ExoPlanet News
An Electronic Newsletter

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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

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

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.

For the next edition we will experiment with the inclusion of ONE figure per abstract. If you wish to do so, please include a figure caption at the end of your abstract and append a single Encapsulated Postscript file (.eps) of your figure. 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 June 2009.

Best wishes
Andrew Norton & Glenn White
The Open University

2 Abstracts of refereed papers

Circumplanetary disc properties obtained from radiation hydrodynamical simulations of gas accretion by protoplanets

Ben A. Ayliffe, Matthew R. Bate
School of Physics, University of Exeter, Stocker Road, Exeter, EX4 4QL, UK

Monthly Notices of the Royal Astronomical Society, accepted (arXiv:0904.4884)

We investigate the properties of circumplanetary discs formed in three-dimensional, self-gravitating radiation hydrodynamical models of gas accretion by protoplanets. We determine disc sizes, scaleheights, and density and temperature profiles for different protoplanet masses, in solar nebulae of differing grain opacities.
We find that the analytical prediction of circumplanetary disc radii in an evacuated gap ($R_{\rm Hill}/3$) from Quillen & Trilling (1998) yields a good estimate for discs formed by high mass protoplanets. The radial density profiles of the circumplanetary discs may be described by power-laws between r^{-2} and $r^{-3/2}$. We find no evidence for the ring-like density enhancements that have been found in some previous models of circumplanetary discs. Temperature profiles follow a $\sim r^{-7/10}$ power-law regardless of protoplanet mass or nebula grain opacity. The discs invariably have large scaleheights ($H/r > 0.2$), making them thick in comparison with their encompassing circumstellar discs, and they show no flaring.

Download/Website: `http://arxiv.org/abs/0904.4884`

Contact: `ayliffe@astro.ex.ac.uk`

A Quasi-Stationary Solution to Gliese 436b's Eccentricity

Konstantin Batygin[1,2], Gregory Laughlin[1], Stefano Meschiari[1], Eugenio Rivera[1], Steve Vogt[1], Paul Butler[3]

[1] UCO/Lick Observatory, University of California, Santa Cruz, CA 95064
[2] Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125
[3] Department of Terrestrial Magnetism, Carnegie Institution of Washington, Washington DC 20015

Astrophysical Journal, in press (http://arxiv.org/abs/0904.3146v2)

We investigate the possibility that the large orbital eccentricity of the transiting Neptune-mass planet Gliese 436b is maintained in the face of tidal dissipation by a second planet in the system. We find that the currently observed configuration can be understood if Gliese 436b and a putative companion have evolved to a quasi-stationary fixed point in which the planets' orbital apses are co-linear and in which secular variations in the orbital eccentricities of the two planets have been almost entirely damped out. In our picture, the two planets are currently experiencing a long-period of gradual orbital circularization. Specifically, if Gliese 436b has a tidal $Q \sim 300,000$, similar to both the Jovian Q and to the upper limit for the Neptunian Q, then this circularization timescale can be of order $\tau \sim 8\,\mathrm{Gyr}$ given the presence of a favorably situated perturber. We adopt an octopole-order secular theory based on a Legendre expansion in the semi-major axis ratio a_1/a_2 to delineate well-defined regions of (P_c, M_c, e_c) space that can be occupied by a perturbing companion. This description includes the leading-order effects of General Relativity, and retains accuracy for perturbing companion planets that have high eccentricity. We incorporate the evolutionary effect of tidal dissipation into our secular model of the system, and solve the resulting initial value problems for a large sample of the allowed configurations. We find a locus of apsidally aligned configurations that are (1) consistent with the currently published radial velocity data, (2) consistent with the current lack of observed transit timing variations, (3) subject to rough constraint on dynamical stability, and which (4) have damping time scales consistent with the current multi-Gyr age of the star. We then polish the stationary configurations derived from secular theory with full numerical integrations, and compute the transit timing variations and radial velocity half-amplitudes induced by the resulting configurations. We present our results in the form of candidate companion planets to Gliese 436b. For these candidates, radial velocity half-amplitudes, K_c, are of order $3\,\mathrm{ms}^{-1}$, and the maximum amplitude of orbit-to-orbit transit timing variations are of order $\Delta t = 1\,\mathrm{s}$ to $\Delta t = 5\,\mathrm{s}$. For the particular example case of a perturber with orbital period, $P_c = 40\,\mathrm{d}$, mass, $M_c = 8.5\,M_\oplus$, and eccentricity, $e_c = 0.58$, we confirm our semi-analytic calculations with a full numerical 3-body integration of the orbital decay that includes tidal damping and spin evolution. Additionally, we discuss the possibility of many-perturber stationary configurations, utilizing modified Laplace-Lagrange secular theory. We then perform a proof-of-concept tidally dissipated numerical integration with 3 planets, which shows the system approaching a triply circular state.

Contact: kbatygin@gps.caltech.edu

Search for Carbon Monoxide in the atmosphere of the Transiting Exoplanet HD 189733b

J.-M. Désert[1], A. Lecavelier des Etangs[1], G. Hébrard[1], D. K. Sing[1], D. Ehrenreich[2], R. Ferlet[1], and A. Vidal-Madjar[1]

[1] Institut d'astrophysique de Paris, CNRS (UMR 7095), Université Pierre et Marie Curie, 98 bis boulevard Arago, 75014 Paris, France
[2] Laboratoire d'astrophysique de l'observatoire de Grenoble, Université Joseph Fourier, CNRS (UMR 5571), BP53 38041 Grenoble cedex 9, France

Astrophysical Journal, Accepted (arXiv:0903.3405)

Water, methane and carbon-monoxide are expected to be among the most abundant molecules besides molecular hydrogen in the hot atmosphere of close-in extrasolar giant planets. Atmospheric models for these planets predict that the strongest spectrophotometric features of those molecules are located at wavelengths ranging from 1 to 10 μm making this region of particular interest. Consequently, transit observations in the mid-IR allow the

atmospheric content of transiting planets to be determined. We present new primary transit observations of the hot-jupiter HD 189733b, obtained simultaneously at 4.5 and 8 μm with the Infrared Array Camera (IRAC) onboard the *Spitzer Space Telescope*. Together with a new refined analysis of previous observations at 3.6 and 5.8 μm using the same instrument, we are able to derive the system parameters, including planet-to-star radius ratio, impact parameter, scale of the system, and central time of the transit from fits of the transit light curves at these four wavelengths. We measure the four planet-to-star radius ratios, to be $(R_p/R_\star)_{3.6\,\mu\mathrm{m}} = 0.1545 \pm 0.0003$, $(R_p/R_\star)_{4.5\,\mu\mathrm{m}} = 0.1557 \pm 0.0003$, $(R_p/R_\star)_{5.8\,\mu\mathrm{m}} = 0.1547 \pm 0.0005$, and $(R_p/R_\star)_{8\,\mu\mathrm{m}} = 0.1544 \pm 0.0004$. The high accuracy of the planet radii measurement allows the search for atmospheric molecular absorbers. Contrary to a previous analysis of the same dataset, our study is robust against systematics and reveals that water vapor absorption at 5.8 μm is not detected in this photometric dataset. Furthermore, in the band centered around 4.5 μm we find a hint of excess absorption with an apparent planetary radius $\Delta R_p/R_* = 0.00128 \pm 0.00056$ larger (2.3σ) than the one measured simultaneously at 8 μm. This value is 4σ above what would be expected for an atmosphere where water vapor is the only absorbing species in the near infrared. This shows that an additional species absorbing around 4.5 μm could be present in the atmosphere. Carbon monoxide (CO) being a strong absorber at this wavelength is a possible candidate and this may suggest a large CO/H_2O ratio between 5 and 60.

Download/Website: `http://lanl.arxiv.org/abs/0903.3405`

Contact: `desert@iap.fr`

Detectability and Error Estimation in Orbital Fits of Resonant Extrasolar Planets

C.A. Giuppone[1]*, M. Tadeu dos Santos*[2]*, C. Beaugé*[1]*, S. Ferraz-Mello*[2]*, T.A. Michtchenko*[2]

[1] Observatorio Astronómico, Universidad Nacional de Córdoba, Córdoba, Argentina
[2] Instituto de Astronomia, Geofísica e Ciências Atmosféricas,Universidade de São Paulo, São Paulo, Brazil

apj, in press (arXiv:0905.0433)

We estimate the conditions for detectability of two planets in a 2/1 mean-motion resonance from radial velocity data, as a function of their masses, number of observations and the signal-to-noise ratio. Even for a data set of the order of 100 observations and standard deviations of the order of a few meters per second, we find that Jovian-size resonant planets are difficult to detect if the masses of the planets differ by a factor larger than ~ 4. This is consistent with the present population of real exosystems in the 2/1 commensurability, most of which have resonant pairs with similar minimum masses, and could indicate that many other resonant systems exist, but are presently beyond the detectability limit.

Furthermore, we analyze the error distribution in masses and orbital elements of orbital fits from synthetic data sets for resonant planets in the 2/1 commensurability. For various mass ratios and number of data points we find that the eccentricity of the outer planet is systematically over estimated, although the inner planet's eccentricity suffers a much smaller effect. If the initial conditions correspond to small amplitude oscillations around stable apsidal corotation resonances (ACR), the amplitudes estimated from the orbital fits are biased toward larger amplitudes, in accordance to results found in real resonant extrasolar systems.

Download/Website: `http://arxiv.org/abs/0905.0433v1`

Contact: `cristian@oac.uncor.edu`

Observational Evidence for Tidal Destruction of Exoplanets

Brian Jackson[1], *Rory Barnes*[1,2], *Richard Greenberg*[1]
[1] University of Arizona, Lunar and Planetary Laboratory, Tucson AZ
[2] University of Washington, Virtual Planetary Laboratory, Seattle WA

Astrophysical Journal, in press (arXiv:0904.1170)

The distribution of the orbits of close-in exoplanets shows evidence for on-going removal and destruction by tides. Tides raised on a planets host star cause the planets orbit to decay, even after the orbital eccentricity has dropped to zero. Comparison of the observed orbital distribution and predictions of tidal theory show good qualitative agreement, suggesting tidal destruction of close-in exoplanets is common. The process can explain the observed cut-off in small a-values, the clustering of orbital periods near three days, and the relative youth of transiting planets. Contrary to previous considerations, a mechanism to stop the inward migration of close-in planets at their current orbits is not necessarily required. Planets nearing tidal destruction may be found with extremely small a, possibly already stripped of any gaseous envelope. The recently discovered CoRoT-Exo-7 b may be an example of such a planet and will probably be destroyed by tides within the next few Gyrs. Also, where one or more planets have already been accreted, a star may exhibit an unusual composition and/or spin rate.

Contact: bjackson@lpl.arizona.edu

Consequences of expanding exoplanetary atmospheres for magnetospheres

E. P. G. Johansson[1], *T. Bagdonat*[1], *and U. Motschmann*[1,2]
[1] Institute for Theoretical Physics, TU Braunschweig, Mendelssohnstrasse 3, 38106 Braunschweig, Germany
[2] Institute for Planetary Research, DLR, Berlin, Germany

Astronomy & Astrophysics, published (2009A&A...496..869J)

The atmospheres of close-in extrasolar planets are expected to both undergo hydrodynamic expansion due to strong heating and produce strong expanding ionospheres due to intense photoionization, while at the same time being exposed to strong stellar winds. This scenario can be expected to lead to new types of magnetospheres and previously unseen interactions between stellar wind plasma and ionospheres. Our aim is to start looking at these kinds of scenarios for close-in terrestrial planets using hybrid simulations. For this purpose we used a hybrid code, treating electrons as a massless, charge-neutralizing, adiabatic fluid and ions as macroparticles, to study the influence of a strongly expanding ionosphere on the stellar wind interaction for an unmagnetized close-in extrasolar terrestrial planet. For both with and without expansion, we can identify bow shock, magnetopause, and ion-composition boundary. The expanding ionosphere pushes the bow shock, magnetic draping, and ion composition boundary upstream and increases the size of the entire interaction region, creating a large wake behind the planet, largely void of electromagnetic fields and dominated only by the expanding ionosphere. On the dayside, little ionospheric radial bulk flow is actually observed since the ions are quickly thermalized after being added to the ionosphere.

Contact: e.johansson@tu-bs.de

Electric charging of dust aggregates and its effect on dust coagulation in protoplanetary disks

Satoshi Okuzumi
Graduate School of Human and Environmental Studies, Kyoto University, Yoshida-nihonmatsu-cho, Sakyo-ku, Kyoto 606-8501, Japan

Astrophysical Journal, in press (arXiv:0901.2886)

Mutual sticking of dust aggregates is the first step toward planetesimal formation in protoplanetary disks. In spite that the electric charging of dust particles is well recognized in some contexts, it has been largely ignored in the current modeling of dust coagulation. In this study, we present a general analysis of the dust charge state in protoplanetary disks, and then demonstrate how the electric charging could dramatically change the currently accepted scenario of dust coagulation. First, we describe a new semianalytical method to calculate the dust charge state and gas ionization state self-consistently. This method is far more efficient than previous numerical methods, and provides a general and clear description of the charge state of gas-dust mixture. Second, we apply this analysis to compute the collisional cross section of growing aggregates taking their charging into account. As an illustrative example, we focus on early evolutionary stages where the dust has been thought to grow into fractal ($D \sim 2$) aggregates with a quasi-monodisperse (i.e., narrow) size distribution. We find that, for a wide range of model parameters, the fractal growth is strongly inhibited by the electric repulsion between colliding aggregates and eventually "freezes out" on its way to the subsequent growth stage involving collisional compression. Strong disk turbulence would help the aggregates to overcome this growth barrier, but then it would cause catastrophic collisional fragmentation in later growth stages. These facts suggest that the combination of electric repulsion and collisional fragmentation would impose a serious limitation on dust growth in protoplanetary disks. We propose a possible scenario of dust evolution after the freeze-out. Finally, we point out that the fractal growth of dust aggregates tends to maintain a low ionization degree and, as a result, a large magnetorotationally stable region in the disk.

Download/Website: `http://arxiv.org/abs/0901.2886`

Contact: `satoshi.okuzumi@ax2.ecs.kyoto-u.ac.jp`

Efficient Fitting of Multi-Planet Keplerian Models to Radial Velocity and Astrometry Data

J. T. Wright[1]*, A. W. Howard*[2]
[1] Cornell University, Ithaca, NY, USA
[2] Space Sciences Laboratory, University of California, Berkeley, CA, USA

ApJS, 2009ApJS...182...205W

We describe a technique for solving for the orbital elements of multiple planets from radial velocity (RV) and/or astrometric data taken with 1 m/s and μas precision, appropriate for efforts to detect Earth-massed planets in their stars' habitable zones, such as NASA's proposed Space Interferometry Mission. We include details of calculating analytic derivatives for use in the Levenberg-Marquardt (LM) algorithm for the problems of fitting RV and astrometric data separately and jointly.
We also explicate the general method of separating the linear and nonlinear components of a model fit in the context of an LM fit, show how explicit derivatives can be calculated in such a model, and demonstrate the speed up and convergence improvements of such a scheme in the case of a five-planet fit to published radial velocity data for 55 Cnc using code we have published at http://exoplanets.org/code/

Contact: `jtwright@astro.cornell.edu`

Probing the Interiors of Very Hot Jupiters using Transit Light Curves

Darin Ragozzine[1]*, Aaron S. Wolf*[1]

[1] Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125
Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125

Astrophysical Journal, in press (arXiv:0807.2856)

Accurately understanding the interior structure of extra-solar planets is critical for inferring their formation and evolution. The internal density distribution of a planet has a direct effect on the star-planet orbit through the gravitational quadrupole field created by the rotational and tidal bulges. These quadrupoles induce apsidal precession that is proportional to the planetary Love number (k_{2p}, twice the apsidal motion constant), a bulk physical characteristic of the planet that depends on the internal density distribution, including the presence or absence of a massive solid core. We find that the quadrupole of the planetary tidal bulge is the dominant source of apsidal precession for very hot Jupiters ($a \lesssim 0.025$ AU), exceeding the effects of general relativity and the stellar quadrupole by more than an order of magnitude. For the shortest-period planets, the planetary interior induces precession of a few degrees per year. By investigating the full photometric signal of apsidal precession, we find that changes in transit shapes are much more important than transit timing variations. With its long baseline of ultra-precise photometry, the space-based *Kepler* mission can realistically detect apsidal precession with the accuracy necessary to infer the presence or absence of a massive core in very hot Jupiters with orbital eccentricities as low as $e \simeq 0.003$. The signal due to k_{2p} creates unique transit light curve variations that are generally not degenerate with other parameters or phenomena. We discuss the plausibility of measuring k_{2p} in an effort to directly constrain the interior properties of extra-solar planets.

Download/Website: `http://arxiv.org/abs/0807.2856`

Contact: `darin@gps.caltech.edu`

3 Other abstracts

CoRoT and Hipparcos Light Curves Available through the NASA Star and Exoplanet Database (NStED)

David R. Ciardi on behalf of the NStED team
NASA Exoplanet Science Institute/Caltech

Announcement of web portal,

The NASA Star and Exoplanet Database (NStED, http://nsted.ipac.caltech.edu) announces the opening of the US portal to public data from the CoRoT (Convection, Rotation, and Transits) mission. NStED is a general purpose stellar and exoplanet archive developed to support the scientific communitys efforts in finding and characterizing planets beyond the solar system.

The US portal to CoRoT data is made possible through an agreement between NASA and the French Space Agency, CNES. The current CoRoT release contains the first two CoRoT observing runs with 20,000 stars and 10,000 - 400,000 epochs per light curve. CoRoT is a CNES/ESA mission and, using the photometric transit method, is the first space mission with a science goal dedicated to the discovery of extra-solar planets. Subsequent releases will be made as the CoRoT mission makes available more data adding tens of thousands of new stars and additional epochs. Tools for the analysis and manipulation of light curves will also be added in coming releases.

NStED also announces the availability of the photometric time series data from the Hipparcos mission. The data include light curves for approximately 120,000 nearby bright stars as measured by the space mission Hipparcos. The prime mission of Hipparcos, an ESA mission launched in 1989, was to measure the distances and proper motions

of approximately 120,000 nearby stars. In the process of meeting that goal, the mission measured the photometric brightness of each of these stars approximately 100 times. These time series data are now available through the NStED interface.
There are two principal components of NStED: a database of 140,000 nearby stars and exoplanet-hosting stars, and a database dedicated to high precision photometric surveys for transiting exoplanets. NStED currently serves the following kinds of data: coordinates, multiplicity (including presence of planets), proper motion, parallax, spectral type, multiband photometry, radial velocity, metallicity, and chromospheric and coronal activity index. Furthermore, the following derived quantities are given: distance, effective temperature, mass, radius, luminosity, space motions, and physical/angular dimensions of habitable zone, predicted radial velocity, astrometric, and transit depth signatures of Earth-sized and Jupiter-sized exoplanets. Published radial velocity data and precision photometric time series data are available for the exoplanet hosting stars.
Queries to NStED can be made using constraints on any combination of the above parameters. All data within NStED are linked to the literature reference(s) from which they are obtained, enabling the user the to understand from where the data originate and make an independent assessment of their utility for a particular application.
The NStED dedicated interface for transit survey data provides an interface to the CoRoT data and to ground-based transit survey data including the TrES observations of the Kepler field and KELT observations of the Praesepe field, as well as observations dedicated to time series coverage of four stellar clusters.
Parties interested in donating stellar and exoplanet data may do so by contacting the NStED science team via nsted@ipac.caltech.edu or by visiting the NStED Helpdesk page at the NStED Website.

Download/Website: `http://nsted.ipac.caltech.edu`

Contact: `nsted@ipac.caltech.edu ciardi@ipac.caltech.edu`

4 Conference announcements

Magnetospheres of extrasolar planets: Detectability and implications for planetary evolution

J.-M. Grießmeier[1]*, M. Khodachenko*[2]

[1] Netherlands Institute for Radio Astronomy, Postbus 2, 7990 AA, Dwingeloo, The Netherlands
[2] Space Research Institute, Austrian Academy of Sciences, Graz, Austria

Potsdam, Germany, 13-18 September 2009

This will be a session MG7 during the European Planetary Science Congress 2009. The scientific program is available on-line (http://meetingorganizer.copernicus.org/EPSC2009/sessionprogramme/MG) and abstracts can be submitted until May 8, 2009.
This session focuses on the magnetospheres of extrasolar planets. The implications of exoplanetary magnetospheres will be discussed, both for giant planets (such as Hot Jupiters) and for terrestrial planets. Possible areas in which magnetospheres may be important include atmospheric loss, atmospheric composition, magnetospheric radio emission, (magnetic) star-planet interaction, and habitability. The observable signatures of these effects will be presented, and their potential for indirect characterization of the magnetosphere will be discussed. This session intends to bring together researchers specialized in different fields, each of which contributes to this strongly interdisciplinary research area.

Download/Website: `http://meetingorganizer.copernicus.org/EPSC2009/session/1813`

Contact: `griessmeier@astron.nl`

5 Jobs and positions

Postdoctoral positions: Herschel/DUNES and Herschel/GASPS

Carlos Eiroa

Universidad Autonoma de Madrid, From June 1st, 2009

Two Postdoctoral positions are available at the Universidad Autonoma de Madrid to work in the frame of the Herschel Open Time Key Programmes DUNES ("Dust Around Nearby Stars", - http://www.mpia-hd.mpg.de/DUNES/ - PI: Eiroa) and GASPS ("Gas in Protoplanetary Systems", - http://www.laeff.inta.es/projects/herschel/ - PI: Dent). The selected candidates will participate intensively in the Herschel data reduction and analysis, and ancillary data. In particular, the candidate assigned to DUNES will have a high responsibility concerning data reduction. It is also expected an active collaboration with team members of both programmes, in particular with those developing theoretical models. Daily work will be carried out in very close collaboration with team members located in Madrid and involved in both programmes, which include staff at UAM, LAEFF, and ESAC. Opportunities to develop independent astrophysical research in circumstellar disks and related areas are not excluded.
Interested persons should have a PhD in Astrophysics. Experience in far-IR observations including continuum and line data reduction and analysis is a clear factor of merit; formation and knowledge in dust and/or gas models of disks is also a clear asset.
One of the positions will start on July 1st and will extend for 2 years and a half. The second position is open from June 1st and should be filled not later than September or October 1st. The duration of this second position is also 2 years and a half. In any case, selection of candidates will continue untill the positions are filled.
Gross yearly salary for both positions is around 27000 - 27500 euros
Applicants should send a curriculum vitae, brief statement of research, interests and plans, and arrange for three letters of reference to be sent to: Carlos Eiroa, Dpto. Fisica Teorica, Universidad Autonoma de Madrid, Cantoblanco, 28049 Madrid, Spain. Applications can also be sent by e-mail to: carlos.eiroa@uam.es

Lectureships/Senior Lectureships/Associate Professorships in Star Formation or Extra-solar Planets

Matthew Bate
University of Exeter, School of Physics, Stocker Road, Exeter EX4 4QL, UK

Exeter, United Kingdom, send applications by 1st June 2009

Applications are invited for up to two lectureships/associate professorships in a further expansion of the Astrophysics Group in the School of Physics at the University of Exeter. This Group currently comprises 8 permanent academic staff, with more than 20 post-doctoral researchers and PhD students. 95% of research from the School of Physics has been classified as being of international quality in the Research Assessment Exercise (RAE).
Our current research programme consists of both observational and theoretical studies of galactic star formation and extra-solar planets, and thus we seek applicants directly in these areas, or in a related field. We particularly encourage applications from candidates with ongoing active observational programmes at optical/ infrared and/or (sub-) millimetre wavelengths, with the goal of exploiting major future facilities including ALMA, JWST, and E-ELT.
The successful applicants will have full competitive access to facilities available to UK astronomers, including the VLT and Gemini, as well as high-performance computing resources at Exeter. The Group leads CONSTELLATION, the EC-funded Research Training Network of 12 European teams working on the origin of stellar masses, and is also involved in CoRoT and eSTAR.
Applicants will have a proven world-class research track record, an appropriate first degree and a PhD. They will be able to demonstrate an independent research programme, which will strengthen and complement the existing team

at the University. Applicants will have a strong record in attracting research funding, or demonstrable potential to attract such funding as well as enthusiasm for delivering undergraduate programmes.
Appointments at a more senior level will be considered for applicants of appropriate experience, details of which are contained within our application pack.
Appointments will be made within the following salary range: Associate Professor £50,816 – £53,650 pa with access to further contribution points rising to £64,060; Senior Lecturer £38,757 – £44,930 pa with access to further contribution points rising to £52,086; Lecturer £31,513 – £35,469 pa with access to further contribution points rising to £38,757.
Informal enquiries may be made to Professor Matthew Bate (telephone: +44 (0)1392 725 513; email: mbate@astro.ex.ac.uk).
Application packs are available from http://www.exeter.ac.uk/working/prospective/vacancies/ or by contacting hradmin@exeter.ac.uk
Applications should quote reference E06. The closing date for completed applications is 12 noon on 1 June 2009.
The University of Exeter is an equal opportunity employer and promotes diversity in its workforce and, whilst all applicants will be judged on merit alone, is particularly keen to consider applications from groups currently underrepresented in the workforce.

Download/Website: `http://www.exeter.ac.uk/working/prospective/vacancies/`

Contact: `mbate@astro.ex.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 April 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/0904.0131: **Investigations of the Formation and Evolution of Planetary Systems** by *Alwyn Wootten, Bryan Butler, Antonio Hales et al.*

astro-ph/0904.0374: **Is there a metallicity enhancement in planet hosting red giants?** by *Pawel Zielinski, Andrzej Niedzielski, Monika Adamow et al.*

astro-ph/0904.1170: **Observational Evidence for Tidal Destruction of Exoplanets** by *Brian Jackson, Rory Barnes & Richard Greenberg*

astro-ph/0904.1208: **The changing phases of extrasolar planet CoRoT-1b** by *Ignas A.G. Snellen, Ernst J.W. de Mooij & Simon Albrecht*

astro-ph/0904.1688: **The spin-orbit alignment of the Fomalhaut planetary system probed by optical long baseline interferometry** by *Jean-Baptiste Le Bouquin, Olivier Absil, Myriam Benisty et al.*

astro-ph/0904.2003: **From Protostars to Planetary Systems : FUV Spectroscopy of YSOs, Protoplanetary Disks, and Extrasolar Giant Planets** by *Paul A. Scowen, Rolf Jansen, Matthew Beasley et al.*

astro-ph/0904.2524: **Extrasolar planet population synthesis I: Method, formation tracks and mass-distance distribution** by *Christoph Mordasini, Yann Alibert & Willy Benz*

astro-ph/0904.2452: **Extrasolar planet population synthesis II: Statistical comparison with observation** by *Christoph Mordasini, Yann Alibert, Willy Benz et al.*

astro-ph/0904.2979: **Bulk composition of the transiting hot Neptune around GJ 436** by *P. Figueira, F. Pont & C. Mordasini*

astro-ph/0904.3336: **Type II migration of planets on eccentric orbits** by *Althea V. Moorhead & Eric B. Ford*

astro-ph/0904.3936: **A Search for Wide Companions to the Extrasolar Planetary System HR 8799** by *Laird M. Close & Jared R. Males*
astro-ph/0904.4106: **Is the HR 8799 extrasolar system destined for planetary scattering?** by *Krzysztof Gozdziewski & Cezary Migaszewski*
astro-ph/0904.4704: **HAT-P-12b: A Low-Density Sub-Saturn Mass Planet Transiting a Metal-Poor K Dwarf** by *J. D. Hartman, G. A. Bakos, G. Torres et al.*

Disks

astro-ph/0904.0334: **Radiation thermo-chemical models of protoplanetary disks I. Hydrostatic disk structure and inner rim** by *Peter Woitke, Inga Kamp & Wing-Fai Thi*
astro-ph/0904.3363: **Dispersal of protoplanetary disks by central wind stripping** by *I. Matsuyama, D. Johnstone & D. Hollenbach*
astro-ph/0904.4160: **Formation of multi-planetary systems in turbulent disks** by *Hanno Rein & John C. B. Papaloizou*
astro-ph/0904.4491: **A Short Guide to Debris Disk Spectroscopy** by *Christine H. Chen*
astro-ph/0904.4884: **Circumplanetary disc properties obtained from radiation hydrodynamical simulations of gas accretion by protoplanets** by *Ben A. Ayliffe & Matthew R. Bate*

Instrumentation and Techniques

astro-ph/0904.0415: **Detection and Characterization of Extrasolar Planets through Doppler Spectroscopy** by *A. Eggenberger & S. Udry*
astro-ph/0904.0822: **Detectability of Terrestrial Planets in Multi-Planet Systems: Preliminary Report** by *Wesley A. Traub, Charles Beichman, Andrew F. Boden et al.*
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