ExoPlanet News
An Electronic Newsletter

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Contents

1 Editorial

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

We plan that the newsletter will cover not only discoveries and observations of exoplanets, but protostellar discs, theoretical simulations of planet formation, exoplanetary atmospheres and interiors, comparative planetology, formation and dynamics of planetary systems, planetary evolution and habitability, instrumentation and missions, origin and evolution of life on terrestrial planets, co-evolution of life, atmospheres and climate, characterisation of terrestrial exoplanets and detection of biomarkers.

To make the newsletter a success we will be relying on you, the subscribers to the newsletter, to send us your abstracts of recent papers, conference announcements, thesis abstracts, job adverts etc. So please send anything relevant to `exoplanet@open.ac.uk` and it will appear in the next edition in a few months time. Please let us know anything else you'd like to see appear in the newsletter, and we'll see what we can do.

Finally, thanks to Boris Gänsicke for permission to use the LaTeX style file which he developed for the 'Interacting Binaries Newsletter' which forms the basis of the layout of this publication.

Best wishes
Andrew Norton & Glenn White

2 Abstracts of refereed papers

SuperWASP-North Extra-solar Planet Candidates between 3hr $<$ RA $<$ 6hr

Clarkson, W.I.[1,2], *Enoch, B.*[1], *Haswell, C.A.*[1], *Norton, A.J.*[1], *Christian, D.J.*[3], *Collier Cameron, A.*[4], *Kane, S.R.*[4,5], *Horne, K.*[4], *Lister, T.A.*[4,6,7], *Street, R.A.*[3,8], *West, R.G.*[9], *Wilson, D.M.*[6], *Evans, A.*[6], *Fitzsimmons, A.*[3], *Hellier, C.*[6], *Hodgkin, S.T.*[10], *Irwin, J.*[10], *Keenan, F.P.*[3], *Osborne, J.*[9], *Pollacco, D.L.*[3], *Ryans, R.*[3], *Skillen, I.*[11], *Wheatley, P.J.*[12]

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Monthly Notices of the Royal Astronomical Society, in press (arXiv:0708.0785)

The Wide Angle Search for Planets (WASP) photometrically surveys a large number of nearby stars to uncover candidate extrasolar planet systems by virtue of small-amplitude lightcurve dips on a $<$5-day timescale typical of the "Hot-Jupiters." Observations with the SuperWASP-North instrument between April and September 2004 produced a rich photometric dataset of some 1.3 billion datapoints from 6.7 million stars. Our custom-built data acquisition and processing system produces $\sim$0.02 mag photometric precision at V=13. We present the transit-candidates in the 03h-06h RA range. Of 141,895 lightcurves with sufficient sampling to provide adequate coverage, 2688 show statistically significant transit-like periodicities. Of these, 44 pass visual inspection of the lightcurve, of which 24 are removed through a set of cuts on the statistical significance of artefacts. All but 4 of the remaining 20 objects are

removed when prior information at higher spatial-resolution from existing catalogues is taken into account. Of the four candidates remaining, one is considered a good candidate for follow-up observations with three further second-priority targets. We provide detailed information on these candidates, as well as a selection of the false-positives and astrophysical false-alarms that were eliminated, and discuss briefly the impact of sampling on our results.

Download/Website: `http://arxiv.org/abs/0708.0785`

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An anomaly detector with immediate feedback to hunt for planets of Earth mass and below by microlensing

M. Dominik[1], *N.J. Rattenbury*[2], *A. Allan*[3], *S. Mao*[2], *D.M. Bramich*[4], *M.J. Burgdorf*[5], *E. Kerins*[2], *Y. Tsapras*[5], *Ł. Wyrzykowski*[6,7]

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Monthly Notices of the Royal Astronomical Society, in press (arXiv:0706.2566)

The discovery of OGLE 2005-BLG-390Lb, the first cool rocky/icy exoplanet, impressively demonstrated the sensitivity of the microlensing technique to extra-solar planets below $10\ M_\oplus$. A planet of $1\ M_\oplus$ instead of the expected $5\ M_\oplus$ for OGLE 2005-BLG-390Lb (with an uncertainty factor of two) in the same spot would have provided a detectable deviation with an amplitude of ~ 3 per cent and a duration of ~ 12 h. While a standard sampling interval of 1.5 to 2.5 hours for microlensing follow-up observations appears to be insufficient for characterizing such light curve anomalies and thereby claiming the discovery of the planets that caused these, an early detection of a deviation could trigger higher-cadence sampling which would have allowed the discovery of an Earth-mass planet in this case. Here, we describe the implementation of an automated anomaly detector, embedded into the eSTAR system, that profits from immediate feedback provided by the robotic telescopes that form the RoboNet-1.0 network. It went into operation for the 2007 microlensing observing season. As part of our discussion about an optimal strategy for planet detection, we shed some new light on whether concentrating on highly-magnified events is promising and planets in the 'resonant' angular separation equal to the angular Einstein radius are revealed most easily. Given that sub-Neptune mass planets can be considered being common around the host stars probed by microlensing (preferentially M- and K-dwarfs), the higher number of events that can be monitored with a network of 2m telescopes and the increased detection efficiency for planets below $5\ M_\oplus$ arising from an optimized strategy gives a common effort of current microlensing campaigns a fair chance to detect an Earth-mass planet (from the ground) ahead of the COROT or Kepler missions. The detection limit of gravitational microlensing extends even below $0.1\ M_\oplus$, but such planets are not very likely to be detected from current campaigns. However, these will be within the reach of high-cadence monitoring with a network of wide-field telescopes or a space-based telescope.

Download/Website: `http://dx.doi.org/10.1111/j.1365-2966.2007.12124.x`

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Spectral Evolution of an Earth-Like Planet

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Astrophysical Journal, published (2007ApJ...658..598K)

We have developed a characterization of the geological evolution of the Earth's atmosphere and surface in order to model the observable spectra of an Earth-like planet through its geological history. These calculations are designed to guide the interpretation of an observed spectrum of such a planet by future instruments that will characterize exoplanets. Our models focus on planetary environmental characteristics whose resultant spectral features can be used to imply habitability or the presence of life. These features are generated by H2O, CO2, CH4, O2, O3, N2O, and vegetation-like surface albedos. We chose six geological epochs to characterize. These epochs exhibit a wide range in abundance for these molecules, ranging from a CO2-rich early atmosphere, to a CO2/CH4-rich atmosphere around 2 billion years ago, to a present-day atmosphere. We analyzed the spectra to quantify the strength of each important spectral feature in both the visible and thermal infrared spectral regions, and the resolutions required to optimally detect the features for each epoch. We find a wide range of spectral resolutions required for observing the different features. For example, H2O and O3 can be observed with relatively low resolution, while O2 and N2O require higher resolution. We also find that the inclusion of clouds in our models significantly affects both the strengths of all spectral features and the resolutions required to observe all these.

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Astrometric effects of solar-like magnetic activity in late-type stars and their relevance for the detection of extrasolar planets

A. F. Lanza[1], *C. De Martino*[1,2], *M. Rodonò*[1,2]
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New Astronomy, in press (arXiv:0706.2942)

Using a simple model based on the characteristics of sunspots and faculae in solar active regions, the effects of surface brightness inhomogeneities on the position of the photocentre of the disk of a solar-like, magnetically active star, are studied. A general law is introduced, giving the maximum amplitude of the photocentre excursion produced by a distribution of active regions with a given surface filling factor. The consequences for the detection of extrasolar planets by means of the astrometric method are investigated with some applications to forthcoming space missions, such as GAIA and SIM, as well as to ground-based interferometric measurements. Spurious detections of extrasolar planets can indeed be caused by activity-induced photocentre oscillations, requiring a simultaneous monitoring of the optical flux and a determination of the rotation period and of the level of activity of the target stars for an appropriate discrimination.

Download/Website: http://web.ct.astro.it/preprints/

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A laboratory demonstration of the capability to image an Earth-like extrasolar planet

John T. Trauger and Wesley A. Traub

Nature, published (2007Natur.446..771T)

The detection and characterization of an Earth-like planet orbiting a nearby star requires a telescope with an extraordinarily large contrast at small angular separations. At visible wavelengths, an Earth-like planet would be 1×10^{-10} times fainter than the star at angular separations of typically 0.1 arcsecond or less. There are several proposed space telescope systems that could, in principle, achieve this. Here we report a laboratory experiment that reaches these limits. We have suppressed the diffracted and scattered light near a star-like source to a level of 6×10^{-10} times the peak intensity in individual coronagraph images. In a series of such images, together with simple image processing, we have effectively reduced this to a residual noise level of about 0.1×10^{-10}. This demonstrates that a coronagraphic telescope in space could detect and spectroscopically characterize nearby exoplanetary systems, with the sensitivity to image an 'Earth-twin' orbiting a nearby star.

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Origin of the Metallicity Dependence of Exoplanet Host Stars in the Protoplanetary Disk Mass Distribution

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MNRAS, in press (arXiv:0707.2733)

The probability of a star hosting a planet that is detectable in radial velocity surveys increases $P_{\rm pl}(Z) \propto (10^Z)^2$, where Z is stellar metallicity. Models of planet formation by core accretion reproduce this trend, since the protoplanetary disk of a high metallicity star has a high density of solids and so forms planetary cores which accrete gas before the primordial gas disk dissipates. This paper considers the origin of the form of the metallicity dependence of $P_{\rm pl}(Z)$. We introduce a simple model in which detectable planets form when the mass of solid material in the protoplanetary disk, $M_{\rm s}$, exceeds a critical value. In this model the form of $P_{\rm pl}(Z)$ is a direct reflection of the distribution of protoplanetary disk masses, $M_{\rm g}$, and the observed metallicity relation is reproduced if $P(M_{\rm g} > M_{\rm g}^{'}) \propto (M_{\rm g}^{'})^{-2}$. We argue that a protoplanetary disk's dust mass measured in sub-mm observations is a relatively pristine indicator of the mass available for planet-building and find that the disk mass distribution derived from such observations is consistent with the observed $P_{\rm pl}(Z)$ if a solid mass $M_{\rm s} > 0.5 M_{\rm J}$ is required to form detectable planets. Any planet formation model which imposes a critical solid mass for detectable planets to form would reproduce the observed metallicity relation, and core accretion models are empirically consistent with such a threshold criterion. While the outcome of planet formation in individual systems is debatable, we identify 7 protoplanetary disks which, by rigid application of this criterion, would be expected to form detectable planets and may provide insight into the physical conditions required to form such planets. A testable prediction of the model is that the metallicity dependence should flatten both for $Z > 0.5$ dex and as more distant and lower mass planets are discovered. Further, combining this model with one in which the evolution of a star's debris disk is also influenced by the solid mass in its protoplanetary disk, results in the prediction that debris disks detected around stars with planets should be more infrared luminous than those around stars without planets in tentative agreement with recent observations.

Download/Website: http://arxiv.org/abs/0707.2733

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3 Other abstracts

Comparative Planetology and the Search for Life Beyond the Solar System

C.A. Beichman, M. Fridlund, W.A. Traub, K.R.Stapelfledt, A. Quirrenbach, and S. Seage

Protostars and Planets, published (2007prpl.conf..915B)

The study of planets beyond the solar system and the search for other habitable planets and life is just beginning. Groundbased (radial velocity and transits) and spacebased surveys (transits and astrometry) will identify planets spanning a wide range of size and orbital location, from Earth-sized objects within 1 AU to giant planets beyond 5 AU, orbiting stars as near as a few parsec and as far as a kiloparsec. After this initial reconnaissance, the next generation of space observatories will directly detect photons from planets in the habitable zones of nearby stars. The synergistic combination of measurements of mass from astrometry and radial velocity, of radius and composition from transits, and the wealth of information from the direct detection of visible and mid-IR photons will create a rich field of comparative planetology. Information on protoplanetary and debris disks will complete our understanding of the evolution of habitable environments from the earliest stages of planet formation to the transport into the inner solar system of the volatiles necessary for life. The suite of missions necessary to carry out the search for nearby, habitable planets and life requires a "Great Observatories" program for planet finding (SIM PlanetQuest, Terrestrial Planet Finder-Coronagraph, and Terrestrial Planet Finder-Interferometer/ Darwin), analogous to the highly successful "Great Observatories Program" for astrophysics. With these new Great Observatories, plus the James Webb Space Telescope, we will extend planetology far beyond the solar system, and possibly even begin the new field of comparative evolutionary biology with the discovery of life itself in different astronomical settings.

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WASP0: A wide field CCD search for extra solar planets. Instrumentation, data analysis and preliminary results

D. Mislis[1]*, S. Pyrzas*[1]*, E. Harlaftis*[2,+]*, R. A. Street*[3]*, K. Horne*[4]*, D. Pollacco*[3]*, J. H. Seiradakis*[1]*, S. R. Kane*[4]*, T. Lister*[4]*, A. Collier Cameron*[4]

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AIP Conf. Proc. (7th International Conference of the Hellenic Astronomical Society), Vol. 848, pp. 810-815

We present the observing strategy, the method of analysis and first results from the WASP0-project, with data taken at the Kryonerion Astronomical Station of the National Observatory of Athens, in 2002. WASP0 (Wide Angle Search for Planets) is a project aiming to discover extrasolar planets using the transit method. Besides extrasolar planets, the project is suitable for detecting new variable stars, novae, asteroids, etc. For the reduction we used the 'SuperWASP pipeline' developed for this specific purpose by the University of St. Andrews and Queens University Belfast, UK, with in situ modifications for our computing facilities.

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Coronagraph Workshop Proceedings

W.A. Traub

Coronagraph Workshop Proceedings, in press (JPL Publication 07-02)

The Coronagraph Workshop Proceedings, from an international workshop held in Pasadena CA in September 2006, focusing on coronagraphic telescopes to detect and characterize Earth-like exoplanets, are just being mailed to people this week: Coronagraph Workshop 2006 (W. Traub, ed.), JPL Publication 07-02, 166 pages, 31 papers, 2007.

Download/Website: `http://planetquest.jpl.nasa.gov/TPF/tpf-c_workshopDocs.cfm`

Contact: `Wesley.A.Traub@jpl.nasa.gov`

Small- and Mid-Scale Exoplanet Space Missions

W.A. Traub

International Workshop, in press (papers available on line)

Small- and Mid-Scale Exoplanet Space Missions, an international workshop held at Moffett Field, CA, in May 2007, focusing on low-cost space missions to detect and characterize Earth-like and other types of exoplanets. All papers are available on-line.

Download/Website: `http://planetquest.jpl.nasa.gov/NavigatorForum/agenda.cfm`

Contact: `Wesley.A.Traub@jpl.nasa.gov`

4 Conference announcements

Darwin-TPF Conference 2008, Osservatorio Capo di Monte, Napoli, Italy, March 10-14

Elvira Covino[1] *& Yves Rabbia*[2]

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Since the Heidelberg (2003) and the San Diego (2004) conferences, the situation of the DARWIN/TPF project has strongly evolved not only politically, but also scientifically and technologically speaking. New scientific observational and theoretical results have been exhibited, laboratory studies have led to interesting breakthroughs, concepts studies concerning the mission itself, but also precursor missions have been done or are under way. At the dawn of the new European "Cosmic Vision" program where the exoplanets science should have a central position, and according to ESA we are pleased to announce that a DARWIN/TPF conference will be held in Napoli (Italy), from the 10th to the 14th of March 2008.
The goal of this conference is to address both scientific and technological aspects of the mission and particularly:

- Planetary systems diversity: formation and evolution, theoretical and observational approaches,
- Planetary atmospheres, spectral signatures and biomarkers
- Zodiacal matter and exo zodis

- DARWIN / TPFI - TPFC project and related technology, including theoretical and laboratory studies.
- DARWIN / TPF precursors: ground-based and space projects.

The conference will include several invited papers on selected topic (state of the art on exoplanets hunting, planetary atmospheres, search for life ...) and contribution papers (oral presentations and posters).
The Web site: http://www.na.astro.it/darwin-tpf/ will be open soon for registration

Download/Website: `http://www.na.astro.it/darwin-tpf/`

5 As seen on astro-ph

The following list contains all the entries relating to exoplanets that we spotted on astro-ph between the beginning of May and and the end of August 2007. If you spot any that we missed, let us know and we'll include them in the next issue.

May 2007

astro-ph/0705.0003: **XO-2b: Transiting Hot Jupiter in a Metal-rich Common Proper Motion Binary** by *Christopher J. Burke et al.*

astro-ph/0705.0004: **On constraining a transiting exoplanet's rotation rate with its transit spectrum** by *David S. Spiegel, Zoltan Haiman, B. Scott Gaudi*

astro-ph/0705.0066: **An Imaging Survey for Extrasolar Planets around 45 Close, Young Stars with SDI at the VLT and MMT** by *Beth A. Biller et al.*

astro-ph/0705.0126: **HD147506b: A Super-Massive Planet in an Eccentric Orbit Transiting a Bright Star** by *G. A. Bakos et al.*

astro-ph/0705.0215: **Transit and secondary eclipse photometry in the near-infrared** by *Ignas Snellen*

astro-ph/0705.0272: **Near infrared spectroscopic search for the close orbiting planet HD 75289b** by *J.R. Barnes et al.*

astro-ph/0705.0356: **Using Transit Timing Observations to Search for Trojans of Transiting Extrasolar Planets** by *Eric B. Ford, Matthew J. Holman*

astro-ph/0705.0910: **Extrasolar planet taxonomy: a new statistical approach** by *Simone Marchi*

astro-ph/0705.0935: **A Planetary Mass Companion to the K0 Giant HD 17092** by *A. Niedzielski et al.*

astro-ph/0705.0993: **A map of the day-night contrast of the extrasolar planet HD 189733b** by *Heather A. Knutson et al.*

astro-ph/0705.1046: **Determination of the size, mass, and density of "exomoons" from photometric transit timing variations** by *A. Simon, K. Szatmary, G.M. Szabo*

astro-ph/0705.1189: **Hot Nights on Extrasolar Planets: Mid-IR Phase Variations of Hot Jupiters** by *N. B. Cowan, E. Agol, D. Charbonneau*

astro-ph/0705.1325: **Planetary embryos and planetesimals residing in thin debris disks** by *Alice C. Quillen, Alessandro Morbidelli, Alex Moore*

astro-ph/0705.1677: **WASP-1: A lithium- and metal-rich star with an oversized planet** by *H.C. Stempels et al.*

astro-ph/0705.1795: **TrES Exoplanets and False Positives: Finding the Needle in the Haystack** by *Francis T. O'Donovan, David Charbonneau*

astro-ph/0705.1858: **A dynamical analysis of the 14 Her planetary system** by *K. Gozdziewski, C. Migaszewski, M. Konacki*

astro-ph/0705.1861: **The Mass of the Candidate Exoplanet Companion to HD 33636 from Hubble Space Telescope Astrometry and High-Precision Radial Velocities** by *Jacob L. Bean et al.*

astro-ph/0705.2004: **TrES-3: A Nearby, Massive, Transiting Hot Jupiter in a 31-Hour Orbit** by *Francis T. O'Donovan et al.*

astro-ph/0705.2164: **Post-Oligarchic Evolution of Protoplanetary Embryos and the Stability of Planetary Systems** by *Ji-Lin Zhou, Douglas N.C. Lin, Yi-Sui Sun*
astro-ph/0705.2219: **Detection of transits of the nearby hot Neptune GJ 436 b** by *M. Gillon et al.*
astro-ph/0705.2598: **SuperWASP-N Extra-solar Planet Candidates Between 18hr $<$ RA $<$ 21hr** by *R.A. Street et al.*
astro-ph/0705.2603: **SuperWASP-North Extrasolar Planet Candidates. Candidates from Fields 17hr $<$ RA $<$ 18hr** by *T. A. Lister et al.*
astro-ph/0705.2781: **Role of Dynamical Research in the Detection and Characterization of Exoplanets** by *Eric B. Ford et al.*
astro-ph/0705.2836: **Atmospheric dynamics of Pegasi planets** by *Adam P. Showman, Curtis S. Cooper*
astro-ph/0705.3023: **The Dust and Gas Around beta Pictoris** by *C. H. Chen et al.*
astro-ph/0705.3039: **Massive planet migration: Theoretical predictions and comparison with observations** by *Philip J. Armitage*
astro-ph/0705.3063: **The Evolution of Protoplanetary Disks Around Millisecond Pulsars: The PSR 1257 +12 System** by *Thayne Currie*
astro-ph/0705.3072: **Observational Techniques for Detecting Planets in Binary Systems** by *Matthew W. Muterspaugh*
astro-ph/0705.3105: **Planetesimal Accretion onto Growing Proto-Gas-Giant Planets** by *Ji-Lin Zhou, Douglas N.C. Lin*
astro-ph/0705.3113: **Dynamics and planet formation in/around binaries** by *Francesco Marzari et al.*
astro-ph/0705.3124: **Do N-planet systems have a boundary between chaotic and regular motions?** by *Ji-Lin Zhou, Yi-Sui Sun*
astro-ph/0705.3141: **The SARG Planet Search** by *S. Desidera et al.*
astro-ph/0705.3173: **Probing the Impact of Stellar Duplicity on Planet Occurrence with Spectroscopic and Imaging Observations** by *A. Eggenberger, S. Udry*
astro-ph/0705.3182: **Gravitational instability in binary protoplanetary disks** by *Lucio Mayer, Alan Boss, Andrew F. Nelson*
astro-ph/0705.3223: **N-body integrators for planets in binary star systems** by *John E. Chambers*
astro-ph/0705.3228: **A Planetary System Around HD 155358: The Lowest Metallicity Planet Host Star** by *William D. Cochran et al.*
astro-ph/0705.3421: **On the Formation and Dynamical Evolution of Planets in Binaries** by *Willy Kley, Richard Nelson*
astro-ph/0705.3436: **The Minimum Gap-opening Planet Mass in an Irradiated Circumstellar Accretion Disk** by *Richard G. Edgar, Alice C. Quillen, Jaehong Park*
astro-ph/0705.3444: **Terrestrial Planet Formation in Binary Star Systems** by *Elisa V. Quintana, Jack J. Lissauer*
astro-ph/0705.3687: **SIM PlanetQuest Key Project Precursor Observations to Detect Gas Giant Planets Around Young Stars** by *Angelle Tanner et al.*
astro-ph/0705.3758: **The habitability of super-Earths in Gliese 581** by *W. von Bloh et al.*
astro-ph/0705.4090: **Global models of turbulence in protoplanetary disks I. A cylindrical potential on a Cartesian grid and transport of solids** by *W. Lyra et al.*
astro-ph/0705.4196: **The AU Microscopii Debris Disk: Multiwavelength Imaging and Modeling** by *Michael P. Fitzgerald et al.*
astro-ph/0705.4285: **Shrinking binary and planetary orbits by Kozai cycles with tidal friction** by *Daniel Fabrycky, Scott Tremaine*
astro-ph/0705.4288: **A Ground-Based Search for Thermal Emission from the Exoplanet TrES-1** by *Heather A. Knutson et al.*
astro-ph/0705.4290: **The Gemini Deep Planet Survey – GDPS** by *David Lafreniere et al.*
astro-ph/0705.4343: **A Systematic Study of the Final Masses of Gas Giant Planets** by *T. Tanigawa, M. Ikoma*

June 2007

astro-ph/0706.0095: **A novel L-band imaging search for giant planets in the Tucana and Beta Pictoris moving groups** by *Markus Kasper, Daniel Apai, Markus Janson*

astro-ph/0706.0224: **Long-term tidal evolution of short-period planets with companions** by *Rosemary A. Mardling*

astro-ph/0706.0344: **Collisional processes and size distribution in spatially extended debris discs** by *Philippe Thebault, Jean-Charles Augereau*

astro-ph/0706.0535: **Terrestrial Zone Debris Disk Candidates in h and chi Persei** by *Thayne Currie et al.*

astro-ph/0706.0732: **Hot Jupiters in binary star systems** by *Yanqin Wu, Norman W. Murray, J. Michael Ramsahi*

astro-ph/0706.1040: **H_2D^+ line emission in Proto-Planetary Disks** by *Andrs Asensio Ramos, Cecilia Ceccarelli, Moshe Elitzur*

astro-ph/0706.1047: **The Dynamics-Based Approach to Studying Terrestrial Exoplanets** by *David Charbonneau, Drake Deming*

astro-ph/0706.1235: **From mean-motion resonances to scattered planets: Producing the Solar System, eccentric exoplanets and Late Heavy Bombardments** by *Edward W. Thommes et al.*

astro-ph/0706.1239: **Water vapour and hydrogen in the terrestrial-planet-forming region of a protoplanetary disk** by *J.A. Eisner*

astro-ph/0706.1241: **Inside-Out Evacuation of Transitional Protoplanetary Disks by the Magneto-Rotational Instability** by *Eugene I. Chiang, Ruth A. Murray-Clay*

astro-ph/0706.1272: **Grain Retention and Formation of Planetesimals near the Snow Line in MRI-driven Turbulent Protoplanetary Disks** by *Katherine A. Kretke, D. N. C. Lin*

astro-ph/0706.1684: **The Total Number of Giant Planets in Debris Disks with Central Clearings** by *Peter Faber, Alice C. Quillen*

astro-ph/0706.1713: **Dynamics of the giant planets of the solar system in the gaseous proto-planetary disk and relationship to the current orbital architecture** by *Alessandro Morbidelli et al.*

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