COOLNEWS

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Stellar Abstracts

Accurate Masses of Very Low Mass Stars: II. The Very Low Mass Triple System Gl 866

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We present very accurate orbital parameters and mass measurements (2.4% accuracy) for the well known very low mass triple system Gl 866. We obtain first orbital elements for the short-period orbit and greatly improve the long period orbit. All three stars have masses close to 0.1 $M_\odot$, and the system thus provides the strongest constraints to date on the mass-luminosity relation close to the brown dwarf limit.

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Spectroscopic Abundances in Cool Pleiades Dwarfs and NGC 2264 Stars

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We derive parameters and abundances of several elements in 2 cool Pleiades dwarfs, 4 cool NGC 2264 pre-main-sequence stars, and a probable NGC 2264 non-member from high resolution, moderate S/N Keck/HIRES spectra. Our

Pleiades Fe abundance agrees with previous spectroscopic and photometric values of hotter stars, and does not resolve the 0.3 mag distance modulus discrepancy between main-sequence fitting and *Hipparcos* parallaxes. Abundances of Cr/Ca/Ti/Al are subsolar, mimicing the pattern of ISM abundances. While modest temperature errors may contribute, the results (particularly for Al) could suggest an association with ionization potential; such effects might be related to the Pleiades Li scatter. The cluster Fe scatter and its relation to Li scatter is discussed. Three NGC 2264 members suggest [Fe/H]$= -0.15$ and near-solar ratios of other elements. Mildly supersolar abundances for another object support its probable non-membership. A fourth member exhibits a Mg/Si/Fe/Ni and Cr/Ti/Ca/Al dichotomy opposite to the Pleiads'; a relation to ionization potential is again suggested. A 0.15-0.20 dex scatter or steep decline, neither well accommodated by stellar models, in the NGC 2264 Li abundances with $T_{\rm eff}$ is indicated. We note the surprising presence of the λ7774 O I triplet in our Pleaids, one of the cool NGC 2264 stars, and the K6 field dwarf GL 241. The inferred LTE O abundances are enhanced by 0.23-0.85 dex over solar, suggesting that even NLTE calculations of the O I triplet are incomplete and perhaps implicating the influence of an overlying chromosphere. Our results demonstrate the utility of cluster abundances besides Fe and Li in addressing fundamental issuses concerning stellar evolution and systematic errors in the analysis of cool young stars.

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HST/STIS Echelle Spectra of the dM1e Star AU Microscopii Outside of Flares

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We report on observations of the dM1e flare star AU Microscopii obtained with the Space Telescope Imaging Spectrograph (STIS) on 1998 Sept 6. A total of 10,105 seconds of observations were obtained with the medium resolution E140M grating. We report here on the 9,200 seconds of "quiescent" data when the star did not obviously flare. In this data set we identify 142 emission lines from 28 species including low temperature chromospheric lines (e.g., C I, O I), transition region lines (e.g., C II–IV, N IV, O III-V, Si II-IV), and the coronal line Fe XXI 1354 Å. There are a number of intersystem lines that are useful for measuring electron densities. We discuss line redshifts and the broad wings of transition region lines that provide evidence of microflare heating. We derive the emission measure distribution and compare it with the solar one. We also discuss the shape and formation mechanisms of the He II 1640 Å lines. The analysis of the flare data and of the interstellar absorption features seen in the H I, D I, C II, and O I resonance lines will be published in two companion papers.

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The Active Binary Star II Peg with *Beppo*SAX

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II Peg is an ideal target to study stellar activity and flares, since intense and long lasting flares have been frequently detected from this system at all wavelengths. We report here about a *Beppo*SAX observation of II Peg. We followed the system for $\sim$ 19 hours on December 5 and 6 1997 with *Beppo*SAX and the X-ray light curve resembles the typical behavior of a decay phase of a long-lasting flare. The spectral analysis shows that the II Peg X-ray spectrum is described by a two–temperature components, with the two dominant temperatures centered in the range of 9–11 and 24–26 MK. The derived coronal metal abundance is low ($Z \sim 0.2 Z_{\odot}$) compared to recent determinations of the photospheric abundance ($Z \sim 0.6 Z_{\odot}$). Some possible explanations for this phenomenology are reviewed. As for most other stellar coronal sources observed with *Beppo*SAX, we find that in order to fit the *Beppo*SAX spectra an interstellar

column density about a factor ten higher than previously determined is required.

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Fundamental Parameters of Nearby Stars from the Comparison with Evolutionary Calculations: Masses, Radii and Effective Temperatures

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The *Hipparcos* mission has made it possible to constrain the positions of nearby field stars in the colour-magnitude diagram with very high accuracy. These positions can be compared with the predictions of stellar evolutionary calculations to provide information on the basic parameters of the stars: masses, radii, effective temperatures, ages, and chemical composition. The degeneracy between mass, age, and metallicity is not so large as to prevent a reliable estimate of masses, radii and effective temperatures, at least for stars of solar metallicity. The evolutionary models of Bertelli et al. (1994) predict those parameters finely, and furthermore, the applied transformation from the theoretical ($\log g-$ $T_{\rm eff}$) to the observational (M_v–B–V) plane is precise enough to derive radii with an uncertainty of $\sim$ 6%, masses within 8%, and $T_{\rm eff}$s within $\sim$ 2% for a certain range of the stellar parameters. This is demonstrated by means of comparison with the measurements in eclipsing binaries and the InfraRed Flux Method.

The application of the interpolation procedure in the theoretical isochrones to the stars within 100 pc from the Sun observed with *Hipparcos* provides estimates for 17,219 stars.

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The Discovery of a Companion to the Very Cool Dwarf Gl 569 B with the Keck Adaptive Optics Facility

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We report observations obtained with the Keck adaptive optics facility of the nearby (d=9.8 pc) binary Gl 569. The system was known to be composed of a cool primary (dM2) and a very cool secondary (dM8.5) with a separation of 5" (49 Astronomical Units). We have found that Gl 569 B is itself double with a separation of only 0".101±0".002 (1 Astronomical Unit). This detection demonstrates the superb spatial resolution that can be achieved with adaptive optics at Keck. The difference in brightness between Gl 569 B and the companion is ∼0.5 magnitudes in the J, H and K' bands. Thus, both objects have similarly red colors and very likely constitute a very low-mass binary system. For reasonable assumptions about the age (0.12 Gyr–1.0 Gyr) and total mass of the system (0.09 $M_\odot$–0.15 $M_\odot$), we estimate that the orbital period is ∼3 years. Follow-up observations will allow us to obtain an astrometric orbit solution and will yield direct dynamical masses that can constrain evolutionary models of very low-mass stars and brown dwarfs.

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The Multiple System LHS 1070: A Case Study for the Onset of Dust Formation in the Atmospheres of Very Low Mass Stars

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LHS 1070 (other common name: GJ 2005) is a nearby multiple system consisting of very low mass red dwarfs. We present the results of WFPC2 photometry and FOS spectroscopy for the three optically resolved components of this system acquired during HST cycle 5. These show (1) absolute brightnesses corresponding to theoretical masses of 0.080–0.083 $M_\odot$ and 0.079–0.080 $M_\odot$ for the faint pair, depending mainly on their age and metallicity; (2) a saturation of the optical TiO and VO absorption bands typical of the onset of photospheric dust formation, and (3) emission lines typical of moderate chromospheric activity in only the two most massive components. Li I lines are not seen. But also all other lines of the alkali elements are remakably weak or even absent in the two faint companions B and C. This appears to be an effect of dust formation. Comparison of the observations with model spectra, which account for dust formation and for the resulting opacities, yields good agreement for solar metallicity and effective temperatures and gravities (in log cm/s^2) of 2950 K;5.3, 2400 K;5.5 and 2300 K;5.5 for the three components A,B and C, respectively. The existence of a fourth component, recently discovered in this system by HST Fine Guidance Sensor observations (Henry et al. (1999), has already been taken into account in the evaluation of the data for the main component. An effective temperature and gravity (in log cm/s^2) for the fourth component of 2500 K;5.3 would best be compatible with our data. Then, based on our analysis the three components C, B and D of LHS 1070, in this order, are the faintest stars within 20 pc of the Sun for which dynamical determinations of mass appear possible within a decade. The system LHS 1070 thus has the potential to be the most important source of information for probing the low mass end of the main sequence.

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The *SOHO*–Stellar Connection

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The "solar-stellar connection" bridges the daytime and nighttime communities; an essential link between the singular, but detailed, views of our Sun, and the broad, but coarse, glimpses of the distant stars. One area in particular—magnetic activity—has profited greatly from the two way traffic in ideas. In that spirit, I present an evolutionary context for coronal activity, focussing on the very different circumstances of low mass main sequence stars like the Sun, compared with more massive stars. The former are active mainly very early in their lives, whereas the latter become coronal only near the end of theirs, during the brief incursion into the cool half of the Hertzsprung-Russell diagram as yellow, then red, giants. I describe tools at the disposal of the stellar astronomer; especially spectroscopy in the ultraviolet and X-ray bands where coronae leave their most obvious imprints. I compare *HST* STIS spectra of solar-type dwarfs—ζ Dor (F7 V), an active coronal source, and α Cen A (G2 V), near twin of the Sun—to the *SOHO* SUMER UV solar atlas. I also compare the STIS line profiles of the active coronal dwarf to the corresponding features in the mixed activity "hybrid chromosphere" bright giant α TrA (K2 II) and the archetype "noncoronal" red giant Arcturus (α Boo; K2 III). The latter shows dramatic evidence for a "cool absorber" in its outer atmosphere that is extinguishing the "hot lines" (like Si IV λ1393 and N V λ1238) below about 1500 Å; the corona of the red giant seems to lie *beneath* its extended chromosphere, rather than *outside* as in the Sun. I present an early taste of the moderate resolution spectra we can expect from the recently launched *Chandra* X-ray Observatory (CXO), and contemporaneous STIS high resolution UV measurements of the CXO calibration star Capella (α Aur; G8 III + G1 III). Last, I describe preliminary results from a May 1999 observing campaign involving *SOHO* SUMER, *TRACE,* and the Kitt Peak Infrared Imaging Spectrometer (IRIS). The purpose was to explore the dynamics of the quiet solar

atmosphere through the key "magnetic transition zone" that separates the kinetically dominated deep photosphere from the magnetically dominated coronal regime. Linking spatially and temporally resolved solar phenomena to properties of the averaged lineshapes (widths, asymmetries, intensity ratios, and Doppler shifts) is a crucial step in carrying physical insights from the solar setting to the realm of the distant stars.

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Accretion-Induced Lithium Line Enhancements in Classical T Tauri Stars: RW Aur

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It is widely accepted that much of the stochastic variability of T Tauri stars is due to accretion by a circumstellar disk. The emission line spectrum as well as the excess continuum emission are common probes of this process. In this communication, we present additional probes of the circumstellar environment in the form of resonance lines of low ionization potential elements. Using a set of 14 high resolution echelle observations of the classical T Tauri star (CTTS), RW Aur, taken between 1986 and 1996, we carefully measure the continuum veiling at each epoch by comparing more than 500 absorption lines with those of an appropriate template. This allows us to accurately subtract out the continuum emission and to recover the underlying photospheric spectrum. In doing so, we find that selected photospheric lines are enhanced by the accretion process, namely the resonance lines of LiI and KI. A resonance line of TiI and a low excitation potential line of CaI also show weak enhancements. Simple slab models and computed line bisectors lead us to propose that these line enhancements are markers of cool gas at the beginning of the accretion flow which provides an additional source of line opacity. These results suggest that published values of surface lithium abundances of classical T Tauri stars are likely to be overestimated. This would account for the various reports of surface lithium abundances in excess of meteoritic values among the extreme CTTS. Computing LTE lithium abundances of RW Aur in a low and then high accretion state yields abundances which vary by one order of magnitude. The low accretion state lithium abundance is consistent with theoretical predictions for a star of this age and mass while the high accretion state spectrum yields a super-meteoritic lithium abundance.

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Solar Abstracts

Polar Plumes and Inter-plume Regions as Observed by SUMER on SOHO

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We present observations of O VI 1032 Å line profiles obtained with the SUMER instrument on SOHO extending from the solar disk to 1.5 $R_\odot$ above the limb in the north polar coronal hole. Variations of the intensity and line width in the polar plume and inter-plume regions are investigated. We find an anti-correlation between the intensity and the line width in the plume and inter-plume regions with detailed plume structures been seen out to 1.5 $R_\odot$. Possible implications regarding the magnetic topologies of these two regions and related heating mechanisms are discussed. The O VI line width measurements are combined with UVCS output to provide an overview of its variations with height extending up to 3.5 $R_\odot$. We find a linear increase of the line width from 1 to 1.2 $R_\odot$, then a plateau followed by a sharp increase around 1.5 $R_\odot$.

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SECIS: The Solar Eclipse Coronal Imaging System

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The Solar Eclipse Coronal Imaging System (SECIS) is an instrument designed to search for short-period modulations in the solar corona seen either during a total eclipse or with a coronagraph. The CCD cameras used in SECIS have the capability of imaging the corona at a rate of up to 70 frames a second, with the intensities in each pixel digitised in 12-bit levels. The data are captured and stored on a modified PC. With suitable optics it is thus possible to search for fast changes or short-period wave motions in the corona that will have important implications for the coronal heating mechanism. The equipment has been successfully tested using the Evans Solar Facility coronagraph at National Solar Observatory/Sacramento Peak and during the August 11, 1999 eclipse at a site in north-eastern Bulgaria. The instrument is described and preliminary results are outlined.

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TRACE-derived Temperature and Emission Measure Profiles Along Long-lived Coronal Loops: The Role of Filamentation

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In a recent letter (ApJ 517, L155) Lenz et al. have shown the evidence of uniform temperature along steady long coronal loops observed by TRACE in two different passbands (171 Å and 195 Å filters). We propose that such an evidence can be explained by the sub-arcsecond structuring of the loops across the magnetic field lines. In this perspective, we present a model of a bundle of six thin parallel hydrostatic filaments with temperature stratification dictated by detailed energy balance and with temperatures at their apex ranging between 0.8 and 5 MK. If analyzed as a single loop, the bundle would appear isothermal along most of its length.

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Quadrupole Moment of the Sun. Gravitational and Rotational Potentials

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The solar quadrupole moment J_2 was computed taking into account an up-to-date solar model of mass and density, combined with a recent rotational model established from the helioseismic data, and including the effects of differential rotation with depth. To determine precisely the theoretical value of J_2 of the Sun, we integrated the extended differential equation governing the fluids in hydrostatic equilibrium, and the Poisson equation for the gravitational potential. From this analysis, we deduced the profiles of J_2, as a function of the radius and of the latitude, from the core to the surface. This study has given information on the distortion of the total potential which accounts for the gravitational and rotational potentials.

As a result of our analysis, we found $J_2 = 1.60.10^{-7}$ which respects the upper bound $J_{2\,\mathrm{max}} = 3.0.10^{-6}$ derived from the best knowledge of the Moon's physical librations. Finally, we linked the profiles of J_2 within the Sun to the solar interior structure mainly governed by the shear in the tachocline and just below the surface.

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Fast Solar Wind Acceleration by Alfvén Waves: Observable Effects on the EUV Lines Detected by SOHO/UVCS

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SOHO/UVCS observations of the most intense EUV spectral lines emitted by the solar corona have been providing us a good opportunity to study in detail the acceleration regions of the solar wind. In this work we aim at deriving useful diagnostics and identifying possible signatures of Alfvén waves momentum deposition. More specifically we investigate, with the help of a detailed wind model (Orlando et al. 1996), the insight and the constraints that these observations give on the presence of Alfvén waves, as deduced from the influence of the waves on the solar wind structure and dynamics.

The model developed by Orlando et al. (1996) accounts for the momentum deposition by a spectrum of non-WKB Alfvén waves, generated in the Sun's lower atmosphere and undergoing significant reflection across the transition region. We compute a set of wind solutions characterized by different physical conditions, synthesize, from them, the emission in the Lyα, Lyβ and O VI doublet (1032 Å, 1038 Å) lines and derive possible diagnostics. We finally compare our results with the most recent SOHO/UVCS data.

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Effects of Reconnection on the Coronal Mass Ejection Process

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This work investigates how magnetic reconnection affects the acceleration of coronal mass ejections (CMEs) and how the acceleration in turn affects the reconnection process. To model the CME process, we use a two-dimensional flux rope model, which drives the ejection by means of a catastrophic loss of mechanical equilibrium. Our model provides a method for relating the motion of the ejected material to the reconnection rate in the current sheet created by the erupting field. In the complete absence of reconnection the tension force associated with the current sheet is always strong enough to prevent the flux rope from escaping from the Sun. However, our results imply that even a fairly small reconnection rate is sufficient to allow the flux rope to escape. Specifically, for a coronal density model that decreases exponentially with height we find that average Alfvén Mach number M_{A} for the inflow into the reconnection site can be as small as $M_{\mathrm{A}} = 0.005$ and still be fast enough to give a plausible eruption. The best fit to observations is obtained by assuming an inflow rate on the order of $M_{\mathrm{A}} \approx 0.1$. With this value the energy output matches the temporal behavior inferred for the long duration events often associated with CMEs. The model also suggests an explanation for the peculiar motion of giant X-ray arches reported by Svestka et al. (1995, 1997). X-ray arches are the large loops associated with CMEs which are similar in form to "post"-flare loops, but they have an upward motion that is often different. Instead of continually slowing with time, the arches move upward at a rate that remains nearly constant or may even increase with time. Here we show how the difference can be explained by reversal of the gradient of the coronal Alfvén speed with height.

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Planet Detections

Detection of Planetary Transits Across a Sun-like Star

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We report high precision, high cadence photometric measurements of the star HD 209458, which is known from radial velocity measurements to have a planetary mass companion in a close orbit. We detect two separate transit events at times that are consistent with the radial velocity measurements. In both cases, the detailed shape of the transit curve due to both the limb darkening of the star and the finite size of the planet is clearly evident. Assuming stellar parameters of 1.1 $R_{\rm Sun}$ and 1.1 $M_{\rm Sun}$, we find that the data are best interpreted as a gas giant with a radius of 1.27 ± 0.02 $R_{\rm Jup}$ in an orbit with an inclination of $87.1 \pm 0.2°$. We present values for the planetary surface gravity, escape velocity, and average density, and discuss the numerous observations that are warranted now that a planet is known to transit the disk of its parent star.

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Ph.D. Thesis Abstract

Extreme Ultraviolet Spectroscopy of the Solar Corona

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Ph.D degree awarded: November 1999

New Extreme Ultra-Violet (EUV) observations of the solar corona, obtained by the Coronal Diagnostic Spectrometer (CDS) instrument on board the NASA/ESA Solar and Heliospheric Observatory (SOHO) are presented. The CDS instrument for the first time has provided the opportunity of observing a large number of emission lines from a wide range of ions of different elements. The spectral and spatial resolution of the CDS instrument has allowed the simultaneous application of a wide range of spectroscopic diagnostic techniques to determine the temperature distribution, densities and elemental abundances in the solar plasma. A differential emission measure (DEM) diagnostic technique has been used to infer the temperature structure and the element abundances. The importance of including DEM effects in the element abundance analysis is demonstrated. A complete in-flight cross-calibration between all the CDS detectors (NIS and GIS, 150-785 Å), is presented here for the first time. The level of accuracy and completeness of the CHIANTI atomic database, used throughout this thesis, has allowed the identification of the many hundreds of spectral lines observed in the CDS spectra, resulting in several new line identifications. An assessment of the GIS solar spectra is presented, showing that, in spite of complexities, GIS spectra are useful for diagnostic analyses. Many discrepancies (in particular with the Li-like ions) between theory and CDS observations are highlighted. It is shown that some of these may be explained by inaccurate ionization equilibrium calculations. Coronal hole densities, temperatures, $DEMs$, and relative element abundances from both off-limb (plume and inter-plume regions) and on-disc observations are derived and compared with quiet sun values. These included (August 1996) a large equatorial hole, the Elephant's Trunk, probably the best example of a coronal hole observed by SOHO. Coronal hole densities in both coronal ($N_e \simeq 1\text{x}10^8$ cm^{-3}) and transition region ($N_e \simeq 1\text{x}10^{10}$ cm^{-3}) plasma were found to be about a factor of 2 lower than in the quiet sun, with much lower emission measures at temperatures above 10^6 K. Moreover, in the transition region, the cell-centres in both coronal holes and quiet sun regions show consistently higher densities (factor of 2) compared to those in the network. Relative element abundances show approximately photospheric values for the coronal holes, with an indication of element abundance variation (neon in particular) with the supergranular structure. On-disc EUV observations of coronal hole plumes have been performed. This allowed a spectroscopic characterisation of plumes to be obtained for the first time, leading to the first identification of a low-latitude plume near sun-centre. Plumes are shown to be quasi-isothermal structures, with temperatures $T \simeq 7 - 8\text{x}10^5$ K. Abundance analyses (using transition region lines) reveal a small FIP effect in these plumes, together with a decreased Ne/O abundance ratio (compared to photospheric).

Thesis-related Publications: Sol. Phys., 170, 143; JGR, 104, 9753; JGR, 104, 9691; JGR, 104, 9709; A&ASS, 135, 171; Space Sci. Rev., 87, 169; Space Sci. Rev., 87, 185

PRELIMINARY ANNOUNCEMENT

Upcoming Meeting

Substellar Astrophysics in the 21st Century

20 - 22 January 2000
Sequoia Village Inn
Sequoia National Park, Ca

Dear Colleagues:

The prospects for the development of Substellar Astrophysics are very good with existing and planned observational facilities, and the realization that brown dwarfs and exoplanets are quite ubiquitous. In scenic Sequoia National Park (California) we will discuss current topics of substellar astrophysics. The format of the meeting will be informal, with plenty of time for discussion. There will be no proceedings. We will also have time for day-time activities, such as hiking, X-country skiing, horse riding, art and nature sightseeing.

Senior researchers expected to participate include Gibor Basri (Berkeley), Isabelle Baraffe (Lyon), Gilles Chabrier (Lyon) and Eduardo Martin (Caltech). More details about the program will be given in a later Announcement. The preliminary dates of the meeting are Jan 14 through Jan 17, 2000 (3 nights). The location is the Sequoia Village Inn. For more information, see

http://www.sequoiapark.com/seq-vil.htm .

If you are interested in participating, please fill in the form attached below and send it by email to ege@gps.caltech.edu. Hurry because space is very limited!

=========== Detach here and send before Dec 10 ===========================

Name:
Institution:
Position (faculty, postdoc, student):
e-mail:
Research interests:
Are you coming alone?:
Do you need transportation to the site?:
Do you have any particular food/acommodation needs?:
Are you interested in coming for the whole duration of the workshop?:

JOB OPENING

Postdoctoral Research Fellowship in Stellar Astrophysics

Uppsala Astronomical Observatory
Uppsala, Sweden

A post-doctoral research fellowship in stellar astrophysics is available at the Uppsala Astronomical Observatory, the Department of Astronomy, at Uppsala University, Sweden. The position is for 2 years with a starting date during 2000, contingent upon availability of funding. The successful candidate should have a PhD in astronomy or a related field, and should additionally have a strong research record in stellar physics, good communication skills and ability to interact constructively with the other research staff. Any field of observational and theoretical stellar physics will be considered for the position, although preference may be given to applicants with an overlap with current or planned research activities of the stellar astrophysics group of the department.

At Uppsala Astronomical Observatory, observational, numerical, theoretical, and instrumention work is carried out. The fields of research include stellar atmospheres, radiative transfer, atomic physics, astrophysical hydrodynamics, stellar surface structures, late-type stars, T-Tauri stars, AGB-stars, circumstellar envelopes, the solar system, galactic chemical evolution, galactic structure and dynamics, galaxies, and active galactic nuclei. The scientific staff currently consists of 4 professors, 7 associate professors, 3 research associates, 2 postdoctoral fellows, 18 PhD students and several short and long-term visitors. More than half of the staff belongs to the stellar astrophysics group. Sweden has access to all ESO telescopes, incl. VLT, the NOT and the Swedish Solar Vacuum Telescope on La Palma, and the various ESA projects, incl. HST. Computing facilities are very good both at the institutional and national levels. Uppsala is located about 80 km north of the capital Stockholm, and has a population of about 200 000 with a strong academic presence.

Applications should consist of Curriculum Vitae, list of publications, three letters of recommendation and a description of current and planned research program. Women are particularly encouraged to apply. The application should be received not later than Jan. 10, 2000, at the above address. For further information, please contact

Director K. Eriksson (e-mail: ke@astro.uu.se)
Prof. N. Piskunov (e-mail: piskunov@astro.uu.se), or
Prof. B. Gustafsson (e-mail: bg@astro.uu.se).

Uppsala Astronomical Observatory
Box 515
SE-751 20 Uppsala,
Sweden

URL: http://www.astro.uu.se

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), brown dwarfs, 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` .