ExoPlanet News
An Electronic Newsletter

No. 15, February 2nd, 2009

Editors: Andrew J. Norton
Glenn J. White
Dept. of Physics & Astronomy, The Open University, Milton Keynes MK7 6AA, UK
exoplanet@open.ac.uk, http://exoplanet.open.ac.uk/

Contents

1 Editorial **2**

2 Abstracts of refereed papers **2**
– The Earth as an extrasolar planet: The vegetation spectral signature today and during the last Quaternary climatic extrema *Arnold, Breon & Brewer* . . . 2
– The HD 40307 Planetary System: Super-Earths or Mini-Neptunes? *Barnes et al.* . . . 3
– Infrared Signatures of Disrupted Minor Planets at White Dwarfs *Farihi, Jura, & Zuckerman* . . . 3
– The NASA-UC Eta-Earth Program: I. A Super-Earth Orbiting HD 7924[1] *Howard et al.* . . . 4
– Jupiter – friend or foe? II: the Centaurs *Jones & Horner* . . . 4
– Optical Images of an Exosolar Planet 25 Light-Years from Earth *Kalas et al.* . . . 5
– Orbital Evolution of a Particle Interacting with a Single Planet in a Protoplanetary Disk *Muto & Inutsuka* 5
– On the width and shape of the corotation region for low-mass planets *Paardekooper & Papaloizou* . . 6
– On corotation torques, horseshoe drag and the possibility of sustained stalled or outward protoplanetary migration *Paardekooper & Papaloizou* . . . 6
– Ground-based secondary eclipse detection of the very-hot Jupiter OGLE-TR-56b *Sing & López-Morales* 7
– Secondary radio eclipse of the transiting planet HD 189733 b: an upper limit at 307-347 MHz *Smith et al.* . . . 7
– The generalised Lomb-Scargle periodogram. A new formalism for the floating-mean and Keplerian periodograms *Zechmeister & Kürster* . . . 8

3 Jobs and positions **8**
– PDRAs in Exoplanet Research at Keele University *Keele University* . . . 8
– Postdoctoral Research Fellow in Exoplanet Research *University of New South Wales* . . . 9
– Research Fellow in Exoplanets and Low Mass Stars *Queens University Belfast* . . . 9
– Opportunity for Assistant Professor Fellowship *Stockholm* . . . 10
– Tenure-track faculty position in Astronomy (Exoplanets) *Lund Observatory* . . . 10

4 As seen on astro-ph **11**

1 Editorial

Welcome to the fifteenth edition of ExoPlanet News, an electronic newsletter reporting the latest developments and research outputs in the field of exoplanets.

It's good to see a range of exoplanet jobs advertised in this month's edition, along with the usual selection of fascinating recent journal articles.

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. We plan to send out the next edition at the beginning of March 2009.

Best wishes
Andrew Norton & Glenn White
The Open University

2 Abstracts of refereed papers

The Earth as an extrasolar planet: The vegetation spectral signature today and during the last Quaternary climatic extrema

Luc Arnold[1]*, François-Marie Beron*[2]*, Simon Brewer*[3]

[1] Observatoire de Haute Provence CNRS INSU, 04870 Saint-Michel-l'Observatoire, France
[2] CEA-DSM-LSCE, 91191 Gif-sur-Yvette, France
[3] CEREGE, BP 80, 13545 Aix-en-Provence Cedex 04, France

Int. J. Astrobiology, in press (2009arXiv0901.1214A/arXiv:0901.1214)

The so-called Vegetation Red-Edge (VRE), a sharp increase in the reflectance around 700 nm, is a characteristic of vegetation spectra, and can therefore be used as a biomarker if it can be detected in an unresolved extrasolar Earth-like planet integrated reflectance spectrum. Here we investigate the potential for detection of vegetation spectra during the last Quaternary climatic extrema, the Last Glacial Maximum (LGM) and the Holocene optimum, for which past climatic simulations have been made. By testing the VRE detectability during these extrema when Earth's climate and biomes maps were different from today, we are able to test the vegetation detectability on a terrestrial planet different from our modern Earth. Data from the Biome3.5 model have been associated to visible GOME spectra for each biome and cloud cover to derive Earth's integrated spectra for given Earth phases and observer positions. The VRE is then measured. Results show that the vegetation remains detectable during the last climatic extrema. Compared to current Earth, the Holocene optimum with a greener Sahara slightly increases the mean VRE on one hand, while on the other hand, the large ice cap over the northern Hemisphere during the LGM decreases vegetation detectability. We finally discuss the detectability of the VRE in the context of recently proposed space missions.

Download/Website: `http://fr.arxiv.org/abs/0901.1214`
`http://hal.archives-ouvertes.fr/hal-00351408/fr/`
`Animated GIF files: http://www.obs-hp.fr/~arnold/results/2009_IJAstrobio/VRE.html`

Contact: `Luc.Arnold@oamp.fr`

The HD 40307 Planetary System: Super-Earths or Mini-Neptunes?

Rory Barnes[1]*, Brian Jackson*[1]*, Sean N. Raymond*[2,3]*, Andrew A. West*[4]*, Richard Greenberg*[1]

[1] Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ 85721
[2] NASA Postdoctoral Program Fellow
[3] Center for Astrophysics and Space Astronomy, University of Colorado, Boulder, CO 80309
[4] Astronomy Department, University of California, 601 Campbell Hall, Berkeley, CA 94720-3411

Astrophysical Journal, in press

Three planets with minimum masses less than 10 $\mathrm{M}_\oplus$ orbit the star HD 40307, suggesting these planets may be rocky. However, with only radial velocity data, it is impossible to determine if these planets are rocky or gaseous. Here we exploit various dynamical features of the system in order to assess the physical properties of the planets. Observations allow for circular orbits, but a numerical integration shows that the eccentricities must be at least 10^{-4}. Also, planets b and c are so close to the star that tidal effects are significant. If planet b has tidal parameters similar to the terrestrial planets in the Solar System and a remnant eccentricity larger than 10^{-3}, then, going back in time, the system would have been unstable within the lifetime of the star (which we estimate to be 6.1$\pm$1.6 Gyr). Moreover, if the eccentricities are that large and the inner planet is rocky, then its tidal heating may be an order of magnitude greater than extremely volcanic Io, on a per unit surface area basis. If planet b is not terrestrial, *e.g.* Neptune-like, these physical constraints would not apply. This analysis suggests the planets are not terrestrial-like, and are more like our giant planets. In either case, we find that the planets probably formed at larger radii and migrated early-on (via disk interactions) into their current or bits. This study demonstrates how the orbital and dynamical properties of exoplanet systems may be used to constrain the planets' physical properties.

Contact: `rory@astro.washington.edu`

Infrared Signatures of Disrupted Minor Planets at White Dwarfs

J. Farihi[1]*, M. Jura*[2]*, B. Zuckerman*[2]

[1] Department of Physics & Astronomy, University of Leicester, University Road Leicester LE1 7RH, UK
[2] Department of Physics & Astronomy, University of California, 430 Portola Plaza, Los Angeles, CA 90095, USA

Astrophysical Journal, in press (arXiv:0901.0973)

Spitzer Space Observatory IRAC and MIPS photometric observations are presented for 20 white dwarfs with $T_{\rm eff} < 20,000$ K and metal-contaminated photospheres. A warm circumstellar disk is detected at GD 16 and likely at PG 1457$-$086, while the remaining targets fail to reveal mid-infrared excess typical of dust disks, including a number of heavily polluted stars. Extending previous studies, over 50% of all single white dwarfs with implied metal accretion rates $dM/dt > 3 \times 10^8$ g s^{-1} display a warm infrared excess from orbiting dust; the likely result of a tidally-destroyed minor planet. This benchmark accretion rate lies between the dust production rates of 10^6 g s^{-1} in the solar system zodiacal cloud and 10^{10} g s^{-1} often inferred for debris disks at main sequence A-type stars. It is estimated that between 1% and 3% of all single white dwarfs with cooling ages less than around 0.5 Gyr possess circumstellar dust, signifying an underlying population of minor planets.

Contact: `jf123@star.le.ac.uk`

The NASA-UC Eta-Earth Program: I. A Super-Earth Orbiting HD 7924[1]

Andrew W. Howard[2,3], John Asher Johnson[4], Geoffrey W. Marcy[2], Debra A. Fischer[5], Jason T. Wright[6], Gregory W. Henry[7], Matthew J. Giguere[5], Howard Isaacson[5], Jeff A. Valenti[8], Jay Anderson[8], and Nikolai E. Piskunov[9]

[1] Based on observations obtained at the W. M. Keck Observatory, which is operated jointly by the University of California and the California Institute of Technology. Keck time has been granted by both NASA and the University of California.
[2] Department of Astronomy, University of California, Berkeley, CA 94720-3411 USA
[3] Townes Fellow, Space Sciences Laboratory, University of California, Berkeley, CA 94720-7450 USA
[4] Institute for Astronomy, University of Hawaii, Honolulu, HI 96822 USA; NSF Postdoctoral Fellow
[5] Department of Physics and Astronomy, San Francisco State University, San Francisco, CA 94132 USA
[6] Department of Astronomy, Cornell University, Ithaca, NY 14853 USA
[7] Center of Excellence in Information Systems, Tennessee State University, 3500 John A. Merritt Blvd., Box 9501, Nashville, TN 37209 USA
[8] Space Telescope Science Institute, 3700 San Martin Dr., Baltimore, MD 21218, USA
[9] Department of Astronomy and Space Physics, Uppsala University, Box 515, 751 20 Uppsala, Sweden

Astrophysical Journal, accepted (arXiv:0901.4394)

We report the discovery of the first low-mass planet to emerge from the NASA-UC Eta-Earth Program, a super-Earth orbiting the K0 dwarf HD 7924. Keplerian modeling of precise Doppler radial velocities reveals a planet with minimum mass $M_P \sin i = 9.26\,M_{\rm Earth}$ in a $P = 5.398$ d orbit. Based on Keck-HIRES measurements from 2001 to 2008, the planet is robustly detected with an estimated false alarm probability of less than 0.001. Photometric observations using the Automated Photometric Telescopes at Fairborn Observatory show that HD 7924 is photometrically constant over the radial velocity period to 0.19 mmag, supporting the existence of the planetary companion. No transits were detected down to a photometric limit of $\sim$0.5 mmag, eliminating transiting planets with a variety of compositions. HD 7924b is one of only eight planets known with $M_P \sin i < 10\,M_{\rm Earth}$ and as such is a member of an emerging family of low-mass planets that together constrain theories of planet formation.

Download/Website: `http://lanl.arxiv.org/abs/0901.4394`

Contact: `howard@astro.berkeley.edu`

Jupiter – friend or foe? II: the Centaurs

B.W. Jones and J.A. Horner

Astronomy Group, Physics & Astronomy, The Open University, Milton Keynes, MK7 6AA, UK

Int. Jnl. Astrobiology, in press

It has long been assumed that the planet Jupiter acts as agiant shield, significantly lowering the impact rate of minor bodies upon the Earth, and thus enabling the development and evolution of life in a collisional environment which is not overly hostile. In other words, it is thought that thanks to Jupiter, mass extinctions have been sufficiently infrequent that the biosphere has been able to diversify and prosper. However, in the past, little work has been carried out to examine the validity of this idea. In the second of a series of papers, we examine the degree to which the impact risk resulting from objects on Centaur-like orbits is affected by the presence of a giant planet, in an attempt to fully understand the impact regime under which life on Earth has developed. The Centaurs are a population of ice-rich bodies which move on dynamically unstable orbits in the outer Solar system. The largest Centaurs known are several hundred kilometres in diameter, and it is certain that a great number of kilometre or sub-kilometre sized Centaurs still await discovery. These objects move on orbits which bring them closer to the Sun than Neptune, although they remain beyond the orbit of Jupiter at all times, and have their origins in the vast reservoir of debris known as the Edgeworth-Kuiper belt that extends beyond Neptune. Over time, the giant planets perturb the Centaurs, sending a significant fraction into the inner Solar System where they become visible as short-period comets. In this work, we obtain results which show that the presence of a giant planet can act to significantly change the impact rate of short-period comets on the Earth, and that such planets often actually increase the impact flux greatly over that which would be expected were a giant planet not present.

Contact: `B.W.Jones@open.ac.uk`

Optical Images of an Exosolar Planet 25 Light-Years from Earth

Paul G. Kalas[1], *James R. Graham*[1], *Eugene Chiang*[1,2], *Michael P. Fitzgerald*[3], *Mark Clampin*[4], *Edwin S. Kite*[2], *Karl Stapelfeldt*[5], *Christian Marois*[6], *John Krist*[5]

[1] Astronomy Department, University of California, Berkeley, CA 94720, USA
[2] Department of Earth & Planetary Science, University of California, Berkeley, CA 94720, USA
[3] Institute of Geophysics & Planetary Science, Lawrence Livermore National Laboratory, Livermore, CA 94551, USA
[4] Exoplanets & Stellar Astrophysics Laboratory, Goddard Space Flight Center, Greenbelt, MD 20771, USA
[5] MS 183-900, Jet Propulsion Laboratory, Caltech, Pasadena, CA 91109, USA
[6] Herzberg Institute for Astrophysics, Victoria, BC V9E2E7, CANADA

Science, Vol. 322, pp. 1345 - 1348 (2008)

Fomalhaut, a bright star 7.7 pc from Earth, harbors a belt of cold dust with a structure consistent with gravitational sculpting by an orbiting planet. Here, we present optical observations of an exoplanet candidate, Fomalhaut b. Fomalhaut b lies approximately 119 AU from the star, and within 18 AU of the dust belt, matching predictions of its location. Hubble Space Telescope observations separated by 1.73 years reveal counterclockwise orbital motion. Dynamical models of the interaction between the planet and the belt indicate that the planet's mass is at most three times that of Jupiter; a higher mass would lead to gravitational disruption of the belt. The flux detected at 0.8 μm is also consistent with that of a planet with mass no greater than a few times that of Jupiter. The brightness at 0.6 μm and the lack of detection at longer wavelengths suggest that the detected flux may include starlight reflected off a circumplanetary disk, with dimension comparable to the orbits of the Galilean satellites. We also observed variability of unknown origin at 0.6 μm.

Download/Website: `http://lanl.arxiv.org/abs/0811.1994`

Contact: `kalas@astron.berkeley.edu`

Orbital Evolution of a Particle Interacting with a Single Planet in a Protoplanetary Disk

Takayuki Muto, Shu-ichiro Inutsuka

Department of Physics, Kyoto University, Kitashirakawa-Oiwake-cho Sakyo-ku Kyoto 606-8502 Japan

Astrophysical Journal, accepted (arXiv:0810.5314)

We investigate the motion of a particle around a low mass planet embedded in a non-turbulent gaseous disk. We take into account the effect of the gas structure that is modified by the gravitational interaction between the planet. We derive an analytic formula that describes the change of the semi-major axis of the particle due to the encounter with the planet using local approximation in distant encounter regime. Our final formula includes the effects of steady, axisymmetric radial gas flow, the global gas pressure gradient in the disk, planet gravity, and the structure of the gas flow modified by the planet's gravity. We compare the analytic results with numerical calculations, and indicate that our formula well describes the secular evolution of the dust particles' semi-major axes well, especially for small particles with large drag coefficient. We discuss the conditions for dust gap opening around a low mass planet and radial distribution of dust particles. Our formula may provide a useful tool for calculating radial distribution of particles in a disk around the planet.

Contact: `muto@tap.scphys.kyoto-u.ac.jp`

On the width and shape of the corotation region for low-mass planets

S.-J. Paardekooper, J.C.B. Papaloizou
DAMTP, University of Cambridge, Wilberforce Road, CB3 0WA Cambridge, UK

Monthly Notices of the Royal Astronomical Society, accepted (arXiv:0901.2263)

We study the coorbital flow for embedded, low mass planets. We provide a simple semi-analytic model for the corotation region, which is subsequently compared to high resolution numerical simulations. The model is used to derive an expression for the half-width of the horseshoe region, x_s, which in the limit of zero softening is given by $x_s/r_p = 1.68(q/h)^{1/2}$, where q is the planet to central star mass ratio, h is the disc aspect ratio and r_p the orbital radius. This is in very good agreement with the same quantity measured from simulations. This result is used to show that horseshoe drag is about an order of magnitude larger than the linear corotation torque in the zero softening limit. Thus the horseshoe drag, the sign of which depends on the gradient of specific vorticity, is important for estimates of the total torque acting on the planet. We further show that phenomena, such as the Lindblad wakes, with a radial separation from corotation of $\sim$ a pressure scale height H can affect x_s, even though for low-mass planets $x_s \ll H$. The effect is to distort streamlines and to reduce x_s through the action of a back pressure. This effect is reduced for smaller gravitational softening parameters and planets of higher mass, for which x_s becomes comparable to H.

Download/Website: `http://arxiv.org/abs/0901.2263`

Contact: `S.Paardekooper@damtp.cam.ac.uk`

On corotation torques, horseshoe drag and the possibility of sustained stalled or outward protoplanetary migration

S.-J. Paardekooper, J.C.B. Papaloizou
DAMTP, University of Cambridge, Wilberforce Road, CB3 0WA Cambridge, UK

Monthly Notices of the Royal Astronomical Society, accepted (arXiv:0901.2265)

We study the torque on low mass protoplanets on fixed circular orbits, embedded in a protoplanetary disc in the isothermal limit. We consider a wide range of surface density distributions including cases where the surface density increases smoothly outwards. We perform both linear disc response calculations and non linear numerical simulations. We consider a large range of viscosities, including the inviscid limit, as well as a range of protoplanet mass ratios, with special emphasis on the coorbital region and the corotation torque acting between disc and protoplanet. For low mass protoplanets and large viscosity the corotation torque behaves as expected from linear theory. However, when the viscosity becomes small enough to enable horseshoe turns to occur, the linear corotation torque exists only temporarily after insertion of a planet into the disc, being replaced by the horseshoe drag first discussed by Ward. This happens after a time that is equal to the horseshoe libration period reduced by a factor amounting to about twice the disc aspect ratio. This torque scales with the radial gradient of specific vorticity, as does the linear torque, but we find it to be many times larger. If the viscosity is large enough for viscous diffusion across the coorbital region to occur within a libration period, we find that the horseshoe drag may be sustained. If not, the corotation torque saturates leaving only the linear Lindblad torques. As the magnitude of the non linear coorbital torque (horseshoe drag) is always found to be larger than the linear torque, we find that the sign of the total torque may change even for for mildly positive surface density gradients. In combination with a kinematic viscosity large enough to keep the torque from saturating, strong sustained deviations from linear theory and outward or stalled migration may occur in such cases.

Download/Website: `http://arxiv.org/abs/0901.2265`

Contact: `S.Paardekooper@damtp.cam.ac.uk`

Ground-based secondary eclipse detection of the very-hot Jupiter OGLE-TR-56b

David K. Sing[1] *& Mercedes López-Morales*[2]

[1] Institut d'Astrophysique de Paris, CNRS/UPMC, 98bis boulevard Arago, 75014 Paris, France
[2] Carnegie Institution of Washington, Dept. of Terrestrial Magnetism, 5241 Broad Branch Road NW, Washington, DC 20015, USA

Astronomy & Astrophysics, 2009A&A...493L..31S

We report on the detection of the secondary eclipse of the very-hot Jupiter OGLE-TR-56b from combined z'-band time series photometry obtained with the VLT and Magellan telescopes. We measure a flux decrement of $0.0363 \pm 0.0091\%$ from the combined Magellan and VLT datasets, which indicates a blackbody brightness temperature of 2718^{+127}_{-107} K, a very low albedo, and a small incident radiation redistribution factor, indicating a lack of strong winds in the planet's atmosphere. The measured secondary depth is consistent with thermal emission, but our precision is not sufficient to distinguish between a black-body emitting planet, or emission as predicted by models with strong optical absorbers such as TiO/VO. This is the first time that thermal emission from an extrasolar planet is detected at optical wavelengths and with ground-based telescopes.

Download/Website: `http://arxiv.org/abs/0901.1876`

Contact: `sing@iap.fr`

Secondary radio eclipse of the transiting planet HD 189733 b: an upper limit at 307-347 MHz

A. M. S. Smith[1]*, A. Collier Cameron*[1]*, J. Greaves*[1]*, M. Jardine*[1]*, G. Langston*[2]*, D. Backer*[3]

[1] SUPA, School of Physics & Astronomy, University of St Andrews, North Haugh, St Andrews, Fife, KY16 9SS, UK
[2] National Radio Astronomy Observatory, Green Bank, WV 24944, USA
[3] Astronomy Department, University of California at Berkeley, Berkeley, CA 94720, USA

Monthly Notices of the Royal Astronomical Society, in press (arXiv:0901:2344)

We report the first attempt to observe the secondary eclipse of a transiting extra-solar planet at radio wavelengths. We observed HD 189733 b with the Robert C. Byrd Green Bank Telescope of the NRAO over about 5.5 hours before, during and after secondary eclipse, at frequencies of 307 - 347 MHz. In this frequency range, we determine the 3-σ upper limit to the flux density to be 81 mJy. The data are consistent with no eclipse or a marginal reduction in flux at the time of secondary eclipse in all subsets of our bandwidth; the strongest signal is an apparent eclipse at the 2-σ level in the 335.2 - 339.3 MHz region. Our observed upper limit is close to theoretical predictions of the flux density of cyclotron-maser radiation from the planet.

Download/Website: `http://arxiv.org/abs/0901.2344`

Contact: `amss@st-and.ac.uk`

The generalised Lomb-Scargle periodogram. A new formalism for the floating-mean and Keplerian periodograms

M. Zechmeister, M. Kürster
Max-Planck-Institut für Astronomie, Königstuhl 17, 69117 Heidelberg, Germany

Astronomy & Astrophysics, in press (arXiv:0901.2573)

The Lomb-Scargle periodogram is a common tool in the frequency analysis of unequally spaced data equivalent to least-squares fitting of sine waves. We give an analytic solution for the generalisation to a full sine wave fit, including an offset and weights (χ^2 fitting). Compared to the Lomb-Scargle periodogram, the generalisation is superior as it provides more accurate frequencies, is less susceptible to aliasing, and gives a much better determination of the spectral intensity. Only a few modifications are required for the computation and the computational effort is similar. Our approach brings together several related methods that can be found in the literature, viz. the date-compensated discrete Fourier transform, the floating-mean periodogram, and the "spectral significance" estimator used in the SigSpec program, for which we point out some equivalences. Furthermore, we present an algorithm that implements this generalisation for the evaluation of the Keplerian periodogram that searches for the period of the best-fitting Keplerian orbit to radial velocity data. The systematic and non-random algorithm is capable of detecting eccentric orbits, which is demonstrated by two examples and can be a useful tool in searches for the orbital periods of exoplanets.

Download/Website: `http://arxiv.org/abs/0901.2573`

Contact: `zechmeister@mpia.de`

3 Jobs and positions

PDRAs in Exoplanet Research at Keele University

Coel Hellier
Astrophysics Group, Keele University, U.K.

Astrophysics Group, Keele University, Deadline: 10th March 2009

Applications are invited for two PDRAs in extrasolar planet research at Keele University, U.K.

The WASP-South survey for exoplanet transits, operated by Keele University as part of the WASP consortium, is the leading transit-search program in the Southern hemisphere, having found the 12 brightest transiting planets in the South.

The PDRAs will join Keele's exoplanet team, and will participate in the operation of WASP-South and the discovery of further WASP planets. They will also have early access to WASP planets for followup science, and will be expected to develop and lead science exploitation of WASP planets and other extrasolar planets.

Applicants should have or expect to obtain a PhD in astrophysics or a related area, and have a background showing an aptitude to contribute to the WASP project in the above areas. The posts will be offered for up to 3 years with a likely starting date of October 2009.

For enquiries please contact Coel Hellier at ch@astro.keele.ac.uk; closing date for applications: 10th March 2009.

Download/Website: `http://www.astro.keele.ac.uk/`

Contact: `ch@astro.keele.ac.uk`

Postdoctoral Research Fellow in Exoplanet Research

Jeremy Bailey
School of Physics, University of New South Wales, Sydney, Australia

UNSW, Deadline: 28th February 2009

The School of Physics at the University of New South Wales has an opening for a postdoctoral research fellow to work on the modelling of exoplanet atmospheres. The fellow would join a growing planetary/exoplanetary research group at UNSW which forms part of the Australian Centre for Astrobiology also located at UNSW. The project will invlove carrying out computer modelling of the radiative transfer in planetary atmospheres with the aim of predicting signatures of habitability and life that might be observable with future space or ground-based instruments. Testing of these models may involve observational work on solar system and extrasolar planets using ground-based telescopes or spacecraft.

The position is for two years with a possible extension for a further 6 to 12 months. Applications should be submitted using the online form obtained by following the "How to Apply" link in the web page below.

Download/Website: `http://www.hr.unsw.edu.au/services/recruitment/jobs/16010908.html`

Contact: `j.bailey@unsw.edu.au`

Research Fellow in Exoplanets and Low Mass Stars

A. Fitzsimmons
Astrophysics Research Centre, School of Mathematics and Physics, Queens University of Belfast

Queens University Belfast, Deadline: 27th March 2009

Applications are invited for a 3-year Post Doctoral Research Fellowship position in low mass stars and exoplanets, funded by the Science & Technology Facilities Council (STFC). The post is located within the Astrophysics Research Centre (ARC) of the School of Mathematics and Physics. ARC is one of the founders of the WASP Project and operates and maintains the SuperWASP facility on La Palma as well as developing a successor survey.

The successful candidate will be expected to develop and support research within the Exoplanet Group in ARC, including planet detection and characterisation methods using SuperWASP and other facilities available to us. However, they will not be expected to directly support SuperWASP operations. The Exoplanet Group within ARC is well supported by STFC and is expanding. By mid-2009 the group will consist of 4 academic staff, 4 research staff and a number of PhD students.

Applicants must have a PhD in a relevant subject either awarded or submitted by the time of taking up the post. Experience of observational techniques used in astrophysics, including spectroscopy and photometry plus associated data reduction techniques, are essential. However these do not have to be at optical wavelengths. Also essential is a reasonable number of high quality publications commensurate with stage of career.

Informal enquiries may be directed to Prof. Alan Fitzsimmons (telephone: +442890973124, email: a.fitzsimmons@qub.ac.uk). Salary: £29,704-£34,435 per annum. Closing date: 4.00 pm, Friday 27 March 2009.

Contact: `a.fitzsimmons@qub.ac.uk`

Opportunity for Assistant Professor Fellowship

Göran Olofsson, Garrelt Mellema
Dept. of Astronomy, Stockholm University, AlbaNova University Centre, SE-10691 Stockholm, Sweden

Stockholm, Deadline: 1st March 2009

To strengthen the star & planet formation research at the department of Astronomy, Stockholm University, we are looking for talented researchers interested in applying together with us for a personal 4 year fellowship from the (VR), with a possible extension to 5 years. To be eligible for this fellowship your PhD should typically be more recent than April 2004 (with some exceptions, e.g. due to parental leave), and you are normally expected to have at least two years of postdoc experience. With the fellowship you will be employed as assistant professor with about 20% teaching/departemental duties (25% if the department agrees to pay a 5th year). It also comes with a personal research budget. The fellowship is prestigious, with only some 30 granted each year for all of the natural sciences in Sweden, and at most one in astronomy. The decision on the fellowship will be taken by the Swedish National Research Councillate 2009, and the position could start any time during 2010.

The star & planet formation research at Stockholm University is mostly observational, using facilities such as ESO/VLT, APEX, and involvement in Herschel and ALMA. Theoretical/computational work mainly deals with disc-planet interaction and the structure of HII regions. We are also part of the Stockholm University graduate school in Astrobiology, a truly crossdisciplinary collaboration with the departments of physics, geology and molecular biology. We are interested in researchers working observationally and/or theoretically on star formation, planet formation/exo-planets, and/or astrobiology.

Since the actual application to the research council has to be done jointly with the institute (with a deadline in April), we invite those interested in applying to contact one of us before March 1. Please include a CV. You can also contact us for more information: Göran Olofsson (olofsson@astro.su.se) or Garrelt Mellema (garrelt@astro.su.se).

Download/Website: `http://www.astro.su.se`

Contact: `olofsson@astro.su.se, garrelt@astro.su.se`

Tenure-track faculty position in Astronomy (Exoplanets)

Lennart Lindegren
Lund Observatory, Box 43, SE-22100 Lund, Sweden

Lund Observatory, Sweden, Deadline: 9th March 2009

Lund Observatory invites applications for a tenure-track faculty position in Astronomy, with specialisation in exoplanets. The appointment is initially limited to four years, but can be made permanent following an evaluation procedure. The official Swedish title of the position is Associate senior lecturer.

Lund Observatory is the Astronomy Department of Lund University, located in southern Sweden and one of the largest universities in Scandinavia.

We seek excellent candidates to carry out research, undergraduate teaching and supervision of PhD students, with a focus within the general area of exoplanets. Research can be theoretical or observational. Relevant areas include, for example: methods to detect and characterize extrasolar planets and planetary systems, observations of such systems, and theoretical studies of their formation and evolution. Undergraduate and advanced teaching (up to about 25% of full time) could concern these and related areas, such as astrobiology and the exploration of the solar

system. Teaching could be in English or Swedish.

Candidates should have completed a PhD degree or have corresponding scientific competence in a relevant subject area. Priority will be given to candidates who have completed their PhD not more than five years before the application deadline, not counting parental leave and similar.

For detailed information about the position and how to apply, please consult the web address below. Applications should quote the reference number for the position, Ref. No. 4398.

The deadline for applications is Monday, March 9, 2009.

The University strives to achieve an even gender balance and especially encourages applications from women for this position.

Download/Website: `http://www.astro.lu.se/vacancybul.html`

Contact: `lennart@astro.lu.se`

4 As seen on astro-ph

The following list contains all the entries relating to exoplanets that we spotted on astro-ph during December 2008 and January 2009. If you spot any that we missed, please let us know and we'll include them in the next issue.

Exoplanets

astro-ph/0812.0029: **A Smaller Radius for the Transiting Exoplanet WASP-10b** by *John A. Johnson, Joshua N. Winn, Nicole E. Cabrera et al*

astro-ph/0812.0586: **Type I Planet Migration in Nearly Laminar Disks** by *H. Li, S. H. Lubow, S. Li et al*

astro-ph/0812.0599: **OGLE2-TR-L9: An extrasolar planet transiting a fast-rotating F3 star** by *I.A.G. Snellen, J. Koppenhoefer, R.F.J. van der Burg et al*

astro-ph/0812.0785: **Characterization of the HD 17156 planetary system** by *M. Barbieri, R. Alonso, S. Desidera et al*

astro-ph/0812.1027: **Habitability of Super-Earth Planets around Other Suns: Models including Red Giant Branch Evolution** by *W. von Bloh, M. Cuntz, K.-P. Schroeder et al*

astro-ph/0812.1161: **HATNet Field G205: Follow-Up Observations of 28 Transiting-Planet candidates and Confirmation of the Planet HAT-P-8b** by *David W. Latham, Gaspar A. Bakos, Guillermo Torres et al*

astro-ph/0812.1305: **Expected Planet and False Positive Detection Rates for the Transiting Exoplanet Survey Satellite** by *Timothy M. Brown & David W. Latham*

astro-ph/0812.1463: **Empirical evidence for tidal spin-up in transiting planetary systems** by *Frederic Pont*

astro-ph/0812.1582: **Ten New and Updated Multi-planet Systems, and a Survey of Exoplanetary Systems** by *J. T. Wright, S. Upadhyay, G. W. Marcy et al*

astro-ph/0812.1608: **The HARPS search for southern extra-solar planets. XVII. Super-Earth and Neptune-mass planets in multiple planet systems HD47186 and HD181433** by *F. Bouchy, M. Mayor & C. Lovis*

astro-ph/0812.1799: **A cool starspot or a second transiting planet in the TrES-1 system?** by *M. Rabus, R. Alonso, J. A. Belmonte et al*

astro-ph/0812.1930: **The extrasolar planet atmosphere and exosphere: Emission and transmission spectroscopy** by *Giovanna Tinetti & Jean-Philippe Beaulieu*

astro-ph/0812.1998: **Improved parameters for the transiting hot Jupiters WASP-4b and WASP-5b** by *M. Gillon, B. Smalley, L. Hebb et al*

astro-ph/0812.2475: **Dynamical Simulations of the Planetary System HD69830** by *Matthew J. Payne, Eric B. Ford, Mark C. Wyatt et al*
astro-ph/0812.2561: **The multiplicity of exoplanet host stars - New low-mass stellar companions of the exoplanet host stars HD125612 and HD212301** by *M. Mugrauer & R. Neuhaeuser*
astro-ph/0812.2949: **Equilibria in the secular, non-coplanar two-planet system** by *Cezary Migaszewski & Krzysztof Gozdziewski*
astro-ph/0812.2951: **Spitzer Planet Limits around the Pulsating White Dwarf GD66** by *Fergal Mullally, William T. Reach, Steven Degennaro et al*
astro-ph/0812.3195: **Eccentricity modulation of a close-in planet by a companion - application to GJ 436 system** by *Tong Xiao & Ji-Lin Zhou*
astro-ph/0812.3240: **WASP-12b: The hottest transiting planet yet discovered** by *L. Hebb, A. Collier-Cameron, B. Loeillet et al*
astro-ph/0812.3549: **Observations of the transiting planet TrES-2 with the AIU Jena telescope in Grosschwabhausen** by *St. Raetz, M. Mugrauer, T. O. B. Schmidt et al*
astro-ph/0901.0282: **HAT-P-11b: A Super-Neptune Planet Transiting a Bright K Star in the Kepler Field** by *G. A. Bakos, G. Torres, A. Pal et al*
astro-ph/0901.0304: **Isotropic Gamma-Ray Background: Cosmic-Ray Induced Albedo from Debris in the Solar System?** by *Igor V. Moskalenko & Troy A. Porter*
astro-ph/0901.0343: **Transit Timing Observations of the Extrasolar Hot-Neptune Planet GL 436b** by *Guy S. Stringfellow, Jeffrey L. Coughlin, Mercedes Lopez-Morales et al*
astro-ph/0901.0582: **Discovering the Growth Histories of Exoplanets: The Saturn Analog HD 149026b** by *Sarah E. Dodson-Robinson & Peter Bodenheimer*
astro-ph/0901.0625: **Transit observations at the observatory in Grossschwabhausen: XO-1b and TrES-1** by *M. Vanko, St. Raetz, M. Mugrauer*
astro-ph/0901.0735: **Thermal Tides in Short Period Exoplanets** by *Phil Arras, Aristotle Socrates*
astro-ph/0901.1206: **Directly Determined Linear Radii and Effective Temperatures of Exoplanet Host Stars** by *Gerard T. van Belle & Kaspar von Braun*
astro-ph/0901.1214: **The Earth as an extrasolar planet: The vegetation spectral signature today and during the last Quaternary climatic extrema** by *Luc Arnold, Franois-Marie Bron & Simon Brewer*
astro-ph/0901.1547: **On the various origins of close-in extrasolar planets** by *B. Levrard, C. Winisdoerffer & G. Chabrier*
astro-ph/0901.1698: **The HD 40307 Planetary System: Super-Earths or Mini-Neptunes?** by *Rory Barnes, Brian Jackson, Sean N. Raymond et al*
astro-ph/0901.1838: **Planet formation bursts at the borders of the dead zone in 2D numerical simulations of circumstellar disks** by *W. Lyra, A. Johansen, A. Zsom et al*
astro-ph/0901.1876: **Ground-based secondary eclipse detection of the very-hot Jupiter OGLE-TR-56b** by *David K. Sing & Mercedes Lopez-Morales*
astro-ph/0901.1878: **Ground-based K-band detection of thermal emission from the exoplanet TrES-3b** by *E.J.W. de Mooij & I.A.G. Snellen*
astro-ph/0901.2018: **Exoplanets - search methods, discoveries, and prospects for astrobiology** by *Barrie W. Jones*
astro-ph/0901.2048: **Falling Transiting Extrasolar Giant Planets** by *B. Levrard, C. Winisdoerffer & G. Chabrier*
astro-ph/0901.2344: **Secondary radio eclipse of the transiting planet HD 189733 b: an upper limit at 307-347 MHz** by *A. M. S. Smith, A. Collier Cameron, J. Greaves et al*
astro-ph/0901.3144: **The architecture of the GJ876 planetary system. Masses and orbital coplanarity for planets b and c** by *Jacob L. Bean & Andreas Seifahrt*
astro-ph/0901.3240: **Exoplanet research with SAFARI: A far-IR imaging spectrometer for SPICA** by *J.R. Goicoechea, K. Isaak & B. Swinyard*

astro-ph/0901.3401: **Diurnal Thermal Tides in a Non-synchronized Hot Jupiter** by *Pin-Gao Gu, Gordon I. Ogilvie*
astro-ph/0901.4346: **The Transit Light Curve Project. XI. Submillimagnitude Photometry of Two Transits of the Bloated Planet WASP-4b** by *Joshua N. Winn, Matthew J. Holman, Joshua A. Carter et al*
astro-ph/0901.4394: **The NASA-UC Eta-Earth Program: I. A Super-Earth Orbiting HD 7924** by *Andrew W. Howard, John A. Johnson, Geoffrey W. Marcy et al*
astro-ph/0901.4523: **The planet-hosting subdwarf B star V391 Pegasi is a hybrid pulsator** by *R. Lutz, S. Schuh, R. Silvotti et al*
astro-ph/0901.4618: **Photospheric activity and rotation of the planet-hosting star CoRoT-Exo-4a** by *A. F. Lanza, S. Aigrain, S. Messina et al.*
astro-ph/0901.4705: **Discovery and characterization of WASP-6b, an inflated sub-Jupiter mass planet transiting a solar-type star** by *M. Gillon, D. R. Anderson, A. H. M. J. Triaud et al*

Disks

astro-ph/0812.2847: **The Frequency of Warm Debris Disks and Transition Disks in a Complete Sample of Intermediate-Mass GLIMPSE Stars: Placing Constraints on Disk Lifetimes** by *B. Uzpen, H.A. Kobulnicky & K. Kinemuchi*
astro-ph/0812.3916: **Two-Dimensional Transport of Solids in Viscous Protoplanetary Disks** by *Fred Ciesla*
astro-ph/0901.4434: **Global MHD simulations of stratified and turbulent protoplanetary discs. II. Dust settling** by *Sebastien Fromang & Richard P. Nelson*

Instrumentation and Techniques

astro-ph/0812.2161: **PIERNIK mhd code - a multi-fluid, non-ideal extension of the relaxing-TVD scheme (I)** by *Michal Hanasz, Kacper Kowalik, Dominik Woltanski et al.*
astro-ph/0812.1591: **Distinguishing between Planetary and Binary Interpretations of Microlensing Central Perturbations under Severe Finite-Source Effect** by *Cheongho Han*
astro-ph/0812.2799: **PIERNIK mhd code - a multi-fluid, non-ideal extension of the relaxing-TVD scheme (II)** by *Michal Hanasz, Kacper Kowalik, Dominik Woltanski et al*
astro-ph/0901.0846: **A Metric and Optimisation Scheme for Microlens Planet Searches** by *Keith Horne, Colin Snodgrass & Yianni Tsapras*
astro-ph/0901.2206: **The CoRoT satellite in flight : description and performance** by *M. Auvergne, P. Bodin, L. Boisnard et al*
astro-ph/0901.2429: **Apodized Lyot Coronagraph for VLT-SPHERE: Laboratory tests and performances of a first prototype in the visible** by *Geraldine Guerri, Sylvie Robbe-Dubois, Jean-Baptiste Daban et al*
astro-ph/0901.3083: **Interpreting the yield of transit surveys: Are there groups in the known transiting planets population?** by *Fressin Francois, Guillot Tristan & Nesta Lionel*
astro-ph/0901.3529: **BIGRE: a low cross-talk integral field unit tailored for extrasolar planets imaging spectroscopy** by *Jacopo Antichi, Kjetil Dohlen, Raffaele G. Gratton et al*