COOLNEWS

A RESEARCH NEWSLETTER DEDICATED TO COOL STARS AND THE SUN

No. 189 — Jan. - Feb. 2014 Editor: Steve Skinner (coolnews@jila.colorado.edu)

TABLE OF CONTENTS

Coolnews on the Web

The current and previous issues of *Coolnews* are available on the following web page in pdf, postscript, and Latex format: **http://casa.colorado.edu/~skinners/coolnews.html**

Stellar Abstracts

Habitability Around F-type Stars

S. Sato[1], M. Cuntz[1], C. M. Guerra Olvera[2], D. Jack[2], and K.-P. Schröder[2]

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We explore the general astrobiological significance of F-type main-sequence stars with masses between 1.2 and 1.5 $M_\odot$. Special consideration is given to stellar evolutionary aspects due to nuclear main-sequence evolution. DNA is taken as a proxy for carbon-based macromolecules following the paradigm that extraterrestrial biology may be most likely based on hydrocarbons. Consequently, the DNA action spectrum is utilized to represent the impact of the stellar UV radiation. Planetary atmospheric attenuation is taken into account based on parameterized attenuation functions. We found that the damage inflicted on DNA for planets at Earth-equivalent positions is between a factor of 2.5 and 7.1 higher than for solar-like stars, and there are intricate relations for the time-dependence of damage during stellar main-sequence evolution. If attenuation is considered, smaller factors of damage are obtained in alignment to the attenuation parameters. Our work is motivated by earlier studies indicating that the UV environment of solar-type stars is one of the most decisive factors in determining the suitability of exosolar planets and exomoons for biological evolution and sustainability. It is a further contribution toward the exploration of the exobiological suitability of stars hotter and, by implication, more massive than the Sun. Although these stars are relatively rare compared to G-type solar-type stars, they possess significantly augmented habitable zones. On the other hand, their emergent photospheric UV fluxes are much larger; fortunately, however, they can be diminished through planetary atmospheric attenuation. Thus, at least in the outer portions of F-star habitable zones, UV radiation s hould not be viewed as an insurmountable hindrance to the existence and evolution of life. (*continued* →)

Accepted by Int. J. Astrobiology

For preprints contact: cuntz@uta.edu

For preprints via ftp or WWW: http://arxiv.org/abs/1312.7431

Origin of W UMa-type Contact Binaries - Age and Orbital Evolution

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Recently, our understanding of the origin of W UMa-type contact binaries has become clearer. Initial masses of their components were successfully estimated by Yıldız & Doğan using a new method mainly based on observational properties of overluminous secondary components. In this paper, we continue to discuss the results and make computations for age and orbital evolution of these binaries. It is shown that the secondary mass, according to its luminosity, also successfully predicts the observed radius. While the current mass of the primary component is determined by initial masses, the current secondary mass is also a function of initial angular momentum. We develop methods to compute the age of A- and W-subtype W UMa-type contact binaries in terms of initial masses and mass according to the luminosity of the secondaries. Comparisons of our results with the mean ages from kinematic properties of these binaries and data pertaining to contact binaries in open and globular clusters have increased our confidence on this method. The mean ages of both A- and W-subtype contact binaries are found as 4.4 and 4.6 Gyr, respectively. From kinematic studies, these ages are given as 4.5 and 4.4 Gyr, respectively. We also compute orbital properties of A-subtype contact binaries at the time of the first overflow. Initial angular momentum of these binaries is computed by comparing them with the well-known detached binaries. The angular momentum loss rate derived in the present study for the detached phase is in very good agreement with the semi-empirical rates available in the literature. In addition to the limitations on the initial masses of W UMa-type contact binaries, it is shown that the initial period of these binaries is less than about 4.45 d.

Accepted by MNRAS,2014, Vol. 437, Issue 1, p.185-194

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For preprints via ftp or WWW: http://arxiv.org/abs/1310.5526

Towards Stellar Effective Temperatures and Diameters at 1% Accuracy for Future Surveys

L. Casagrande[1], L. Portinari[2], I. S. Glass[3], D. Laney[4], V. Silva Aguirre[5], J. Datson[2], J. Andersen[6], B. Nordström[6], J. Holmberg[6], C. Flynn[7], M. Asplund[1]

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The apparent size of stars is a crucial benchmark for fundamental stellar properties such as effective temperatures, radii and surface gravities. While interferometric measurements of stellar angular diameters are the most direct method to gauge these, they are still limited to relatively nearby and bright stars, which are saturated in most of the modern photometric surveys. This dichotomy prevents us from safely extending well-calibrated relations to the faint stars targeted in large spectroscopic and photometric surveys. Here, we alleviate this obstacle by presenting South African Astronomical Observatory near-infrared JHK observations of 55 stars: 16 of them have interferometric angular diameters and the rest are in common with the 2 Micron All Sky Survey (2MASS, unsaturated) data set, allowing us to tie the effective temperatures and angular diameters derived via the infrared flux method to the interferometric scale. We extend the test to recent interferometric measurements of unsaturated 2MASS stars, including giants, and the metal-poor benchmark target HD122563. With a critical evaluation of the systematics involved, we conclude that a 1 per cent accuracy in fundamental stellar parameters is usually within reach. Caution, however, must be used when indirectly testing a Teff scale via colour relations as well as when assessing the reliability of interferometric measurements, especially at submilliarcsec level. As a result, rather different effective temperature scales can be compatible with a given subset of interferometric data. We highlight some caveats to be aware of in such a quest and suggest a simple method to check against systematics in fundamental measurements. A new diagnostic combination seismic radii with astrometric distances is also presented.

Accepted by MNRAS

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For preprints via ftp or WWW: http://arxiv.org/abs/1401.3754

Strömgren Survey for Asteroseismology and Galactic Archaeology: Let the SAGA Begin[1]

L. Casagrande[2], V. Silva Aguirre[3], D. Stello[4], D. Huber[5,6], A.M. Serenelli[7], S. Cassisi[8], A. Dotter[2], A.P. Milone[2], S. Hodgkin[9], A.F. Marino[2], M.N. Lund[3], A. Pietrinferni[8], M. Asplund[2], S. Feltzing[10], C. Flynn[11], F. Grundahl[3], P.E. Nissen[3] R. Schönrich[12,13], K.J. Schlesinger[2], W. Wang[14]

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Asteroseismology has the capability of precisely determining stellar properties which would otherwise be inaccessible, such as radii, masses and thus ages of stars. When coupling this information with classical determinations of stellar parameters, such as metallicities, effective temperatures and angular diameters, powerful new diagnostics for Galactic studies can be obtained. The ongoing Strömgren survey for Asteroseismology and Galactic Archaeology (SAGA) has the goal of transforming the *Kepler* field into a new benchmark for Galactic studies, similarly to the solar neighborhood. Here we present first results from a stripe centred at Galactic longitude 74° and covering latitude from about 8° to 20°, which includes almost 1000 K-giants with seismic information and the benchmark open cluster NGC 6819. We describe the coupling of classical and seismic parameters, the accuracy as well as the caveats of the derived effective temperatures, metallicities, distances, surface gravities, masses, and radii. Confidence in the achieved precision is corroborated by the detection of the first and secondary clump in a population of field stars with a ratio of 2 to 1, and by the negligible scatter in the seismic distances among NGC 6819 member stars. An assessment of the reliability of stellar parameters in the Kepler Input Catalogue is also performed, and the impact of our results for population studies in the Milky Way is discussed, along with the importance of an all-sky Strömgren survey.

Accepted by ApJ

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For preprints via ftp or WWW: http://arxiv.org/abs/1403.2754
SAGA website: http://www.mso.anu.edu.au/saga

Possible Chromospheric Activity Cycles in AD Leo

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AD Leo (GJ 388) is an active dM3 flare star extensively observed both in the quiescent and flaring states. Since this active star is near the fully-convective boundary, to study in detail its long-term chromospheric activity could be an appreciable contribution for the dynamo theory. Here, we analyze with the Lomb-Scargle periodogram the Ca II K line-core fluxes derived from CASLEO spectra obtained between 2001 and 2013 and the V magnitude from the ASAS database between 2004 and 2010. From both totally independent time-series, we obtain a possible activity cycle of period ~ 7 years and a less-significant shorter one of ~ 2 years. A tentative interpretation is that a dynamo operating near the surface could be generating the longer cycle, while a second dynamo operating in the deep convection zone could be responsible for the shorter one.

Based on the long duration of our observing program at CASLEO and the fact that we observe simultaneously different spectral features, we also analyze the relation between simultaneous measurements of the Na I index (R'_D), Hα and Ca II K fluxes at different activity levels of AD Leo, including flares.

Published by ApJL

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The Chemical Evolution of Fluorine in the Bulge - High-resolution K-band Spectra of Giants in Three Fields

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Context: Possible main formation sites of fluorine in the Universe include AGB stars, the ν-process in Type II supernova, and/or Wolf-Rayet stars. The importance of the Wolf-Rayet stars has theoretically been questioned and they are probably not needed in the modelling of the chemical evolution of fluorine in the solar neighborhood. It has, however, been suggested that Wolf-Rayet stars are indeed needed to explain the chemical evolution of fluorine in the Bulge. The molecular spectral data, needed to determine the fluorine abundance, of the often used HF-molecule has not been presented in a complete and consistent way and has recently been debated in the literature.
Aims: We intend to determine the trend of the fluorine-oxygen abundance ratio as a function of a metallicity indicator in the Bulge to investigate the possible contribution from Wolf-Rayet stars. Additionally, we present here a consistent HF line list for the K- and L-bands including the often used 23358.33 Å line.
Methods: High-resolution near-infrared spectra of eight K giants were recorded using the spectrograph CRIRES mounted at VLT. A standard setting was used covering the HF molecular line at 23358.33 Å. The fluorine abundances were determined using spectral fitting. We have also re-analyzed five previously published Bulge giants observed with the Phoenix spectrograph on Gemini using our new HF molecular data.
Results: We find that the fluorine-oxygen abundance in the Bulge probably cannot be explained with chemical evolution models including only AGB-stars and he ν-process in supernovae Type II, i.e. a significant amount of fluorine production in Wolf-Rayet stars is likely needed to explain the fluorine abundance in the Bulge. Concerning the HF line list, we find that a possible reason for the inconsistencies in the literature, with two different excitation energies being used, is two different definitions of the zero-point energy for the HF molecule and therefore also two accompanying

different dissociation energies. Both line lists are correct, as long as the corresponding consistent partition function is used in the spectral synthesis. However, we suspect this has not been the case in several earlier works leading to fluorine-abundances ∼0.3 dex too high. We present a line list for the K- and L-bands and an accompanying partition function.

Accepted by A&A

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For preprints via ftp or WWW: http://arxiv.org/abs/1403.2594

Solar Abstracts

Critical Analysis of a Hypothesis of the Planetary Tidal Influence on Solar Activity

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The present work is a critical revision of the hypothesis of the planetary tidal influence on solar activity published by Abreu et al. (Astron. Astrophys. 548, A88, 2012; called A12 here). A12 describes a hypothesis that planets can have an impact on the solar tachocline and therefore on solar activity. We checked the procedure and results of A12, namely the algorithm of planetary tidal torque calculation and the wavelet coherence between torque and heliospheric modulation potential. We found that the claimed peaks in long-period range of the torque spectrum are artefacts caused by the calculation algorithm. Also the statistical significance of the results of the wavelet coherence is found to be overestimated by an incorrect choice of the background assumption of red noise. Using a more conservative non-parametric random phase method, we found that the long-period coherence between planetary torque and heliospheric modulation potential becomes insignificant. Thus we conclude that the considered hypothesis of planetary tidal influence on solar activity is not based on a solid ground.

and the name of journal, for example: Accepted by Solar Physics, in press

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For preprints via ftp or WWW: http://arxiv.org/abs/1401.3547

Evidence for Distinct Modes of Solar Activity

I.G. Usoskin[1], G. Hulot[2], Y. Gallet[2], R. Roth[3], A. Licht[2], F. Joos[3], G. A. Kovaltsov[4], E. Thébault[2], A. Khokhlov[2,5]

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Aims: The Sun shows strong variability in its magnetic activity, from Grand minima to Grand maxima, but the nature of the variability is not fully understood, mostly because of the insufficient length of the directly observed solar activity records and of uncertainties related to long-term reconstructions. Here we present a new adjustment-free reconstruction of solar activity over three millennia and study its different modes.

Methods: We present a new adjustment-free, physical reconstruction of solar activity over the past three millennia, using the latest verified carbon cycle, ^{14}C production, and archeomagnetic field models. This great improvement allowed us to study different modes of solar activity at an unprecedented level of details.

Results: The distribution of solar activity is clearly bi-modal, implying the existence of distinct modes of activity. The main regular activity mode corresponds to moderate activity that varies in a relatively narrow band between sunspot numbers ≈ 20 and 67. The existence of a separate Grand minimum mode with reduced solar activity, which cannot be explained by random fluctuations of the regular mode, is confirmed at a high confidence level. The possible existence

of a separate Grand maximum mode is also suggested, but the statistics is too low to reach a confident conclusion. *Conclusions:* The Sun is shown to operate in distinct modes - a main general mode, a Grand minimum mode corresponding to an inactive Sun, and a possible Grand maximum mode corresponding to an unusually active Sun. These results provide important constraints for both dynamo models of Sun-like stars and investigations of possible solar influence on Earth's climate.

Published in A&A, 562, L10, 2014.

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Announcement

BinHab: A New Interactive Tool for Habitable Regions

In late March / early April 2014, a new interactive numerical tool, available to the scientific community, will be offered at The University of Texas at Arlington (UTA), called `BinHab`.

`BinHab` will allow for the calculation of S-type and P-type habitable regions in stellar binary systems. P-type orbits occur when the planet orbits both binary components, whereas in the case of S-type orbits the planet orbits only one of the binary components, with the second component considered a perturbator. The selected approach considers a variety of aspects, which include: 1. Besides simple cases, the treatment of nonequal-mass systems and systems in elliptical orbits. 2. The consideration of a joint constraint, including orbital stability and a habitable region for a putative system planet through the stellar radiative energy fluxes ("radiative habitable zone"; RHZ), needs to be met. 3. The provision of a combined formalism for the assessment of both S-type and P-type habitability; in particular, through the solution of a fourth-order polynomial, mathematical criteria are employed for the kind of system in which S-type and P-type habitability is realized. 4. The treatment of conservative (CHZ), general (GHZ), and extended zones (EHZ) of habitability for the various systems as defined for the Solar System and beyond (see `BinHab` for details).

In principle, five different cases of habitability are identified, which are: S-type and P-type habitability provided by the full extent of the RHZs; habitability, where the RHZs are truncated by the additional constraint of planetary orbital stability (referred to as ST and PT-type, respectively, for **T**runcated); and cases of no habitability at all. Regarding the treatment of planetary orbital stability, the formulae of Holman & Wiegert (1999) [AJ 117, 621] are currently utilized.

The adopted method is based on: Cuntz, M., 2014, ApJ 780, 14 (arXiv: 1303.6645v2) and references therein.

This website is being created by Dr. Robert Bruntz, University of Texas at Arlington.

For comments and suggestions, please contact: Dr. Manfred Cuntz: cuntz@uta.edu

Upcoming Meeting

Binary Systems: Their Evolution And Environments

1 - 5 September 2014

Ulaan Baatar, Mongolia

SECOND ANNOUNCEMENT

Web page: http://mongolia.csp.escience.cn/ - binaries2014@gmail.com

!! REGISTRATION IS OPEN; ABSTRACT DEADLINE: 1 APRIL 2014 !!

IMPORTANT DATES:

- Registration open: 16 January 2014
- Abstract submission (and initial registration deadline): 1 April 2014
- Notification of oral/poster presentations: 30 April 2014
- Third announcement: May 2014
- Deadline for submission of visa information (if applicable): 1 June 2014

We will have the conference website updated as soon as possible to reflect these dates.

REGISTRATION

Formal registration is now open. Even if you pre-registered, please take a minute to update your registration now!

This also applies to all speakers and SOC members. We need to have a census of the total number of participants, so if you don't register you may not be able to attend...

The conference is limited to about 70 participants. If we receive more registrations, the SOC will make a selection from the registered participants. Admission of late registration is at the discretion of the SOC.

The list of registered participants will be made available on the conference website; for the time being, please have a look at our exciting line-up of review and invited speakers at

http://mongolia.csp.escience.cn/dct/page/65581

VISAS

Participants from many countries will need to apply for a Mongolian visa in advance of their travel. If this applies to you, please check the visa information page at

http://mongolia.csp.escience.cn/dct/page/65584

Please strictly adhere to the deadline of 1 June 2014 for submission of your information, so that invitation letters can be issued in June. A copy of the application form is provided as a link from the visa page.

If you're a US citizen you're lucky: you won't need to apply for a visa!

ACCOMMODATION

The following website provides numerous hotel options:

http://www.mongolianhotels.net/

The local organizers recommend that you book your accommodation at the Zaluuchuud or Puma hotels. The Puma Imperial Hotel (Ulaanbaatar) is nearest to the University. See

http://www.welcome2mongolia.com/archives/zaluuchuud/ and

http://www.mongolianhotels.net/hotel_more.php?hid=51

for more information. (*continued* →)

If you need any help, please let us know and we'll pass your request on to the local organizers for further action.

KEEP UP TO DATE!

The conference organisation is still evolving at this point. We have reached agreement with the local Mongolia-Japan Centre to hold the meeting there. We have been told that this is a very nice, modern venue.

In the next few weeks, we hope to be able to provide more clarity as regards the conference fee, social activities, options for excursions, etc. To keep abreast of developments, please keep an eye on the conference website

http://mongolia.csp.escience.cn/dct/page/1

We hope to see many of you in Ulaan Baatar in September!

Richard de Grijs, Licai Deng (SOC co-chairs)

Upcoming Meeting

Polarimetry: From the Sun to Stars and Stellar Environments

IAU Symposium 305

30 Nov. - 5 Dec. 2014

Punta Leona, Costa Rica

IAU Symposium 305 will convene in Punta Leona, Costa Rica November 30 December 5, 2014. The Symposium will be the first meeting devoted entirely to interaction between the solar and nighttime polarimetry communities. These two communities, until now evolving mostly independently, will share advances in science, data analysis, modeling, and instrumentation. Each session will be integrated to include both solar and nighttime polarimetry.

The website for IAU Symposium 305 is:

https://www2.hao.ucar.edu/events/IAUS305

The site currently provides more information about the meeting venue, agenda, accommodations, and financial support. Registration will be possible at this site in the near future.

The Organizing Committee aims to encourage participation by students and early-career scientists, particularly those having interest in entering the field of astronomical polarimetry. As such, the first day of the Symposium, November 30, will be devoted to a series of introductory tutorial lectures on Astronomical Polarimetry.

Those desiring financial support should complete the IAU application form for financial support by following the link and instructions provided at the above website. The deadline for application for financial support is 12 May, 2014.

For more information or questions, please direct inquiries to info_IAUS305@hao.ucar.edu.

Upcoming Meeting

Why Galaxies Care About AGB Stars III: A Closer Look in Space and Time

28 July - 1 August 2014

Vienna, Austria

SECOND ANNOUNCEMENT

The conference aims to build a bridge between AGB research and its application to the modelling of stellar populations and the chemical evolution of galaxies and the universe as a whole. It is a follow-up meeting to the successful Viennese conferences on similar topics in 2006 and 2010.

This time the focus of the meeting will be:

1) Complex Atmospheres: Observation and theoretical understanding

2) Living together: Binarity, disks, ISM interaction

3) What is left: Dust, yields, AGBs in the cosmic matter cycle

4) Resolved and unresolved: AGB star populations in external stellar systems

5) Perspectives: ALMA, SKA, SOFIA, JWST, VLTI+, ELT,

INVITED SPEAKERS

J. Blommaert, G. Bono, I. Cherchneff, O. Chesneau, A. Chiavassa, N. Cox, L. Girardi, S. Hfner, R. Izzard, M. Maercker, M. Marengo, P. Marigo, J. Menzies, S. Mohamed, K. Ohnaka, G. Perrin, A. Renzini, R. Riffel, R. Schneider, S. Srinivasan, O. Straniero, W. Vlemmings SCIENTIFIC ORGANIZING COMMITTEE

H. Olofsson (chair), I. Cherchneff, M. Groenewegen, S. Hfner, R.M. Humphreys, A. Jorissen, A. Karakas, F. Kerschbaum (co-chair), T. Lebzelter, C. Maraston, M. Meixner, B. Plez, P. Whitelock, H. van Winckel, R. Wing, M. Wittkowski LOCAL ORGANIZING COMMITTEE

F. Kerschbaum (chair), J. Hron (co-chair), T. Lebzelter, W. Nowotny, R. Ottensamer, T. Posch, et al. IMPORTANT DEADLINES

Registration for the conference is now open via our webpage http://www.univie.ac.at/galagb including the possibility to submit abstracts for invited and contributed talks and posters.

-Deadline for abstract submission for contributed talks: April 30, 2014

-Deadline for applications for financial support: April 30, 2014

-End of early registration: May 31, 2014

-Deadline for abstract submission for posters: June 15, 2014

If you have any questions, please contact us at galagb.astro@univie.ac.at

We are looking forward to seeing you in Vienna in 2014!

Upcoming Meeting

Solar and Stellar Flares: Observations, Simulations and Synergies

23 - 27 June 2014

Prague, Czech Republic

The meeting in honour of Prof. Zdenek Svestka will cover issues of the physics of solar and stellar flares.

Registration and accommodation on-line forms are now open, list of invited speakers was added. Deadlines for abstract submission and young scientists support applications are approaching - April 1, 2014.

For more information, please visit http://solarflares2014.cz/index.php

Upcoming Meeting

EWASS Special Session 2

Helios and Helium: What is Wrong With Them ?

2 - 3 July 2014

Geneva, Switzerland

Dear colleague,

within the European Week of Astronomy and Space Science (EWASS 2014) in Geneva we are organizing a Special Session on :

Helios and Helium : what is wrong with them ?

We are gathering experts on asteroseismology, stellar models and 3D model atmospheres to discuss current puzzles about the Solar Model and low Main Sequence stars, as well as data synergy between the Gaia mission and asteroseismology.

More details on the program of the EWASS week and of our Special Session at:

http://eas.unige.ch/EWASS2014/

Registrations to the EWASS week is now open. For further information, please check for updates on the above web-site, and do not hesitate to contact us at: helios.ewass@gmail.com

On behalf of the Scientific Organizing Committee

Luca Casagrande, Orlagh Creevey and Laura Portinari

Upcoming Meeting

Cool Stars 18, Splinter Session

Galactic Archaeology with Cool Stars

10 June 2014

Flagstaff, Arizona

Cool stars are fundamental astrophysical laboratories. On the H-R diagram they span a vast range of gravities, luminosities, and, thus, internal structures. As a result, they probe a plethora of distances and are preferential targets of past and current Galactic surveys (e.g., 2MASS, SDSS, RAVE, Gaia-ESO, SAGA, APOGEE, GALAH, Kepler, LSST). Be it a dwarf or a giant, their cool surface temperatures are the realm of interesting atomic and molecular physics that shape their emergent spectra. This temperature regime is dominated by convection, which is the main driver underlying the fundamental oscillations detected by asteroseismology.

Cool stars are thus at the cross-roads of a number of areas in astronomy. To best exploit cool stars, we must accurately and precisely measure their observational properties with Galactic surveys. This is only possible if we have realistic models to both guide and interpret observations. For example, the orbits and chemical compositions of cool stars provide an unprecedented fossil record of different epochs of star formation. However, only with advanced stellar modeling can we determine reliable stellar ages and distances, allowing us to constrain Galactic evolution.

The purpose of this Splinter Session is to bring together experts from both observational and theoretical stellar astronomy to highlight successes, discuss problems and failures, and explore new ideas to use Cool Stars for Galactic studies. This session features two panel discussions, one focused on surveys and the other on theory. Prior to the meeting, *we request to interested participants to contribute topics and questions for the discussion via*:

http://www.mso.anu.edu.au/∼kschles/coolstars/index.html

Each panelist will briefly discuss the audience-proposed topics and questions, after which the session will shift to a discussion between the panelists and audience.

Session Organizers:

Luca Casagrande, Remo Collet, Aaron Dotter, Katie Schlesinger.

JOB OPENING

Postdoctoral Position

Solar Physics

Max Planck Institute for Solar System Research (Germany)

The Max Planck Institute for Solar System Research (MPS) invites applications for a postdoctoral position in solar physics, dedicated to modelling of solar spectral irradiance variations using the output of 3D radiation MHD simulations and the observed magnetograms. The project is attractive not just from the science point of view, but also because of its relevance to global climate change.

Applicants must hold a Ph.D. in physics with focus on solar physics, astronomy, astrophysics, or a closely related field. They should have an outstanding research record and experience in solar or stellar physics. Experience in numerical radiative transfer modelling is important and a background in non-LTE radiative transfer is of particular advantage.

The position is available as early as 1.5.2014 or later and is offered for a period of up to three years. Salary will be according to E13 of the TVD scale of the German public service. An earlier start can be negotiated.

Applications, including a CV, a statement of research interests, a publication list and contact information of three potential referees should be sent as one pdf file to solanki-office@mps.mpg.de.

Review of applications will begin March 1 and continue until the position is filled.

The Max Planck Society is an equal opportunity employer and particularly encourages applications from women. The Max Planck Society is committed to employing more handicapped individuals and especially encourages them to apply.

For further information please contact Natalie Krivova (natalie@mps.mpg.de) or Johannes Stecker (stecker@mps.mpg.de).

Abstract Guidelines

Abstracts for *COOLNEWS* are solicited for papers that have been recently accepted by or submitted to refereed journals, and for recent Ph.D. theses. Abstracts for conference proceedings articles are *not* posted in *COOLNEWS*. The subject matter should pertain directly to cool stars (spectral types F,G,K,M or L), substellar objects, or the sun. Both theoretical and observational abstracts are appropriate.

Abstracts dealing with cool pre-main-sequence (PMS) stars will generally not be included in *COOLNEWS*, since they are already covered by the *Star Formation Newsletter*. Exceptions to this rule will be considered if the subject matter is truly cross-disciplinary. If you wish to submit a cross-disciplinary abstract on PMS stars, then first submit it to the *Star Formation Newsletter*. After doing so, submit the abstract to *COOLNEWS* accompanied by a short e-mail stating that it has already been submitted to the *Star Formation Newsletter*, and summarizing why it will be of interest to the cool star/solar community at large.

A bimonthly call for abstracts will be issued. Announcements of general interest to the cool star and solar communities may also be submitted for posting in the newsletter. These might include (but are not restricted to) the following: (i) *Job Openings* directed toward cool star or solar researchers, (ii) announcements of *Upcoming Meetings*, (iii) announcements of *Upcoming Observing Campaigns* for which participation is solicited from the community at large, (iv) reviews of *New Books*, and (v) *General Announcements* that provide or request research-related information. Please send all correspondence to the editor at coolnews@jila.colorado.edu. Abstract templates and back issues can be obtained from the COOLNEWS Web-page at

`http://casa.colorado.edu/~skinners/coolnews.html` .

*** Please send abstracts in the body of the message and *not* as attachments.***