferometry

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Context: Red giant branch (RGB) stars are very bright objects in galaxies and are often used as standard candles. Interferometry is the ideal tool to characterize the dynamics and morphology of their atmospheres.
Aims: We aim at precisely characterizing the surface dynamics of a sample of RGB stars.
Methods: We obtained interferometric observations for three RGB stars with the MIRC instrument mounted at the CHARA interferometer. We looked for the presence of asymmetries on the stellar surfaces using limb darkening models.
Results: We measured the apparent diameters of HD 197989 (ϵ Cyg) = 4.61 ± 0.02 mas, HD 189276 (HR 7633) = 2.95 ± 0.01 mas, and HD 161096 (β Oph) = 4.43 ± 0.01 mas. We detected departures from centrosymmetric case for all three stars with the tendency of having a larger effect for lower $\log g$ of the sample. We explored the causes of this signal and conclude that a possible explanation to the interferometric signal is the convection- and/or the magnetic-related surface activity. However, it is necessary to monitor these stars with new observations, possibly coupled with spectroscopy, in order to firmly establish the cause.

Accepted for publication in Astronomy & Astrophysics Letters
Available from https://arxiv.org/abs/1703.02406

On the relation of silicates and SiO maser in evolved stars

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The SiO molecule is one of the candidates for the seed of silicate dust in the circumstellar envelope of evolved stars, but this opinion is challenged. In this work we investigate the relation of the SiO maser emission power and the silicate dust emission power. With both our own observation by using the PMO/Delingha 13.7m telescope and archive data, a sample is assembled of 21 SiO $v = 1$,$J = 2$–1 sources and 28 SiO $v = 1$,$J = 1$–0 sources that exhibit silicate emission features in the ISO/SWS spectrum as well. The analysis of their SiO maser and silicate emission power indicates a clear correlation, which is not against the hypothesis that the SiO molecules are the seed nuclei of silicate dust. On the other hand, no correlation is found between SiO maser and silicate crystallinity, which may imply that silicate crystallinity does not correlate with mass-loss rate.

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Mass transfer and disk formation in AGB binary systems

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We investigate mass transfer and the formation of disks in binary systems using a combination of numerical simulations and theory. We consider six models distinguished by binary separation, secondary mass and outflow mechanism. Each system consists of an Asymptotic Giant Branch (AGB) star and an accreting secondary. The AGB star loses its mass via a wind. In one of our six models, the AGB star incurs a short period of outburst. In all cases, the secondary accretes part of the ejected mass and also influences the mass-loss rate of the AGB star. The ejected mass may remain gravitationally bound to the binary system and form a circumbinary disk, or contribute to an accretion disk around the secondary. In other cases, the ejecta will escape the binary system. The accretion rate onto the secondary changes non-linearly with binary separation. In our closest binary simulations, our models exemplify the Wind Roche-lobe Overflow (WROLF) while in our wide binary cases, the mass transfer exhibits Bondi–Hoyle (BH) accretion. The morphologies of the outflows in the binary systems are varied. The variety may provide clues to how the late AGB phase influences Planetary Nebulæ (PNe) shaping. We employ the adaptive-mesh-refinement code AstroBEAR for our simulations and include ray-tracing, radiation transfer, cooling and dust formation. To attain the highest computational efficiency and the most stable results, all simulations are run in the co-rotating frame.

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Internal rotation of 13 low-mass low-luminosity red giants in the *Kepler* field

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Context: The *Kepler* space telescope has provided time series of red giants of such unprecedented quality that a detailed asteroseismic analysis becomes possible. For a limited set of about a dozen red giants, the observed oscillation frequencies obtained by peak-bagging together with the most recent pulsation codes allowed us to reliably determine the core/envelope rotation ratio. The results so far show that the current models are unable to reproduce the rotation ratios, predicting higher values than what is observed and thus indicating that an efficient angular momentum transport mechanism should be at work. Here we provide an asteroseismic analysis of a sample of 13 low-luminosity low-mass red giant stars observed by Kepler during its first nominal mission. These targets form a subsample of the 19 red giants studied previously Corsaro et al. (2015), which not only have a large number of extracted oscillation frequencies, but also unambiguous mode identifications.
Aims: We aim to extend the sample of red giants for which internal rotation ratios obtained by theoretical modeling of peak-bagged frequencies are available. We also derive the rotation ratios using different methods, and compare the results of these methods with each other.
Methods: We built seismic models using a grid search combined with a Nelder–Mead simplex algorithm and obtained rotation averages employing Bayesian inference and inversion methods. We compared these averages with those obtained using a previously developed model-independent method.
Results: We find that the cores of the red giants in this sample are rotating 5 to 10 times faster than their envelopes,

which is consistent with earlier results. The rotation rates computed from the different methods show good agreement for some targets, while some discrepancies exist for others.

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The mass, luminosity and mass-loss rate of the donor of the V1387 Aql/GRS 1915+105 binary system

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V1387 Aql (the donor in the microquasar GRS 1915+105) is a low-mass giant. Such a star consists of a degenerate helium core and a hydrogen-rich envelope. Both components are separated by an hydrogen burning shell. The structure of such an object is relatively simple and easy to model. Making use of the observational constraints on the luminosity and the radius of V1387 Aql, we constrain the mass of this star with evolutionary models. We find a very good agreement between the constraints from those models and from the observed rotational broadening and the NIR magnitude. Combining the constraints, we find solutions with stripped giants of the mass of ≥ 0.28 $M_\odot$ and of the spectral class K5 III, independent of the distance to the system, and a distance-dependent upper limit, $\lesssim 1$ $M_\odot$. We also calculate the average mass transfer rate and the duty cycle of the system as a function of the donor mass.

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Radio variability and non-thermal components in stars evolving toward planetary nebulæ

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We present new JVLA multi-frequency measurements of a set of stars in transition from the post-AGB to the planetary nebula phase monitored in the radio range over several years. Clear variability is found for five sources. Their light curves show increasing and decreasing patterns. New radio observations at high angular resolution are also presented for two sources. Among these is IRAS 18062+2410, whose radio structure is compared to near-infrared images available in the literature. With these new maps, we can estimate inner and outer radii of $0\farcs03$ and $0\farcs08$ for the ionised shell, an ionised mass of 3.2×10^{-4} $M_\odot$, and a density at the inner radius of 7.7×10^{-5} cm^{-3}, obtained by modelling the radio shell with the new morphological constraints. The combination of multi-frequency data and, where available, spectral-index maps leads to the detection of spectral indices not due to thermal emission, contrary to what one would expect in planetary nebulæ. Our results allow us to hypothesise the existence of a link between radio variability and non-thermal emission mechanisms in the nebulæ. This link seems to hold for IRAS 22568+6141 and may generally hold for those nebulæ where the radio flux decreases over time.

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Interferometric confirmation of "water fountain" candidates

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Water fountain stars (WFs) are evolved objects with water masers tracing high-velocity jets (up to several hundreds of km s^{-1}). They could represent one of the first manifestations of collimated mass-loss in evolved objects and thus, be a key to understanding the shaping mechanisms of planetary nebulæ. Only 13 objects had been confirmed so far as WFs with interferometer observations. We present new observations with the Australia Telescope Compact Array and archival observations with the Very Large Array of four objects that are considered to be WF candidates, mainly based on single-dish observations. We confirm IRAS 17291−2147 and IRAS 18596+0315 (OH 37.1−0.8) as bona fide members of the WF class, with high-velocity water maser emission consistent with tracing bipolar jets. We argue that IRAS 15544−5332 has been wrongly considered as a WF in previous works, since we see no evidence in our data nor in the literature that this object harbours high-velocity water maser emission. In the case of IRAS 19067+0811, we did not detect any water maser emission, so its confirmation as a WF is still pending. With the result of this work, there are 15 objects that can be considered confirmed WFs. We speculate that there is no significant physical difference between WFs and obscured post-AGB stars in general. The absence of high-velocity water maser emission in some obscured post-AGB stars could be attributed to a variability or orientation effect.

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Double O–Ne–Mg white dwarfs merging as the source of the powerful gravitational waves for LIGO/VIRGO type interferometers

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New strong non spiralling gravitational waves (GW) source for LIGO/VIRGO detectors are proposed. It is noted that double O–Ne–Mg white dwarfs mergers can produce strong gravitational waves with frequencies in the 600–1200 Hz range. Such events can be followed by the Super Nova type Ia.

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The long-period binary central stars of the planetary nebulæ NGC 1514 and LoTr 5

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The importance of long-period binaries on the formation and evolution of planetary nebulæ is still rather poorly

understood, in part due to the lack of central star systems known to comprise such long-period binaries. Here, we report on the latest results from the on-going Mercator-HERMES survey for variability in the central stars of planetary nebulæ. We present a study of the central stars of NGC 1514, BD +30°623, the spectrum of which shows features associated with a hot nebular progenitor as well as a possible A-type companion. Cross-correlation of high-resolution HERMES spectra against synthetic spectra shows the system to be a highly eccentric ($e \sim 0.5$), double-lined binary with a period of ~ 3300 days. Previous studies indicated that the cool component might be a Horizontal Branch star of mass ~ 0.55 $M_{\odot}$ but the observed radial velocity amplitudes rule out such a low mass. Assuming the nebular symmetry axis and binary orbital plane are perpendicular, the data are more consistent with a post-main-sequence star ascending towards the Giant Branch. We also present the continued monitoring of the central star of LoTr 5, HD 112313, which has now completed one full cycle, allowing the orbital period ($P \sim 2700$ days) and eccentricity ($e \sim 0.3$) to be derived. To date, the orbital periods of BD +30°623 and HD 112313 are the longest to have been measured spectroscopically in the central stars of planetary nebulæ. Furthermore, these systems, along with BD +33°2642, comprise the only spectroscopic wide-binary central stars currently known.

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Once in a blue moon: detection of 'bluing' during debris transits in the white dwarf WD 1145+017

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The first transiting planetesimal orbiting a white dwarf was recently detected in K2 data of WD 1145+017 and has been followed up intensively. The multiple, long, and variable transits suggest the transiting objects are dust clouds, probably produced by a disintegrating asteroid. In addition, the system contains circumstellar gas, evident by broad absorption lines, mostly in the u'-band, and a dust disc, indicated by an infrared excess. Here we present the first detection of a change in colour of WD 1145+017 during transits, using simultaneous multi-band fast-photometry ULTRACAM measurements over the $u'g'r'i'$-bands. The observations reveal what appears to be 'bluing' during transits; transits are deeper in the redder bands, with a $u' - r'$ colour difference of up to ~ -0.05 mag. We explore various possible explanations for the bluing. Synthetic photometry using spectroscopic data in- and out-of-transit, compared to the photometric data, shows that the observed colour difference is most likely the result of reduced circumstellar absorption in the spectrum during transits. This indicates that the transiting objects and the gas share the same line-of-sight, and that the gas covers the white dwarf only partially, as would be expected if the gas, the transiting debris, and the dust emitting the infrared excess, are part of the same general disc structure (although

possibly at different radii). In addition, we present the results of a week-long monitoring campaign of the system.

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Polluting white dwarfs with perturbed exo-comets

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We present a model to account for the observed debris disks around young white dwarfs and the presence of metal-lines in their spectra. Stellar evolution models predict that the mass-loss on the AGB will be pulsed and furthermore, observations indicate that the bulk of the mass-loss occurs on the AGB. In this case, if the progenitors of the white dwarfs had remnants of planetary formation like the Sun's Oort cloud or the Kuiper Belt and a planet lying within that cloud or nearby, we find that between 0.06% to 2.3% of the planetesimals will fall either into planet-crossing orbits or into chaotic regions after the mass-loss, depending on the location and mass of the planet (from Mars to Neptune). This yields a sufficient mass of comets that can be scattered toward the star, form a debris disk and pollute the atmosphere.

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Physical properties of the very young PN Hen 3-1357 (Stingray Nebula) based on multiwavelength observations

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We have carried out a detailed analysis of the interesting and important very young planetary nebula (PN) Hen 3-1357 (Stingray Nebula) based on a unique dataset of optical to far-IR spectra and photometric images. We calculated the abundances of nine elements using collisionally excited lines (CELs) and recombination lines (RLs). The RL C/O ratio indicates that this PN is O-rich, which is also supported by the detection of the broad 9/18 μm bands from amorphous silicate grain. The observed elemental abundances can be explained by asymptotic giant branch (AGB) nucleosynthesis models for initially 1–1.5 $M_\odot$ stars with $Z = 0.008$. The Ne overabundance might be due to the enhancement of ^{22}Ne isotope in the He-rich intershell. By using the spectrum of the central star synthesized by Tlusty as the ionization/heating source of the PN, we constructed the self-consistent photoionization model with Cloudy to the observed quantities, and we derived the gas and dust masses, dust-to-gas mass ratio, and core-mass of the central star. About 80% of the total dust mass is from warm-cold dust component beyond ionization front. Comparison with other Galactic PNe indicates that Hen 3-1357 is an ordinary amorphous silicate rich and O-rich gas PN. Among other studied PNe, IC 4846 shows many similarities in properties of the PN to Hen 3-1357, although their post-AGB evolution is quite different from each other. Further monitoring observations and comparisons with other PNe such as IC 4846 are necessary to understand the evolution of Hen 3-1357.

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H I emission from the red giant Y CVn with the VLA and FAST

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Imaging studies with the VLA have revealed H I emission associated with the extended circumstellar shells of red giants. We analyse the spectral map obtained on Y CVn, a J-type carbon star on the AGB. The H I line profiles can be interpreted with a model of a detached shell resulting from the interaction of a stellar outflow with the local interstellar medium. We reproduce the spectral map by introducing a distortion along a direction corresponding to the star's motion in space. We then use this fitting to simulate observations expected from the FAST radiotelescope, and discuss its potential for improving our description of the outer regions of circumstellar shells.

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SPHERE / ZIMPOL observations of the symbiotic system R Aqr. I. Imaging of the stellar binary and the innermost jet clouds

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R Aqr is a symbiotic binary system consisting of a mira variable, a hot companion with a spectacular jet outflow, and an extended emission line nebula. We have used R Aqr as test target for the visual camera subsystem ZIMPOL, which is part of the new extreme adaptive optics (AO) instrument SPHERE at the Very Large Telescope (VLT). We compare our observations with data from the *Hubble* Space Telescope (HST) and illustrate the complementarity of the two instruments. We determine from the Hα emission the position, size, geometric structure, and line fluxes of the jet source and the clouds in the innermost region ($< 2''$) of R Aqr and determine Hα emissivities mean density, mass, recombination time scale, and other cloud parameters. Our data resolve for the first time the R Aqr binary and we measure for the jet source a relative position 46 ± 1 mas West of the mira. The central jet source is the strongest Hα component. North east and south west from the central source there are many clouds with very diverse structures. We see in the SW a string of bright clouds arranged in a zig–zag pattern and, further out, more extended bubbles. In the N and NE we see a bright, very elongated filamentary structure and faint perpendicular "wisps" further out. Some jet clouds are also detected in the ZIMPOL [O I] and He I filters, as well as in the HST line filters for Hα, [O III], [N II], and [O I]. We determine jet cloud parameters and find a very well defined anti-correlation between cloud density and distance to the central binary. Future Hα observations will provide the orientation of the orbital plane of the binary and allow detailed hydrodynamical investigations of this jet outflow and its interaction with the wind of the red giant companion.

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Available from https://arxiv.org/abs/1703.05624

Abundances and kinematics of TYC 5619-109-1

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Previous studies in the literature have shown the metal-poor red giant ([Fe/H] = −1.55) TYC 5619-109-1 (2M 16011638 −1201525) to be strongly enriched in the elements N and Al (with values of [N/Fe] and [Al/Fe] > 1.0 dex). These chemical abundance results were derived via high-resolution, near-infrared spectra (λ = 1.54–1.70 μm) from the APOGEE survey. High-resolution optical spectra ($R \sim 48\,000$) of TYC 5619-109-1 were obtained and analyzed here, both to verify the large N and Al overabundances reported in the literature, as well as to measure abundances of a wider range of chemical elements. The optical analysis here confirms the N- and Al-rich nature of this red giant, as well as finding that the abundances of the *s*-process elements are also strongly enhanced, particularly in the heavy 2$^{\rm nd}$ *s*-process peak elements, such as Ba, La, Ce, and Nd. Smaller overabundances of the lighter *s*-process elements,Y and Zr, are found, and the ratio of the light to heavy *s*-process elements is consistent with that expected for the ^{13}C(α,n)^{16}O neutron source operating in a low-metallicity environment. The astrophysical site of these *s*-process elements is not known, but the lack of Tc I lines in TYC 5619-109-1, as well as the abundance of Nb compared to Zr, indicate that this red giant is probably not a thermally-pulsing (TP) AGB star. No significant radial-velocity variations are found over a period of several hundred days, so there is no evidence that TYC 5619-109-1 is a binary with a white dwarf companion; mass transfer from a former *s*-process rich TP-AGB is one avenue for forming an *s*-process rich non-AGB star. It is suggested here that TYC 5619-109-1 formed from gas already strongly enriched in *s*-process elements; this type of chemical evolution is found in many dwarf galaxies and globular clusters, with the peculiar globular cluster ω Cen being the prototype of this sort of chemical evolution. A dynamical analysis reveals that there is only a small probability that TYC 5619-109-1 is an escaped member of a globular cluster. In case this star originated in a globular cluster, the most likely candidate would be ω Cen. TYC 5619-109-1 may be the prototype of a significant population of chemically peculiar stars inhabiting the inner Galaxy.

Accepted for publication in MNRAS

Conference Papers

San Pedro meeting on wide-field variability surveys: some concluding comments

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This is a written version of the closing talk at the 22$^{\rm nd}$ Los Alamos Stellar pulsation conference on wide field variability surveys. It comments on some of the issues which arise from the meeting. These include the need for attention to photometric standardization (especially in the infrared) and the somewhat controversial problem of statistical bias in the use of parallaxes (and other methods of distance determination). Some major advances in the use of pulsating variables to study Galactic structure are mentioned. The paper includes a clarification of apparently conflicting results from classical Cepheids and RR Lyræ stars in the inner Galaxy and bulge. The importance of understanding non-periodic phenomena in variable stars, particularly AGB variables and RCB stars is stressed, especially for its relevance to mass-loss in which pulsation may only play a minor role.

Oral contribution, published in "Wide-Field Variability Surveys: a 21$^{\rm st}$-century perspective" (closing talk)

Available from https://arxiv.org/abs/1702.07147

Meteoritic stardust and the presolar history of the Solar Neighborhood

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Presolar stardust is present at low levels in meteorites and cometary dust and identified as ancient stellar matter by unusual isotopic compositions reflecting nuclear processes in stellar interiors and galactic chemical evolution. Most grains originated in winds from asymptotic giant branch (AGB) stars and supernova and their isotopic compositions provide important constraints on models of evolution and nucleosynthesis in these environments. The presolar grains from AGB stars appear to have formed in a lower-mass population of stars than predicted by GCE models. A merger of the Milky Way with a dwarf galaxy some 1 Gyr before the birth of the Solar System may explain this and other grain observations and the data thus can provide a unique window into the presolar history of the Solar Neighborhood.

Oral contribution, published in the "14^{th} International Symposium on Nuclei in the Cosmos (NIC2016)"
Available from http://journals.jps.jp/doi/pdf/10.7566/JPSCP.14.010301

Implementacion de un nuevo algoritmo de identificacion de fuentes estelares en el codigo SACAMAN

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[2]IATE (CONICET), Argentina

An improved version of the identification stellar sources module in the quasi-automatic SACAMAN code is presented, which allows to obtain $YZJHK_{\rm s}$-VVV magnitudes for a set of predefined objects.
The procedure uses a proximity algorithm $\simeq 10$ less time-consuming than the previous method of successive and counting approximation.
This code is being applied to the study of variability of carbon stars belonging to the Galactic Bulge and will be applied to Galactic Disk carbon stars soon.

Poster contribution, published in Terceras Jornadas de Astrofísica Estelar AAA Workshop Series, Vol. 9, Cordoba (2016), eds. L.P. Bassino, Z.L. Lopez Garcia, L.S. Cidale & F.A. Bareilles
Available from https://arxiv.org/abs/1702.07712

Review Paper

X-ray emissions from accreting white dwarfs: a review

Koji Muukai[1,2]

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[2]Department of Physics, University of Maryland, Baltimore County, USA

Interacting binaries in which a white dwarf accretes material from a companion – cataclysmic variables (CVs) in which the mass donor is a Roche-lobe filling star on or near the main sequence, and symbiotic stars in which the mass donor is a late type giant – are relatively commonplace. They display a wide range of behaviors in the optical, X-rays, and other wavelengths, which still often baffle observers and theorists alike. Here I review the existing body of research on

X-ray emissions from these objects for the benefits of both experts and newcomers to the field. I provide introductions to the past and current X-ray observatories, the types of known X-ray emissions from these objects, and the data analysis techniques relevant to this field. I then summarize of our knowledge regarding the X-ray emissions from magnetic CVs, non-magnetic CVs and symbiotic stars, and novæ in eruption. I also discuss space density and the X-ray luminosity functions of these binaries and their contribution to the integrated X-ray emission from the Galaxy. I then discuss open questions and future prospects.

Published in Publications of the Astronomical Society of the Pacific (Invited Review)
Available from https://arxiv.org/abs/1703.06171

Job Advert

Postdoctoral position in astronomy or space physics

We have an opening for a postdoctoral researcher in astronomy or space physics at the Department of Physics and Astronomy, Uppsala University, starting August 2017, or earlier, as agreed upon. The Division for Astronomy and Space Physics hosts about 30 scientists. We study the physics of stars and their environments, the evolution of the Milky Way Galaxy, fundamental processes, exoplanets, galaxies, and the early Universe. In collaboration with the Swedish Institute of Space Physics (IRF) we also study plasma around the Earth and in the solar wind as well as bodies in the Solar System. Development of instrumentation for large telescopes and space probes is also an important activity.

More information on our research and contact information can be found under
http://www.physics.uu.se/research/astronomy-and-space-physics/ and http://www.irfu.se/

Prerequisites: The holder of a position as postdoctoral researcher must have a Ph.D. degree or equivalent. The Ph.D. degree must have been obtained at the start of the employment and no more than three years prior to the application deadline; however, periods of e.g. sick leave or parental leave are deducted from this three-year period.

The application should contain a letter describing the applicant and her/his qualifications and research interests. It should contain a CV, copies of relevant degrees and grades, contact information for at least two reference persons, and copies of the applicant's Ph.D. thesis and research papers, if applicable. Personal circumstances that may be of relevance in the evaluation, for example periods of parental leave, should be mentioned in the CV. The application must contain a brief description of research interests and a statement of which research group the applicant is interested in joining.

Employment Period: 2 years.
Starting date: August 2017, or earlier
Number of reference: UFV-PA 2017/858
Last application date: 2017-05-02

See also https://www.uu.se/en/about-uu/join-us/details/?positionId=140638

Announcements

Cosmic Dust X

Venue: Mitaka Campus of National Astronomical Observatory of Japan (NAOJ), 2-21-1 Osawa, Mitaka, Tokyo 181-8588, Japan

Dates: Monday, August 14 – Friday, August 18, 2017

Admissions: 50 Participants

Objectives: This series of Cosmic Dust meetings aims at finding a consensus among experts on the formation and evolution of cosmic dust: where it comes from and where it goes. The meeting is organized by dust freaks who are very enthusiastic not only to make the goal achievable but also to establish a dust community across every scientifically relevant discipline for the development of cosmic dust research. For this reason, the primary objective of the meeting is to bring together professionals who deal with cosmic dust as well as provide an opportunity for participants to develop interpersonal relationships and scientific interactions among themselves.

Scope: All kinds of cosmic dust such as intergalactic dust, circumnuclear dust, interstellar dust, protoplanetary disk dust, debris disk dust, cometary dust, interplanetary dust, circumplanetary dust, stellar nebular condensates, presolar grains, micrometeorites, meteoroids, meteors, regolith particles, planetary aerosols are the subject of discussion. The meeting is open for any aspects of dust research by means of different methods of studies (in situ and laboratory measurements, astronomical observations, laboratory and numerical simulations, theoretical modeling, data analyses, etc.). Also welcome are papers on dust-related topics, for example, the formation of molecules and their reactions on and their desorption from the surface of a solid substance, light scattering by non-spherical particles and particulate surfaces, space missions and instrumentation for measurements of particulates.

Admissions application: Please complete online meeting application at the CPS website in order to attend the meeting. The deadline for the application is May 13, 2017, 11:59 p.m. Japan Standard Time (GMT+09:00). Because the number of participants is limited to a maximum of 50, the online application does not guarantee admission to the meeting. Participants will be determined at the discretion of the SOC and all applicants will be notified of the admissions decision by May 31, 2017. Priority will be given to those who contribute to oral or poster sessions and retain enthusiasm for discussions throughout the meeting. For further details, please visit the Cosmic Dust website. https://www.cps-jp.org/∼dust/Application.html

Registration fee: The early bird rate of 10,000 JPY is available for those who complete both admissions application and abstract submission by April 30, 2017. The registration fee for those who complete admissions application on and after May 1, 2017 is 15,000 JPY. While no payment is required at the time of admissions application and abstract submission, the registration fee should be paid by cash on arrival at the venue. No matter what circumstances are specified, the registration fee will not be waived.

Proceedings: The proceedings of the meeting is planned to be published as a special issue of original papers (or in exceptional cases, review articles from invited speakers) in a peer-reviewed journal. All participants are strongly encouraged to publish a paper in this special issue of the journal, although paper submission to the proceedings is not obligatory. In recent years, the proceedings were published in Planetary and Space Science:
http://www.sciencedirect.com/science/journal/00320633/133/supp/C
http://www.sciencedirect.com/science/journal/00320633/116/supp/C
http://www.sciencedirect.com/science/journal/00320633/100/supp/C

Important dates:

- 30 April 2017, Deadline for Early-Bird Application
- 13 May 2017, Deadline for Admissions Application
- 31 May 2017, Notification of Admissions Decision
- 14–18 August 2017, Cosmic Dust

Scientific Organizing Committee (SOC):

- Jean-Charles Augereau (IPAG, France)
- Cornelia Jäger (Max Planck Institute for Astronomy, Germany)
- Hidehiro Kaneda (Nagoya University, Japan)
- Hiroshi Kimura (Nagoya University, Japan) [Chair]
- Ludmilla Kolokolova (University of Maryland, USA)
- Aigen Li (University of Missouri-Columbia, USA)

Local Organizing Committee (LOC):

- Hiroki Chihara (Osaka Sangyo University)
- Takayuki Hirai (JAXA/CAC)
- Akio Inoue (Osaka Sangyo University)
- Hidehiro Kaneda (Nagoya University)
- Hiroshi Kimura (Kobe University)
- Hiroshi Kobayashi (Nagoya University)
- Takaya Nozawa (National Astronomical Observatory of Japan) [Chair]
- Tomomi Omura (Kobe University, Japan)
- Takafumi Ootsubo (The University of Tokyo, Japan)
- Hiroki Senshu (Chitec/PERC)
- Takashi Shimonishi (Tohoku University)
- Ryo Tazaki (Kyoto University)
- Koji Wada (Chitec/PERC)

Contact information: ¡dust-inquiries@cps-jp.org¿
Please mind that any email attachment will be blocked.

See also https://www.cps-jp.org/∼dust/

COASTARS – Second announcement

For the first time we can observationally resolve the surfaces of, and wind formation around, nearby giant stars. This fits very timely with the recent development of 3D models of surface convection in giant stars, and detailed models aimed at studying the wind-driving mechanisms.

The Swedish AGB research community is deeply involved in both theoretical and observational aspects, and can provide an ideal setting for discussions on the recent dramatic progress. We will organize an international conference where a selected set of current topics will be discussed in detail. The recent progress in each topic will be covered by two invited keynote speakers followed by contributed talks, and extended afternoon discussion sessions.

The conference is open to any astronomer, will take place during the 12–16$^{\text{th}}$ of June 2017, in Göteborg and is limited to about 70 participants. The conference is called COASTARS – Connecting Observational and theoretical studies of AGB STARS, since the aim of the meeting is to create fruitful discussions between theoretical and observational researchers. Registration is open, but will close on the 3$^{\text{rd}}$ of April (at midnight).

Topics:

Day 1: Dust in M-type AGB stars – theory and wind

Day 2: Dust in M-type AGB stars – observations

Day 3: High-energy emission – Chromospheres or companions?

Day 4: Detached shells – Only for carbon stars?

Day 5: Stellar surface imaging – What will it tell us?

Keynote speakers:

Day 1: Anja Andersen, Sara Bladh

Day 2: Markus Wittkowski, Tomasz Kamiński

Day 3: Raghvendra Sahai, Rodolfo Montez

Day 4: Paola Marigo, Franz Kerschbaum

Day 5: Claudia Paladini, Keiichi Ohnaka

SOC:

- Sofia Ramstedt
- Susanne Höfner
- Bernd Freytag
- Hans Olofsson
- Wouter Vlemmings
- Kay Justtanont
- Matthias Maercker
- Elvire De Beck
- Theo Khouri

See also http://www.astro.uu.se/∼coastars17/