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1 Editorial

Welcome to the twentieth edition of ExoPlanet News, an electronic newsletter reporting the latest developments and research outputs in the field of exoplanets. This issue, for the first time, we have included some figures with abstracts where authors have submitted them.

Remember that past editions of this newsletter, submission templates and other information can be found at the ExoPlanet News website: http://exoplanet.open.ac.uk. As ever, we rely on you, the subscribers of the newsletter, to send us your abstracts of recent papers, conference announcements, thesis abstracts, job adverts etc for each edition.

Please send anything relevant to exoplanet@open.ac.uk, and it will appear in the next edition which we plan to send out at the beginning of August 2009. As for this issue, if you wish to include ONE figure per abstract, please do so.

Best wishes
Andrew Norton & Glenn White
The Open University

2 Abstracts of refereed papers

The History of the Solar System’s Debris Disc: Observable Properties of the Kuiper Belt

M. Booth¹, M. C. Wyatt¹, A. Morbidelli², A. Moro-Martín³,⁴, H. F. Levison⁵

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The Nice model of Gomes et al. (2005) suggests that the migration of the giant planets caused a planetesimal clearing event which led to the Late Heavy Bombardment (LHB) at 880 Myr. Here we investigate the IR emission from the Kuiper belt during the history of the Solar System as described by the Nice model. We describe a method for easily converting the results of n-body planetesimal simulations into observational properties (assuming black-body grains and a single size distribution) and further modify this method to improve its realism (using realistic grain properties and a three-phase size distribution). We compare our results with observed debris discs and evaluate the plausibility of detecting an LHB-like process in extrasolar systems. Recent surveys have shown that 4% of stars exhibit 24 μm excess and 16% exhibit 70 μm excess. We show that the Solar System would have been amongst the brightest of these systems before the LHB at both 24 and 70 μm. We find a significant increase in 24 μm emission during the LHB, which rapidly drops off and becomes undetectable within 30 Myr, whereas the 70 μm emission remains detectable until 360 Myr after the LHB. Comparison with the statistics of debris disc evolution shows that such depletion events must be rare occurring around less than 12% of Sun-like stars and with this level of incidence we would expect approximately 1 of the 413 Sun-like, field stars so far detected to have a 24 μm excess to be currently going through an LHB. We also find that collisional processes are important in the Solar System before the LHB and that parameters for weak Kuiper belt objects are inconsistent with the Nice model interpretation of the LHB.

Download/Website: http://arxiv.org/abs/0906.3755

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Eleven Exoplanet Host Star Angular Diameters from the CHARA Array


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We directly measured the angular diameters for eleven exoplanet host stars using Georgia State University’s CHARA Array interferometer and calculated their linear radii and effective temperatures. The sample tends towards evolving or evolved stars and includes one dwarf, four subgiants, and six giants. We then estimated masses and ages for the stars using our effective temperatures combined with metallicity measurements from the literature.

Download/Website: http://arxiv.org/abs/0906.2702

Imaging search for the unseen companion to $\epsilon$ Ind A – Improving the detection limits with 4 $\mu$m observations


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$\epsilon$ Ind A is one of the nearest sun-like stars, located only 3.6 pc away. It is known to host a binary brown dwarf companion, $\epsilon$ Ind Ba/Bb, at a large projected separation of 6.9$, but radial velocity measurements imply that an additional, yet unseen component is present in the system, much closer to $\epsilon$ Ind A. Previous direct imaging has excluded the presence of any stellar or high-mass brown dwarf companion at small separations, indicating that the unseen companion may be a low-mass brown dwarf or high-mass planet. We present the results of a deep high-contrast imaging search for the companion, using active angular differential imaging (aADI) at 4 $\mu$m, a particularly powerful technique for planet searches around nearby and relatively old stars. We also develop an additional PSF reference subtraction scheme based on locally optimized combination of images (LOCI) to further enhance the detection limits. No companion is seen in the images, although we are sensitive to significantly lower masses than previously achieved. Combining the imaging data with the known radial velocity trend, we constrain the properties of the companion to within approximately 5-20 $M_{\text{jup}}$, 10-20 AU, and $i > 20^o$, unless it is an exotic stellar remnant. The results also imply that the system is probably older than the frequently assumed age of $\sim$1 Gyr.

Download/Website: http://arxiv.org/abs/0906.4145

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Stellar coronal magnetic fields and star-planet interaction

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Evidence of magnetic interaction between late-type stars and close-in giant planets is provided by the observations of stellar hot spots rotating synchronously with the planets and showing an enhancement of chromospheric and X-ray fluxes. Possible photospheric signatures of such an interaction have also been reported. We investigate star-planet interaction in the framework of a magnetic field model of a stellar corona, considering the interaction between the coronal field and that of a planetary magnetosphere moving through the corona. This is motivated, among others, by the difficulty of accounting for the energy budgets of the interaction phenomena with previous models. A linear force-free model is applied to describe the coronal field and study the evolution of its total magnetic energy and relative helicity according to the boundary conditions at the stellar surface and the effects related to the planetary motion through the corona. The energy budget of the star-planet interaction is discussed assuming that the planet may trigger a release of the energy of the coronal field by decreasing its relative helicity. The observed intermittent character of the star-planet interaction is explained by a topological change of the stellar coronal field, induced by a variation of its relative helicity. The model predicts the formation of many prominence-like structures in the case of highly active stars owing to the accumulation of matter evaporated from the planet inside an azimuthal flux rope in the outer corona. Moreover, the model can explain why stars accompanied by close-in planets have a higher X-ray luminosity than those with distant planets. It predicts that the best conditions to detect radio emission from the exoplanets and their host stars are achieved when the field topology is characterized by field lines connected to the surface of the star, leading to a chromospheric hot spot rotating synchronously with the planet. The main predictions of the model can be verified with present observational techniques, by a simultaneous monitoring of the chromospheric flux and X-ray (or radio) emission, and spectropolarimetric observations of the photospheric magnetic fields.

Download/Website: http://web.ct.astro.it/preprints/
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Follow-up Observations of the Neptune Mass Transiting Extrasolar Planet HAT-P-11b

Dittmann, Jason A., Close, Laird M., Green, Elizabeth M., Scuderi, Louis J., Males, Jared R.
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We have confirmed the existence of the transiting super Neptune extrasolar planet HAT-P-11b. On May 1, 2009 UT the transit of HAT-P-11b was detected at the University of Arizona’s 1.55m Kuiper Telescope with 1.7 millimag rms accuracy. We find a central transit time of \( T_c = 2454952.92534 \pm 0.00060 \) BJD; this transit occurred 80 ± 73 seconds sooner than previous measurements (71 orbits in the past) would have predicted. Hence, our transit timing rules out the presence of any large (> 200s) deviations from the ephemeris of Bakos et al. (2009). We obtain a slightly more accurate period of \( P = 4.8878045 \pm 0.0000043 \) days. We measure a slightly larger planetary radius of \( R_p = 0.452 \pm 0.020 R_J \) (5.07 ± 0.22 \( R_{\text{earth}} \)) compared to Bakos and co-workers’ value of 0.422 ± 0.014 \( R_J \) (4.73 ± 0.16 \( R_{\text{earth}} \)). Our values confirm that HAT-P-11b is very similar to GJ 436b (the only other known transiting super Neptune) in radius and other bulk properties.

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A Tentative Detection of a Starspot During Consecutive Transits of an Extrasolar Planet from the Ground: No Evidence of a Double Transiting Planet System Around TrES-1

Dittmann, Jason A., Close, Laird M., Green, Elizabeth M., Fenwick, Mike.
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There have been numerous reports of anomalies during transits of the planet TrES-1b. Recently, Rabus and coworkers’ analysis of HST observations lead them to claim brightening anomalies during transit might be caused by either a second transiting planet or a cool starspot. Observations of two consecutive transits are presented here from the University of Arizona’s 61-inch Kuiper Telescope on May 12 and May 15, 2008 UT. A 5.4 ± 1.7 mmag (0.54 ± 0.17%) brightening anomaly was detected during the first half of the transit on May 12 and again in the second half of the transit on May 15th. We argue that the significance of these spot events are 3.2 and 2.9 σ for May 12 and May 15 respectively and we estimate that each of these have a probability ≥ 90% of not being systematic red noise peaks. Therefore we conclude that this is a tentative detection of a r ≥ 6R_earth starspot rotating on the surface of the star. We suggest that all evidence to date suggest TrES-1 has a spotty surface and there is no need to introduce a second transiting planet in this system to explain these anomalies. Assuming that the spin axis of
the star and orbital axis of the planet are aligned (and in the plane of the sky) suggests a stellar rotational period of $40.2 \pm 0.1$ days. Introducing the $\lambda = 30 \pm 21^\circ$ inclination of the stellar spin axis with respect to the planetary orbital axis of Narita et al. (2007) adds much more uncertainty and we are only able to constrain the rotational period of the star to $40.2^{+22.6}_{-14.6}$ days, which is consistent with the previously observed $P_{\text{obs}} = 33.2^{+22.3}_{-14.3}$ day period. We note that this technique could be applied to other transiting systems for which starspots exist on the star in the transit path of the planet in order to constrain the rotation rate of the star.

Download/Website: http://arxiv.org/abs/0906.4320
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Local Linear Analysis of Interaction between a Planet and Viscous Disk and an Implication on Type I Planetary Migration

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We investigate the effects of viscosity on disk-planet interaction and discuss how type I migration of planets is modified. We have performed a linear calculation using shearing-sheet approximation and obtained the detailed, high resolution density structure around the planet embedded in a viscous disk with a wide range of viscous coefficients. We use a time-dependent formalism that is useful in investigating the effects of various physical processes on disk-planet interaction. We find that the density structure in the vicinity of the planet is modified and the main contribution to the torque comes from this region, in contrast to inviscid case. Although it is not possible to derive total torque acting on the planet within the shearing-sheet approximation, the one-sided torque can be very different from the inviscid case, depending on the Reynolds number. This effect has been neglected so far but our results indicate that the interaction between a viscous disk and a planet can be qualitatively different from an inviscid case and the details of the density structure in the vicinity of the planet is critically important.

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Massive Protoplanetary Disks in Orion Beyond the Trapezium Cluster

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We present Submillimeter Array observations of the 880 $\mu$m continuum emission from three circumstellar disks around young stars in Orion that lie several arcminutes (> 1 pc) north of the Trapezium cluster. Two of the three disks are in the binary system 253-1536. Silhouette disks 216-0939 and 253-1536a are found to be more massive than any previously observed Orion disks, with dust masses derived from their submillimeter emission of 0.045 $M_\odot$ and 0.066 $M_\odot$, respectively. The existence of these massive disks reveals the disk mass distribution in Orion does extend to high masses, and that the truncation observed in the central Trapezium cluster is a result of photoevaporation due to the proximity of O-stars. 253-1536b has a disk mass of 0.018 $M_\odot$, making the 253-1536 system the first optical binary in which each protoplanetary disk is massive enough to potentially form Solar systems.

Download/Website: http://arxiv.org/abs/0906.1400
Contact: rmann@ifa.hawaii.edu
A SuperWASP search for additional transiting planets in 24 known systems

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We present results from a search for additional transiting planets in 24 systems already known to contain a transiting planet. We model the transits due to the known planet in each system and subtract these models from lightcurves obtained with the SuperWASP survey instruments. These residual lightcurves are then searched for
Figure 3: (A.M.S. Smith et al.) Simulation results for a second planet in the WASP-1 system. Contour map showing SuperWASP detection efficiency as a function of orbital period and planetary radius.

evidence of additional periodic transit events. Although we do not find any evidence for additional planets in any of the planetary systems studied, we are able to characterise our ability to find such planets by means of Monte Carlo simulations. Artificially generated transit signals corresponding to planets with a range of sizes and orbital periods were injected into the SuperWASP photometry and the resulting lightcurves searched for planets. As a result, the detection efficiency as a function of both the radius and orbital period of any second planet, is calculated. We determine that there is a good (> 50 per cent) chance of detecting additional, Saturn-sized planets in $P \sim 10$ d orbits around planet-hosting stars that have several seasons of SuperWASP photometry. Additionally, we confirm previous evidence of the rotational stellar variability of WASP-10, and refine the period of rotation. We find that the period of the rotation is $11.91 \pm 0.05$ d, and the false alarm probability for this period is extremely low ($\sim 10^{-13}$).

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Resolving the hot dust around HD69830 and eta Corvi with MIDI and VISIR

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Astronomy & Astrophysics, in press

Most of the known debris discs exhibit cool dust in regions analogous to the Edgeworth-Kuiper Belt. However, a rare subset show hot excess from within a few AU, which is often inferred to be transient. We examine 2 such sources to place limits on their location to help distinguish between different interpretations for their origin. We use
MIDI on the VLTI to observe the debris discs around η Corvi and HD69830 using baseline lengths from 44-130m. New VISIR observations of HD69830 at 18.7µm are also presented. These observations are compared with disc models to place limits on disc size. The visibility functions measured with MIDI for both sources show significant variation with wavelength across 8-13µm in a manner consistent with the disc flux being well resolved, notably with a dip at 10–11.5µm due to the silicate emission feature. The average ratio of visibilities measured between 10-11.5µm and 8-9µm is 0.934±0.015 for HD69830 and 0.880±0.013 for η Corvi over the 4 baselines for each source, a departure of 4 and 9sigma from that expected if the discs were unresolved. HD69830 is unresolved by VISIR at 18.7µm. The combined limits from MIDI and 8m imaging constrain the warm dust to lie within 0.05–2.4AU for HD69830 and 0.16–2.98AU for η Corvi. These results represent the first resolution in the mid-IR of dust around main sequence stars. The constraints placed on the location of the dust are consistent with radii predicted by SED modelling. Tentative evidence for a common position angle for the dust at 1.7AU with that at 150AU around η Corvi, which might be expected if the hot dust is fed from the outer disc, demonstrates the potential of this technique for constraining the origin of the dust and more generally for the study of dust in the terrestrial regions of main sequence stars.

Download/Website: http://arxiv.org/abs/0906.3704
Contact: rsed@ast.cam.ac.uk

Figure 4: (R. Smith et al.) Top row: VISIR observations of planet and debris disc host HD69830 at Q show no evidence for extended emission. Bottom: MIDI observations resolve the dust emission on baselines 44-130m long. Combined limits from MIDI and VISIR place the dust between 0.05-2.4AU.
A Third Planet Orbiting HIP 14810

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We present new precision radial velocities and a three-planet Keplerian orbit fit for the V = 8.5, G5 V star HIP 14810. We began observing this star at Keck Observatory as part of the N2K Planet Search Project. Wright et al. (2007) announced the inner two planets to this system, and subsequent observations have revealed the outer planet and the proper orbital solution for the middle planet. The planets have minimum masses of 3.9, 1.3, and 0.6 M\textsubscript{Jup} and orbital periods of 6.67, 147.7, and 952 d, respectively. We have numerically integrated the family of orbital solutions consistent with the data and find that they are stable for at least 10\textsuperscript{6} yr. Our photometric search shows that the inner planet does not transit.

Contact: jtwright@astro.cornell.edu

Figure 5: (Wright et al.) RV curves of the three components of the HIP 14810 triple-giant-planet system, from data taken at Keck Observatory.
3 Conference announcements

Building Habitable Worlds: Fourth Conference of the Astrobiology Society of Britain

Astrobiology society of Great Britain

Royal Holloway, University of London, April 7th to 9th, 2010

First Announcement & Call for Abstracts.

Astrobiology is a multidisciplinary topic that brings together many branches of science. This conference will cover all aspects of research related to astrobiology, including (but not exclusively):

Astronomy; Astrochemistry; Astrobiology Technology; Biology; Development of Life-Forms in Other Environments; Exoplanets; Extremophiles; Geomicrobiology; Humans in Space; Lifes Origins; Mars; Meteorites; Microbial Communities; Panspermia; Planetary Protection; Prebiotic Climates; Public Engagement

Papers are solicited on all these and related topics but are particularly encouraged if they concern the conference theme “Building Habitable Worlds”. Abstracts (200 words) should be submitted by Feb 1, 2010.

Conference Fees:
Registration – £200 (includes ASB membership for 2 years).
Accommodation at Royal Holloway – £44.61 per night (Single, en-suite).
We anticipate that bursaries will be available to assist attendance by Postgraduate students.

Contact: conference@astrobiologysociety.org

Pathways towards habitable planets

Vincent Coudé du Foresto

Barcelona, Spain, 14–18 September 2009

Dear Colleagues,

This is a reminder that the deadline for early registration to the Pathways conference is June 28th. After that date, only poster papers can be accepted and the registration fee will no longer include the conference dinner.

We encourage you to visit the main conference website (http://www.pathways2009.net) for further details, to submit your abstract, and register.

Important dates:

• June 28th: deadline for early registration and abstract submission
• July 15th: publication of the final programme in the web
• July 15th: deadline for full refund (except for 15? handling fee)
• September 14th-18th: conference
• November 15th: deadline for submission of proceedings
• Spring 2010: distribution of proceedings

Looking forward to seeing you in Barcelona,
Vincent Coudé du Foresto and Ignasi Ribas for the Scientific Organizing Committee

Contact: soc@pathways2009.net

Download/Website: http://www.pathways2009.net
2009 Sagan Summer Workshop: Exoplanetary Atmospheres

Dr. Dawn Gelino on behalf of the SOC: Chas Beichman (NExScI), Dawn Gelino (NExScI), Glenn Orton (JPL), Sara Seager (MIT), Mark Swain (JPL), Wes Traub (JPL)

Caltech Campus, Pasadena, California, USA, July 19 - 24, 2009

The 2009 Sagan Summer Workshop, hosted by the NASA Exoplanet Science Institute, will consist of a series of tutorial discussions covering theory and observations of exoplanetary atmospheres. In addition, attendees will have the opportunity to present brief summaries of their research during short research Pops.

Final chances to register!

Registration Fee includes: conference attendance and materials; transportation between Pasadena Hilton; and Workshop on Workshop Dates; lunches on Monday, Wednesday and Friday; light breakfast, snacks, and drinks during morning and afternoon breaks each day of the workshop; opening reception; 1 ticket to attend workshop dinner on Thursday (extra tickets available for purchase); and 1 ticket to attend tour to the Griffith Observatory on Wednesday afternoon (extra tickets available for purchase)

Interactive activities

Research POPS: Registered attendees are invited to submit short presentations (pops) on their research. These presentations should be submitted by July 6 and will be presented Monday and Tuesday of the workshop.

Design Your Own Mission!: This year, learn the basics of designing a space or ground-based mission. There will be 5 different types of missions that you can sign-up to design: 1. Combined Light; 2. Coronography; 3. Interferometry; 4. Ground-based; 5. Transit

You will hear about the science drivers for each type of mission, as well as the technical aspects to consider. Experts in each area will advise the groups throughout the week, culminating in presentations on Friday afternoon. All workshop participants are encouraged to sign-up for a mission project. Prizes will be given out in a number of categories!

Important Dates: July 6: Deadline to submit research pops; July 10: On-line registration deadline; July 19: Opening reception; July 24: On-site registration deadline

See the workshop website for more information, current participant list, and the workshop agenda complete with speaker names!

Download/Website: http://nexsci.caltech.edu/workshop/2009/

Contact: sagan_workshop@ipac.caltech.edu

41st Meeting of the AAS Division for Planetary Sciences (DPS)

DPS SOC

San Juan, Puerto Rico, 4-9 October 2009

Dear colleagues,

We are inviting you to submit abstracts to this year’s DPS meeting, that is planning 3 special sessions on exoplanets (abstract deadline July 22 2009)

1) Characterizing Exoplanets
2) Detected Extrasolar Planet Systems and Super-Earths
3) Habitability and Extremophiles

Abstract deadline: 9:00 PM EDT, Wednesday, 22 July 2009
Deadline for student travel grants: July 8th
http://dps.aas.org/meetings/travel_grant_application
We are looking forward to lively discussions and exciting new results from current ground-based searches and space missions.
See you all in Puerto Rico.
Lisa Kaltenegger (for the DPS SOC)
P.S. Abstract submission for exoplanets: currently use ‘Others’ if you do not find the session listed (the session list is work in progress)

Download/Website: http://dps09.naic.edu/abs.shtml
Contact: lkaltene@cfa.harvard.edu

4 Jobs and positions

Postdoctoral Fellow(s) - Exo-Planets, Brown Dwarfs and Young Stars

Prof. Ray Jayawardhana
University of Toronto

Applications are invited for one or more postdoctoral research position(s) at the University of Toronto to start in January 2010 or later. The successful candidate(s) will work with Prof. Ray Jayawardhana and his collaborators on observational and analytical studies of extra-solar planets, brown dwarfs and young stars, and will be encouraged to pursue independent research on related topics. On-going projects include high-contrast imaging searches for companions around young stars, the SONYC (Substellar Objects in Nearby Young Clusters) ultra-deep survey, photometric and spectroscopic studies of exo-planets, and investigations of brown dwarf variability, using data from VLT, Subaru, Gemini, Keck, Spitzer, CFHT, Las Campanas and other major observatories. The position is for two years, with extension to a third year possible, and comes with funds for research expenses. Applicants should send a curriculum vitae, a description of research interests and plans and a list of publications, and should arrange for three letters of recommendation to be sent directly to Prof. Ray Jayawardhana, Dept. of Astronomy & Astrophysics, University of Toronto, 50 St. George Street, Room 101, Toronto, ON M5S 3H4, CANADA. E-mail submission preferred. Applications received before 2009 August 15 will receive full consideration. Early expressions of interest and inquiries are welcome.

Download/Website: http://www.astro.utoronto.ca
Contact: rayjay@astro.utoronto.ca

5 Announcements

The SONG Network and Extrasolar Planets

W.J. Chaplin¹, Y.P. Elsworth¹, I.R. Stevens², M.J. Thompson² et al.
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The SONG network is planned to consist of eight 1 metre class telescopes, distributed around the world. Although the principle purpose for SONG is asteroseismology, enabling continuous observations of asteroseismic targets, SONG is also being designed to have an important role in studying extrasolar planets.
SONG is designed to overcome the difficulty of securing continuous data on stars. Although the KEPLER mission will revolutionize our view of asteroseismology (and transiting exoplanets) with photometric observations, SONG will principally provide long, well-filled Doppler-velocity observations, which will have a higher signal to noise in the pulsation mode. Long duration, continuous observations are essential for these asteroseismic studies.

Each of the identical SONG telescopes will have two main instruments: The main instrument is a high precision spectrometer (with iodine cell), capable of a spectral resolution of 1 m/s. In addition to monitoring the surface motion of pulsating stars, the spectrometer will be capable of detecting exoplanets by means of the Doppler wobble. The second instrument is a photometer, designed to monitor gravitational lensing events and hence find planets via microlensing. The continuous monitoring enabled by the SONG network will greatly enhance the prospects of finding the short duration planetary microlensing events.

SONG is currently being funded by two Danish organizations and there is money sufficient for the initial prototype SONG node, to be located on Tenerife, with installation occurring in 2010. After that the hope is for additional funding to be forthcoming from various organizations around the world. Currently interested parties include the US, China, Australia and the UK. Possible future sites could include a number of those of the existing BISON solar oscillation network.

There has been a recent meeting on SONG, held in Aarhus, Denmark. Further details of SONG can be found at the SONG website:

Download/Website: http://astro.phys.au.dk/SONG/
Contact: irs@star.sr.bham.ac.uk

6 As seen on astro-ph

The following list contains all the entries relating to exoplanets that we spotted on astro-ph during June 2009. If you spot any that we missed, please let us know and we’ll include them in the next issue. And of course, the best way to ensure we include your paper is to send us the abstract!

Exoplanets

astro-ph/0906.0364: Spitzer/IRAC Limits to Planetary Companions of Fomalhaut and epsilon Eridani by M. Marengo, K. Stapelfeldt, M. W. Werner et al
astro-ph/0906.0544: An Ultracool Star’s Candidate Planet by Steven H. Pravdo & Stuart B. Shaklan
astro-ph/0906.0570: Earthshine observations of an inhabited planet by Enric Palle
astro-ph/0906.0769: Gifts from Exoplanetary Transits by Norio Narita
astro-ph/0906.0864: On posterior probability and significance level: application to the power spectrum of HD49933 observed by CoRoT by


astro-ph/0906.1783: Stellar coronal magnetic fields and star-planet interaction by A. F. Lanza

astro-ph/0906.1785: Tidal Limits to Planetary Habitability by Rory Barnes, Brian Jackson, Richard Greenberg et al

astro-ph/0906.2193: Title: Detecting planetary geochemical cycles on exoplanets: Atmospheric signatures and the case of SO2 by L. Kaltenegger & D. Sasselov


astro-ph/0906.2702: Eleven Exoplanet Host Star Angular Diameters from the CHARA Array by Ellyn K. Barnes, Harold A. McAllister, Theo A. ten Brummelaar et al


astro-ph/0906.2783: GMRT radio observations of the transiting extrasolar planet HD189733b at 244 and 614 MHz by A. Lecavelier des Etangs, S. K. Sirothia et al


astro-ph/0906.2958: The transmission spectrum of Earth through lunar eclipse observation by Enric Palle, Maria Rosa Zapatero Osorio, Pilar Montanes-Rodriguez et al

astro-ph/0906.3414: A SuperWASP search for additional transiting planets in 24 known systems by A. M. S. Smith, L. Hebb, A. Collier Cameron et al


astro-ph/0906.4030: General Analysis of Type I Planetary Migration with Stochastic Perturbations by Fred C. Adams & Anthony M. Bloch

astro-ph/0906.4130: Collisions, Cosmic Radiation and the Colors of the Trojan Asteroids by M.D. Melita, G. Strazzulla & A. Bar-Nun


astro-ph/0906.4574: A record of planet migration in the Main Asteroid Belt by David A. Minton & Renu Malhotra
astro-ph/0906.4904: Spin-orbit misalignment for the transiting planet HD 80606b by M. Gillon
astro-ph/0906.4934: Abundance analysis of prime B-type targets for asteroseismology II. B6–B9.5 stars in the field of view of the CoRoT by E. Niemczura, T. Morel & C. Aerts
astro-ph/0906.5011: Characteristics of solar-like oscillations in red giants observed in the CoRoT exoplanet field by S. Hekker, T. Kallinger, F. Baudin et al

Disks
astro-ph/0906.0888: The dynamical role of the circumplanetary disc in planetary migration by A. Crida, C. Baruteau, W. Kley et al

Instrumentation and Techniques
astro-ph/0906.0068: Pathway Toward a Mid-Infrared Interferometer for the Direct Characterization of Exoplanets by Jean Schneider