ExoPlanet News
An Electronic Newsletter

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Contents

1 Editorial

Welcome to the ninety eighth edition of ExoPlanet News, and a significant announcement that I wish to make. Soon I will have been producing this newsletter for ten years and I have decided that will be a good time for me to hand over its production to someone else. The first Exoplanet News was distributed on 1st August 2007 and I have decided that the 100th edition, likely to be sent out at the beginning of October 2017, will be my last. In this edition I am therefore requesting expressions of interest from anyone who would like to take over running the newsletter in the future.

If you are interested in taking over the editorship of the Exoplanet News, please send me an email outlining:

- Why you would be a good person to take on the newsletter
- How you would make the newsletter sustainable for the next ten years
- What changes (if any) you propose to make to the newsletter

Based on the responses I receive in the next two months, I will select someone to be the new editor. The ninety ninth edition will be distributed at the beginning of September 2017, and I will announce in that edition who will be taking over the editorship of the newsletter. The 100th edition will be my last and will be jointly produced with the new editor.

I look forward to hearing from anyone who is interested in taking the newsletter forward.

Best wishes
Andrew Norton
The Open University

2 Abstracts of refereed papers

Triggering Collapse of the Presolar Dense Cloud Core and Injecting Short-Lived Radioisotopes with a Shock Wave. V. Nonisothermal Collapse Regime

Alan P. Boss
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The Astrophysical Journal, in press

Recent meteoritical analyses support an initial abundance of the short-lived radioisotope ^{60}Fe that may be high enough to require nucleosynthesis in a core collapse supernova, followed by rapid incorporation into primitive meteoritical components, rather than a scenario where such isotopes were inherited from a well-mixed region of a giant molecular cloud polluted by a variety of supernovae remnants and massive star winds. This paper continues to explore the former scenario, by calculating three dimensional, adaptive mesh refinement, hydrodynamical code (FLASH 2.5) models of the self-gravitational, dynamical collapse of a molecular cloud core that has been struck by a thin shock front with a speed of 40 km/sec, leading to the injection of shock front matter into the collapsing cloud through the formation of Rayleigh-Taylor fingers at the shock-cloud intersection. These models extend the previous work into the nonisothermal collapse regime using a polytropic approximation to represent compressional heating in the optically thick protostar. The models show that the injection efficiencies of shock front material are enhanced compared to previous models, which were not carried into the nonisothermal regime and so did not reach such high densities. The new models, combined with the recent estimates of initial ^{60}Fe abundances, imply that the supernova triggering and injection scenario remains as a plausible explanation for the origin of the short-lived radioisotopes involved in the formation of our solar system.

Download/Website: `https://home.dtm.ciw.edu/users/boss/ftp/triggerV.pdf`

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An Improved Age-Activity Relationship for Cool Stars older than a Gigayear

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Monthly Notices of the Royal Astronomical Society, accepted (arXiv: 1706.08979)

Stars with convective envelopes display magnetic activity, which decreases over time due to the magnetic braking of the star. This age-dependence of magnetic activity is well-studied for younger stars, but the nature of this dependence for older stars is not well understood. This is mainly because absolute stellar ages for older stars are hard to measure. However, relatively accurate stellar ages have recently come into reach through asteroseismology. In this work we present X-ray luminosities, which are a measure for magnetic activity displayed by the stellar coronae, for 24 stars with well-determined ages older than a gigayear. We find 14 stars with detectable X-ray luminosities and use these to calibrate the age-activity relationship. We find a relationship between stellar X-ray luminosity, normalized by stellar surface area, and age that is steeper than the relationships found for younger stars, with an exponent of -2.80 ± 0.72. Previous studies have found values for the exponent of the age-activity relationship ranging between -1.09 to -1.40, dependent on spectral type, for younger stars. Given that there are recent reports of a flattening relationship between age and rotational period for old cool stars, one possible explanation is that we witness a strong steepening of the relationship between activity and rotation.

Download/Website: `http://arxiv.org/abs/1706.08979`

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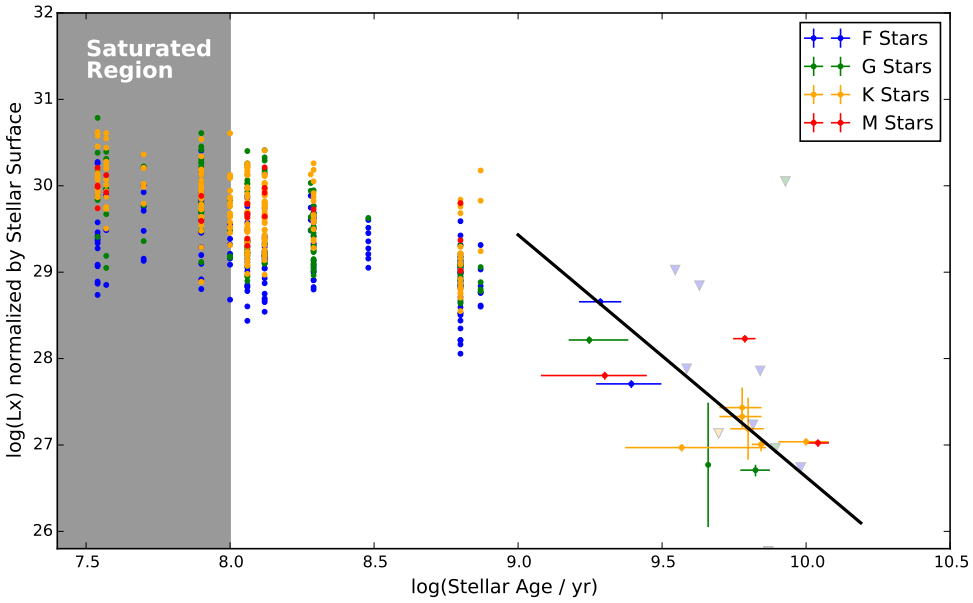

Figure 1: (Booth et al.) Plot showing the data analysed in Booth et al. (2017) alongside the cluster data from Jackson et al. (2012). The quantity on the vertical axis is $\log \frac{L_x}{(R_*/R_\odot)^2}$. Upper limits are indicated by downward triangles and lighter colours. Black line indicates the best fit age-activity relationship found for data analysed in this work.

Stability of Multiplanetary Systems in Star Clusters

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Monthly Notices of the Royal Astronomical Society, published arxiv:1706.03789

Most stars form in star clusters and stellar associations. However, only about $\sim 1\%$ of the presently known exoplanets are found in these environments. To understand the roles of star cluster environments in shaping the dynamical evolution of planetary systems, we carry out direct N-body simulations of four planetary systems models in three different star cluster environments with respectively $N = 2$k, 8k and 32k stars. In each cluster, an ensemble of initially identical planetary systems are assigned to solar-type stars with ~ 1 M$_\odot$ and evolved for 50 Myr. We found that following the depletion of protoplanetary disks, external perturbations and planet-planet interactions are two driving mechanisms responsible for the destabilization of planetary systems. The planet survival rate varies from $\sim 95\%$ in the $N = 2$k cluster to $\sim 60\%$ in the $N = 32$k cluster, which suggests that most planetary systems can indeed survive in low-mass clusters, except in the central regions. We also find that planet ejections through stellar encounters are cumulative processes, as only $\sim 3\%$ of encounters are strong enough to excite the eccentricity by $\Delta e \geq 0.5$. Short-period planets can be perturbed through orbit crossings with long-period planets. When taking

into account planet-planet interactions, the planet ejection rate nearly doubles, and therefore multiplicity contributes to the vulnerability of planetary systems. In each ensemble, $\sim 0.2\%$ of planetary orbits become retrograde due to random directions of stellar encounters. Our results predict that young low-mass star clusters are promising sites for next-generation planet surveys, yet low planet detection rates are expected in dense globular clusters such as 47 Tuc. Nevertheless, planets in denser stellar environments are likely to have shorter orbital periods, which enhances their detectability.

Download/Website: `https://academic.oup.com/mnras/article-lookup/doi/10.1093/mnras/stx1464`

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Gravitational instabilities in a protosolar-like disc II: continuum emission and mass estimates

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Monthly Notices of the Royal Astronomical Society, in press (arXiv:1706.00254)

Gravitational instabilities (GIs) are most likely a fundamental process during the early stages of protoplanetary disc formation. Recently, there have been detections of spiral features in young, embedded objects that appear consistent with GI-driven structure. It is crucial to perform hydrodynamic and radiative transfer simulations of gravitationally unstable discs in order to assess the validity of GIs in such objects, and constrain optimal targets for future observations. We utilise the radiative transfer code LIME to produce continuum emission maps of a $0.17\,\mathrm{M}_{\odot}$ self-gravitating protosolar-like disc. We note the limitations of using LIME as is and explore methods to improve upon the default gridding. We use CASA to produce synthetic observations of 270 continuum emission maps generated across different frequencies, inclinations and dust opacities. We find that the spiral structure of our protosolar-like disc model is distinguishable across the majority of our parameter space after 1 hour of observation, and is especially prominent at 230 GHz due to the favourable combination of angular resolution and sensitivity. Disc mass derived from the observations is sensitive to the assumed dust opacities and temperatures, and therefore can be underestimated by a factor of at least 30 at 850 GHz and 2.5 at 90 GHz. As a result, this effect could retrospectively validate GIs in discs previously thought not massive enough to be gravitationally unstable, which could have a significant impact on the understanding of the formation and evolution of protoplanetary discs.

Download/Website: `https://arxiv.org/abs/1706.00254`

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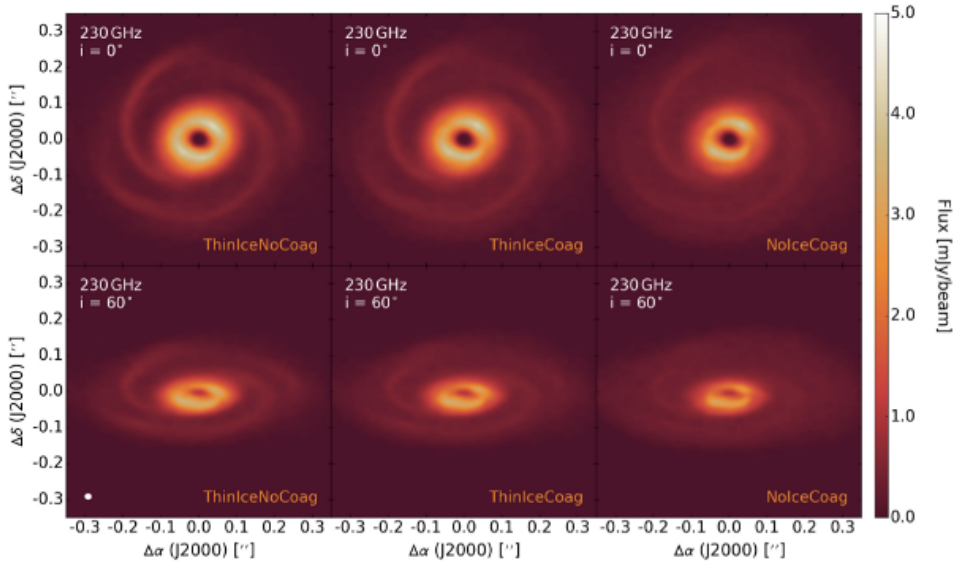

Figure 2: (Evans et al.) Continuum emission images of our disc model at 230 GHz for three different dust opacity models and two different inclinations, synthesised using the ALMA Cycle 5 antenna configuration. The white ellipse in the lower left indicates the size of the beam, which is 0.019×0.017 arcsec and is constant across all panels. The noise is approximately 15 μJy per beam across the parameter space.

MOVES I. The evolving magnetic field of the planet-hosting star HD189733

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Monthly Notices of the Royal Astronomical Society, in press/arXiv:1706.07262

HD189733 is an active K dwarf that is, with its transiting hot Jupiter, among the most studied exoplanetary systems. In this first paper of the Multiwavelength Observations of an eVaporating Exoplanet and its Star (MOVES) program, we present a 2-year monitoring of the large-scale magnetic field of HD189733. The magnetic maps are reconstructed for five epochs of observations, namely June-July 2013, August 2013, September 2013, September 2014, and July 2015, using Zeeman-Doppler Imaging. We show that the field evolves along the five epochs, with mean values of the total magnetic field of 36, 41, 42, 32 and 37 G, respectively. All epochs show a toroidally-dominated field. Using previously published data of Moutou et al. 2007 and Fares et al. 2010, we are able to study the evolution of the magnetic field over 9 years, one of the longest monitoring campaign for a given star. While the field evolved during the observed epochs, no polarity switch of the poles was observed. We calculate the stellar magnetic field value at the position of the planet using the Potential Field Source Surface extrapolation technique. We show that the planetary

magnetic environment is not homogeneous over the orbit, and that it varies between observing epochs, due to the evolution of the stellar magnetic field. This result underlines the importance of contemporaneous multi-wavelength observations to characterise exoplanetary systems. Our reconstructed maps are a crucial input for the interpretation and modelling of our MOVES multi-wavelength observations.

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The GAPS Programme with HARPS-N at TNG. XV. A substellar companion around a K giant star identified with quasi-simultaneous HARPS-N and GIANO measurements

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Astronomy & Astrophysics, Accepted (https://arxiv.org/abs/1706.06955)

Context: Identification of planetary companions of giant stars is made difficult because of the astrophysical noise, that may produce radial velocity variations similar to those induced by a companion. On the other hand any stellar signal is wavelength dependent, while signals due to a companion are achromatic.
Aims: Our goal is to determine the origin of the Doppler periodic variations observed in the thick disk K giant star TYC 4282-605-1 by HARPS-N at the Telescopio Nazionale Galileo (TNG) and verify if they can be due to the presence of a substellar companion.
Methods: Several methods have been used to exclude the stellar origin of the observed signal including detailed analysis of activity indicators and bisector and the analysis of the photometric light curve. Finally we have conducted an observational campaign to monitor the near infrared (NIR) radial velocity with GIANO at the TNG in order to verify whether the NIR amplitude variations are comparable with those observed in the visible.
Results: Both optical and NIR radial velocities show consistent variations with a period at 101 days and similar amplitude, pointing to the presence of a companion orbiting the target. The main orbital properties obtained for our giant star with a derived mass of $M = 0.97 \pm 0.03\ M_{\odot}$ are $M_P \sin i = 10.78 \pm 0.12\ M_{\rm J}$; $P = 101.54 \pm 0.05$ days; $e = 0.28 \pm 0.01$ and $a = 0.422 \pm 0.009$ AU. The chemical analysis shows a significant enrichment in the abundance of Na I, Mg I, Al I and Si I while the rest of analyzed elements are consistent with the solar value demonstrating that the chemical composition corresponds with an old K giant (age = 10.1 Gyr) belonging to local thick disk.
Conclusions: We conclude that the substellar companion hypothesis for this K giant is the best explanation for the observed periodic radial velocity variation. This study also shows the high potential of multi-wavelength radial velocity observations for the validation of planet candidates.

Download/Website: https://arxiv.org/abs/1706.06955

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Structure and Evolution of Internally Heated Hot Jupiters

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The Astrophysical Journal, accepted (arXiv:1706.07605)

Hot Jupiters receive strong stellar irradiation, producing equilibrium temperatures of $1000-2500$ Kelvin. Incoming irradiation directly heats just their thin outer layer, down to pressures of ~ 0.1 bars. In standard irradiated evolution models of hot Jupiters, predicted transit radii are too small. Previous studies have shown that deeper heating – at a small fraction of the heating rate from irradiation – can explain observed radii. Here we present a suite of evolution models for HD 209458b where we systematically vary both the depth and intensity of internal heating, without specifying the uncertain heating mechanism(s). Our models start with a hot, high entropy planet whose radius decreases as the convective interior cools. The applied heating suppresses this cooling. We find that very shallow heating – at pressures of $1-10$ bars – does not significantly suppress cooling, unless the total heating rate is $\gtrsim 10\%$ of the incident stellar power. Deeper heating, at 100 bars, requires heating at only 1% of the stellar irradiation to explain the observed transit radius of $1.4 R_{\rm Jup}$ after 5 Gyr of cooling. In general, more intense and deeper heating results in larger hot Jupiter radii. Surprisingly, we find that heat deposited at 10^4 bars – which is exterior to $\approx 99\%$ of the planet's mass – suppresses planetary cooling as effectively as heating at the center. In summary, we find that relatively shallow heating is required to explain the radii of most hot Jupiters, provided that this heat is applied early and persists throughout their evolution.

Download/Website: `https://arxiv.org/abs/1706.07605`

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Ground-based photometry of the 21-day Neptune HD 106315c

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Astronomy & Astrophysics Letters, in press (arXiv:1706.06124)

Space-based transit surveys such as *K2* and (soon) *TESS* allow the detection of small transiting planets with orbital periods beyond 10 days. Few of those *warm* Neptunes are currently known around stars bright enough to allow for detailed follow-up observations dedicated to their atmospheric characterization. The 21-day period and 3.95 $R_\oplus$ planet HD 106315c has been discovered based on the observation of two of its transits by *K2*. We have observed HD 106315 using the 1.2 m Euler telescope equipped with the EulerCam camera on two instances to confirm the transit using broad-band photometry and refine the planetary period. Based on two observed transits of HD 106315c, we detect its ~ 1 mmag transit and obtain a precise measurement of the planetary ephemerides, which are critical for planning further follow-up observations. We have used the attained precision together with the predicted yield from the *TESS* mission to evaluate the potential for ground-based confirmation of Neptune-sized planets found by *TESS*. We find that 1-meter–class telescopes on the ground equipped with precise photometers could substantially contribute to the follow-up of 162 *TESS* candidates orbiting stars with magnitudes of $V \leq 14$. Out of these, 74 planets orbit stars with $V \leq 12$ and 12 planets orbit $V \leq 10$, which makes these candidates high-priority objects for atmospheric characterization with high-end instrumentation.

Download/Website: `https://arxiv.org/abs/1706.06124`

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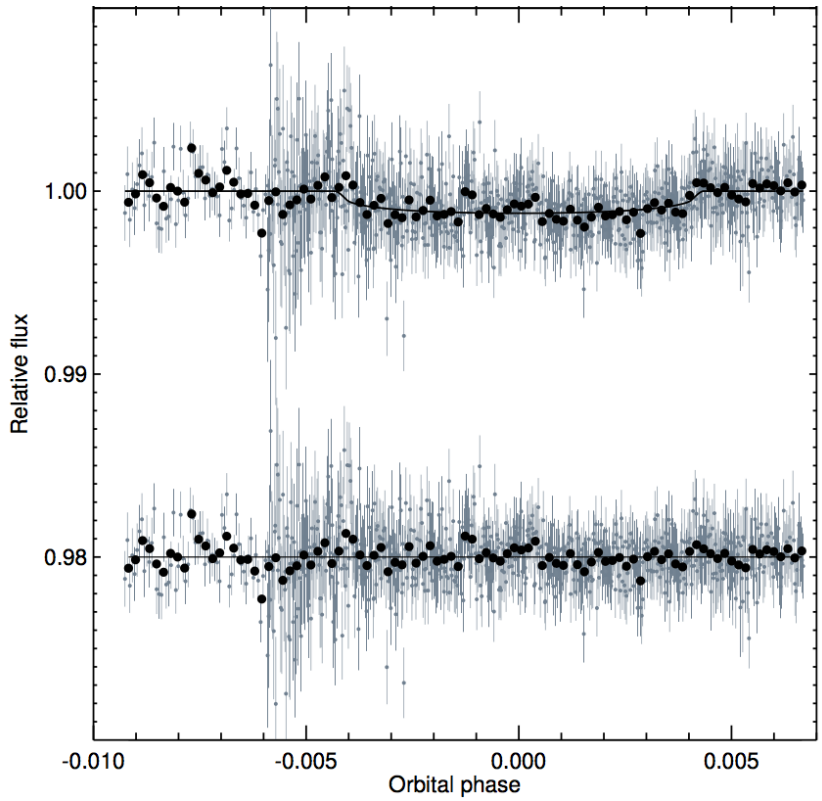

Figure 3: (Lendl et al.) Phase-folded, baseline-corrected EulerCam light curve (top) and residuals (bottom). Unbinned data are shown in gray, and the same data binned per 5 minutes are shown in black

Cloud formation in metal-rich atmospheres of hot super-Earths like 55 Cnc e and CoRot7b

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Monthly Notices of the Royal Astronomical Society, in press (arXiv:1706.07219)

Clouds form in the atmospheres of planets where they can determine the observable spectra, the albedo and phase curves. Cloud properties are determined by the local thermodynamical and chemical conditions of an atmospheric gas. A retrieval of gas abundances requires a comprehension of the cloud formation mechanisms under varying chemical conditions. With the aim of studying cloud formation in metal rich atmospheres, we explore the possibility of clouds in evaporating exoplanets like CoRoT-7b and 55 Cnc e in comparison to a generic set of solar abundances and the metal-rich gas giant HD149026b. We assess the impact of metal-rich, non-solar element abundances on the gas-phase chemistry, and apply our kinetic, non-equilibrium cloud formation model to study cloud structures and their details. We provide an overview of global cloud properties in terms of material compositions, maximum particle formation rates, and average cloud particle sizes for various sets of rocky element abundances. Our results suggest that the conditions on 55 Cnc e and HD149026b should allow the formation of mineral clouds in their atmosphere. The high temperatures on some hot-rocky super-Earths (e.g. the day-side of Corot-7b) result in an ionised atmospheric gas and they prevent gas condensation, making cloud formation unlikely on its day-side.

Download/Website: `https://arxiv.org/abs/1706.07219`

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Exoplanets as probes of the winds of host stars: the case of the M dwarf GJ 436

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Monthly Notices of the Royal Astronomical Society, in press

Winds of cool dwarfs are difficult to observe, with only a few M dwarfs presenting observationally-derived mass-loss rates ($\dot{M}$), which span several orders of magnitude. Close-in exoplanets are conveniently positioned in the inner regions of stellar winds and can, thus, be used to probe the otherwise-unobservable local properties of their host-stars' winds. Here, we use local stellar wind characteristics observationally-derived in the studies of atmospheric evaporation of the warm-neptune GJ 436b to derive the global characteristics of the wind of its M-dwarf host. Using an isothermal wind model, we constrain the stellar wind temperature to be in the range [0.36,0.43] MK, with $\dot{M} = [0.5, 2.5] \times 10^{-15}\ M_{\odot}$/yr. By computing the pressure balance between the stellar wind and the interstellar medium, we derive the size of the astrophere of GJ 436 to be around 25 au, significantly more compact than the heliosphere. We demonstrate in this paper that transmission spectroscopy, coupled to planetary atmospheric evaporation and stellar wind models, can be a useful tool for constraining the large-scale wind structure of planet-hosting stars. Extending our approach to future planetary systems discoveries will open new perspectives for the combined characterisation of planetary exospheres and winds of cool dwarf stars.

Download/Website: `https://arxiv.org/abs/1706.05894`

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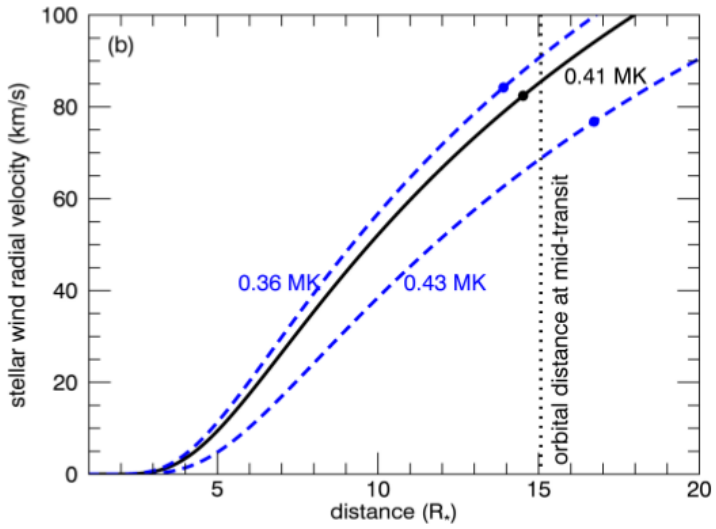

Figure 4: (Vidotto & Bourrier) The inner velocity profile of the stellar wind. Black solid line assumes a wind temperature that best matches the observationally-derived velocity at the planet orbit, while the blue dashed lines are associated to the 1-σ uncertainty in the observed velocity. Circles indicate the distance at which the wind becomes supersonic.

3 Jobs and Positions

Senior Professor in Astronomy & Astrophysics

Mary Brennan
Dublin Institute for Advanced Studies, Dublin, Ireland

DIAS, 31st July 2017

The Governing Board of the School of Cosmic Physics wishes to nominate an exceptional scientist for appointment by the President of Ireland to the position of Senior Professor in the School and Head of the Astronomy & Astrophysics Section. The position will become available following the retirement of Professor Luke Drury in June 2018.

In addition to an established international research reputation, the person appointed will be a scientist of vision capable of motivating large national, European and international research projects over decadal timeframes.

The successful nominee will be expected to define and lead an innovative research programme in the Astronomy & Astrophysics section in the areas of Exoplanetary Systems and/or Sun-Earth Interactions, building on the section's strengths in Star Formation and the Interstellar Medium. Linking the new activities to work in the Geophysics Section of the School is desirable. Other current areas of strength are High Energy Astrophysics, and the curating, mining, and knowledge extraction from large data sets.

This is a research position and carries no undergraduate teaching responsibilities. Guest lecturing in higher education institutions is encouraged. Supervision of graduate students and mentoring of postdoctoral fellows is required.

The post is permanent and pensionable with an attaching salary of 150,212 Euro (PPC scale) 142,702 Euro (Standard scale)
.
Interested scientists are invited to apply by sending an e-mail application to registrarsoffice@admin.dias.ie. The application should comprise a single PDF attachment containing:

1. The candidate's standard academic CV.
2. The candidate's list of publications, including brief notes on the five most significant.
3. The candidate's research vision for the Astronomy & Astrophysics section within the School of Cosmic Physics (maximum 3 A4 pages).
4. Optionally up to two further A4 pages containing any supplemental material the candidate wishes to add.

All applications received before close of business on 31 July 2017 will be acknowledged and considered by a Search Committee appointed by the Governing Board of the School of Cosmic Physics. The Search Committee may, at its absolute discretion, in addition consider late applications or candidates other than those who apply directly. Shortlisted candidates will be requested to provide contact details of three academic referees. It is planned to hold interviews in September/ October 2017.

DIAS is an equal opportunities employer

Download/Website: `https://dias.ie/SeniorProfVacancy`

Contact: `registrarsoffice@admin.dias.ie`

W2-Professorship for Stellar Physics and Exoplanets

Klaus Strassmeier
Leibniz-Institut fur Astrophysik Potsdam (AIP), An der Sternwarte 16, D-14482 Potsdam, Germany

Leibniz-Institut fur Astrophysik Potsdam, 31st August 2017

The University of Potsdam, Faculty of Science, Institute of Physics and Astronomy and the Leibniz Institute for Astrophysics Potsdam (AIP) invite applications in a joint appointment (Julicher Modell) for the following new professorship to be filled in 2018.

W2-Professorship for Stellar Physics and Exoplanets

The professorship is combined with the position of head of the section "Stellar Physics and Stellar Activity" at the AIP. Office location is at AIP in Potsdam/Babelsberg. The Stellar Physics and Stellar Activity section is one of the six science sections at AIP and is part of its Research Branch I (Cosmic Magnetic Fields). This Branch focuses on the solar-stellar connection, optical and radio solar physics, magnetohydrodynamics and turbulence as well as technological developments of high-resolution spectroscopy and polarimetry and robotics.

The appointee is responsible for establishing a research group carrying out independent research programs in the broadly defined field of Stellar Physics and Exoplanets and in encouraging collaborations among the different research groups. We are particularly excited about candidates interested in the star-exoplanet relationship. Successful candidates are expected to have a proper track record of publishing in international peer-review journals and demonstrated their competence in defining research projects and attracting research funding. The appointee is expected to actively participate in the educational programs at the Institute of Physics and Astronomy at the University of Potsdam as part of the Bachelor and Master study programs in Physics and Astrophysics. Educational skills and teaching experience are therefore required. The employment is planned according to the "Jlicher Modell". The candidate will be appointed as a civil servant with the obligation to teach at least two hours per week at the University of Potsdam.

Prerequisites for the application are a doctoral degree and a record of research equivalent to the German "Habilitation". Scientific qualifications achieved in the private sector, outside Germany, or as junior professor will also be considered (41 Brandenburgisches Hochschulgesetz - BbgHG). Appointment will be made as a civil servant or a public employee according to the State law (40 BbgHG).

The University of Potsdam and the AIP strive to increase the proportion of women in research and teaching and specifically encourages female applicants to apply for this position. Handicapped applicants will be given preference in case of equal suitability. People with an immigration background are specifically encouraged to apply.

The University of Potsdam offers dual career support and coaching for newly-appointed professors: `http://www.uni-potsdam.de/en/neue-beschaeftigte/information-for-newly-appointed-professors`
Applications (with a presentation of your research interests, curriculum vitae, copies of academic certificates and documents, a list of publications, a list of conducted courses, a list of externally funded projects) should be sent to the University of Potsdam ausschreibungen@uni-potsdam.de with-in 8 weeks of the publication of this notice.

Contact: `ausschreibungen@uni-potsdam.de`

The Winton Fellowship @ Birmingham

Amaury Triaud & Bill Chaplin
Birmingham University, Birmingham, UK

For a start at the University of Birmingham, between 1st Oct 2017 and 31st March 2018

We invite talented, inventive and productive early-career researchers to apply for a Winton Fellowship to be held at the University of Birmingham – as part of the Sun, Stars, and Exoplanets research group – to work primarily with Dr Amaury Triaud, who will move to Birmingham in August. The Winton Fellowship programme supports postdoctoral fellows working on the detection and characterisation of exoplanets. Selected universities can nominate up to two fellowship applications per institution. Applicants must have obtained their PhD by 30 September 2017, and we would prefer candidates within four years of the award date of their PhD.

If you would like to apply for a Fellowship to be held in Birmingham, please send the following documents, **by 14 July 2017**, to Amaury Triaud (aht34@cam.ac.uk) and Bill Chaplin (w.j.chaplin@bham.ac.uk):

- A notification of interest, briefly detailing your research and what you would like to work on at Birmingham (1 page),
- a CV,
- a list of your most important publications and research achievements not represented by publications (1 page),
- the contact details of two people able to recommend you.

After a review process we will select up to two candidates, who will create and write a full application to the Winton Fellowship in partnership with local faculty members. This application will need to be submitted by 1 September 2017.
Information about the Winton Fellowship programme can be found in the link provided below, as well as the webpage for our research group.

We look forward to hearing from you,
Amaury Triaud, Bill Chaplin and colleagues in Birmingham

Download/Website: `https://www.winton.com/en/philanthropies/the-winton-exoplanet-fellowship`

Download/Website: `http://www.birmingham.ac.uk/research/activity/physics/astronomy/solar-and-stellar/index.aspx`

Contact: `aht34@cam.ac.uk`

PhD studentship on Asteroseismology with the NASA TESS mission

Tiago Campante
Instituto de Astrofisica e Ciencias do Espaco - University of Porto (Portugal)

IA-U.Porto/Aarhus University, starting Autumn 2017

A call is ongoing for a PhD studentship on "Ensemble asteroseismology of solar-type stars with the NASA TESS mission" (see abstract below). Details on the application procedure can be found at `http://www.idpasc.lip.pt/LIP/thesis_program/index.php?opt=1`. This PhD project has been made available in the context of the IDPASC PhD Program, funded by the FCT PD Program Initiative (Portugal). The deadline for applications is the **17th of July 2017**.

The student will be based at Instituto de Astrofísica e Ciências do Espaço – University of Porto (Portugal). It is nonetheless expected that the student will spend one-third of their time at Aarhus University (Denmark).

Abstract: The Transiting Exoplanet Survey Satellite (TESS) is a NASA space mission, with launch scheduled for March 2018, that will perform an all-sky survey for planets transiting bright nearby stars. Furthermore, TESS's excellent photometric precision will enable asteroseismology, the detailed study of stars by the observation of their natural, resonant oscillations. Asteroseismology is proving to be particularly relevant for the study of solar-type stars (i.e., low-mass, main-sequence stars and cool subgiants), in great part due to the exquisite photometric data made available by NASA's Kepler space telescope and, more recently, by the repurposed K2 mission. In extending the legacy of Kepler/K2, the main goal of this project will be to perform an ensemble asteroseismic study of bright solar-type stars that reside in the solar neighborhood, making use of data collected by TESS during its 2-year primary mission. To that end, we propose an end-to-end PhD project that will provide the student with skills in photometric time-series preparation from pixel data, asteroseismic data analysis and stellar modeling techniques. The implications of this project are far-reaching. The proposed research will provide a well characterized sample of benchmark solar-type stars to be used in studies of exoplanetary systems and of the chemical evolution of the solar neighborhood, the latter of which will impact on Galactic archaeology studies.

Download/Website: `http://www.idpasc.lip.pt/LIP/thesis_program/index.php?opt=1`
Contact: `campante@bison.ph.bham.ac.uk`

4 Conference announcements

Exoplanets and Planet Formation

Dong Lai
Cornell University, Ithaca, NY 14853, USA

Shanghai, December 11-15, 2017

This international conference is devoted to the astrophysics of exoplanets. Among the more than 5000 exoplanets discovered so far are many extreme systems that are quite unlike our own Solar System. Understanding these exoplanets, in conjuction with Solar System planets and protoplanetary disks, can provide new insights into the structure, formation and evolution of planets and planetary systems.

The conference will consist of invited talks and contributed talks/posters. While all topics of exoplanetary science are welcome, a general theme is planet formation and evolution. To this end, relavent topics on Solar System planetary science and protoplanetary disks will also be covered.

The conference will take place at the newly-established T. D. Lee Institute http://leeinst.sjtu.edu.cn/), named after a famous Nobel laureate. T.D. Lee Institute is dedicated to pursue forefront research in physics and astrophysics.

SOC (partial list) includes Isabelle Baraffe (Exeter), Willy Benz (Bern), Eugene Chiang (Berkeley), Debra Fischer (Yale), Tristan Guillot (OCA), Heather Knutson (Caltech), Dong Lai (Cornell; chair), Doug Lin (UCSC), Renu Malhotra (Arizona), Karin Oberg (Harvard), Fred Rasio (Northwestern), Scott Tremaine (IAS), Josh Winn (Princeton), Yanqin Wu (Toronto).

Download/Website: `https://indico.leeinst.sjtu.edu.cn/event/25/`

Know Thy Star - Know Thy Planet: Assessing the Impact of Stellar Characterization on Our Understanding of Exoplanets

David Ciardi
Caltech/IPAC, NASA Exoplanet Science Institute, 770 South Wilson, Pasadena, CA 91125

Pasadena Hilton, October 9-12, 2017

The abstract submission deadline for the Know Thy Star Know - Thy Planet Conference is July 28. The conference will be held October 9-12, 2017 in Pasadena, CA.

This four-day meeting will focus on the needs for stellar characterization, bound (and unbound) companions, false positive assessment, and planetary characterization with an emphasis on the techniques necessary to accomplish these goals. The follow-up needs for radial velocity, transit, direct imaging, and microlensing detections of planets are similar but also different in detail.

This meeting will gather experts in the field to understand community needs for follow-up observations in the era of *K2* and *TESS* and leading into *JWST*, *PLATO*, and *WFIRST*. A preliminary agenda can be found on the conference website.

NASA attendees: Please forecast your attendance at this conference through your center as soon as possible. The NCTS number is 29202-18.

Important Dates

- July 28: Abstract Submission Deadline
- September 7: Registration Deadline and Hotel Reservation Deadline at the Pasadena Hilton

- October 2: Deadline to purchase tickets for conference social events
- October 8: Opening reception at El Cholo restaurant
- October 9-12: Know Thy Star - Know Thy Planet conference at the Pasadena Hilton

Download/Website: `http://nexsci.caltech.edu/conferences/2017/knowthystar/`
Contact: `knowthystar@ipac.caltech.edu`

5 As seen on astro-ph

The following list contains all the entries relating to exoplanets that we spotted on astro-ph during June 2017. If you see any that we missed, please let us know and we'll include them in the next issue.

astro-ph/1706.00027 : **Search for water vapor in the high-resolution transmission spectrum of HD189733b in the visible** by *R. Allart et al.*
astro-ph/1706.00058 : **A survey for planetary-mass brown dwarfs in the Chamaeleon I star-forming region** by *T. L. Esplin, et al.*
astro-ph/1706.00084 : **Moderately Eccentric Warm Jupiters from Secular Interactions with Exterior Companions** by *Kassandra R. Anderson, Dong Lai*
astro-ph/1706.00251 : **Compositional imprints in density-distance-time: a rocky composition for close-in low-mass exoplanets from the location of the valley of evaporation** by *Sheng Jin, Christoph Mordasini*
astro-ph/1706.00254 : **Gravitational instabilities in a protosolar-like disc II: continuum emission and mass estimates** by *M. G. Evans, et al.*
astro-ph/1706.00417 : **Convergence of the critical cooling rate for protoplanetary disk fragmentation achieved; the key role of numerical dissipation of angular momentum** by *Hongping Deng, Lucio Mayer, Farzana Meru*
astro-ph/1706.00466 : **Atmospheric Circulation and Cloud Evolution on the Highly Eccentric Extrasolar Planet HD 80606b** by *N. K. Lewis, et al.*
astro-ph/1706.00495 : **The TESS Input Catalog and Candidate Target List** by *Keivan G. Stassun, et al.*
astro-ph/1706.00509 : **Three planets around HD 27894. A close-in pair with a 2:1 period ratio and an eccentric Jovian planet at 5.4 AU** by *T. Trifonov, et al.*
astro-ph/1706.00653 : **Decryption of Messages from Extraterrestrial Intelligence Using the Power of Social Media - The SETI Decrypt Challenge** by *René Heller*
astro-ph/1706.01218 : **SONS: The JCMT legacy survey of debris discs in the submillimetre** by *Wayne S. Holland, et al.*
astro-ph/1706.01224 : **Quantitative estimates of the surface habitability of Kepler-452b** by *Laura Silva et al.*
astro-ph/1706.01278 : **Tracking Advanced Planetary Systems (TAPAS) with HARPS-N. V.: A Massive Jupiter orbiting the very low metallicity giant star BD+03 2562 and a possible planet around HD 103485** by *E. Villaver, et al.*
astro-ph/1706.01522 : **Forecasted masses for seven thousand KOIs** by *Jingjing Chen, David Kipping*
astro-ph/1706.01883 : **The Young L Dwarf 2MASS J11193254-1137466 is a Planetary-Mass Binary** by *William M.J. Best, et al.*
astro-ph/1706.01892 : **Three's Company: An additional non-transiting super-Earth in the bright HD 3167 system, and masses for all three planets** by *Jessie L. Christiansen, et al.*
astro-ph/1706.01907 : **Is there anybody out there?** by *Luis A. Anchordoqui, Susanna M. Weber, Jorge F. Soriano*
astro-ph/1706.01975 : **Dynamics and Collisional Evolution of Closely Packed Planetary Systems** by *Jason A. Hwang, et al.*

astro-ph/1706.02018 : **On the Age of the TRAPPIST-1 System** by *Adam J. Burgasser, Eric E. Mamajek*
astro-ph/1706.02050 : **Hydrodynamic Escape of Planetary Atmospheres during a Star's X-ray and Extreme Ultraviolet Saturation May Impose a Size Limit of $\sim$2 Earth Radii on Rocky Exoplanets** by *Owen Lehmer, David Catling*
astro-ph/1706.02098 : **Influence of Photoelectrons on the Structure and Dynamics of the Upper Atmosphere of a Hot Jupiter** by *D.E. Ionov, V.I. Shematovich, Ya.N. Pavlyuchenkov*
astro-ph/1706.02234 : **Star-planet interactions. IV. Possibility of detecting the orbit-shrinking of a planet around a red giant** by *Georges Meynet, et al.*
astro-ph/1706.02302 : **GENESIS: New Self-Consistent Models of Exoplanetary Spectra** by *Siddharth Gandhi, Nikku Madhusudhan*
astro-ph/1706.02532 : **The transiting multi-planet system HD3167: a 5.7 MEarth Super-Earth and a 8.3 MEarth mini-Neptune** by *Davide Gandolfi, et al.*
astro-ph/1706.02608 : **The Flying Saucer: Tomography of the thermal and density gas structure of an edge-on protoplanetary disk** by *A. Dutrey, et al.*
astro-ph/1706.02689 : **Constraining the Compositions of the TRAPPIST-1 Planets to Trace Snow Lines and Migration in M Dwarf Disks** by *Cayman T. Unterborn, et al.*
astro-ph/1706.03064 : **Robust, open-source removal of systematics in Kepler data** by *S. Aigrain et al.*
astro-ph/1706.03066 : **On the formation of multiple concentric rings and gaps in protoplanetary disks** by *Jaehan Bae, Zhaohuan Zhu, Lee Hartmann*
astro-ph/1706.03155 : **Hydrodynamic Photoevaporation of Protoplanetary Disks with Consistent Thermochemistry** by *Lile Wang, Jeremy J. Goodman*
astro-ph/1706.03188 : **Radiative Transfer for Exoplanet Atmospheres** by *Kevin Heng, Mark Marley*
astro-ph/1706.03420 : **The formation of giant planets in wide orbits by photoevaporation-synchronised migration** by *O.M. Guilera, M.M. Miller Bertolami, M.P. Ronco*
astro-ph/1706.03655 : **Radially resolved simulations of collapsing pebble clouds in protoplanetary discs** by *Karl Wahlberg Jansson, Anders Johansen*
astro-ph/1706.03708 : **ALMA Observations of the Young Substellar Binary System 2M1207** by *L. Ricci, et al.*
astro-ph/1706.03789 : **Stability of Multiplanetary Systems in Star Clusters** by *Maxwell Xu Cai, et al.*
astro-ph/1706.03858 : **HATS-36b and 24 other transiting/eclipsing systems from the HATSouth - K2 Campaign 7 program** by *D. Bayliss, et al.*
astro-ph/1706.04319 : **Searching for Exoplanets Using Artificial Intelligence** by *Kyle A. Pearson, Leon Palafox, Caitlin A. Griffith*
astro-ph/1706.04354 : **Planet-disc interaction in laminar and turbulent discs** by *Moritz Stoll, Giovanni Picogna, Wilhelm Kley*
astro-ph/1706.04363 : **The impact of the Hall effect during cloud core collapse:implications for circumstellar disk evolution** by *Yusuke Tsukamoto, et al.*
astro-ph/1706.04504 : **A Three-Dimensional View of Turbulence: Constraints on Turbulent Motions in the HD 163296 Protoplanetary Disk using DCO+** by *Kevin M. Flaherty, et al.*
astro-ph/1706.04570 : **Radiation Hydrodynamics Simulations of Photoevaporation of Protoplanetary Disks: Metallicity Dependence** by *Riouhei Nakatani, et al.*
astro-ph/1706.04581 : **A new statistical method for characterizing the atmospheres of extrasolar planets** by *Cassandra S. Henderson, et al.*
astro-ph/1706.04624 : **The First Scattered Light Image of the Debris Disk around the Sco-Cen target HD 129590** by *Elisabeth Matthews, et al.*
astro-ph/1706.04686 : **Dust Ablation on the Giant Planets: Consequences for Stratospheric Photochemistry** by *Julianne I. Moses, Andrew R. Poppe*
astro-ph/1706.04990 : **Eccentric Companions to Kepler-448b and Kepler-693b: Clues to the Formation of Warm Jupiters** by *Kento Masuda*
astro-ph/1706.05458 : **An Investigation into Exoplanet Transits and Uncertainties** by *Yi Ji, et al.*

astro-ph/1706.05570 : **Interstellar communication. II. Application to the solar gravitational lens** by *Michael Hippke*
astro-ph/1706.05805 : **Stable habitable zones of single Jovian planet systems** by *Matthew T. Agnew, et al.*
astro-ph/1706.05865 : **Seeing double with K2: Testing re-inflation with two remarkably similar planets around red giant branch stars** by *Samuel K. Grunblatt, et al.*
astro-ph/1706.05894 : **Exoplanets as probes of the winds of host stars: the case of the M dwarf GJ 436** by *A. A. Vidotto, V. Bourrier*
astro-ph/1706.05959 : **Cosmic Modesty** by *Abraham Loeb*
astro-ph/1706.06005 : **Comparative Climates of TRAPPIST-1 planetary system: results from a simple climate-vegetation model** by *Tommaso Alberti, et al.*
astro-ph/1706.06124 : **Ground-based photometry of the 21-day Neptune HD106315c** by *M. Lendl et al.*
astro-ph/1706.06204 : **The California-Kepler Survey V. Peas in a Pod: Planets in a Kepler Multi-planet System are Similar in Size and Regularly Spaced** by *Lauren M. Weiss, et al.*
astro-ph/1706.06329 : **Eccentricity excitation and merging of planetary embryos heated by pebble accretion** by *Ondrej Chrenko, Miroslav Broz, Michiel Lambrechts*
astro-ph/1706.06349 : **How Expanded Ionospheres of Hot Jupiters Can Prevent Escape of Radio Emission Generated by the Cyclotron Maser Instability** by *Christof Weber, et al.*
astro-ph/1706.06537 : **Gravito-turbulence and the excitation of small-scale parametric instability in astrophysical discs** by *A. Riols, H. Latter, S-J. Paardekooper*
astro-ph/1706.06602 : **Supervised Learning Detection of Sixty Non-Transiting Hot Jupiter Candidates** by *Sarah Millholland, Gregory Laughlin*
astro-ph/1706.06678 : **A resolved and asymmetric ring of PAHs within the young circumstellar disk of IRS 48** by *Guillaume Schworer, et al.*
astro-ph/1706.06723 : **A giant planet undergoing extreme ultraviolet irradiation by its hot massive-star host** by *B. Scott Gaudi, et al.*
astro-ph/1706.06865 : **EPIC 228735255b - An eccentric 6.57 day transiting hot Jupiter in Virgo** by *H.A.C. Giles, et al.*
astro-ph/1706.06988 : **Escape and fractionation of volatiles and noble gases from Mars-sized planetary embryos and growing protoplanets** by *P. Odert, et al.*
astro-ph/1706.07038 : **The Detectability of Radio Auroral Emission from Proxima B** by *Blakesley Burkhart, Abraham Loeb*
astro-ph/1706.07131 : **Gap and rings carved by vortices in protoplanetary dust** by *P. Barge, et al.*
astro-ph/1706.07219 : **Cloud formation in metal-rich atmospheres of hot super-Earths like 55 Cnc e and CoRot7b** by *G.Mahapatra, Ch.Helling, Y. Miguel*
astro-ph/1706.07262 : **MOVES I. The evolving magnetic field of the planet-hosting star HD189733** by *R. Fares, et al.*
astro-ph/1706.07489 : **Deep imaging search for planets forming in the TW Hya protoplanetary disk with the Keck/NIRC2 vortex coronagraph** by *G. Ruane, et al.*
astro-ph/1706.07492 : **Submillimetre-sized dust aggregate collision and growth properties** by *J. Brisset, et al.*
astro-ph/1706.07512 : **Low-velocity collision behaviour of clusters composed of sub-mm sized dust aggregates** by *J. Brisset, et al.*
astro-ph/1706.07605 : **Structure and Evolution of Internally Heated Hot Jupiters** by *Thaddeus D. Komacek, Andrew N. Youdin*
astro-ph/1706.07807 : **LAMOST Reveals Neptune-size Cousins of hot Jupiters, preferentially in "(metal-)rich" and "one-child" Kepler families** by *Subo Dong et al.*
astro-ph/1706.07823 : **Inclination Evolution of Protoplanetary Disks Around Eccentric Binaries** by *J. J. Zanazzi, Dong Lai*
astro-ph/1706.08444 : **The ARIEL Mission Reference Sample** by *Tiziano Zingales, et al.*
astro-ph/1706.08556 : **Unsupervised Method for Correlated Noise Removal for Multi-wavelength Exoplanet**

Transit Observations by *Ali Dehghan Firoozabadi, et al.*

astro-ph/1706.08625 : **NanoRocks: Design and Performance of an Experiment Studying Planet Formation on the International Space Station** by *J. Brisset, et al.*

astro-ph/1706.08781 : **The EBLM project III. A Saturn-size low-mass star at the hydrogen-burning limit** by *Alexander von Boetticher, et al.*

astro-ph/1706.08975 : **Effect of dust radial drift on viscous evolution of gaseous disk** by *Kazuhiro D. Kanagawa, et al.*

astro-ph/1706.08977 : **A Millimeter Continuum Size-Luminosity Relationship for Protoplanetary Disks** by *Anjali Tripathi, et al.*

astro-ph/1706.09427 : **Polarized scattered light from self-luminous exoplanets** by *Tomas Stolker, et al.*

astro-ph/1706.09565 : **Magnetically Induced Disk Winds and Transport in the HL Tau Disk** by *Yasuhiro Hasegawa, et al.*

astro-ph/1706.09613 : **Analytical model of multi-planetary resonant chains and constraints on migration scenarios** by *J.-B. Delisle*

astro-ph/1706.09840 : **Triggering Collapse of the Presolar Dense Cloud Core and Injecting Short-Lived Radioisotopes with a Shock Wave. V. Nonisothermal Collapse Regime** by *Alan P. Boss*

astro-ph/1706.09849 : **Transit Timing and Duration Variations for the Discovery and Characterization of Exoplanets** by *Eric Agol, Dan Fabrycky*

astro-ph/1706.09905 : **Generation of inclined protoplanetary discs and misaligned planets through mass accretion I: Coplanar secondary discs** by *M. Xiang-Gruess, P. Kroupa*

astro-ph/1706.10282 : **Stellar Chemical Clues As To The Rarity of Exoplanetary Tectonics** by *Cayman T. Unterborn, et al.*