ExoPlanet News
An Electronic Newsletter

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Contents

1 Editorial

Welcome to the forty-first edition of ExoPlanet News.

As usual we have a great selection of recent abstracts in various areas of Exoplanet science, and a couple of upcoming conferences too, as well as an interesting announcement from Marc Kuchner.

As in previous years, we'll take a break from the newsletter in August to allow for summer vacations, so the next edition is planned for September 2011. Please send anything relevant to exoplanet@open.ac.uk, and it will appear then.
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.

Best wishes
Andrew Norton & Glenn White
The Open University

2 Abstracts of refereed papers

Thermal Structure of a Protoplanetary Disk around HD163296: A Study of Vertical Temperature Distribution by CO Emission Lines

E. Akiyama[1], *M. Momose*[1], *H. Hayashi*[1], *Y. Kitamura*[2]
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Publications of the Astronomical Society of Japan, in press

This paper presents observations of a protoplanetary disk around Herbig Ae star HD163296 in ^{12}CO (J=1–0), ^{12}CO (J=3–2), ^{13}CO (J=1–0), and ^{13}CO (J=3–2) emission lines. Double-peaked emission profiles originating from the rotating circumstellar disk were detected in all the lines. The disk parameters were estimated from model calculation in which the radial distribution of temperature or surface density inside the disk has a power-law form. The surface density should be sufficiently high so that the disk is optically thick for all the CO lines, as discussed in previous studies based on interferometric observations. The temperature and outer radius of the disk were also confirmed to be consistent with the previous results. Taking advantage of difference in position of the photosphere among the CO lines, we revealed temperature distribution in vertical direction. The temperature of ^{12}CO (J=3–2) emitting region is about twice higher than that of any other CO emitting region; the former is 58.5 ± 9.5 K while the latter is 31 ± 15 K at 100 AU from the central star, suggesting that there are at least two distinct temperature regions. The best fit temperature for ^{13}CO (J=1–0) that should trace the deepest region of the disk is even lower, implying that there is also a different temperature region in deep inside of the disk. Such vertical temperature distribution in a disk was identified both in T Tauri and Herbig Ae stars (e.g., DM Tau, AB Aur, and HD31648), and this should be a common feature in protoplanetary disks.

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Rapid inward migration of planets formed by gravitational instability

Clément Baruteau[1,2], *Farzana Meru*[3,4] *& Sijme-Jan Paardekooper*[1]
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Monthly Notices of the Royal Astronomical Society, in press (arXiv:1106.0487)

The observation of massive exoplanets at large separation ($\gtrsim 10$ AU) from their host star, like in the HR 8799 system, challenges theories of planet formation. A possible formation mechanism involves the fragmentation of massive self-gravitating discs into clumps. While the conditions for fragmentation have been extensively studied, little is known of the subsequent evolution of these giant planet embryos, in particular their expected orbital migration. Assuming a single planet has formed by fragmentation, we investigate its interaction with the gravitoturbulent disc it is embedded in. Two-dimensional hydrodynamical simulations are used with a simple prescription for the disc cooling. A steady gravitoturbulent disc is first set up, after which simulations are restarted including a planet with a range of masses approximately equal to the clump's initial mass expected in fragmenting discs. Planets rapidly migrate inwards, despite the stochastic kicks due to the turbulent density fluctuations. We show that the migration timescale is essentially that of type I migration, with the planets having no time to open a gap. In discs with aspect ratio ~ 0.1 at their forming location, planets with a mass comparable to, or larger than Jupiter's can migrate in as short as 10^4 years, that is, about 10 orbits at 100 AU. Massive planets formed at large separation from their star by gravitational instability are thus unlikely to stay in place, and should rapidly migrate towards the inner parts of protoplanetary discs, regardless of the planet mass.

Download/Website: `http://arxiv.org/abs/1106.0487`

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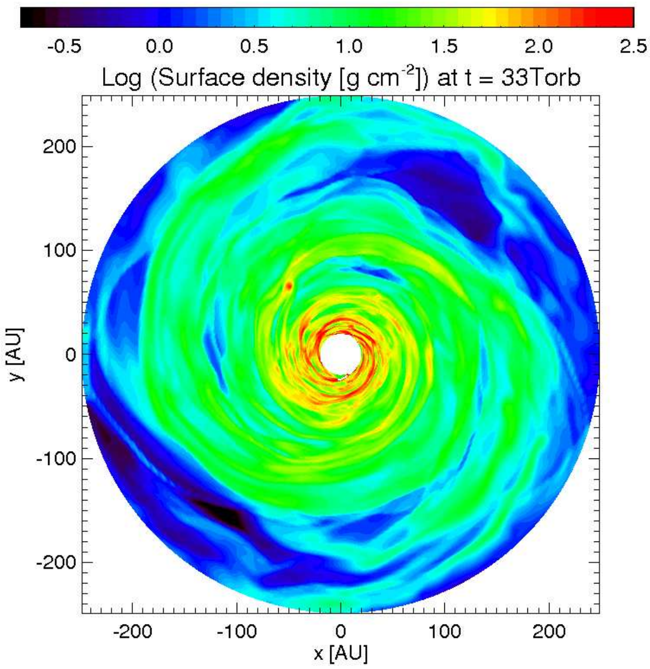

Figure 1: (Baruteau et al.) Contours of the disc's surface density obtained in a restart simulation with a cooling timescale in units of the orbital timescale, $\beta = 30$, where a Jupiter-mass planet has been introduced at 100 AU. Results are displayed three orbits after the restart time. The planet is now located at about 60 AU from the central star (at $x \sim -60$ AU, $y \sim 60$ AU).

Evolution of the Solar Nebula. IX. Gradients in the Spatial Heterogeneity of the Short-Lived Radioisotopes ^{60}Fe and ^{26}Al and the Stable Oxygen Isotopes

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Astrophysical Journal, in press

Short-lived radioisotopes (SLRI) such as ^{60}Fe and ^{26}Al were likely injected into the solar nebula in a spatially and temporally heterogeneous manner. Marginally gravitationally unstable (MGU) disks, of the type required to form gas giant planets, are capable of rapid homogenization of isotopic heterogeneity as well as of rapid radial transport of dust grains and gases throughout a protoplanetary disk. Two different types of new models of a MGU disk in orbit around a solar-mass protostar are presented. The first set has variations in the number of terms in the spherical harmonic solution for the gravitational potential, effectively studying the effect of varying the spatial resolution of the gravitational torques responsible for MGU disk evolution. The second set explores the effects of varying the initial minimum value of the Toomre Q stability parameter, from values of 1.4 to 2.5, i.e., toward increasingly less unstable disks. The new models show that the basic results are largely independent of both sets of variations. MGU disk models robustly result in rapid mixing of initially highly heterogeneous distributions of SLRIs to levels of $\sim$ 10% in both the inner ($<$ 5 AU) and outer ($>$ 10 AU) disk regions, and to even lower levels ($\sim$ 2%) in intermediate regions, where gravitational torques are most effective at mixing. These gradients should have cosmochemical implications for the distribution of SLRIs and stable oxygen isotopes contained in planetesimals (e.g., comets) formed in the giant planet region ($\sim$ 5 to $\sim$ 10 AU) compared to those formed elsewhere.

Download/Website: `http://www.dtm.ciw.edu/users/boss/ftp/nebulaix.pdf`

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The Occurrence Rate of Earth Analog Planets Orbiting Sunlike Stars

Joseph Catanzarite and Michael Shao
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Astrophysical Journal, in press (arXiv:1103.1443)

Kepler is a space telescope that searches Sun-like stars for planets. Its major goal is to determine η_{Earth}, the fraction of Sunlike stars that have planets like Earth. When a planet 'transits' or moves in front of a star, Kepler can measure the concomitant dimming of the starlight. From analysis of the first four months of those measurements for over 150,000 stars, Kepler's science team has determined sizes, surface temperatures, orbit sizes and periods for over a thousand new planet candidates. In this paper, we characterize the period probability distribution function of the super-Earth and Neptune planet candidates with periods up to 132 days, and find three distinct period regimes. For candidates with periods below 3 days the density increases sharply with increasing period; for periods between 3 and 30 days the density rises more gradually with increasing period, and for periods longer than 30 days, the density drops gradually with increasing period. We estimate that 1% to 3% of stars like the Sun are expected to have Earth analog planets, based on the Kepler data release of Feb 2011. This estimate of is based on extrapolation from a fiducial subsample of the Kepler planet candidates that we chose to be nominally 'complete' (i.e., no missed detections) to the realm of the Earth-like planets, by means of simple power law models. The accuracy of the extrapolation will improve as more data from the Kepler mission is folded in. Accurate knowledge of η_{Earth} is essential for the planning of future missions that will image and take spectra of Earthlike planets. Our result that Earths are relatively scarce means that a substantial effort will be needed to identify suitable target stars prior to these future missions.

Download/Website: `http://arxiv.org/abs/1103.1443`

A dynamical analysis of the proposed HU Aquarii planetary system

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Monthly Notices of the Royal Astronomical Society, in press
(http://adsabs.harvard.edu/abs/2011arXiv1106.0777H)

It has recently been suggested that the eclipsing polar HU Aquarii is host to at least two giant planets. We have performed highly detailed dynamical analysis of the orbits of those planets and show that the proposed system is highly unstable on timescales of $< 5\times10^3$ years. For the coplanar orbits suggested in the discovery letter, we find stable orbital solutions for the planetary system only if the outer body moves on an orbit that brings it no closer to the host star than ~ 6 AU. The required periastron distance for the outer planet lies approximately 5 Hill radii beyond the orbit of the inner planet, and well beyond the 1-σ error bars placed on the orbit of the outer planet in the discovery letter. If the orbits of the proposed planets are significantly inclined with respect to one another, the median stability increases slightly, but such systems still become destabilised on astronomically minute timescales (typically within a few 10^4 years). Only in the highly improbable scenario where the outer planet follows a retrograde but coplanar orbit (i.e. inclined by 180° to the orbit of the inner planet) is there any significant region of stability within the original 1-σ orbital uncertainties. Our results suggest that, if there is a second (and potentially, a third planet) in the HU Aquarii system, its orbit is dramatically different to that suggested in the discovery paper, and that more observations are critically required in order to constrain the nature of the suggested orbital bodies.

Download/Website: `http://jontihorner.com/papers/HU_Aqr.pdf`

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Exploring the Habitable Zone for Kepler planetary candidates

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Astrophysical Journal Letters, in press (http://adsabs.harvard.edu/abs/2011arXiv1105.0861K)

This paper outlines a simple approach to evaluate habitability of terrestrial planets by assuming different types of planetary atmospheres and using corresponding model calculations. Our approach can be applied for current and future candidates provided by the Kepler mission and other searches. The resulting uncertainties and changes in the number of planetary candidates in the HZ for the Kepler February 2011 data release are discussed. To first order the HZ depends on the effective stellar flux distribution in wavelength and time, the planet albedo, and greenhouse gas effects. We provide a simple set of parameters which can be used for evaluating current and future planet candidates from transit searches.

Download/Website: `http://adsabs.harvard.edu/abs/2011arXiv1105.0861K`

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The shocking transit of WASP-12b Modelling the observed early ingress in the near ultraviolet

J. Llama[1], *K. Wood*[1], *M. Jardine*[1], *A. A. Vidotto*[1], *Ch. Helling*[1], *L. Fossati*[2], *C. A. Haswell*[2]

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Monthly Notices of the Royal Astronomical Society Letters, in press (arXiv: 1106.2935)

Near ultraviolet observations of WASP-12b have revealed an early ingress compared to the optical transit lightcurve. This has been interpreted as due to the presence of a magnetospheric bow shock which forms when the relative velocity of the planetary and stellar material is supersonic. We aim to reproduce this observed early ingress by modelling the stellar wind (or coronal plasma) in order to derive the speed and density of the material at the planetary orbital radius. From this we determine the orientation of the shock and the density of compressed plasma behind it. With this model for the density structure surrounding the planet we perform Monte Carlo radiation transfer simulations of the near UV transits of WASP-12b with and without a bow shock. We find that we can reproduce the transit lightcurves with a wide range of plasma temperatures, shock geometries and optical depths. Our results support the hypothesis that a bow shock could explain the observed early ingress.

Download/Website: `http://arxiv.org/abs/1106.2935`

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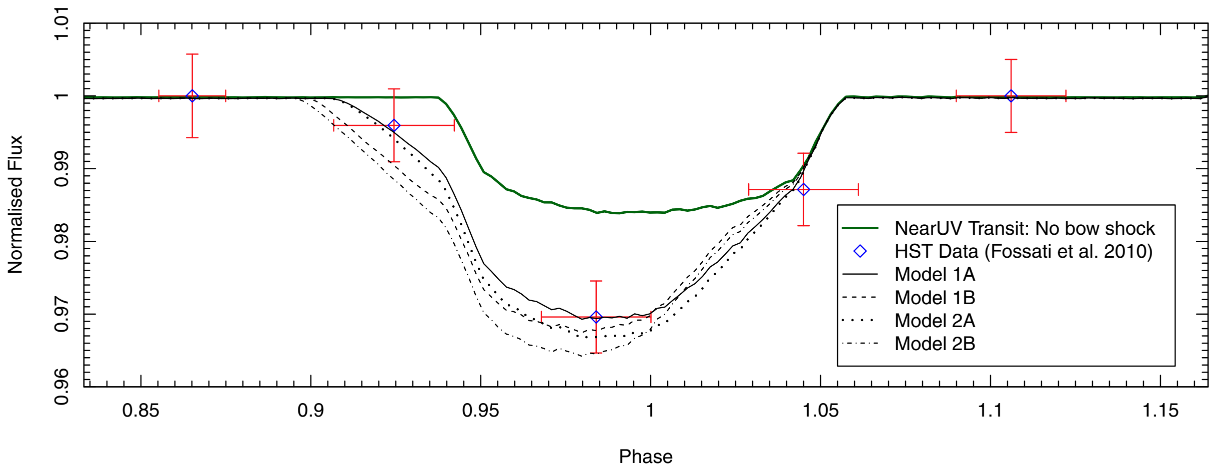

Figure 2: (Llama et al.) Our simulated lightcurves. The green line represents a near-UV transit of a planet without a bow shock. The HST observations are shown in red. The black lines show the results of our simulations of a planet with a bow shock for various shock orientations and geometries.

Kepler Exoplanet Candidate Host Stars are Preferentially Metal Rich

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Astrophysical Journal, in press (astro-ph/1106.6043)

We find that *Kepler* exoplanet candidate (EC) host stars are preferentially metal-rich, including the low-mass stellar hosts of small-radius ECs. The last observation confirms a tentative hint that there is a correlation between the metallicity of low-mass stars and the presence of low-mass and small-radius exoplanets. In particular, we compare the $J - H$—$g - r$ color-color distribution of *Kepler* EC host stars with a control sample of dwarf stars selected from the $\sim$150,000 stars observed during Q1 and Q2 of the *Kepler* mission but with no detected planets. We find that at $J - H = 0.30$ characteristic of solar-type stars, the average $g - r$ color of stars that host giant ECs is 4-σ redder than the average color of the stars in the control sample. At the same time, the average $g - r$ color of solar-type stars that host small-radius ECs is indistinguishable from the average color of the stars in the control sample. In addition, we find that at $J - H = 0.62$ indicative of late K dwarfs, the average $g - r$ color of stars that host small-radius ECs is 4-σ redder than the average color of the stars in the control sample. These offsets are unlikely to be caused by differential reddening, age differences between the two populations, or the presence of giant stars in the control sample. Stellar models suggest that the first color offset is due to a 0.2 dex enhancement in [Fe/H] of the giant EC host population at $M_* \approx 1\ M_\odot$, while Sloan photometry of M 67 and NGC 6791 suggests that the second color offset is due to a similar [Fe/H] enhancement of the small-radius EC host population at $M_* \approx 0.7\ M_\odot$. These correlations are a natural consequence of the core-accretion model of planet formation.

Download/Website: `http://arxiv.org/abs/1106.6043`

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VLT/NACO polarimetric differential imaging of HD100546 – Disk structure and dust grain properties between 10–140 AU

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Astrophysical Journal, in press (1106.1101)

We present polarimetric differential imaging (PDI) data of the circumstellar disk around the Herbig Ae/Be star HD100546 obtained with VLT/NACO. We resolve the disk in polarized light in the H and K_s filter between $\sim$0.1–1.4$''$ (i.e., $\sim$10–140 AU). The innermost disk regions are directly imaged for the first time and the mean apparent disk inclination and position angle are derived. The surface brightness along the disk major axis drops off roughly with $S(r) \propto r^{-3}$ but has a maximum around 0.15$''$ suggesting a marginal detection of the main disk inner rim at $\sim$15 AU. We find a significant brightness asymmetry along the disk minor axis in both filters with the far side of the disk appearing brighter than the near side. This enhanced backward scattering and a low total polarization degree of the scattered disk flux of 14^{+19}_{-8}% suggests that the dust grains on the disk surface are larger than typical ISM grains. Empirical scattering functions reveal the backward scattering peak at the largest scattering angles and a second maximum for the smallest scattering angles. This indicates a second dust grain population preferably forward scattering and smaller in size. It shows that, relatively, in the inner disk regions (40–50 AU) a higher fraction of larger grains is found compared to the outer disk regions (100–110 AU). Finally, our images reveal distinct substructures between 25–35 AU physical separation from the star and we discuss the possible origin for the two features in the context of ongoing planet formation.

Download/Website: `http://xxx.lanl.gov/abs/1106.1101`

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Searching for gas giant planets on Solar System scales: VLT NACO/APP observations of the debris disk host stars HD172555 and HD115892

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ApJL, in press (arXiv:1106.4528v1)

Using the APP coronagraph of VLT/NACO we searched for planetary mass companions around HD115892 and HD172555 in the thermal infrared at 4 μm. Both objects harbor unusually luminous debris disks for their age and it has been suggested that small dust grains were produced recently in transient events (e.g., a collision) in these systems. Such a collision of planetesimals or protoplanets could have been dynamically triggered by yet unseen companions. We did not detect any companions in our images but derived the following detection limits: For both objects we would have detected companions with apparent magnitudes between $\sim$13.2–14.1 mag at angular separations between 0.4–1.0$''$ at the 5-σ level. For HD115892 we were sensitive to companions with 12.1 mag even at 0.3$''$. Using theoretical models these magnitudes are converted into mass limits. For HD115892 we would have detected objects with 10–15 $M_{\rm Jup}$ at angular separations between 0.4–1.0$''$ (7–18 AU). At 0.3$''$ ($\sim$5.5 AU) the detection limit was $\sim$25 $M_{\rm Jup}$. For HD172555 we reached detection limits between 2–3 $M_{\rm Jup}$ at separations between 0.5–1.0$''$ (15–29 AU). At 0.4$''$ ($\sim$11 AU) the detection limit was $\sim$4 $M_{\rm Jup}$. Despite the non-detections our data demonstrate the unprecedented contrast performance of NACO/APP in the thermal infrared at very small inner working angles and we show that our observations are mostly background limited at separations $\sim$0.5$''$.

Download/Website: `http://xxx.lanl.gov/abs/1106.4528`

Contact: `quanz@astro.phys.ethz.ch`

3 Conference announcements

From Atoms to Pebbles: Herschel's View of Star and Planet Formation

Symposium Chairs: Michel Rouzé (CNES) and Jean-Charles Augereau (IPAG)

Grenoble, France, March 20–23, 2012

How do stars and planets form and evolve in time?

Since mid-2009, the Herschel Space Observatory provides new light on these long-standing astrophysical questions. With its 3.5 m primary mirror, it delivers observations in the 55–671 μm range with unprecedented sensitivity, spatial and spectral resolution, revolutionising our understanding of the star and planet formation processes.

Approaching the three year anniversary of the launch of Herschel, the French Space Agency (CNES) and the Institut de Planétologie et d'Astrophysique de Grenoble (IPAG), are organising an exceptional Symposium: **From Atoms to Pebbles: Herschel's view of Star and Planet Formation**. This event will be held over 3.5 days, from 20$^{\rm th}$ to 23$^{\rm rd}$ of March 2012, in Grenoble (the heart of the French Alps), France.

The scientific themes of the symposium will be centred around the physical and chemical evolution of gas and dust in star and planet forming environments and on the impact of the low-and high-mass star formation processes on the surroundings. Specific sessions will be dedicated to :

- The pre-collapse phase,
- The protostellar phase,

- Planet-forming circumstellar disks,
- Debris disks, together with their connection to extra-solar planets.

Please consider your participation at this event and reserve the week from 20 to 23 March 2012 in your agenda. More details and key dates will be reported in the second announcement, as well as on the Symposium web site. **To receive future announcements, you are welcome to provide your email address by going to:** http://www.herschel2012.com/newsletter/newsletter.php

Looking forward to your participation in this unique event.

Scientific Committee: P. André (CEA/Saclay), P. Caselli (Leeds), F. Casoli (CNES), E. Caux (IRAP), N. Evans (Austin), T. Henning (MPIA), I. Kamp (Groningen), R. Liseau (Onsala), A. Roberge (NASA Goddard), M. Wyatt (Cambridge), J.-C. Augereau, Chair (IPAG)

Organizing Committee: J.-C. Augereau (IPAG), A. Bacmann (IPAG), P. Boucheron (CTA EVENTS), C. Ceccarelli (IPAG), B. Darolles (CNES), A. Faure (IPAG), P. Hily-Blant (IPAG), S. Maret (IPAG), F. Ménard (IPAG), C. Monsan (CNES), C. Pinte (IPAG), M. Rouzé (CNES), M. Soulié (CTA EVENTS), M.-H. Sztefek (IPAG), W.-F. Thi (IPAG)

Download/Website: http://www.herschel2012.com/information/

Contact: augereau@obs.ujf-grenoble.fr

2011 Sagan Summer Workshop: Exploring Exoplanets with Microlensing

C. Brinkworth
NASA Exoplanet Science Institute, California Institute of Technology, Pasadena, CA, USA

Pasadena, CA, July 25-29, 2011

Space is still available for the 2011 Sagan Exoplanet Summer Workshop: “Exploring Exoplanets with Microlensing”. The workshop will take place on the Caltech campus July 25 - 29, 2011. The workshop is intended for graduate students and postdocs interested in learning more about the microlensing technique, however all interested parties are welcome to attend. The list of topics to be covered includes:

- History of Microlensing Theory, Detection, and Follow-up Teams
- Introduction to Microlensing Photometric Techniques
- HST/AO Data Reduction
- Modeling of Microlensing Data
- Extracting the Physical Parameters of Planetary Events
- Null Results and Detection Efficiency
- Future Prospects and Challenges of Microlensing

The workshop will include hands-on group projects to give participants direct experience with the microlensing technique. Attendees will also have the opportunity to present brief summaries of their research.

Important Dates

- July 8: On-line registration closed

- July 24: Sagan Exoplanet Summer Workshop Opening Reception
- July 25-29: 2011 Sagan Exoplanet Summer Workshop

Download/Website: http://nexsci.caltech.edu/workshop/2011
Contact: sagan_workshop@ipac.caltech.edu

4 Announcements

Marketing for Scientists

M. Kuchner
NASA Goddard Space Flight Center, Greenbelt, MD 20771

Island Press, published/available for pre-order

This book began its life as *Marketing for Astrophysicists*, a collection of notes on advice I received mostly from exoplanet folks: Sara Seager, Malcolm Fridlund, Heidi Hammel, Robert Naeye, Anne Kinney, Rus Belikov, Dave Leckrone, John Debes, Michael Liu, Andrew Youdin, Paul Kalas, Fergal Mullaly, Dennis Overbye, and many others. You may have read an early draft that Marc Postman sent around. Now, with help from my friends in several other fields, in business, in the press and in government, it has become a real book.
There are many fewer jobs in astronomy now than in past years. And science as a whole seems to be in decline in the U.S. The American Competes act never got funded; anti-science sentiments are rampant in the media. I think we need the tools of marketing if we want to persevere. I want everyone to have a copy of this book—if you can't afford it, send me an email and I'll try to get you a copy somehow.
There are more resources at www.marketingforscientists.com. Best, Marc

Download/Website: http://www.amazon.com/Marketing-Scientists-Shine-Tough-Times/dp/1597269948/ref=sr_1_3?ie=UTF8&qid=1308914409&sr=8-3
Contact: marc@marketingforscientists.com

5 As seen on astro-ph

The following list contains all the entries relating to exoplanets that we spotted on astro-ph during June 2011. If you see any that we missed, please let us know and we'll include them in the next issue.

Exoplanets

astro-ph/1106.0136: **Mapping Clouds and Terrain of Earth-like Planets from Photometric Variability** by *Hajime Kawahara, Yuka Fujii*
astro-ph/1106.0189: **A correlation between host star activity and planet mass for close-in extrasolar planets?** by *K. Poppenhaeger, J.H.M.M. Schmitt*
astro-ph/1106.0487: **Rapid inward migration of planets formed by gravitational instability** by *Clement Baruteau, Farzana Meru, Sijme-Jan Paardekooper*
astro-ph/1106.0492: **Probing the Physical Properties of Directly Imaged Gas Giant Exoplanets Through Polarization** by *Mark S. Marley, Sujan Sengupta*
astro-ph/1106.0635: **Taxonomy of theextrasolar planet** by *E. Plavalova*

astro-ph/1106.1152: **55 Cancri: Stellar Astrophysical Parameters, a Planet in the Habitable Zone, and Implications for the Radius of a Transiting Super-Earth** by *Kaspar von Braun, Tabetha S. Boyajian, Theo A. ten Brummelaar et al.*

astro-ph/1106.1169: **HAT-P-31b,c: A Transiting, Eccentric, Hot Jupiter and a Long-Period, Massive Third-Body** by *David M. Kipping, Joel Hartman, Gaspar A. Bakos et al*

astro-ph/1106.1212: **HAT-P-32b and HAT-P-33b: Two Highly Inflated Hot Jupiters Transiting High-Jitter Stars** by *J. D. Hartman, G. A. Bakos, G. Torres et al.*

astro-ph/1106.1388: **Further deep imaging of HR 7329 A (eta Tel A) and its brown dwarf companion B** by *R. Neuhuser, C. Ginski, T. O. B. Schmidt*

astro-ph/1106.1404: **Possible detection of two giant extrasolar planets orbiting the eclipsing polar UZ Fornacis** by *Stephen B. Potter, Encarni Romero-Colmenero, Gavin Ramsay et al.*

astro-ph/1106.1411: **Transient conditions for biogenesis on low-mass exoplanets with escaping hydrogen atmospheres** by *R. Wordsworth*

astro-ph/1106.1434: **Revised Orbit and Transit Exclusion for HD 114762b** by *Stephen R. Kane, Gregory W. Henry, Diana Dragomir et al.*

astro-ph/1106.1522: **The corona and companion of CoRoT-2A. Insights from X-rays and optical spectroscopy** by *S. Schroter, S. Czesla, U. Wolter et al*

astro-ph/1106.1989: **Of 'Cocktail Parties' and Exoplanets** by *Ingo P. Waldmann*

astro-ph/1106.2047: **Planetary Core Formation with Collisional Fragmentation and Atmosphere to Form Gas Giant Planets** by *Hiroshi Kobayashi, Hidekazu Tanaka, Alexander V. Krivov*

astro-ph/1106.2118: **A lower mass for the exoplanet WASP-21b** by *S. C. C. Barros, D. L. Pollacco, N. P. Gibson et al.*

astro-ph/1106.2160: **Discovery and Mass Measurements of a Cold, 10-Earth Mass Planet and Its Host Star** by *Y. Muraki, C. Han, D.P. Bennett et al.*

astro-ph/1106.2251: **Planet Engulfment by 1.5-3 Solar-Mass Red Giants** by *M. Kunitomo, M. Ikoma, B. Sato et al.*

astro-ph/1106.2548: **Two Upper Limits on the Rossiter-McLaughlin Effect, with Differing Implications: WASP-1 has a High Obliquity and WASP-2 is Indeterminate** by *Simon Albrecht, Joshua N. Winn, JohnAsher Johnson et al.*

astro-ph/1106.2701: **A dynamo driven by zonal jets at the upper surface: applications to giant planets** by *Celine Guervilly, Philippe Cardin, Nathanaal Schaeffer*

astro-ph/1106.2800: **Post-Capture Evolution of Potentially Habitable Exomoons** by *Simon B. Porter, William M. Grundy*

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