COOLNEWS

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Fe XIII Coronal Line Emission in Cool M Dwarfs

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We report on a search for the Fe XIII forbidden coronal line at 3388.1 Å in a sample of 15 M-type dwarf stars covering the whole spectral class as well as different levels of activity. A clear detection was achieved for LHS 2076 during a major flare and for CN Leo, where the line had been discovered before. For some other stars the situation is not quite clear. For CN Leo we investigated the timing behaviour of the Fe XIII line and report a high level of variability on a timescale of hours which we ascribe to microflare heating.

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Doppler Imaging of Stellar Surface Structure - XXII. Time-series Mapping of the Young Rapid Rotator LQ Hydrae

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We reconstruct a time series of 28 surface temperature maps (Doppler-images) of the spotted single K2-dwarf LQ Hya from 35 consecutive stellar rotations in Nov.-Dec. 1996. Two more maps are obtained from data in late April and early May 2000. All maps show spot activity preferably at low latitudes between $-20°$ and $+50°$, with a concentration in a band centered at around $+30°$, and with only occasional evidence for a higher-latitude spot extension. No trace of a polar spot is found at any of the above epochs. Most of this morphology can be reproduced by our flux-tube emergence model, except for the equatorial activity where the strong Coriolis force due to the rapid rotation always deflects flux tubes to higher latitudes. We also present the detection of weak differential surface rotation from a number of cross-correlation maps of the time-series images in late 1996. A solar-type differential rotation law, i.e. the equator rotating faster than the poles, with $\Delta\Omega$=+0.022 (lap time of ≈280 days) is in agreement with the data. Using the available photoelectric observations from 21 years we refine the rotation period to 1.60066±0.00013 days and find a remarkable phase coherence over the course of 21 years, supporting the recent finding of active longitudes by Berdyugina et al.. Furthermore, our photometry shows a complex multi-cyclic long-term brightness variability with three periods of 13.8±2.8 years, its harmonic 6.9±0.8 and 3.7±0.3 years, respectively. The 3.7-year period would be in good agreement with the fundamental-mode oscillation period predicted by Kitchatinov et al. from a distributed-dynamo model, but remains yet to be confirmed.

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Distribution of Magnetically Confined Circumstellar Matter in Oblique Rotators

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We consider the mechanical equilibrium and stability of matter trapped in the magnetosphere of a rapidly rotating star. Assuming a dipolar magnetic field and arbitrary inclination of the magnetic axis with respect to the axis of rotation we find stable equilibrium positions a) in a (warped) disk roughly aligned with the magnetic equatorial plane and b) at two locations above and below the disk, whose distance from the star increases with decreasing inclination angle between dipole and rotation axis. The distribution of matter is not strongly affected by allowing for a spatial offset of the magnetic dipole. These results provide a possible explanation for some observations of corotating localized mass concentrations in hot magnetic stars.

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Chromospherically Active Stars. XXII. HD 18955, A Massive K Dwarf Binary

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HD 18955 is a double-lined spectroscopic binary with a period of 43.3214 days and a high eccentricity of 0.761. The spectral types of the components are K0 V and K2–3 V. The secondary is a typical early-K dwarf although its minimum mass is greater than canonical values. However, this larger mass is consistent with other early-K dwarf, spectroscopic binary results. The primary is anomalous, being substantially under luminous for its radius and mass, which are equal to or slightly greater than solar values. A lack of lithium argues that the components are not pre-main-sequence stars. The large minimum masses of both components suggest that the system has a high orbital inclination. Our photometric observations around the times of conjunction show no evidence of eclipses, but, considering the uncertainties in the ephemerides, there is only a 50% chance that our photometric observations should have detected the primary eclipse and almost no chance that we covered the secondary eclipse. Hence, eclipses remain a real possibility in this system. Photometric variations with an amplitude of 0.02 mag reveal a period of 7.55 days, which is assumed to be the primary star's rotation period. Thus, given the spectral types of the stars, this system is a BY Draconis type variable. With $v \sin i$ values of 5 km s^{-1} for both components, the two stars are rotating more rapidly than typical K dwarf field stars, but the observed rotation period is still substantially longer than the predicted pseudosynchronous rotation period of 4.6 days for the primary.

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Parameter Properties and Stellar Population of the Old Open Cluster NGC 3960

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We present a *BVI* photometric and astrometric catalogue of the open cluster NGC 3960, down to limiting magnitude $V \sim 22$, obtained from observations taken with the Wide Field Imager camera at the MPG/ESO 2.2 m Telescope at La Silla. The photometry of all the stars detected in our field of view has been used to estimate a map of the strong differential reddening affecting this area. Our results indicate that, within the region where the cluster dominates, the $E(V-I)$ values range from 0.21 up to 0.78, with $E(V-I) = 0.36$ ($E(B-V) = 0.29$) at the nominal cluster centroid position; color excesses $E(V-I)$ up to 1 mag have been measured in the external regions of the field of view where field stars dominate. The reddening corrected color-magnitude diagram (CMD) allows us to conclude that the cluster has an age between 0.9 and 1.4 Gyr and a distance modulus of $(V - M_V)_0 = 11.35$.

In order to minimize field star contamination, their number has been statistically subtracted based on the surface density map. The empirical cluster main sequence has been recovered in the V vs. $V-I$ and in the J vs. $J-K_S$ planes, using optical and infrared data, respectively. From these empirical cluster main sequences, two samples of candidate cluster members were derived in order to obtain the luminosity distributions as a function of the V and J magnitudes. The Luminosity Functions have been transformed into the corresponding Mass Functions; for $M > 1\ M_\odot$, the two distributions have been fitted with a power law of index $\alpha_V = 2.95 \pm 0.53$ and $\alpha_J = 2.81 \pm 0.84$ in V and in J, respectively, while the Salpeter Mass Function in this notation has index $\alpha = 2.35$.

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On the Galactic Chemical Evolution of Sulfur

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Sulfur abundances have been determined for ten stars to resolve a debate in the literature on the Galactic chemical evolution of sulfur in the halo phase of the Milky Way. Our analysis is based on observations of the S I lines at 9212.9, 9228.1, and 9237.5 Å for stars for which the S abundance was obtained previously from much weaker S I lines at 8694.0 and 8694.6 Å. In contrast to the previous results showing [S/Fe] to rise steadily with decreasing [Fe/H], our results show that [S/Fe] is approximately constant for metal-poor stars ([Fe/H]$\lesssim$−1) at [S/Fe] $\simeq +0.3$. Thus, sulfur behaves in a similar way to the other α elements, with an approximately constant [S/Fe] for metallicities lower than [Fe/H] $\simeq -1$. We suggest that the reason for the earlier claims of a rise of [S/Fe] is partly due to the use of the weak S I 8694.0 and 8694.6 Å lines and partly uncertainties in the determination of the metallicity when using Fe I lines. The S I 9212.9, 9228.1, and 9237.5 Å lines are preferred for an abundance analysis of sulfur for metal-poor stars.

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Simulating Stochastically Excited Oscillations. The Mode Lifetime of xi Hya.

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The discovery of solar-like oscillations in the giant star xi Hya (G7III) was reported by Frandsen et al. (2002). Their frequency analysis was very limited due to alias problems in the data set (caused by single-site observations). The extent to which the aliasing affected their analysis was unclear due to the unknown damping time of the stellar oscillation modes. In this paper we describe a simulator created to generate time series of stochastically excited oscillations, which takes as input an arbitrary window function and includes both white and non-white noise. We also outline a new method to compare a large number of simulated time series with an observed time series to determine the damping time, amplitude, and limited information on the degree of the stochastically excited modes. For xi Hya we find the most likely amplitude to be 2 m/s, in good agreement with theory (Houdek & Gough, 2002), and the most likely damping time to be 2 days, which is much shorter than the theoretical value of 15-20 days calculated by Houdek & Gough (2002).

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Membership, Rotation, and Lithium Abundances in the Open Clusters NGC 2451 A and B

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High resolution spectra of 30 late-type and 9 early-type candidate members of the young ($\sim$ 50–80 Myr open clusters NGC 2451 A and B have been analyzed in order to complement our previous photometric and X-ray study. Cluster membership of these X-ray selected stars has been confirmed or rejected on the basis of radial velocity and Hα chromospheric emission. The metallicity of both clusters seems to be about solar – contrary to previous investigations. Lithium abundances have been determined by two different methods, namely curve-of-growth techniques and spectrum synthesis, yielding quite consistent results. The pattern of Li abundances versus effective temperature resembles that of the equally-old Alpha Per cluster, i.e., little Li depletion is seen for solar–type and earlier–type stars, while towards cooler stars Li is more and more depleted, possibly showing a star-to-star scatter below $\sim$ 5200 K. The hottest star in our sample shows a Li abundance $\sim$ 0.5 dex higher than the meteoritic value. Rotational velocities have been determined in order to investigate the supposed dependence of activity and Li depletion on rotation.

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Category: stellar

Chemical abundance analysis of Kapteyn's Star

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We report spectral chemical abundances for twelve elements in Kapteyn's Star (HD 33793), a subdwarf M star. We use stellar temperature and gravity parameters derived using the recent interferometric measurement of its radius. We find [Fe/H] $= -1.13 \pm 0.01$, [Ti/H] $= -0.90 \pm 0.03$, and a weighted mean metallicity [M/H] $= -0.98 \pm 0.10$, where the uncertainties in temperature, gravity, and microturbulence are included in the latter. This value falls about midway between the metallicity found in the only previous high resolution analysis, [M/H] $= -0.55 \pm 0.15$, and the value derived from low resolution spectra of TiO and CaH features, [M/H] $= -1.5 \pm 0.5$. It is essentially identical to that found using low resolution infrared spectra of water lines, [M/H] $= -1.0 \pm 0.3$. This abundance determination for a nearby subdwarf M star using well-determined stellar parameters and a spectrum with a high signal to noise ratio will provide an anchor point for abundance studies of similar stars where the situation is not so favourable.

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Butterfly Diagram for Starspots on LQ Hya

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Information on the latitude distribution of starspots and changes in this distribution from year to year is very important for our understanding of the nature of stellar activity and for developing dynamo theory. The concept of buttefly diagrams is introduced for highly spotted stars of late spectral types, by analogy to the Maunder diagrams for the Sun. Our approach is based on the zonal spottedness models constucted by Alekseev and Gershberg. A detailed analysis is given for the single star LQ Hya, and a comparison is made to similar analysis for several stars with two well-separated spot belts - EK Dra, VY Ari, V775 Her, and V833 Tau. The lower boundary of the butterfly diagram drifts toward the equator during the activity rise phase, i.e. during years when the relative spotted area increases. This effect is clearly expressed for LQ Hya and other stars whose orientation enables observation of both hemispheres and virtually unchanged for all the considered spotted stars except V775 Her, for which it moves toward the pole. The drift rate of the lower boundary is -1 to -2 deg/yr, a factor of two or three smaller in magnitude than the corresponding solar value. Our analysis provides an independent confirmation of the occurence of high-latitude spots on stars that are younger than the Sun and whose activity is high but less regular than the solar activity; it also enables the identification of the starting times of stellar cycles.

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Butterfly Diagrams of Strongly Spotted Late Type Stars

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At the present, long-term (over 30 years) multicolour photometric observations give the possibility to determine general properties of spotted areas on late-type stars. Starspot modelling from broadband photometric data had been carried out by Alekseev and Gershberg since 1996 under the assumption that spots are situated in two latitudinal zones. Here we propose a new analysis of their results for several G and K dwarf stars with high irregular activity. On these stars, EK Dra, VY Ari, V775 Her and V833 Tau, two spot belts exist separately and do not merge into a single equatorial active region, as it occurs on cooler red-dwarf stars. The zonal spottedness models allow us to fit simultaneously both rotational modulation and long-term variability of stellar brightness. These models give evidence for an equatorward drift of the lower latitude boundary of the spotted region, ϕ_0, during the rising phase of activity, beyond any possible errors concerned with our methodology. In order to evaluate the drift rate we introduce the concept of "effective" spot belt, whose width is independent of longitude. This permits us to construct butterfly diagrams for stellar spots. The equatorward drift rates of the lower boundary of the spotted region $D = d\phi_{low}/dt$ are (- 1) – (- 2) deg/year in the years of increasing spottedness. These values are less than the analogous solar one $D \approx -4$ deg/year for the rising phase of the cycle. Thus, cyclic activity can be revealed from butterfly diagrams and derived drifts of starspots prior to a possible detection from the spectral analysis of photometric variability. Finally, we briefly discuss a possible explanation of high-latitude activity and surface drifts of starspots in the framework of the current state of dynamo theory.

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Oxygen in Open Cluster Dwarfs: Pleiades and M34

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We analyze the high-excitation λ7774 OI triplet in high-resolution, moderate signal-to-noise spectra of 15 Pleiades and 8 M34 open cluster dwarfs over the effective temperature range of 5048 - 6172 K. Relative O abundances have been derived using model atmospheres interpolated from four different sets of ATLAS9 grids. In contrast to existing NLTE redictions, a dramatic increase in OI triplet abundance with *decreasing* temperature is seen for both clusters, regardless of atmospheric model. SI abundances of three Pleiads derived from the high-excitation λ6053 feature mimic the OI abundance behavior. O abundances have also been derived from the λ6300 [OI] feature in three Pleiads; the abundances exhibit a much lower mean-value than the cool dwarf triplet results. Inasmuch as the [OI] abundances are presumed to be free from NLTE effects, their mean ($[\mathrm{O/H}]_{6300} = +0.14$) provide the current best estimate of the Pleiades O abundance. Spreads in $[\mathrm{O/H}]_{\mathrm{Trip}}$ at a given temperature are also seen in both clusters; no correlation is found between the spreads and chromospheric emission measures.

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Doppler Shifts and Broadening and the Structure of the X-ray Emission from Algol

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In a study of *Chandra* High Energy Transmission Grating spectra of Algol, we clearly detect Doppler shifts caused by the orbital motion of Algol B. These data provide the first definitive proof that the X-ray emission of Algol is dominated by the secondary, in concordance with expectations that the primary B8 component should be X-ray dark. However, the measured Doppler shifts are slightly smaller than might be expected, implying an effective orbital semi-major axis of about $10R_\odot$ instead of $11.5R_\odot$ for the Algol B center of mass. This could be caused by a small contribution of Algol A, possibly through accretion, to the observed X-ray flux, in which case such a contribution does not exceed 10-15%. We suggest the more likely explanation is an asymmetric corona biased toward the system center of mass by the tidal distortion of the surface of Algol B. A detailed analysis of the profiles of the strongest lines indicates the presence of excess line broadening amounting to approximately 150 km s^{-1} above that expected from thermal motion and surface rotation. Possible explanations for this additional broadening include turbulence, flows or explosive events, or rotational broadening from a radially extended corona. We favor the latter scenario and infer that a significant component of the corona at temperatures $< 10^7$ K has a scale height of order the stellar radius. This interpretation is supported by the shape of the X-ray lightcurve and tentative detection of a shallow dip at secondary eclipse. We also examine the O VII intercombination and forbidden lines in a Low Energy Transmission Grating Spectrograph observation and find no change in their relative line fluxes as the system goes from quadrature to primary eclipse. Since these lines appear to be strongly affected by UV irradiation from Algol A through radiative excitation of the $2\,^3S \rightarrow 2\,^3P$ transition, this supports the conjecture that the corona of Algol B at temperatures of several million K must be significantly extended and/or located toward the poles to avoid being shadowed from Algol A during primary eclipse.

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Solar Abstracts

Evidence for the Hanle Effect in Molecular Lines

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In many wavelength regions molecular lines dominate the second solar spectrum that results from coherent scattering. Scattering polarization is modified by magnetic fields via the Hanle effect. This allows us to explore the magnetic field regime with weak field strengths and mixed polarities, which is not seen with the Zeeman effect and thus contains complementary information. Molecular lines are particularly well suited to diagnose such turbulent fields because they exhibit a broad range of magnetic sensitivities within narrow spectral regions. Thus, it is possible to employ the technique of the differential Hanle effect, i.e. to obtain field strengths by observing polarization ratios in various lines. We have identified one R- and one P-triplet of C_2 at 5140 Å and 5141 Å, respectively, that satisfy all conditions to be used in the differential Hanle effect. Based on these lines we have developed a model that can diagnose turbulent magnetic fields using the Hanle effect. The tool is sensitive over a broad range of magnetic field strengths from a few Gauss up to several hundred Gauss. This tool has allowed us to find a significant Hanle depolarization of C_2 lines in quiet Sun observations, which corresponds to a magnetic field strength of 15 ± 3 G.

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Coronal Response of Bi-directional Jets

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EUV bi-directional jets are a prominent class of phenomena characterizing the solar transition region. Using simultaneously obtained SUMER observations in the chromospheric Si II 1251.16 Å and C I 1251.17 Å, transition region N V 1238.8 Å and coronal Mg X 625 Å lines we show an example of a bi-directional jet registered in the chromospheric and the transition region lines but not showing any detectable signature in the coronal line. The phenomenon, however, was also clearly detected by the TRACE imager with the 171 Å filter. This discrepancy is explained here with a non-Maxwellian electron distribution which makes a significant fraction of the plasma in the TRACE 171 Å pass-band to be derived from temperatures around ≈300,000K, as opposed to ≈800,000K. This could have implications for other phenomena observed in the TRACE pass-bands, including the transition region 'moss' and the 3 and 5 mins oscillations.

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Signature of Oscillations in Coronal Bright Points

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A detailed study of two consecutive bright points observed simultaneously with the Coronal Diagnostic Spectrometer (CDS), the Extreme ultraviolet Imaging Telescope (EIT) and the Michelson Doppler Imager (MDI) onboard the Solar and Heliospheric Observatory (SOHO) is presented. The analysis of the evolution of the photospheric magnetic features and their coronal counterpart shows that there is a linear dependence between the EIT Fe XII 195 Å flux and

the total magnetic flux of the photospheric bipolarity. The appearance of the coronal emission is associated with the emergence of new magnetic flux and the disappearance with the cancellation of one of the polarities. In one of the cases the disappearance takes place ~3-4 hours before the full cancellation of the weakest polarity. The spectral data obtained with CDS show that one of the bright points experienced short time variations in the flux on a time scale of 420-650 seconds, correlated in the transition region lines (O V 629 Å and O III 599 Å) and also the He I 584.33 Å line. The coronal line (Mg IX 368 Å) undergoes changes as well, but on a longer scale. The wavelet analysis of the temporal series reveals that many of these events appear in a random fashion and sometimes after periods of quietness. However, we have found two cases of an oscillatory behaviour. A sub-section of the O V temporal series of the second bright point shows a damped oscillation of five cycles peaking in the wavelet spectrum at 546 seconds, but showing in the latter few cycles a lengthening of that period. The period compares well with that detected in the S VI 933.4 Å oscillations seen in another bright point observed with the Solar Ultraviolet Measurements of Emitted Radiation (SUMER) spectrometer, which has a period of 491 seconds. The derived electron density in the transition region was 3×10^{10} cm^{-3} with some small variability, while the coronal electron density was 5×10^{8} cm^{-3}.

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Evidence for Magnetic Reconnection Along Coronal Hole Boundaries

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The present study reveals for the first time the existence of bi-directional jets, which are a signature of magnetic reconnection, occurring along coronal hole boundaries. The SUMER observations obtained in the N IV 765.15 Å ($1.3\ 10^5$ K) and Ne VIII 770.42 Å ($6\ 10^5$ K) emission lines in an equatorial extension of a polar coronal hole, known as the 'Elephant's Trunk' coronal hole, show small regions of a few arcsec size with strong blue- and red-shifted emission reaching Doppler shifts of up to 150 km s^{-1}, i.e. bi-directional jets. The jets' number density along coronal hole boundaries was found to be of about 4-5 times higher with respect to the quiet Sun.

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Propagating Waves and MHD Mode Coupling in the Quiet-Sun Network

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High-cadence, multiwavelength optical observations were taken with the Dunn Solar Telescope at the National Solar Observatory/Sacramento Peak, accompanied by Advanced Stokes Polarimeter vectormagnetograms. A total of eleven network bright points (NBPs) have been studied at differing atmospheric heights, using images taken in wavebands centred on Mg I $b_1 - 0.4$ Å, Hα and Ca II K_3. Wavelet analysis was used to study wavepackets, and identify travelling magnetohydrodynamic waves. Wave speeds were estimated through temporal cross-correlation of signals, in selected frequency bands of wavelet power, in each wavelength. Four mode-coupling cases were identified, one in each of four of the NBPs, and the variation of the associated Fourier power with height studied. Three of the detected mode-coupling, transverse-mode frequencies were observed in the $1.2 - 1.6$ mHz range (mean NBP apparent flux density magnitudes over $99 - 111$ Mx cm^{-2}) with the final case showing $2.0 - 2.2$ mHz (with 142 Mx cm^{-2}). Following this, longitudinal-mode frequencies were detected in the range $2.6 - 3.2$ mHz for three of our cases with $3.9 - 4.1$ mHz for the remaining case. After mode coupling, two cases displayed a decrease in longitudinal-mode Fourier power in the higher chromosphere.

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Low-Mass and Substellar Abstracts

The Evolution of Irradiated Planets. Application to Transits

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Extending the theory we derived recently for HD209458b to different cases of strongly irradiated gaseous exoplanets, we have calculated the consistent evolution of the new transiting planet, OGLE-TR-56b, for its recently revised mass determination. The theory is shown to successfully reproduce the observed radius, for the proper age of the system. We also examine the dissipation of kinetic energy at the planet's internal adiabat due to atmospheric winds, and place constraints on the efficiency of this process. We show that a fraction $\sim 0.1 - 0.5\%$ of the incident flux transformed into thermal energy deposited at the adiabatic level can accommodate the observed radii of both OGLE-TR-56b and HD209458b. The present theory yields quantitative predictions on the evolution of the emergent spectrum and fundamental properties of hot-jupiters. The predictions for radius, luminosity, temperature as a function of the planet's mass and orbital distance can be used as benchmarks for future detections of transit planets.

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Upcoming Meeting

SAAS Fee Winter School (First Announcement)

The Sun, Solar Analogs, and the Climate

15 - 20 March 2004

Davos, Switzerland

The Swiss Society of Astrophysics & Astronomy (SSAA) is now organizing its 34th Advanced Course in Astronomy and Astrophysics. This winter school will be held in Davos, Switzerland from March 15 to 20, 2004. The subject of the course is: THE SUN, SOLAR ANALOGS AND THE CLIMATE. The course will address the subject of the solar variability and its interaction with the terrestrial climate. In these times of concern about global warming, it is important to understand the solar variability and its interaction with the atmosphere, in order to be able to distinguish between the solar and anthropogenic contributions to the rising temperatures in the last century. One third of the course will be devoted to the observed variability of the Sun, its theoretical origin and the present understanding of the variability. The second third of the course will address the Earth's climate and how solar variability affects it. Finally, the last third will discuss the variability of solar analog stars. This helps to better understand the solar cycle and to estimate how large the solar variations could be on longer time scales, and consequently, which effect the long term solar variability has on the Earth's climate.

The lectures will be given in English by three experts, each covering one of the three topics:
Mike Lockwood (Solar variability)
Mark Giampapa (Stellar variability)
Joanna Haigh (Sun-Earth relationship)

The course is intended mainly for post-graduate astronomers and physicists who wish to broaden their knowledge in the field. More information on the course program, general information and registration is available on the following web-site: http://www.pmodwrc.ch .

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JOB OPENING

Postdoctoral Position
Stellar Astrophysics
Paul Scherrer Institute (Switzerland)

We invite applications for a new postdoctoral research position in stellar astrophysics, starting between spring-fall 2004. This position will be awarded for two years; extension is contingent on further funding. Candidates with an observational or theoretical background in star formation and/or magnetic activity/coronal physics in young stars are particularly encouraged to apply. Experience in either infrared, millimeter, or X-ray astronomical observing and/or related theory is welcome. Candidates with expertise in related fields of stellar astronomy are also invited to apply.

The successful candidate will work in a joint team of astronomers from the Paul Scherrer Institute and ETH Zurich. This team has a strong background and interest in X-ray, millimeter and radio astronomy of magnetically active and young stars, star formation, plasma physics, and solar physics. PSI has been involved in the development of space missions such as XMM-Newton, the James Webb Space Telescope (JWST), RHESSI, and Integral. We offer extensive scientific collaborations within several ongoing research projects. The candidate is expected to develop further vigorous research activities. Office space and computing facilities will be provided by both PSI and ETH Zurich.

Please send CV, publication list, and a short description of research interests, and arrange for two letters of recommendation sent directly to us. Applications are requested by 20 February 2004 but will continue to be considered thereafter until the position is filled. For questions, please send e-mail to Dr. M. Güdel (guedel@astro.phys.ethz.ch).

Human Resources, Ref. Code 1513
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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.***