ExoPlanet News
An Electronic Newsletter

No. 19, June 5th, 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

Welcome to the nineteenth 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.

Apologies that, in the call for submissions to this edition, we forgot to remind you that we intended to experiment with the inclusion of ONE figure per abstract. We'll try this again next time! So, 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 July 2009.

Best wishes
Andrew Norton & Glenn White
The Open University

2 Abstracts of refereed papers

Is Beta Pic b the transiting planet of November 1981?

A. Lecavelier des Etangs, A. Vidal-Madjar
Institut d'astrophysique de Paris, CNRS - UPMC, $98^{\rm bis}$ boulevard Arago, F-75014 Paris, France

Astronomy & Astrophysics, published (2009A&A...497..557L)

In 1981, β Pictoris showed strong and rapid photometric variations that were attributed to the transit of a giant comet or a planet orbiting at several AUs. Recently, a candidate planet has been identified by imagery in the circumstellar disk of β Pictoris (Lagrange et al. 2009). This planet, named β Pic b, is observed at a projected distance of 8 AU from the central star. It is therefore a plausible candidate for the photometric event observed in 1981. The coincidence of the observed position of the planet in November 2003 and the calculated position assuming that the 1981 transit is due to a planet orbiting at 8 AU is intriguing. Assuming that the planet that is detected on the image is the same as the object transiting in November 1981, we estimate ranges of possible orbital distances and periods. In the favored scenario, the planet orbits at $\sim$8 AU and was seen close to its quadrature position in the 2003 images. In this case, most of the uncertainties are related to error bars on the position in 2003. Uncertainties related to the stellar mass and orbital eccentricity are also discussed. We find a semi-major axis in the range [7.6 - 8.7] AU and an orbital period in the range [15.9 - 19.5] years. We give predictions for imaging observations at quadrature in the southwest branch of the disk in future years (2011-2015). We also estimate possible dates for the next transits and anti-transits.

Contact: lecaveli@iap.fr

Dynamics of the TrES-2 system

F. Freistetter[1], *Á. Süli*[2], *B. Funk*[3]

[1] Astrophysikalisches Institut und Universitätssternwarte Jena, Schillergäßchen 2-3, D-07745 Jena, Germany
[2] Department of Astronomy Eötvös Loránd University Pázmány Péter sétány 1/A 1117 H-Budapest, Hungary
[3] Institut für Astronomie, Universität Wien, Türkenschanzstrasse 17, A-1180 Wien, Austria

Astronomische Nachrichten, published (arXiv:0905.1806)

The TrES-2 system harbors one planet which was discovered with the transit technique. In this work we investigate the dynamical behavior of possible additional, lower-mass planets. We identify the regions where such planets can move on stable orbits and show how they depend on the initial eccentricity and inclination. We find, that there are stable regions inside and outside the orbit of TrES-2b where additional, smaller planets can move. We also show that those planets can have a large orbital inclination which makes a detection with the transit technique very difficult.

Download/Website: `http://www.astro.uni-jena.de/Observations/gsh/gsh_papers.htm`

Contact: `florian@astro.uni-jena.de`

A possible architecture of the planetary system HR 8799

M. Reidemeister, A. V. Krivov, T. O. B. Schmidt, S. Fiedler, S. Müller, T. Löhne, R. Neuhäuser
Astrophysikalisches Institut, Friedrich-Schiller-Universität Jena, Schillergäßchen 2–3, 07745 Jena, Germany

Astronomy & Astrophysics, accepted (arXiv:0905.4688)

HR8799 is a nearby A-type star with a debris disk and three planetary candidates recently imaged directly. We undertake a coherent analysis of various portions of observational data on all known components of the system, including the central star, imaged companions, and dust. The goal is to elucidate the architecture and evolutionary status of the system. We try to further constrain the age and orientation of the system, orbits and masses of the companions, as well as the location of dust. From the high luminosity of debris dust and dynamical constraints, we argue for a rather young system's age of < 50 Myr. The system must be seen nearly, but not exactly, pole-on. Our analysis of the stellar rotational velocity yields an inclination of 13 – 30°, whereas $i > 20^\circ$ is needed for the system to be dynamically stable, which suggests a probable inclination range of 20 – 30°. The spectral energy distribution, including the Spitzer/IRS spectrum in the mid-infrared as well as IRAS, ISO, JCMT and IRAM observations, is naturally reproduced with two dust rings associated with two planetesimal belts. The inner "asteroid belt" is located at ~ 10 AU inside the orbit of the innermost companion and a "Kuiper belt" at > 100 AU is just exterior to the orbit of the outermost companion. The dust masses in the inner and outer ring are estimated to be $\approx 1 \times 10^{-5}$ and 4×10^{-2} Earth masses, respectively. We show that all three planetary candidates may be stable in the mass range suggested in the discovery paper by Marois et al. 2008 (between 5 and 13 Jupiter masses), but only for some of all possible orientations. For $(M_b, M_c, M_d) = (5, 7, 7)$ Jupiter masses, an inclination $i > 20^\circ$ is required and the line of nodes of the system's symmetry plane on the sky must lie within 0° to 50° from north eastward. For higher masses (M_b, M_c, M_d) from $(7, 10, 10)$ to $(11, 13, 13)$, the constraints on both angles are even more stringent. Stable orbits imply a double (4:2:1) mean-motion resonance between all three companions. We finally show that in the cases where the companions themselves are orbitally stable, the dust-producing planetesimal belts are also stable against planetary perturbations.

Download/Website: `http://arxiv.org/abs/0905.4688`

Contact: `krivov@astro.uni-jena.de`

X-Ray and Infrared Observations of Two Externally Polluted white Dwarfs

M. Jura[1], *M.P. Muno*[2], *J. Farihi*[3], *B. Zuckerman*[1]
[1] UCLA
[2] Caltech
[3] Leicester

ApJ, in press (ADS-Bibcode/arXiv:0905.0117)

With *XMM-Newton* and the *Spitzer Space Telescope*, we obtain upper bounds to the X-ray fluxes from G29-38 and GD 362, and the 70 μm flux from G29-38. These data provide indirect evidence that G29-38 is accreting from a tidally disrupted asteroid: it is neither accreting large amounts of hydrogen and helium nor is its surrounding dusty disk being replenished from a reservoir of cold grains experiencing Poynting-Robertson drag. The upper bound to the X-ray flux from GD 362 is consistent with the estimated rate of mass accretion required to explain its pollution by elements heavier than helium. GD 362 also possesses 0.01 $M_\oplus$ of hydrogen, an anomalously large amount for a white dwarf with a helium-dominated atmosphere. One possibility is that before the current disk was formed, this hydrogen was accreted from either $\sim$100 Ceres-like asteroids or one large object. An alternative scenario which simultaneously explains all of GD 362's distinctive properties is that we are witnessing the consequences of the tidal-destruction of a single parent body that had internal water and was at least as massive as Callisto and probably as massive as Mars.

Download/Website: `http://lanl.arxiv.org/pdf/0905.0117`

Contact: `jura@astro.ucla.edu`

Planetary transit observations at the University Observatory Jena: XO-1b and TrES-1

St. Raetz[1], *M. Mugrauer*[1], *T. O. B. Schmidt*[1], *T. Roell*[1], *T. Eisenbeiss*[1], *M. M. Hohle*[1,4], *N. Tetzlaff*[1], *M. Vaňko*[1], *A. Seifahrt*[1,2], *Ch. Broeg*[3], *J. Koppenhoefer*[5], *R. Neuhäuser*[1]
[1] Astrophysikalisches Institut und Universitäts-Sternwarte Jena, Schillergäßchen 2-3, 07745 Jena, Germany
[2] Institut für Astrophysik, Georg-August-Universität, Friedrich-Hund-Platz 1, 37077 Göttingen, Germany
[3] Space Research and Planetary Sciences, Physikalisches Institut, University of Bern, Sidlerstraße 5, 3012 Bern, Switzerland
[4] Max Planck Institute for Extraterrestrial Physics, Giessenbachstraße, 85748 Garching, Germany
[5] University Observatory Munich, Scheinerstrasse 1, 81679 München, Germany

AN, accepted (arXiv:0905.1833)

We report on observations of transit events of the transiting planets XO-1b and TrES-1 with a 25 cm telescope of the University Observatory Jena. With the transit timings for XO-1b from all 50 available XO, SuperWASP, Transit Light Curve (TLC)-Project- and Exoplanet Transit Database (ETD)-data, including our own I-band photometry obtained in March 2007, we find that the orbital period is $P = (3.941501 \pm 0.000001)$ d, a slight change by $\sim$3 s compared to the previously published period. We present new ephemeris for this transiting planet.
Furthermore, we present new R-band photometry of two transits of TrES-1. With the help of all available transit times from literature this allows us to refine the estimate of the orbital period: $P = (3.0300722 \pm 0.0000002)$ d.
Our observations will be useful for future investigations of timing variations caused by additional perturbing planets and/or stellar spots and/or moons.

Download/Website: `http://arxiv.org/abs/0905.1833`

Contact: `straetz@astro.uni-jena.de`

Planetary transit observations at the University Observatory Jena: TrES-2

St. Raetz[1], *M. Mugrauer*[1], *T. O. B. Schmidt*[1], *T. Roell*[1], *T. Eisenbeiss*[1], *M. M. Hohle*[1,4], *A. Koeltzsch*[1], *M. Vaňko*[1], *Ch. Ginski*[1], *C. Marka*[1], *M. Moualla*[1], *N. Tetzlaff*[1], *A. Seifahrt*[1,2], *Ch. Broeg*[3], *J. Koppenhoefer*[5], *M. Raetz*[6], *R. Neuhäuser*[1]

[1] Astrophysikalisches Institut und Universitäts-Sternwarte Jena, Schillergäßchen 2-3, 07745 Jena, Germany
[2] Institut für Astrophysik, Georg-August-Universität, Friedrich-Hund-Platz 1, 37077 Göttingen, Germany
[3] Space Research and Planetary Sciences, Physikalisches Institut, University of Bern, Sidlerstraße 5, 3012 Bern, Switzerland
[4] Max Planck Institute for Extraterrestrial Physics, Giessenbachstraße, 85748 Garching, Germany
[5] University Observatory Munich, Scheinerstrasse 1, 81679 München, Germany
[5] Private observatory Raetz, Stiller Berg 6, 98587 Herges-Hallenberg, Germany

AN, accepted (arXiv:0905.1842)

We report on observations of several transit events of the transiting planet TrES-2 obtained with the Cassegrain-Teleskop-Kamera at the University Observatory Jena. Between March 2007 and November 2008 ten different transits and almost a complete orbital period were observed. Overall, in 40 nights of observation 4291 exposures (in total 71.52 h of observation) of the TrES-2 parent star were taken. With the transit timings for TrES-2 from the 34 events published by the TrES-network, the Transit Light Curve project and the Exoplanet Transit Database plus our own ten transits, we find that the orbital period is $P = (2.470614 \pm 0.000001)$ d, a slight change by ~ 0.6 s compared to the previously published period. We present new ephemeris for this transiting planet.
Furthermore, we found a second dip after the transit which could either be due to a blended variable star or occultation of a second star or even an additional object in the system.
Our observations will be useful for future investigations of timing variations caused by additional perturbing planets and/or stellar spots and/or moons.

Download/Website: `http://arxiv.org/abs/0905.1842`

Contact: `straetz@astro.uni-jena.de`

Planet-planet scattering in planetesimal disks

Sean N. Raymond[1,2], *Philip J. Armitage*[2,3], *Noel Gorelick*[4]

[1] Center for Astrophysics and Space Astronomy, 389 UCB, University of Colorado, Boulder CO 80309
[2] Department of Astrophysical and Planetary Sciences, University of Colorado, Boulder CO 80309
[3] JILA, 440 UCB, University of Colorado, Boulder CO 80309
[4] Google, Inc., 1600 Amphitheatre Parkway, Mountain View, CA 94043

Astrophysical Journal Letters, in press (arXiv:0905.3741)

We study the final architecture of planetary systems that evolve under the combined effects of planet-planet and planetesimal scattering. Using N-body simulations we investigate the dynamics of marginally unstable systems of gas and ice giants both in isolation and when the planets form interior to a planetesimal belt. The unstable isolated systems evolve under planet-planet scattering to yield an eccentricity distribution that matches that observed for extrasolar planets. When planetesimals are included the outcome depends upon the total mass of the planets. For $M_{\rm tot} > 1\ M_J$ the final eccentricity distribution remains broad, whereas for $M_{\rm tot} < 1\ M_J$ a combination of divergent orbital evolution and recircularization of scattered planets results in a preponderance of nearly circular final orbits. We also study the fate of marginally *stable* multiple planet systems in the presence of planetesimal disks, and find that for high planet masses the majority of such systems evolve into resonance. A significant fraction lead to resonant chains that are planetary analogs of Jupiter's Galilean satellites. We predict that a transition from eccentric to near-circular orbits will be observed once extrasolar planet surveys detect sub-Jovian mass planets at orbital radii of $a \simeq 5 - 10$ AU.

Download/Website: `http://arxiv.org/abs/0905.3741`

Contact: `sean.raymond@colorado.edu`

The role of cluster evolution in disrupting planetary systems and disks: the Kozai mechanism

Richard J. Parker & Simon P. Goodwin
Department of Physics and Astronomy, University of Sheffield, Sheffield, S3 7RH, UK

Monthly Notices of the Royal Astronomical Society, in press (arXiv:0905.0815)

We examine the effects of dynamical evolution in clusters on planetary systems or protoplanetary disks orbiting the components of binary stars. In particular, we look for evidence that the companions of host stars of planetary systems or disks could have their inclination angles raised from zero to between the threshold angles (39.23° and 140.77°) that can induce the Kozai mechanism. We find that up to 20 per cent of binary systems have their inclination angles increased to within the threshold range. Given that half of all extrasolar planets could be in binary systems, we suggest that up to 10 per cent of extrasolar planets could be affected by this mechanism.

Download/Website: `http://arxiv.org/abs/0905.0815`

Contact: `r.parker@sheffield.ac.uk`

The sub-Jupiter mass transiting exoplanet WASP-11b

R.G. West[1]*, A. Collier Cameron*[2]*, L. Hebb*[2]*, Y.C. Joshi*[3]*, D. Pollacco*[3]*, E. Simpson*[3]*, I. Skillen*[4]*, H.C. Stempels*[2]*, P.J. Wheatley*[5]*, D. Wilson*[6]*, D. Anderson*[6]*, S. Bentley*[6]*, F. Bouchy*[7,8]*, D. Christian*[3]*, B. Enoch*[9]*, N. Gibson*[2]*, G. Hébrard*[7]*, C. Hellier*[6]*, B. Loeillet*[10]*, M. Mayor*[11]*, P. Maxted*[6]*, I. McDonald*[6]*, C. Moutou*[10]*, F. Pont*[11]*, D. Queloz*[11]*, A.M.S. Smith*[2]*, B. Smalley*[6]*, R.A. Street*[12]*, S. Udry*[11]

[1] Department of Physics & Astronomy, University of Leicester, Leicester, LE1 7RH, UK
[2] School of Physics and Astronomy, University of St Andrews, North Haugh, St Andrews, Fife KY16 9SS, UK
[3] Astrophysics Research Centre, School of Mathematics & Physics, Queen's University, University Road, Belfast, BT7 1NN, UK
[4] Isaac Newton Group of Telescopes, Apartado de Correos 321, E-38700 Santa Cruz de la Palma, Tenerife, Spain
[5] Department of Physics, University of Warwick, Coventry CV4 7AL, UK
[6] Astrophysics Group, Keele University, Staffordshire, ST5 5BG
[7] Institut d'Astrophysique de Paris, CNRS (UMR 7095) – Université Pierre & Marie Curie, 98^{bis} bvd. Arago, 75014 Paris, France
[8] Observatoire de Haute-Provence, 04870 St Michel l'Observatoire, France
[9] Department of Physics and Astronomy, The Open University, Milton Keynes, MK7 6AA, UK
[10] Laboratoire d'Astrophysique de Marseille, OAMP, Université Aix-Marseille & CNRS, 38 rue Frédéric Joliot-Curie, 13388 Marseille cedex 13, France
[11] Observatoire de Genève, Université de Genève, 51 Ch. des Maillettes, 1290 Sauverny, Switzerland
[12] Las Cumbres Observatory, 6740 Cortona Dr. Suite 102, Santa Barbara, CA 93117, USA

Astronomy & Astrophysics, in press (arXiv:0809.4597)

We report the discovery of a sub-Jupiter mass exoplanet transiting a magnitude $\mathrm{V} = 11.6$ host star 1SWASP J030928.54+304024.7. A simultaneous fit to the transit photometry and radial-velocity measurements yield a planet mass $M_\mathrm{p} = 0.53 \pm 0.07\,\mathrm{M_J}$, radius $R_\mathrm{p} = 0.91^{+0.06}_{-0.03}\,\mathrm{R_J}$ and an orbital period of $3.722465^{+0.000006}_{-0.000008}$ days. The host star is an early to mid-K dwarf, with a spectral analysis yielding an effective temperature of $4800 \pm 100\,\mathrm{K}$ and $\log g = 4.45 \pm 0.2$. It is amongst the smallest, least massive and lowest luminosity stars known to harbour a transiting exoplanet. WASP-11b is the third least strongly irradiated transiting exoplanet discovered to date, experiencing an incident flux $F_\mathrm{p} = 1.9 \times 10^8\,\mathrm{erg\,s^{-1}\,cm^{-2}}$ and having an equilibrium temperature $T_\mathrm{eql} = 960 \pm 70\,\mathrm{K}$.

Contact: `rgw@astro.le.ac.uk`

Precessing planetary magnetospheres in SiO stars ? First detection of quasi-periodic polarization fluctuations in R Leonis and V Camelopardalis

H. Wiesemeyer[1,2]*, C. Thum*[1]*, A. Baudry*[3,4]*, F. Herpin*[3,4]

[1] Institut de Radioastronomie Millimétrique, 300 rue de la Piscine, 38406 Saint Martin d'Hères, France
[2] Instituto de Radioastronomía Milimétrica, Avenida Divina Pastora 7, Local 20, 18012 Granada, Spain
[3] Université de Bordeaux, Laboratoire d'Astrophysique de Bordeaux, F-33000 Bordeaux, France
[4] CNRS/INSU, UMR 5804, BP 89, F-33270 Floirac, France

Astronomy & Astrophysics, published (2009A&A...498..801W)

Context: The origin of magnetism around asymptotic giant branch (AGB) stars remains an uncertainty. These stars may drive an important dynamo, but if the magnetic energy dissipates entirely into X-rays, the observed X-ray luminosities are too low to maintain a strong, dynamically important global field. Other explanations of the circular polarization in SiO masers in AGB atmospheres may thus be required. Aims: The interaction of the AGB wind with both previously ejected matter and planets is expected to produce complex magnetohydrodynamic phenomena on a short timescale, such that strong magnetic fields can be maintained locally. Here, we provide observational evidence of the corresponding magnetic fluctuations. Methods: We use the circular polarization of the $v = 1, J = 2 - 1$ SiO masers as a tracer of magnetic activity. A correlation polarimeter allows us to record simultaneously all Stokes parameters. An SiO maser survey of 80 AGB stars was performed from which eight sources of the strongest circular polarization were selected for further monitoring. Results: In two AGB stars, V Cam and R Leo, we find evidence of pseudo-periodic fluctuations in the fractional circular polarization on a timescale of a few hours, from which we infer magnetic fluctuations of ~ 1 G. The phenomenon is rare and, if detected in an SiO star, restricted to a narrow range of velocities. It seems to be associated with planetary wake flows suggested by VLBI maps. Conclusions: While scenarios involving magnetic activity in the extended stellar atmosphere have problems explaining all observed features, precessing Jovian magnetospheres predict all of them without difficulty. For the case of R Leo, we constrain the orbit of the planet (estimated period 5.2 years), derive a stellar mass estimate of $0.7\,M_{\odot}$ from it, and discuss the impact of planetary magnetism on the survival of planets. Smooth velocity variations in the fluctuating circular polarization feature are predicted as the planet moves along its orbit.

Contact: wiesemeyer@iram.es

The modulation of SiO maser polarization by Jovian planets

H. Wiesemeyer[1,2]

[1] Institut de Radioastronomie Millimétrique, 300 rue de la Piscine, 38406 Saint Martin d'Hères, France
[2] Instituto de Radioastronomía Milimétrica, Avenida Divina Pastora 7, Local 20, 18012 Granada, Spain

Astronomy & Astrophysics, in press (DOI: 10.1051/0004-6361/200811537)

Aims: Searching for planets in the atmosphere of AGB stars is difficult, due to confusion with the stellar wind and pulsations. The aim here is to provide a complementary strategy for planet searches in such a dense environment. Methods: The polarization properties of SiO masers, especially their circular polarization, are, under certain conditions, good tracers of rapid magnetospheric events. A Jovian planet with a magnetosphere whose dipole axis is misaligned with its rotation axis naturally provides such conditions. Here I present several models showing that the polarization will be periodically modulated. Results: The linear and circular polarization of an SiO maser in a planetary magnetosphere is modulated by the precessing dipole component of the latter. The effect is measurable in saturated masers, while unsaturated masers only exhibit weak changes, because of dilution effects, and because the circular polarization there stems from the Zeeman effect making it as weak as for thermal radiation. The situation would change if anisotropic pump- and loss-rates were included, which would increase the fractional linear and, via magnetorotation, the circular polarization of the modulation. Conclusions: Single-dish monitoring with a dense enough time sampling and a carefully calibrated polarimeter, in combination with VLBI observations, are suited to

detecting and locating a periodic modulation of the circular maser polarization due to a precessing Jovian magnetosphere. The phenomenon will be rare, because a favorable arrangement of maser and magnetosphere is needed. Otherwise the polarization may be below the detection threshold, especially if the maser is unsaturated. Though exhibiting a qualitatively similar modulation, linear polarization is likely to suffer more from confusion due to dilution of the magnetosphere within the maser cross section, even in VLBI observations.

Download/Website: `http://dx.doi.org/10.1051/0004-6361/200811537`

Contact: `wiesemeyer@iram.es`

3 Conference announcements

Unsinkable planets: telluric planet detection and stellar activity

S. Aigrain, F. Pont
Astrophysics Group, University of Exeter, UK

University of Exeter, 16-18 September 2009

Telluric planets are now detectable both by radial velocity (high-accuracy Doppler surveys like HARPS) and by photometric transits (wide-field space missions CoRoT and Kepler). In this regime, stellar activity is the major obstacle to planet detection. Star-spots induce semi-periodic fluctuations in radial velocity as well as in photometry, with amplitudes and timescales that overlap with the planet signals. Developing tools to tackle this problem robustly is an imperative if we are to find "unsinkable" telluric planets in the next few years.

The aim of this workshop is to take stock of what we know of stellar activity as an integrated time signal, to estimate its impact on detection limits for transit, radial velocity and astrometry planet searches, and to discuss future developments: how to assign confidence levels to transit candidates in the presence of stellar activity (especially in the context of the CoRoT and Kepler missions), how to separate stellar activity from planetary orbits in radial velocity and astrometry near the instrumental detection limit.

The program will be a mixture of invited and contributed talks with considerable time for discussion. The number of participants will be limited to approximately 30, so please register early (by emailing the address below) if you would like to come. If you would like to give a presentation, please provide a title and brief abstract in your email.

Download/Website: `http://www.astro.ex.ac.uk/esp09`

Contact: `esp09@astro.ex.ac.uk`

2009 Sagan Summer Workshop: Exoplanetary Atmospheres

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

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

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

Register by July 10 for the on-line rate!

Registration Fee includes: conference attendance and materials; transportation between Pasadena Hilton; and Workshop on Workshop Dates; lunches on Monday, Wednesday and Friday; light breakfast, snacks, and drinks during

morning and afternoon breaks each day of the workshop; opening reception; 1 ticket to attend workshop dinner on Thursday (extra tickets available for purchase); and 1 ticket to attend tour to the Griffith Observatory on Wednesday afternoon (extra tickets available for purchase)

Important Dates:
June 18: Hilton Hotel group rate registration deadline;
July 6: Deadline to submit research pops;
July 10: On-line registration deadline.

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

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

Contact: `sagan_workshop@ipac.caltech.edu`

4 As seen on astro-ph

The following list contains all the entries relating to exoplanets that we spotted on astro-ph during May 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/0905.0439: **Homogeneous comparison of planet candidates imaged directly until 2008** by *T. O. B. Schmidt, R. Neuhauser & A. Seifahrt*
astro-ph/0905.0565: **Tracing the potential planet-forming regions around seven pre-main-sequence stars** by *A. A. Schegerer, S. Wolf, C. A. Hummel et al*
astro-ph/0905.1114: **Follow-up Observations of the Neptune Mass Transiting Extrasolar Planet Hat-P-11b** by *Jason A. Dittman, Laird M. Close, Elizabeth M. Green et al*
astro-ph/0905.1728: **High Cadence Near Infrared Timing Observations of Extrasolar Planets: I. GJ 436b and XO-1b** by *C. Caceres, V.D. Ivanov, D. Minniti et al*
astro-ph/0905.1806: **Dynamics of the TrES-2 system** by *Florian Freistetter, Aron Suli & Barbara Funk*
astro-ph/0905.1833: **Planetary transit observations at the University Observatory Jena: XO-1b and TrES-1** by *St. Raetz, M. Mugrauer, T. O. B. Schmidt et al*
astro-ph/0905.1842: **Planetary transit observations at the University Observatory Jena: TrES-2** by *St. Raetz, M. Mugrauer, T. O. B. Schmidt et al*
astro-ph/0905.1921: **Finding new sub-stellar co-moving companion candidates - the case of CT Cha** by *T. O. B. Schmidt & R. Neuhuuser*
astro-ph/0905.2365: **Photometric Orbits of Extrasolar Planets** by *Robert A. Brown*
astro-ph/0905.2587: **Gas accretion by planetary cores** by *Ben A. Ayliffe & Matthew R. Bate*
astro-ph/0905.2597: **The role of magnetic fields for planetary formation** by *Anders Johansen*
astro-ph/0905.2985: **First Results from the CHEPS: Exoplanets and the Discovery of an Eccentric Brown Dwarf in the Desert** by *James S. Jenkins, Hugh R.A. Jones, Krzysztof Gozdziewski et al*
astro-ph/0905.3115: **The 0.5M_J transiting exoplanet WASP-13b** by *I. Skillen, D. Pollacco, A. Collier Cameron et al*
astro-ph/0905.3340: **Looking for pulsations in HgMn stars through CoRoT lightcurves** by *A. Ofir, H. J. Deeg & C. H. S. Lacy*
astro-ph/0905.3633: **CoRoT-2a magnetic activity: hints for possible star-planet interaction** by *Isabella Pagano, Antonino F. Lanza, Giuseppe Leto et al*

astro-ph/0905.3741: **Planet-planet scattering in planetesimal disks** by *Sean N. Raymond, Philip J. Armitage & Noel Gorelick*
astro-ph/0905.3829: **SPICA infrared coronagraph for the direct observation of exo-planets** by *Keigo Enya, for the SPICA working group*
astro-ph/0905.4030: **Detection of orbital parameter changes in the TrES-2 exoplanet ?** by *D. Mislis & J.H.M.M. Schmitt*
astro-ph/0905.4571: **VLT transit and occultation photometry for the bloated planet CoRoT-1b** by *M. Gillon, B.-O. Demory, A.H.M.J. Triaud et al*
astro-ph/0905.4680: **A transit timing analysis of nine RISE light curves of the exoplanet system TrES-3** by *N. P. Gibson, D. Pollacco, I. Skillen et al*
astro-ph/0905.4688: **A possible architecture of the planetary system HR 8799** by *Martin Reidemeister, Alexander V. Krivov, Tobias O. B. Schmidt et al*
astro-ph/0905.4680: **A transit timing analysis of nine RISE light curves of the exoplanet system TrES-3** by *N. P. Gibson, D. Pollacco, I. Skillen et al*

Disks

astro-ph/0905.1001: **X-ray irradiated protoplanetary disk atmospheres II: Predictions from models in hydrostatic equilibrium** by *Barbara Ercolano, Cathie J. Clarke & Jeremy J. Drake*
astro-ph/0905.2344: **Radiation pressure mixing of large dust grains in protoplanetary disks** by *Dejan Vinkovic*
astro-ph/0905.2649: **IRS Characterization of a Debris Disk around an M-type star in NGC2547** by *Paula S. Teixeira, Charles J. Lada, Kenneth Wood et al*
astro-ph/0905.4404: **Two-fluid Instability of Dust and Gas in the Dust Layer of a Protoplanetary Disk** by *Naoki Ishitsu, Shu-ichiro Inutsuka & Minoru Sekiya*
astro-ph/0905.4523: **Formation of Water in the Warm Atmospheres of Protoplanetary Disks** by *A. E. Glassgold, R. Meijerink & J. R. Najita*

Instrumentation and Techniques

astro-ph/0905.0164: **The Subaru Coronagraphic Extreme AO project** by *Frantz Martinache, Olivier Guyon, Julien Lozi et al*
astro-ph/0905.0167: **Aperture Masking Interferometry for Subaru** by *Frantz Martinache, Olivier Guyon & Vincent Garrel*
astro-ph/0905.1676: **Shaped pupil design for the Gemini Planet Imager** by *Eric Cady, Bruce Macintosh, N. Jeremy Kasdin et al*
astro-ph/0905.3003: **Difference imaging photometry of blended gravitational microlensing events with a numerical kernel** by *M. D. Albrow, K. Horne, D. M. Bramich et al*
astro-ph/0905.3062: **An iterative filter to reconstruct planetary transit signals in the presence of stellar variability** by *A. Alapini & S. Aigrain*
astro-ph/0905.3400: **Searching For Transiting Circumbinary Planets in CoRoT and Ground-Based Data Using CB-BLS** by *A. Ofir, H. J. Deeg & C. H. S. Lacy*
astro-ph/0905.3426: **Characterization of Microlensing Planets with Moderately Wide Separations** by *Cheongho Han*