COOLNEWS

A RESEARCH NEWSLETTER DEDICATED TO COOL STARS AND THE SUN

No. 128 — November 2006 Editor: Steve Skinner (coolnews@jila.colorado.edu)

TABLE OF CONTENTS

Stellar Abstracts

Coronal Activity Cycles in 61 Cygni

A. Hempelmann[1], J. Robrade[1], J.H.M.M. Schmitt[1], F. Favata[2], S.L. Baliunas[3], J.C. Hall[4]

[1] Universität Hamburg, Hamburger Sternwarte, Gojenbergsweg 112, D-21029 Hamburg, Germany
[2] Astrophysics Division – Research and Science Support Department of ESA, ESTEC, Postbus 299, NL-2200 AG Noordwijk, The Netherlands
[3] Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA
[4] Lowell Observatory, 1400 West Mars Hill Road, Flagstaff, AZ 86001, USA

While the existence of stellar analogues of the 11 years solar activity cycle is proven for dozens of stars from optical observations of chromospheric activity, the observation of clearly cyclical coronal activity is still in its infancy. In this paper, long-term X-ray monitoring of the binary 61 Cygni is used to investigate possible coronal activity cycles in moderately active stars. We are monitoring both stellar components, a K5V (A) and a K7V (B) star, of 61 Cyg with XMM-Newton. The first four years of these observations are combined with ROSAT HRI observations of an earlier monitoring campaign. The X-ray light curves are compared with the long-term monitoring of chromospheric activity, as measured by the Mt.Wilson CaII H+K S-index. Besides the observation of variability on short time scales, long-term variations of the X-ray activity are clearly present. For 61 Cyg A we find a coronal cycle which clearly reflects the well-known and distinct chromospheric activity cycle. The changes of coronal properties during the cycle resemble the solar behaviour. The coronal activity of 61 Cyg B also follows the chromospheric variability, although a pronounced sinusoidal chromospheric cycle of large amplitude is not noticeable. This is also reflected in the XMM-Newton observations with a rather complex long-term variability during that time. 61 Cyg A is the first star where a persistent coronal activity cycle has been observed.

Accepted by A&A

For preprints contact: ahempelmann@hs.uni-hamburg.de

Photospheric and Chromospheric Active Regions in Four Young Solar-type Stars

K. Biazzo[1], A. Frasca[1], G. W. Henry[2], S. Catalano[1] and E. Marilli[1]

[1] INAF - Catania Astrophysical Observatory, via S. Sofia 78, I–95123 Catania, Italy
[2] Center of Excellence in Information Systems, Tennessee State University, 3500 John A. Merritt Blvd., Box 9501, Nashville, TN 37209

We present a photometric and spectroscopic study of four G–K dwarfs, namely HD 166, ϵ Eri, χ^1 Ori and κ^1 Cet. In three cases, we find a clear spatial association between photospheric and chromospheric active regions. For χ^1 Ori we do not find appreciable variations of photospheric temperature or chromospheric Hα emission. We applied a spot/plage model to the observed rotational modulation of temperature and flux to derive spot/plage parameters and to reconstruct a rough "three-dimensional" map of the outer atmosphere of κ^1 Cet, HD 166 and ϵ Eri.

Accepted by ApJ

For preprints contact: kbiazzo@oact.inaf.it

For preprints via ftp or WWW: http://arxiv.org/abs/astro-ph/0609525

A Deep XMM-Newton X-ray Observation of the Chamaeleon I Dark Cloud

J. Robrade[1], J.H.M.M. Schmitt[1]

[1] Universität Hamburg, Hamburger Sternwarte, Gojenbergsweg 112, D-21029 Hamburg, Germany

Aims: A deep XMM-Newton exposure is used to investigate X-ray properties of the pre-main sequence population of the Chamaeleon I star forming region.
Methods: The northern-eastern fringe of the Chameleon I dark cloud was observed with XMM-Newton, revisiting a region observed with ROSAT 15 years ago. Centered on the extended X-ray source CHXR 49 we are able to resolve it into three major contributing components and to analyse their spectral properties. Furthermore, the deep exposure allows not only the detection of numerous, previously unknown X-ray sources, but also the investigation of variability and the study of the X-ray properties for the brighter targets in the field. We use EPIC spectra, to determine X-ray brightness, coronal temperatures and emission measures for these sources, compare the properties of classical and weak-line T Tauri stars and make a comparison with results from the ROSAT observation.
Results: X-ray properties of T Tauri stars in Cha I are presented. The XMM-Newton images resolve some previously blended X-ray sources, confirm several possible ones and detect many new X-ray targets, resulting in the most comprehensive list with 71 X-ray sources in the northern Cha I dark cloud. The analysis of medium resolution spectra shows an overlapping distribution of spectral properties for classical and weak-line T Tauri stars, with the X-ray brighter stars having hotter coronae and a higher $L_{\rm X}/L_{\rm bol}$ ratio. X-ray luminosity correlates with bolometric luminosity, whereas the $L_{\rm X}/L_{\rm bol}$ ratio is slightly lower for the classical T Tauri stars. Large flares as well as a low iron and a high neon abundance are found in both types of T Tauri stars. Abundance pattern, plasma temperatures and emission measure distributions during quiescent phases are attributed to a high level of magnetic activity as the dominant source of their X-ray emission.

Accepted by A&A

For preprints contact: jrobrade@hs.uni-hamburg.de

For preprints via ftp or WWW: http://xxx.lanl.gov/abs/astro-ph/0610778

The Stellar Content of the XMM-Newton Bright Serendipitous Survey

J. López-Santiago[1], G. Micela[1], S. Sciortino[1], F. Favata[2], A. Caccianiga[3], R. Della Ceca[3], P. Severgnini[3] and V. Braito[4,5]

[1] INAF - Osservatorio Astronomico di Palermo Giuseppe S. Vaiana, Piazza Parlamento 1, I-90134 Palermo, Italy
[2] Astrophysics Missions Division, Research and Science Support Department of ESA/ESTEC, Postbus 299, 2200 AG Noordwijk, Netherlands
[3] INAF - Osservatorio Astronomico di Brera, via Brera 28, I-20121 Milan, Italy
[4] X-ray Astrophysics Laboratory, Code 662, NASA/Goodard Space Flight Center, Greenbelt, MD 20771
[5] Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD 21218

The comparison of observed counts in a given sky direction with predictions by Galactic models yields constraints to the spatial distribution and the stellar birthrate of young stellar populations. In this work we present the results of the analysis of the stellar content of the XMM-Newton Bright Serendipitous Survey (XBSS). This unbiased survey includes a total of 58 stellar sources selected in the 0.5 – 4.5 keV energy band, having a limiting sensitivity of 10^{-2} cnt s^{-1} and covering an area of 28.10 sq. deg. Our main goal is to understand the recent star formation history of the Galaxy in the vicinity of the Sun. We compare the observations with the predictions obtained with XCOUNT, a model of the stellar X-ray content of the Galaxy. The model predicts the number and properties of the stars to be observed in terms of magnitude, colour, population and f_x/f_v ratio distributions of the coronal sources detected with a given instrument and sensitivity in a specific sky direction. As in other shallow surveys, we observe an excess of stars not predicted by our Galaxy model. Comparing the colours of the identified infrared counterparts with the model predictions, we observe that this excess is produced by yellow (G+K) stars. The study of the X-ray spectrum of each source reveals a main population of stars with coronal temperature stratification typical of intermediate-age stars. As no assumptions have been made for the selection of the sample, our results must be representative of the entire Solar Neighbourhood. Some stars show excess circumstellar absorption indicative of youth.

Accepted by A&A

For preprints contact: jlopez@astropa.unipa.it

Non-grey Hydrogen Burning Evolution of Sub-Solar Mass Population III Stars

G. J. Harris[1], A. E. Lynas-Gray[2], S. Miller[1] and J. Tennyson[1]

[1] Dept. of Physics and Astronomy, University College London, Gower Street, London. WC1E 6BT, UK
[2] Dept. of Physics, University of Oxford, Keble Road, Oxford, OX1 3RH, UK

The primordial elements, H, He and Li are included in a low temperature equation of state and monochromatic opacity function. The equation of state and opacity function are incorporated into the stellar evolution code NGELMS, which makes use of a non-grey model atmosphere computed at runtime. NGELMS is used to compute stellar evolution models for primordial and lithium free element mixtures, for stars in the sub-Solar mass range 0.8–0.15 $M_\odot$. We find that lithium has little or no effect upon the structure and observable properties of of stars in this mass range. Furthermore lithium is completely destroyed by fusion before the main sequence in stars of mass less than $\sim$0.7 $M_\odot$. We find that on the red giant branch and Hayashi track, the use of a non-grey model atmosphere to provide the upper boundary conditions for the stellar evolution calculation, results in significantly cooler less luminous stars, across the mass range.

Accepted by MNRAS

For preprints contact: greg@theory.phys.ucl.ac.uk

For preprints via WWW: http://arxiv.org/abs/astro-ph/0610165

Sloan/Johnson-Cousins/2MASS Color Transformations for Cool-Stars

James R. A. Davenport[1], Andrew A. West[2], Caleb K. Matthiesen[1], Michael Schmieding[1], and Adam Kobelski[3]

[1] Department of Astronomy, University of Washington, Box 351580, Seattle, WA 98195
[2] Astronomy Department, University of California, 601 Campbell Hall, Berkeley, CA 94720-3411
[3] Department of Physics, 264 EPS Building, Montana State University, Bozeman, MT 59717

We present multi-color transformations and photometric parallaxes for a sample of 40 low mass dwarfs selected from the Sloan Digital Sky Survey (SDSS) and the General Catalog of Trigonometric Stellar Parallaxes. Our sample was re-observed at the Manastash Ridge Observatory (MRO) using both Sloan and Johnson-Cousin filters and color transformations between the two photometric systems were derived. A subset of the sample had previously measured Johnson-Cousins photometry and parallaxes as well as 2MASS photometry. We observed these stars at MRO using Sloan filters and used these data to derive photometric parallax relations as well as SDSS/Johnson-Cousins/2MASS color transformations. We present the data and derived transformations for use in future low mass star studies.

Accepted by PASP

For preprints contact: uwjim@astro.washington.edu (continued →)

For preprints via ftp or WWW: http://astro.berkeley.edu/~awest/davenport.pdf

Solar Abstracts

RHESSI Investigation of Solar Flare Footpoints

T. Mrozek[1]

[1] Astronomical Institute, University of Wrocław, ul. Kopernika 11, 51-622 Wrocław, Poland

Footpoints of several strong solar flares have been investigated using images obtained by Ramaty High Energy Solar Spectroscopic Imager (*RHESSI*). The altitude of hard X-ray sources in various energy bands has been measured. Some observational characteristics of the energy-height relation have been obtained and presented in the form of histograms. Using them we were able to conclude that during impulsive phase the region in which electrons are stopped is rather narrow with the thickness in the range 1500-4000 km. Moreover, it is shown that all electrons producing photons with energies exceeding 20-30 keV are stopped at similar altitudes. For the flare of 3 August 2002 we analyzed the temporal evolution of the energy-height relation. It has been shown that changes in this relation can be interpreted as a manifestation of simultaneous upflows and downflows of the transition region and chromosphere. Obtained values of velocities are between -50 km/s and 150 km/s.

Accepted by Adv. in Space Res.

For preprints contact: mrozek@astro.uni.wroc.pl

Footpoint Versus Loop-Top Hard X-ray Emission Sources in Solar Flares

M. Tomczak[1] **and T. Ciborski**[1]

[1]Astronomical Institute, University of Wroclaw, ul. Kopernika 11, Wroclaw, Poland The hard X-ray flux ratio R of the footpoint sources to the loop-top source has been used to investigate non-thermal electron trapping and precipitation in solar flares. Considering the mission-long Yohkoh Hard X-ray Telescope database, from which we selected 117 flares, we investigated a dependence of the ratio R on flare loop parameters like height h and column depth N. We used non-thermal electron beams as a diagnostic tool for magnetic convergence. The ratio R decreases with h which we interpret as an effect of converging field geometry. Two branches seen in the R-h diagram suggest that in the solar corona two kinds of magnetic loops can exist: a more-converged ones that are more frequent (above 80and less-converged loops that are less frequent (below 20correlation between the ratio R and N can be due to a more complex configuration of investigated events than seen in soft X-rays. Obtained values of the magnetic mirror ratio are consistent with previous works and suggest a strongly nonpotential configuration. Further investigation including RHESSI data is needed to verify our results.

Accepted by A&A

For preprints contact: tomczak@astro.uni.wroc.pl

Low-Mass and Substellar Abstracts

Low-Mass Dwarf Template Spectra from the Sloan Digital Sky Survey

John J. Bochanski[1], **Andrew A. West**[1,2], **Suzanne L. Hawley**[1], **and Kevin R. Covey**[1]

[1]Astronomy Department, University of Washington, Box 351580, Seattle, WA 98195
[2] Dept. of Astronomy, 601 Campbell Hall, Univ. of California, Berkeley, CA 94720 USA

We present template spectra of low-mass (M0-L0) dwarfs derived from over 4,000 Sloan Digital Sky Survey (SDSS) spectra. These composite spectra are suitable for use as medium-resolution (R $\sim$ 1,800) radial velocity standards. We report mean spectral properties (molecular bandhead strengths, equivalent widths) and use the templates to investigate the effects of magnetic activity and metallicity on the spectroscopic and photometric properties of low-mass stars.

Accepted by AJ (continued →)

For preprints contact: bochansk@astro.washington.edu

For preprints WWW: http://www.astro.washington.edu/bochansk/lowmass.pdf

Simultaneous Optical and X-ray Observations of a Giant Flare on the Ultracool Dwarf LP 412-31

B. Stelzer[1], J. H. M. M. Schmitt[2], G. Micela[1] and C. Liefke[2]

[1] INAF - Osservatorio Astronomico di Palermo, Piazza del Parlamento 1, I-90134 Palermo, Italy
[2] Hamburger Sternwarte, Gojenbergsweg 112, D-21029 Hamburg, Germany

Cool stars are known to produce flares probably as a result of the magnetic reconnection in their outer atmospheres. We present simultaneous *XMM-Newton* optical V band and X-ray observations of the M8 dwarf LP 412-31. During the observation a giant flare occurred, with an optical amplitude of 6 mag and total energy of $3 \cdot 10^{32}$ erg in both the V band and soft X-rays. Both flare onset and flare decay were completely covered in both wavebands with a temporal resolution of 20 s, allowing determination of the flare time scales, as well as a study of the temperature evolution of the flaring plasma. The data are consistent with an impulsive energy release followed by radiative cooling without any further energy release during the decay phase. Our analysis suggests that the optical flare originates from a small fraction of the surface of LP 412-31, while the characteristic scale size of the flaring X-ray plasma is of the order of the stellar radius or larger. The absence of any small-scale variability in the light curve suggests a non-standard flare number energy distribution.

Accepted by A&A Letters

For preprints contact: stelzer@astropa.unipa.it

For preprints via ftp or WWW: `http://www.astropa.unipa.it/~stelzer/publications.html`

XEST Abstracts

The First High-resolution X-ray Spectrum of a Herbig Star: The Case of AB Aurigae

Alessandra Telleschi[1], Manuel Güdel[1], Kevin Briggs[1], Stephen L. Skinner[2], Marc Audard[3], and Elena Franciosini[4]

[1] Paul Scherrer Institut, Würenlingen and Villigen, CH-5232 Villigen PSI, Switzerland
[2] Center for Astrophysics and Space Astronomy, University of Colorado, Boulder, CO 80309-0389
[3] Columbia Astrophysics Laboratory, Mail code 5247, 550 West 120th Street, New York, NY 10027
[4] INAF - Osservatorio Astronomico di Palermo, Piazza del Parlamento 1, 90134 Palermo, Italy

The X-ray emission from Herbig Be/Ae stars has so far defied an unequivocal explanation. In later-type T Tauri stars, X-rays are thought to be produced by magnetically trapped coronal plasma, although accretion-shock induced X-rays have also been suggested. In earlier-type (OB) stars, shocks in unstable winds are thought to produce X-rays. We use X-ray spectroscopy data from the XMM-Newton Reflection Grating Spectrometers and the EPIC instruments. The spectra are interpreted using thermal, optically thin emission models with variable element abundances and a photoelectric absorption component. We interpret line flux ratios in He-like triplet of O VII as a function of electron density and the UV radiation field. We use the nearby co-eval classical T Tauri star SU Aur as a comparison. AB Aurigae reveals a soft X-ray spectrum, most plasma being concentrated at 1–6 MK. The He-like triplet reveals no signatures of increased densities as reported for some accreting T Tau stars in the previous literature. There are also no clear indications for strong abundance anomalies in the emitting plasma. The light curve displays modulated variability, with a period of $\approx$ 42 hr.It is unlikely that a nearby, undetected lower-mass companion is the source of the X-rays. Accretion shocks close to the star should be irradiated by the photosphere, leading to alteration in the He-like triplet fluxes of O VII, which we do not measure. Also, no indications for high densities are found, although the mass accretion rate is presently unknown. Emission from wind shocks is unlikely, given the weak radiation pressure. A possible explanation would be a solar-like magnetic corona. Magnetically confined winds provide a very promising alternative. The X-ray period is indeed close to periods previously measured in optical lines from the wind.

Accepted by A&A, to appear in a special section/issue dedicated to the XMM-Newton Extended Survey of the Taurus

Molecular Cloud (XEST)

For preprints contact: atellesc@astro.phys.ethz.ch

For preprints via ftp or WWW: http://www.issibern.ch/teams/Taurus/papers.html

High Resolution X-ray Spectroscopy of T Tauri Stars in the Taurus-Auriga Complex

Alessandra Telleschi[1], Manuel Güdel[1], Kevin R. Briggs[1], Marc Audard[2], and Luigi Scelsi[3]

[1] Paul Scherrer Institut, Würenlingen and Villigen, CH-5232 Villigen PSI, Switzerland
[2] Columbia Astrophysics Laboratory, Mail code 5247, 550 West 120th Street, New York, NY 10027
[3] Dipartimento di Scienze Fisiche ed Astronomiche, Sezione di Astronomia, Università di Palermo, Piazza del Parlamento 1, 90134 Palermo, Italy

Differences have been reported between the X-ray emission of accreting and non-accreting stars. Some observations have suggested that accretion shocks could be responsible for part of the X-ray emission in Classical T Tauri stars (CTTS). We present high-resolution X-ray spectroscopy of nine pre-main sequence stars in order to test the proposed spectroscopic differences between accreting and non-accreting pre-main sequence stars. We use X-ray spectroscopy from the *XMM-Newton* Reflection Grating Spectrometers and the EPIC instruments. We interpret the spectra using optically thin thermal models with variable abundances, together with an absorption column density. For BP Tau and AB Aur we derive electron densities from the O VII triplets. Using the O VII/O VIII count ratios as a diagnostic for cool plasma, we find that CTTS display a soft excess (with equivalent electron temperatures of $\approx 2.5-3$ MK) when compared with WTTS or zero-age main-sequence stars. Although the O VII triplet in BP Tau is consistent with a high electron density (3.4×10^{11} cm^{-3}), we find a low density for the accreting Herbig star AB Aur ($n_{\rm e} < 10^{10}$ cm^{-3}). The element abundances of accreting and non-accreting stars are similar. The Ne abundance is found to be high (4-6 times the Fe abundance) in all K and M-type stars. In contrast, for the three G-type stars (SU Aur, HD 283572, and HP Tau/G2), we find an enhanced Fe abundance (0.4-0.8 times solar photospheric values) compared to later-type stars. Adding the results from our sample to former high-resolution studies of T Tauri stars, we find a soft excess in all accreting stars, but in none of the non-accretors. On the other hand, high electron density and high Ne/Fe abundance ratios do not seem to be present in all accreting pre-main sequence stars.

To be published in A&A, to appear in a special section/issue dedicated to the XMM-Newton Extended Survey of the Taurus Molecular Cloud (XEST)

For preprints contact: atellesc@astro.phys.ethz.ch

For preprints via ftp or WWW: http://www.issibern.ch/teams/Taurus/papers.html

Upcoming Meeting

Call for Abstracts
IUGG 2007 General Assembly Session ASIV030
New Results From Solar and Heliospheric Missions
2 - 13 July 2007
Perugia, Italy

Web Page: http://www.iugg2007perugia.it

Continuous observations of the Sun obtained by ground- and space-based instrumentation have provided detailed information on the solar interior, atmosphere, extended corona and solar wind. These observations offer a unique capability to investigate the physical processes responsible for the dynamic nature of the Sun and the Solar Wind. The symposium invites contributions covering new results from observations from existing missions (e.g., SOHO, TRACE, RHESSI, Ulysses, ACE, Wind, Genesis, Cassini) and new missions (e.g., Solar B, STEREO); theory, and modeling of the different aspects of the Sun, including its interior, atmosphere and wind. This symposium is aimed at stimulating exchange and promoting discussion on the recent developments derived from the observations and the latest research in the field.

Convener: Mari Paz Miralles, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., MS-50, Cambridge, MA 02138, USA, tel: +1 617 496-7925, fax: +1 617 495-7455, mmiralles@cfa.harvad.edu

Co-convener: Michael L. Kaiser, NASA/GSFC/Code 695, Greenbelt, MD 20771, USA, tel: +1 301 286-5461, fax: +1 301 286-1433, Michael.Kaiser@nasa.gov

Co-convener: Takeo Kosugi, Institute of Space and Astronautical Science of the Japan Aerospace Exploration Agency (ISAS/JAXA), 3-1-1 Yoshinodai, Sagamihara, Kanagawa 229-8510, Japan tel: +81 42 759-8175, fax: +81 42 759-8526, kosugi@solar.isas.jaxa.jp

Co-convener: Jorge Sanchez Almeida, Instituto de Astrofisica de Canarias, E-38200 La Laguna, Tenerife, Spain, tel: +34 922 605-200, fax: +34 922 605-210, jos@iac.es

The Preliminary Program indicates that IAGA session ASIV030 will be held on July 2-3, 2007. Since this session covers a very broad range of topics, we would appreciate hearing from those interested in attending. Please send either a title and/or abstract to the convener, so that we can plan the sessions and invited contributions based on interest and anticipated attendance.

Important dates: Deadline for paper abstracts submission: 15 January 2007;
Deadline for electronic abstracts: 31 January 2007

For abstract submission, registration, and more information see http://www.iugg2007perugia.it/

Job Opening

Postdoctoral Research Position

Magnetic Activity and (Sub-)Stellar Atmospheres

Institute for Astrophysics

University of Göttingen (Germany)

The new Emmy Noether Research Group *"Magnetic Activity from Stars to Planets"* at the University of Göttingen, Institute for Astrophysics, invites applications for a postdoctoral position.
The successful candidate will be member of the new research group led by Dr. Ansgar Reiners, which will work on various aspects of magnetic activity with an emphasis on observations of late-type stars and brown dwarfs. The group offers access to first-rate research facilities, including the VLT, Keck observatory, HET, and collaboration with the Kepler project. Some experience in stellar magnetic activity, spectroscopy in stars and/or brown dwarfs, and variability analysis is desirable.

The appointment will be for an initial period of two years with a possible extension to 5 years. The positions include funds for publications, visitor support, and travel. The salary will be according to the German postdoctoral standards (BAT IIa/TV-L).
The Georg-August-Universität is an equal opportunity employer. Applications from women and disabled people are particularly welcome. The Georg-August-Universität supports its employees in their search for suitable child care institutions.

Candidates should send a curriculum vitae, a publication list, a description of research interests and plans. They should also arrange for at least two letters of recommendation to be sent by e-mail to areiners@astro.physik.uni-goettingen.de,

or directly to

Dr. Ansgar Reiners
Georg-August-Universität
Institut für Astrophysik
Friedrich-Hund-Platz 1
D-37077 Göttingen
Tel +49 551 3913825
Fax +49 551 395043
URL: http://www.astro.physik.uni-goettingen.de/˜areiners/science.htm

The deadline for all material is 15 December 2006.

Job Opening

Beatrice Watson Parrent Postdoctoral Fellow

Astrophysics

Institute for Astronomy

University of Hawaii

Closing Date: December 31, 2006

The Institute for Astronomy (IfA) at the University of Hawaii (UH) invites applications for the Beatrice Watson Parrent Postdoctoral Fellowship. We seek researchers displaying significant promise in any field of astrophysics, including observation, theory, and instrumentation. The term of the fellowship is for up to 3 years, starting around Fall 2007. The IfA has strong research groups in nearly all areas of astrophysics and has guaranteed access to the entire suite of observational facilities on the summits of Mauna Kea and Haleakala. More information is available at http://www.ifa.hawaii.edu. The Fellow will be provided an annual research budget of $15,000 and may apply for UH telescope time.

The candidate will undertake a program of independent research in astrophysics and participate in the academic and scientific life of the IfA. Applicants should have a Ph.D. in Astronomy or Physics, and outstanding promise as a researcher as demonstrated by research and letters of recommendation. (Ph.D. candidates may apply but must submit evidence of Ph.D. completion upon hire). The annual salary will be $52,800.

For information on how to apply for the position, please see http://www.ifa.hawaii.edu/position-vacancies/Parrent-26485.html.

Job Opening

Assistant Astronomer (Tenure-Track)

Institute for Astronomy

University of Hawaii

Closing Date: December 31, 2006

The Institute for Astronomy (IfA) at the University of Hawaii invites applications for a faculty position at the Assistant Astronomer (tenure-track) level. We seek applicants in any field of astrophysics, including observation, theory, and instrumentation. Applicants should have an outstanding research record, an ability to lead and support a research program involving students and postdocs, and an ability to teach effectively at the undergraduate and graduate levels. The IfA has strong research groups in nearly all areas of astrophysics and has guaranteed access to the entire suite of observational facilities on the summit of Mauna Kea and Haleakala. More information is available at http://www.ifa.hawaii.edu.

Duties include undertaking a program of independent research in astronomy, teaching an average of one graduate or undergraduate course per year, and participating in the academic and scientific life of the IFA. Applicants should have a Ph.D. in Astronomy or Physics and successful experience as a researcher as demonstrated by publications and letters of recommendation. Prior teaching experience and at least two years of post-doctoral research are desirable but not essential. Salary will be commensurate with qualifications and experience.

For information on how to apply for the position, please see http://www.ifa.hawaii.edu/position-vacancies/AssistAstron-061231.html

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 monthly call for abstracts will be issued and abstracts received by the last day of the month will usually appear in the following month's newsletter. 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.***