ExoPlanet News
An Electronic Newsletter

No. 128, 18 February 2019

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1 Editorial

Welcome to the 128^{th} Edition of the ExoPlanet News!

In this edition, we bring you abstracts of scientific papers, job ads, conference announcements, and an overview of exoplanet-related articles on astro-ph. We thank all of you who contributed to this issue of the newsletter.

The last few weeks have been very good for the CHEOPS satellite. The cover of the space telescope was successfully and smoothly opened on 29 January 2020. Finally, CHEOPS took its first picture of The Starry Night on 7 February 2020.

The new editorial team is very happy to bring you this newsletter. As before, we are looking forward to your abstracts, ads or announcements. This is a community newsletter and, as such, we are eager to receive feedback and suggestions from you, the community. The Latex template for submitting contributions, as well as all previous editions of ExoPlanet News, can be found on the ExoPlanet News webpage (http://nccr-planets.ch/exoplanetnews/).

The next issue will be sent on 17 March 2020.

Thanks again for your support, and best regards from the editorial team,

Julia Venturini
Lokesh Mishra (Editor-in-Chief for this edition)
Holly Capelo
Daniel Angerhausen

2 Abstracts of refereed papers

A Search for Transiting Planets in the Globular Cluster M4 with K2: Candidates and Occurrence Limits

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The Astronomical Journal, published 2020AJ....159..106W

We perform a search for transiting planets in the NASA K2 observations of the globular cluster (GC) M4. This search is sensitive to larger orbital periods ($P < 35$ days, compared to the previous best of $P < 16$ days) and, at the shortest periods, smaller planet radii ($R_p > 0.3\,R_J$, compared to the previous best of $R_p > 0.8\,R_J$) than any previous search for GC planets. Seven planet candidates are presented. An analysis of the systematic noise in our data shows that most, if not all, of these candidates are likely false alarms. We calculate planet occurrence rates assuming our highest significance candidate is a planet and occurrence rate upper limits assuming no detections. We calculate 3σ occurrence rate upper limits of 6.1% for 0.71–2 R_J planets with 1–36 day periods and 16% for 0.36–0.71 R_J planets with 1–10 day periods. The occurrence rates from *Kepler*, *TESS*, and RV studies of field stars are consistent with both a non-detection of a planet and detection of a single hot Jupiter in our data. Comparing to previous studies of GCs, we are unable to place a more stringent constraint than Gilliland et al. 2000 for the radius–period range they were sensitive to, but do place tighter constraints than both Weldrake et al. 2008 and Nascimbeni et al. 2012 for the large-radius regimes to which they were sensitive.

Download/Website: `https://arxiv.org/abs/2001.08362`

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Exo-MerCat: a merged exoplanet catalog with Virtual Observatory connection.

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Astronomy and Computing, accepted (arXiv:2002.01834)

The heterogeneity of papers dealing with the discovery and characterization of exoplanets makes every attempt to maintain a uniform exoplanet catalog almost impossible. Four sources currently available online (NASA Exoplanet Archive, Exoplanet Orbit Database, Exoplanet Encyclopaedia, and Open Exoplanet Catalogue) are commonly used by the community, but they can hardly be compared, due to discrepancies in notations and selection criteria.
Exo-MerCat is a Python code that collects and selects the most precise measurement for all interesting planetary and orbital parameters contained in the four databases, accounting for the presence of multiple aliases for the same target. It can download information about the host star as well by the use of Virtual Observatory ConeSearch connections to the major archives such as SIMBAD and those available in VizieR. A Graphical User Interface is provided to filter data based on the user's constraints and generate automatic plots that are commonly used in the exoplanetary community.
With Exo-MerCat, we retrieved a unique catalog that merges information from the four main databases, standardizing the output and handling notation differences issues. Exo-MerCat can correct as many issues that prevent a direct correspondence between multiple items in the four databases as possible, with the available data. The catalog is available as a VO resource for everyone to use and it is periodically updated, according to the update rates of the source catalogs.

Download/Website: `https://arxiv.org/abs/2002.01834`

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Planetary evolution with atmospheric photoevaporation I. Analytical derivation and numerical study of the evaporation valley and transition from super-Earths to sub-Neptunes

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A&A, accepted / arXiv:2002.02455

Observations have revealed in the Kepler data a depleted region separating smaller super-Earths from larger sub-Neptunes. This can be explained as an evaporation valley between planets with and without H/He that is caused by atmospheric escape.
We want to analytically derive the valley's locus and understand how it depends on planetary properties and stellar XUV luminosity. We also want to derive constraints for planet formation models.First, we conduct numerical simulations of the evolution of close-in low-mass planets with H/He undergoing escape. We make parameter studies with grids in core mass and orbital separation, and vary the post-formation H/He mass, the strength of evaporation, and the atmospheric and core composition. Second, we develop an analytical model for the valley locus.
We find that the bottom of the valley quantified by the radius of the largest stripped core $R_{\rm bare}$ at a given orbital distance depends only weakly on post-formation H/He mass. The reason is that a high initial H/He mass means that there is more gas to evaporate, but also that the planet density is lower, increasing mass loss. Regarding the stellar XUV-luminosity, $R_{\rm bare}$ is found to scale as $L_{\rm XUV}^{0.135}$. The same weak dependency applies to the efficiency factor ε of energy-limited evaporation. As found numerically and analytically, $R_{\rm bare}$ varies a function of orbital period P for a constant ε as $P^{-2p_{\rm c}/3} \approx P^{-0.18}$ where $M_{\rm c} \propto R_{\rm c}^{p_{\rm c}}$ is the mass-radius relation of solid cores. $R_{\rm bare}$ is about 1.7 $R_{\oplus}$ at a 10-day orbital period for an Earth-like composition, increasing linearly with ice mass fraction.
The numerical results are explained very well with the analytical model where complete evaporation occurs if the temporal integral over the stellar XUV irradiation absorbed by the planet is larger than binding energy of the envelope in the gravitational potential of the core. The weak dependency on the post-formation H/He means that the valley does not strongly constrain gas accretion during formation. But the weak dependency on primordial H/He mass, stellar $L_{\rm XUV}$ and ε could be the reason why observationally the valley is so clearly visible, and why theoretically various models find similar results. At the same time, given the large observed spread of $L_{\rm XUV}$, the dependency on it is still strong enough to explain why the valley is not completely empty.

Download/Website: `https://ui.adsabs.harvard.edu/abs/2020arXiv200202455M/abstract`

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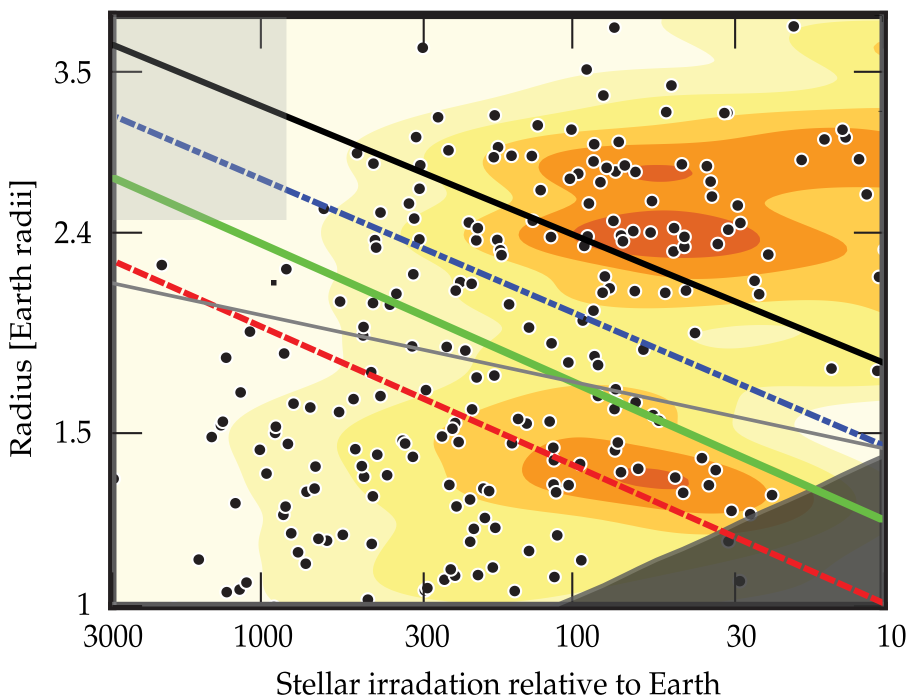

Figure 1: Comparison of the locus of the valley as observed for Kepler planets around solar-like stars (points and yellow-brown occurrence maps, Fulton & Petigura 2018, with permission) and as theoretically found in the simulations. Note that all the theoretical lines show the bottom of the valley, not its middle. The green solid line is the nominal simulation. The red dashed and blue dashed-dotted lines show strong and weak evaporation. The black line represents ice cores. The thin gray line assumes a distance- dependent evaporation efficiency factor. The gray rectangle in the top left corner is the empty evaporation desert as found in the nominal simulation. The black triangle is observationally unconstrained.

ISPY - NACO Imaging Survey for Planets around Young stars: Survey description and results from the first 2.5 years of observations

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Astronomy & Astrophysics, in press (arXive: 2002.01807)

The occurrence rate of long-period giant planets around young stars is highly uncertain since it is not only governed by the protoplanetary disc structure and planet formation process, but also reflects both dynamical re-structuring processes after planet formation as well as possible capture of planets not formed in-situ. Direct imaging is currently the only feasible method to detect such wide-orbit planets and constrain their occurrence rate. To detect and characterise wide-orbit giant planets during and shortly after their formation phase within protoplanetary and debris discs around nearby young stars, we carry out a large L'-band high-contrast direct imaging survey of 200 young stars with protoplanetary or debris discs using the NACO instrument at the ESO Very Large Telescope on Cerro Paranal in Chile. We use very deep angular differential imaging observations with typically $> 60^\circ$ field rotation, and employ a vector vortex coronagraph where feasible to achieve the best possible point source sensitivity down to an inner working angle of about 100 mas. This paper introduces the NACO Imaging Survey for Planets around Young stars ("NACO-*ISPY*"), its goals and strategy, the target list, and data reduction scheme, and presents results from the first 2.5 survey years. We achieve a mean $5\,\sigma$ contrast of $\Delta L' = 6.4 \pm 0.1$ mag at 150 mas and a background limit of $L'_{\rm bg} = 16.5 \pm 0.2$ mag at $> 1.5''$. Our detection probability is >50% for companions with $\geq 8\,{\rm M_{Jup}}$ at semi-major axes of 80 – 200 au and $>13\,{\rm M_{Jup}}$ at 30 – 250 au. It thus compares well to the detection space of other state-of-the-art high-contrast imaging surveys. We have already contributed to the characterisation of two new planets originally discovered by VLT/SPHERE, but we have not yet independently discovered new planets around any of our target stars. We have discovered two new close-in low-mass stellar companions around R CrA and HD 193571 and report in this paper the discovery of two more close co-moving low-mass stellar companions around HD 72660 and HD 92536. Furthermore, we report L'-band scattered light images of the discs around eleven stars, six of which have never been imaged at L'-band before. The first 2.5 years of the NACO-*ISPY* survey have already demonstrated that VLT/NACO combined with our survey strategy can achieve the anticipated sensitivity to detect giant planets and reveal new close stellar companions around our target stars.

Download/Website: `http://arxiv.org/abs/2002.01807`

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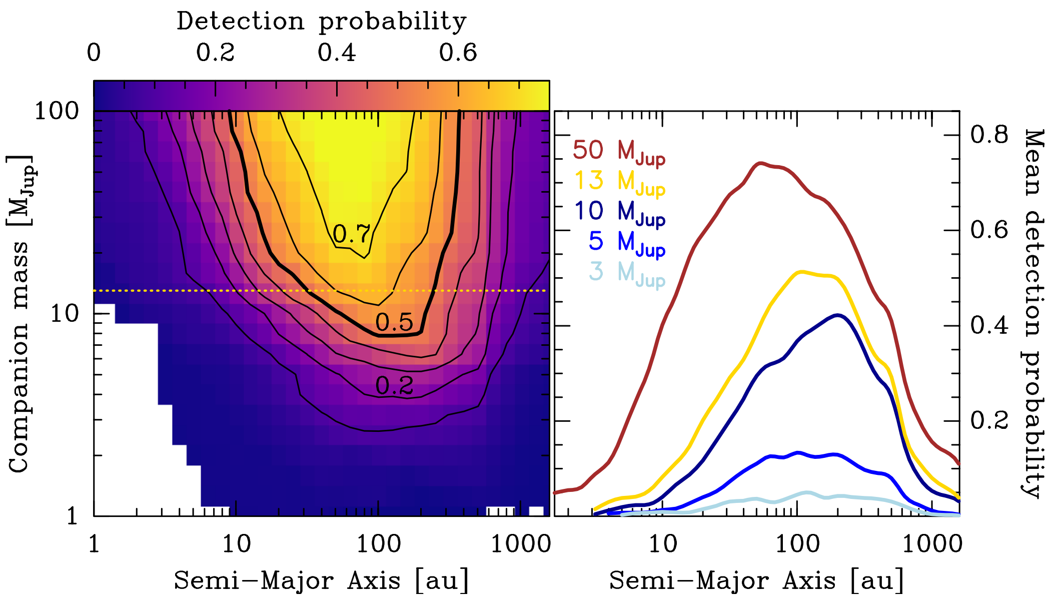

Figure 2: *Left:* Detection probability as function of companion mass and semi-major axis for all 112 targets observed during P96 through P100. Contours show detection probabilities from 0.1 to 0.7; the maximum is 0.8 (at SMA ≈ 60 au and $M > 60\,\mathrm{M_{Jup}}$). The horizontal yellow dotted line marks the approximate boundary between GP and BD ($13\,\mathrm{M_{Jup}}$). *Right:* Probability curves for different masses as function of semi-major axes.

Gemini-GRACES high-quality spectra of *Kepler* evolved stars with transiting planets. I. Detailed characterization of multi-planet systems Kepler-278 and Kepler-391

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Astronomy & Astrophysics, in press (arXiv:1912.10278)

Aims. Kepler-278 and Kepler-391 are two of the three evolved stars known to date on the red giant branch (RGB) to host multiple short-period transiting planets. Moreover, the planets orbiting Kepler-278 and Kepler-391 are among the smallest discovered around RGB stars. Here we present a detailed stellar and planetary characterization of these remarkable systems.*Methods*. Based on high-quality spectra from Gemini-GRACES for Kepler-278 and Kepler-391, we obtained refined stellar parameters and precise chemical abundances for 25 elements. Nine of these elements and the carbon isotopic ratios, $^{12}\mathrm{C}/^{13}\mathrm{C}$, had not previously been measured. Also, combining our new stellar parameters with a photodynamical analysis of the *Kepler* light curves, we determined accurate planetary properties of both systems. *Results* Our revised stellar parameters agree reasonably well with most of the previous results, although we find that Kepler-278 is $\sim$15% less massive than previously reported. The abundances of C, N, O, Na, Mg, Al, Si, S, Ca, Sc, Ti, V, Cr, Mn, Co, Ni, Cu, Zn, Sr, Y, Zr, Ba, and Ce, in both stars, are consistent with those of nearby evolved thin disk stars. Kepler-391 presents a relatively high abundance of lithium (A(Li)$_{NLTE}$ = 1.29 $\pm$ 0.09 dex), which is likely a remnant from the main-sequence phase. The precise spectroscopic parameters of Kepler-278 and Kepler-391, along with their high $^{12}\mathrm{C}/^{13}\mathrm{C}$ ratios, show that both stars are just starting their ascent on the RGB. The planets Kepler-278b, Kepler-278c, and Kepler-391c are warm sub-Neptunes, whilst Kepler-391b is a hot sub-Neptune that falls in the hot super-Earth desert and, therefore, it might be undergoing photoevaporation of its outer envelope. The high-precision obtained in the transit times allowed us not only to confirm Kepler-278c's TTV signal, but also to find evidence of a previously undetected TTV signal for the inner planet Kepler-278b. From the presence of gravitational interaction between these bodies we constrain, for the first time, the mass of Kepler-278b (M_p = 56 $^{+37}_{-13}$ $M_\oplus$) and Kepler-278c (M_p = 35 $^{+9.9}_{-21}$ $M_\oplus$). The mass limits, coupled with our precise determinations of the planetary radii, suggest that their bulk compositions are consistent with a significant amount of water content and the presence of H_2 gaseous envelopes. Finally, our photodynamical analysis also shows that the orbits of both planets around Kepler-278 are highly eccentric (e $\sim$ 0.7) and, surprisingly, coplanar. Further observations (e.g., precise radial velocities) of this system are needed to confirm the eccentricity values presented here.

Download/Website: `https://arxiv.org/abs/1912.10278`

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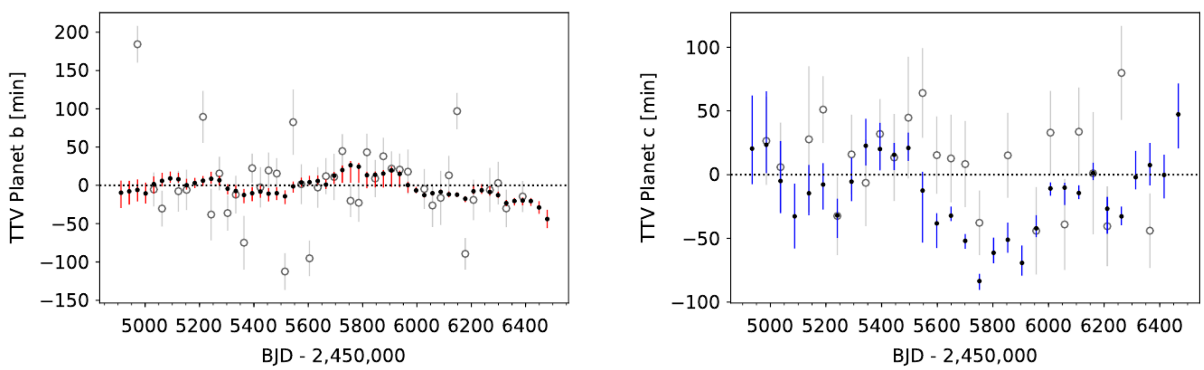

Figure 3: Posterior TTV of Kepler-278 b (left panel, red) and Kepler-278c (right panel, blue) obtained from the photodynamical modeling. For comparison the TTV of Rowe et al. (2015) measured on individual transits are shown as empty circles with grey errorbars. Adapted from Fig. 10 of Jofré et al. (2019).

Radio eclipses of exoplanets by the winds of their host stars

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Monthly Notices of the Royal Astronomical Society, in press (arXiv:2002.03901)

The search for exoplanetary radio emission has resulted in zero conclusive detections to date. Various explanations for this have been proposed, from the observed frequency range, telescope sensitivity, to beaming of the emission. In a recent paper, we illustrated that exoplanets can orbit through the radio photosphere of the wind of the host star, a region that is optically thick at a specific frequency, for a large fraction of their orbits. As a result, radio emission originating from the planet could be absorbed or 'eclipsed' by the wind of the host star. Here we investigate how the properties of the stellar wind and orbital parameters affect the fraction of the orbit where the planet is eclipsed by the stellar wind. We show that planets orbiting stars with low density winds are more favourable for detection in the radio. In terms of the orbital parameters, emission from transiting planets can escape the stellar wind easiest. We apply our model to the τ Boo planetary system, and show that observing the fraction of the planet's orbit where it is eclipsed by the wind of the host star could be used to constrain the properties of the stellar wind. However, our model developed would need to be used in conjunction with a separate method to disentangle the mass-loss rate and temperature of the stellar wind.

Download/Website: `https://arxiv.org/abs/2002.03901`

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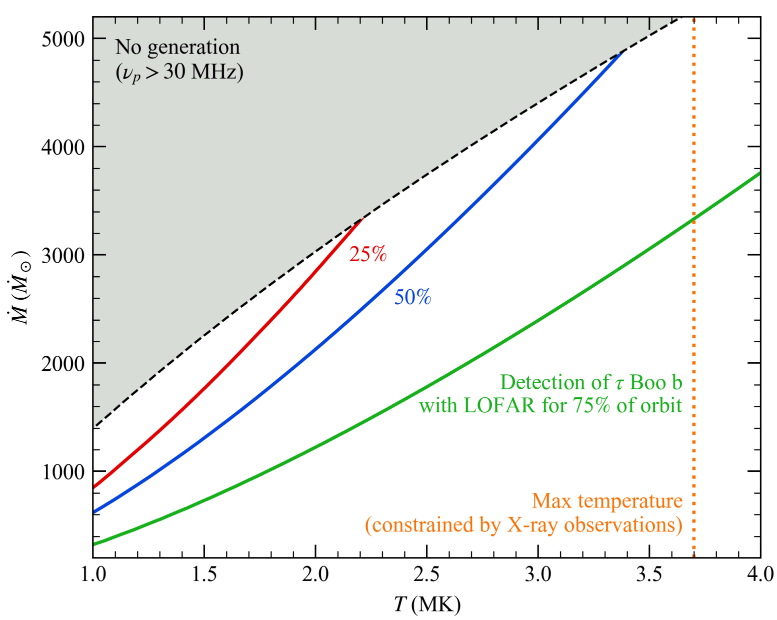

Figure 4: The combined stellar wind mass-loss rate and temperature that results in detection of radio emission from τ Boo b at 30 MHz with LOFAR, for 25%, 50%, and 75% of its orbit. The shaded area illustrates where the plasma frequency of the stellar wind at the planet's orbit is too high for generation of radio emission at 30 MHz. The vertical dotted line marks the maximum temperature of the stellar wind, which is constrained by X-ray observations of the host star.

Detection of Ionized Calcium in the Atmosphere of the Ultra-hot Jupiter KELT-9b

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Astrophysical Journal Letters, Published (2020ApJ...888L..13T)

With a day-side temperature in excess of 4500K, comparable to a mid-K-type star, KELT-9b is the hottest planet known. Its extreme temperature makes KELT-9b a particularly interesting test bed for investigating the nature and diversity of gas giant planets. We observed the transit of KELT-9b at high spectral resolution (R∼94,600) with the CARMENES instrument on the Calar Alto 3.5-m telescope. Using these data, we detect for the first time ionized calcium (CaII triplet) absorption in the atmosphere of KELT-9b; this is the second time that CaII has been observed in a hot Jupiter. Our observations also reveal prominent Hα absorption, confirming the presence of an extended hydrogen envelope around KELT-9b. We compare our detections with an atmospheric model and find that all four lines form between atmospheric temperatures of 6100 K and 8000 K and that the CaII lines form at pressures between 10 and 50 nbar while the Hα line forms at a lower pressure (∼6 nbar), higher up in the atmosphere. The altitude that the core of Hα line forms is found to be ∼1.4 R_p, well within the planetary Roche lobe (∼1.9 R_p). Therefore, rather than probing the escaping upper atmosphere directly, the Hα line and the other observed Balmer and metal lines serve as atmospheric thermometers enabling us to probe the planet's temperature profile, thus energy budget.

Download/Website: `https://arxiv.org/abs/1910.06882`

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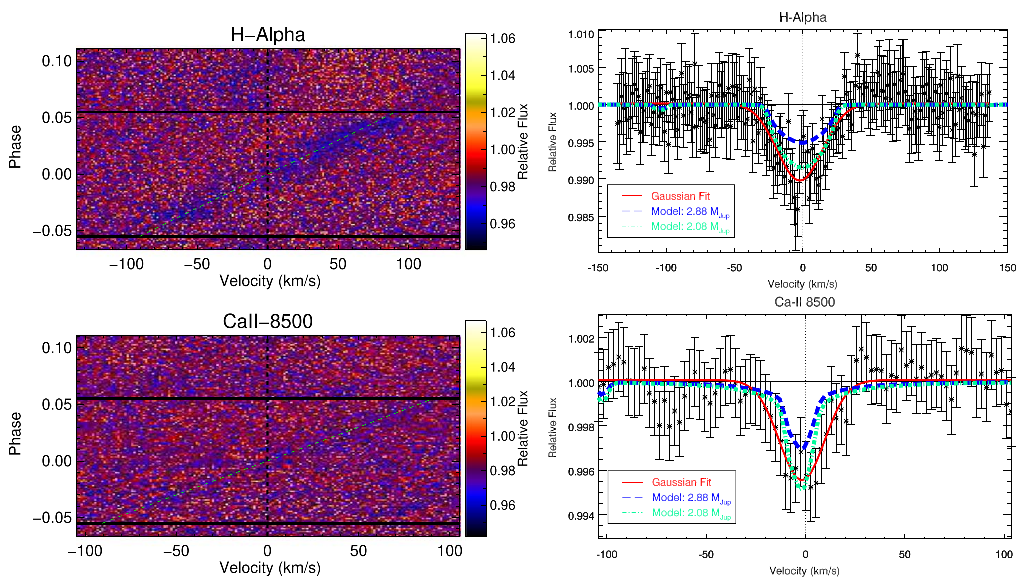

Figure 5: Spectra of the ultra-hot Jupiter KELT-9b from the CARMENES spectrograph on the 3.5-m Calar Alto telescope during transit are shown surrounding the Hα and ionized calcium (CaII) infrared triplet lines. The **left column** shows the final spectrum with absorption from the planet's atmosphere, Doppler shifted due to its changing radial velocity during transit (green-dashed line). The ingress and egress of the transit are shown as solid black lines. The **right column** shows the Hα and CaII composite absorption profiles in the rest frame of KELT-9b. The red dot-dashed line is a Gaussian fit to the data and the blue dashed curve and green dashed curve are a synthetic atmospheric model with a planetary mass of 2.88 M_{Jup} and 2.08 M_{Jup}, respectively. The depth of the Hα line is $1.02\pm0.08\%$ (compared to the optical transit depth of 0.67%) and indicates the existence of an extended hydrogen envelope around the planet. We find an absorption depth of 0.40 ± 0.5 for the CaII $8500.35\mathring{A}$ line.

Constraining the origin of the planetary debris surrounding ZTF J0139+5245 through rotational fission of a triaxial asteroid

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MNRAS, In Press, arXiv:2001.08223

White dwarfs containing orbiting planetesimals or their debris represent crucial benchmarks by which theoretical investigations of post-main-sequence planetary systems may be calibrated. The photometric transit signatures of likely planetary debris in the ZTF J0139+5245 white dwarf system has an orbital period of about 110 days. An asteroid which breaks up to produce this debris may spin itself to destruction through repeated close encounters with the star without entering its Roche radius and without influence from the white dwarf's luminosity. Here, we place coupled constraints on the orbital pericentre (q) and the ratio (β) of the middle to longest semiaxes of a triaxial asteroid which disrupts outside of this white dwarf's Roche radius ($r_{\rm Roche}$) soon after attaining its 110-day orbit. We find that disruption within tens of years is likely when $\beta \lesssim 0.6$ and $q \approx 1.0 - 2.0 r_{\rm Roche}$, and when $\beta \lesssim 0.2$ out to $q \approx 2.5 r_{\rm Roche}$. Analysing the longer-timescale disruption of triaxial asteroids around ZTF J0139+5245 is desirable but may require either an analytical approach relying on ergodic theory or novel numerical techniques.

Download/Website: `https://arxiv.org/abs/2001.08223`

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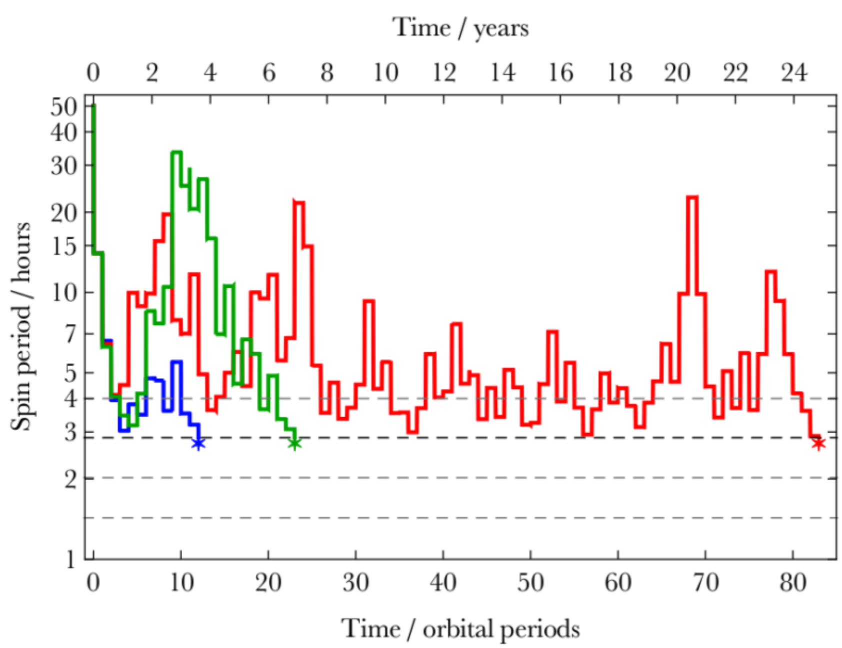

Figure 6: Three representative spin evolutions of triaxial asteroids with dimensions $\{a, b, c\} = \{100, 75, 55\}$ km orbiting ZTF J0139+5245 on a 110-day orbit with a pericentre of $1.3 r_{\rm Roche}$ and an initial spin rate of one revolution every 50 hours. They all break up at the locations of the six-pointed stars at different times upon reaching the critical spin period (black dashed line at 2.85 hours).

Constraining planet formation around $6M_\odot - 8M_\odot$ stars

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MNRAS, In Press, arXiv:2001.08757

Identifying planets around O-type and B-type stars is inherently difficult; the most massive known planet host has a mass of only about $3M_\odot$. However, planetary systems which survive the transformation of their host stars into white dwarfs can be detected via photospheric trace metals, circumstellar dusty and gaseous discs, and transits of planetary debris crossing our line-of-sight. These signatures offer the potential to explore the efficiency of planet formation for host stars with masses up to the core-collapse boundary at $\approx 8M_\odot$, a mass regime rarely investigated in planet formation theory. Here, we establish limits on where both major and minor planets must reside around $\approx 6M_\odot - 8M_\odot$ stars in order to survive into the white dwarf phase. For this mass range, we find that intact terrestrial or giant planets need to leave the main sequence beyond approximate minimum star-planet separations of respectively about 3 and 6 au. In these systems, rubble pile minor planets of radii 10, 1.0, and 0.1 km would have been shorn apart by giant branch radiative YORP spin-up if they formed and remained within, respectively, tens, hundreds and thousands of au. These boundary values would help distinguish the nature of the progenitor of metal-pollution in white dwarf atmospheres. We find that planet formation around the highest mass white dwarf progenitors may be feasible, and hence encourage both dedicated planet formation investigations for these systems and spectroscopic analyses of the highest mass white dwarfs.

Download/Website: `https://arxiv.org/abs/2001.08757`

Contact: `d.veras@warwick.ac.uk`

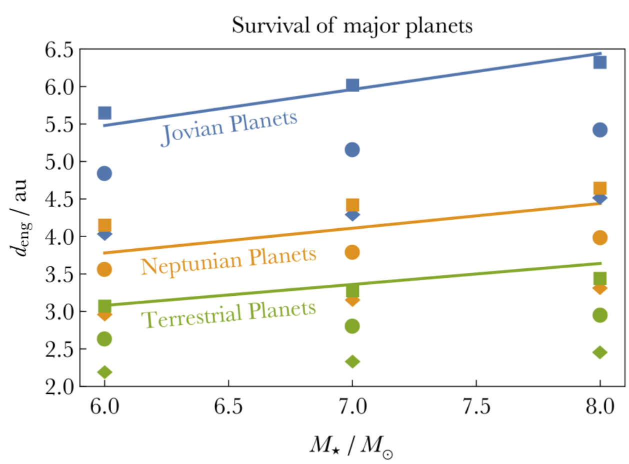

Figure 7: Minimum main-sequence star-planet distances (y-axis) for which a major planet will avoid engulfment in the asymptotic giant branch stellar envelope and survive until the white dwarf phase. The solid lines are simple linear extrapolations from Mustill & Villaver (2012) and the symbols are applications of Adams Bloch (2013). The diamonds represent the (unrealistic) case when no pulsations along the asymptotic giant branch phase are taken into account. The circles and squares assume a pulsation enhancement factor of 20 and 40 per cent, respectively. The stars are assumed to have solar metallicity.

3 Jobs and Positions

Post-doctoral Researcher in Astronomical Instrumentation

Prof. Sascha Quanz

ETH Zurich, Deadline - 30 April, 2020

We are looking for a postdoc with a PhD in Physics, Astronomy or Optical Engineering with experience and interests in some of the following fields: Astronomical instrumentation in the infrared, interferometry, optical design and setups, cryogenic instruments, and/or adaptive optical systems.

Project background: In the context of our LIFE initiative (see *https://www.life-space-mission.com*), our research group will develop over the next years a cryogenic testbed to demonstrate the nulling performance of a mid-infrared space interferometer dedicated to detect earth-like exoplanets. In a later phase, this facility shall also provide the test environment for the technology development of components needed for such a mission. For this ambitious experiment, we invite applications for a new post-doctoral position to join our Laboratory for Astronomical Instrumentation to work on the design and implementation of this project.

Job description: The candidate is expected to work 60% of the time to support the development of the cryogenic nulling test facility, including the definition of a conceptual and preliminary design, the definition of the facility requirements as well as the supervision of students to develop preparatory experiments in the ambient and cryogenic environment. 10% of the candidate's time (averaged over the year) will be devoted to supporting the teaching activities in our group, and the remaining 30% can be devoted to personal research, ideally synergistic with science carried out by other group members. Our group is involved in the Swiss National Centre for Competence in Research (NCCR) "PlanetS" Project, an interdisciplinary and inter-institutional research program focused on the origin, evolution, and characterization of planets inside and outside the Solar System (*http://nccr-planets.ch*). Furthermore, our group is actively involved in instrumentation activities for the Very Large Telescope, the future Extremely Large Telescope and the James Webb Space Telescope.

We look forward to receiving your online application including the following documents: Curriculum vitae, publication list and motivation letter (combined length not to exceed 6 pages) and copy of university degree(s) (all combined in a single .pdf file). This file, as well as contact information for three potential referees, shall be submitted through our online application portal. Applications via email or postal services will not be considered.

For further information about the research group or project, please visit our group webpage through *https://quanz-group.ethz.ch/*. Questions regarding the position should be directed to Dr. Adrian Glauser via email (see below).

Download/Website: `https://bit.ly/36SX5jf`

Contact: `glauser@phys.ethz.ch`

4 Conferences

EAS symposium on planet formation

Dear colleague,

We would like to bring to your attention the following symposium about planet formation, proto-planetary discs and debris discs that will be held at EAS (European Astronomical Society Annual Meeting) 2020. The deadline for abstract submission is 2 March 2020 and abstracts can be submitted through the EAS website: `https://eas.unige.ch/EAS2020/abstract_submission.jsp`. EAS will also have sessions about exoplanets, astro-chemistry, ALMA (and much more!) that you might be interested in.

SYMPOSIUM S1 - Planet formation enters the observational era

EAS 2020
30 June - 1 July 2020, Leiden, Netherlands

`https://eas.unige.ch//EAS2020/session.jsp?id=S1`

Invited speakers

Myriam Benisty (IPAG Grenoble & Universidad de Chile)
Bertram Bitsch (MPIA Heidelberg)
Natalia Engler (ETH Zurich)
Quentin Kral (Observatoire de Paris)
Yamila Miguel (Leiden)
Catherine Walsh (Leeds)

Contact

Giovanni Rosotti: rosotti@strw.leidenuniv.nl
Alex Cridland: cridland@strw.leidenuniv.nl

Scientific organisers

Giovanni Rosotti (Leiden; chair), Alex Cridland (Leiden; co-chair), Stefano Facchini (ESO; co-chair), Sascha Zeegers (Academia Sinica; co-chair), Elodie Choquet (Marseille), Cathie Clarke (Cambridge), Cornelis Dullemond (Heidelberg), Agnes Kospal (Budapest), Jes Jorgensen (Copenhagen), Giuseppe Lodato (Milan), Jonathan Marshall (Academia Sinica), Luca Matra (CfA), Farzana Meru (Warwick), Julien Milli (Grenoble), Alessandro Morbidelli (Nice), Christoph Mordasini (Bern), Nicole Pawellek (Cambridge), Linda Podio (Arcetri)

3rd announcement: TOEIII - From Solar System to Exoplanets (Douro Valley, Portugal) Early Registation deadline: 29th February!

O. Demangeon, S. Sousa, G. Gilli, N. Santos
Instituto de Astrofísica e Ciências do Espaço (IA), Portugal

Lamego, Douro Valley, Portugal, 1-5 June 2020

Atmosphere, Interior, formation and evolution of planets and planetary systems. The Solar System Planets and Exoplanets communities aim at answering similar questions, but seldom interact due to the different datasets they have access to. Our goal is to discuss how the detailed and in situ datasets from Solar System planets can inform the often under constrained exoplanetary models. We will try to understand how the diversity and large sample offered by exoplanets can put in context and inform our understanding of Solar System planets, focusing on each of these categories:

1. Super-Earths, Mercury, Venus, Mars and Earth
2. Ice giants, Uranus and Neptune
3. Gas giants, Jupiter and Saturn
4. Planetary System architecture

List of confirmed invited speakers:

Agustin Sanchez-Lavega	Seth Jacobson
Courtney Dressing	Shogo Tachibana
Michel Mayor	Vardan Adibekyan
Ravit Helled	Vincent Bourrier
Robin Wordsworth	Yamila Miguel
Sean Raymond	

Scientific Organization Commitee:

David Ehrenreich	Jonathan Fortney
Victoria Meadows	Antonio Garcia Munoz
Caroline Dorn	Tristan Guillot
Heike Rauer	Li Zeng
Christophe Mordasini	Alessandro Morbidelli
Rebecca Dawson	Gabriella Gilli
Sérgio Sousa	Nuno Santos
Olivier Demangeon	

Key dates:
26 Jun. 2019: 1st announcement
15 Nov. 2019: 2nd announcement
29 Feb. 2020: Early registration deadline
30 Apr. 2020: Late registration deadline
1-5 June 2020: Conference week

Download/Website: `http://www.iastro.pt/toe3/`
Contact: `toe3@iastro.pt`

CONFERENCE ANNOUNCEMENT: FROM CLOUDS TO PLANETS II: THE ASTROCHEMICAL LINK

Conference Chair(s): P. Caselli, D. Semenov

[1] Max-Planck-Institut für extraterrestrische Physik, P.O. Box 1312 85741 Garching, Germany
[2] Max-Planck-Institut für Astronomie, Königstuhl 17, 69117 Heidelberg, Germany and Department of Chemistry, Ludwig Maximilian University, Butenandtstr. 5-13, D-81377 Munich, Germany

Harnack Haus, Ihnestr. 16-20, 14195 Berlin, Germany, 28.09-02.10.2020

In 2015, we gathered at the Harnack Haus in Berlin to discuss about star and planet formation and the crucial role played by Astrochemistry in our understanding of the various steps that transform an interstellar cloud in stellar systems like our own. It is now time to meet again and present the exciting results that have been achieved in recent years, thanks to ALMA, IRAM, JVLA, GBT, APEX, SOFIA and other facilities, as well as thanks to coordinated efforts in the laboratory and theory (in particular, quantum chemistry and chemical-dynamical models of evolving clouds and disks). This will be important to cast a fresh look into the future, which we already know is going to be bright, thanks to revolutionary telescopes coming up in the next few years (such as JWST and ELT) and next decades (SKA and ngVLA).

During the conference, we will make a journey through space and time, starting from interstellar clouds and then moving to cloud filaments and dense cores on the verge of star formation, to protostars and their embedded disks, to planet-forming disks to exoplanet and finally landing in our Solar System, while delving into laboratory facilities and theoretical calculations and simulations. Each evening, before dinner, there will be a general talk on each topic of the conference (the "aperitive talk"), to allow all communities to understand better the "big picture" and to facilitate finding links across disciplines, which always provide fertile ground in our journey towards understanding our astrochemical origins.

Students and young researchers are encouraged to attend and interact with all participants, to present their work and broaden their horizons. Some financial help will be available for them upon request.

The total number of participants is limited to less than or equal to 120.

If you are interested in attending and present an oral contribution or poster, please follow instructions at this web address: https://events.mpe.mpg.de/event/12/abstracts/

We hope to see you at the Harnack Haus later this year!

Paola Caselli and Dima Semenov (on behalf of the SOC)

Download/Website: `https://events.mpe.mpg.de/event/12/`

Contact: `semenov@mpia.de`

2020 Sagan Summer Workshop: Extreme Precision Radial Velocity

E. Furlan, D. Gelino
NASA Exoplanet Science Institute, California Institute of Technology, Pasadena, CA, USA

Pasadena, CA, July 20-24, 2020

Join us in 2020 for the 20th Sagan Summer Workshop! This year we will focus on the technique of Extreme Precision Radial Velocity (EPRV) for finding and characterizing exoplanets. The recent National Academy of Sciences Exoplanet Strategy Report highlighted EPRV as a critical technique for advancing the goal of finding and characterizing potentially habitable Earth analogs. With expected radial velocity signals that are an order of magnitude (or more) smaller than the currently best achieved results, EPRV observations are necessary to measure the masses and orbits of Earth analogs orbiting nearby stars. These nearby planetary systems are expected to be the targets for future planetary direct imaging programs with LUVOIR and HabEx in space, and the Extremely Large Telescopes on the ground. This workshop will provide an introduction to the basics of the PRV technique, a summary of planet demographics from PRV surveys, and an evaluation of the importance of planet masses and orbits to imaging missions and of the challenges in advancing PRV precision by the factor of 10-30 needed to detect terrestrial analogs in orbit around nearby solar type stars.

Attendees will participate in hands-on group projects and will have the opportunity to present their own work through short presentations (research POPs) and posters.

Registration and the application for financial assistance to attend the workshop are now available along with the preliminary agenda. The hotel reservation link is also posted on the workshop website.

Important Dates

- February 6: Registration available and Application for Travel Support period open
- March 6: Application for Travel Support and Recommendation Letters due
- March 21: Travel Support decisions announced via email
- May 7: POP/Poster/Talk submission link available
- early June: Sign up for lunch with speakers and lunch ordering site available
- June 16: Hotel Reservation Deadline for workshop hotel
- July 20-24: Sagan Exoplanet Summer Workshop

Download/Website: `http://nexsci.caltech.edu/workshop/2020`
Contact: `sagan_workshop@ipac.caltech.edu`

Characterising stellar activity in the era of extreme radial-velocity surveys of low-mass planets orbiting F-M stars

N. Meunier[1], *X. Delfosse*[1], *A. Mortier*[2], *C. Watson*[3], *R. Haywood*[4], *H. Cegla*[5]

[1] Institut de Planétologie et d'Astrophysique de Grenoble, Université Grenoble Alpes, France
[2] Kavli Institute & Cavendish Laboratory, University of Cambridge, UK
[3] Astrophysics Research Centre, Queen's University Belfast, UK
[4] Harvard-Smithsonian Center for Astrophysics, USA
[5] Observatoire de Genève, Université de Genève, Switzerland

Toulouse, France, 22 - 26 June 2020

We are happy to announce our splinter session for the next Cool Stars 21 meeting in Toulouse, France (22-26 June 2020) on "Characterising stellar activity in the era of extreme radial-velocity surveys of low-mass planets orbiting F-M stars". More information on this splinter session can be found on http://cs21-eprv.sciencesconf.org/, including the call for contributed talks (deadline: 15th of April), the preliminary programme, and expressions of interest (suggestions, questions for the panel discussion). We encourage students and early-career researchers to submit an abstract.

Download/Website: `http://cs21-eprv.sciencesconf.org/`

Contact: `cs21-eprv@univ-grenoble-alpes.fr`

5 Exoplanet Archive Updates

January Updates at the NASA Exoplanet Archive

The NASA Exoplanet Archive team
Caltech/IPAC-NASA Exoplanet Science Institute, MC 100-22 Pasadena CA 91125

Pasadena CA USA, February 18, 2020

Note: All new planetary data can be viewed in the Confirmed Planets (`http://bit.ly/2MqFnub`), Composite Planet Data (`http://bit.ly/2l84Qw9`), and Extended Planet Data (`http://bit.ly/2NLy1Ci`) tables. New microlensing solutions are in the Microlensing Data table (`http://bit.ly/2JQr180`).

Also, the new alpha release of the Planetary Systems table allows you to browse ALL the planet and host star solutions (`http://bit.ly/2Pt0tM1`).

January 30, 2020

Eight new planets!

This week we have eight new planets, including a TESS planet, a K2 planet, and a four-planet system found by the Dispersed Matter Planet Project! The new planets are: DMPP-1 b, c, d & e (`http://bit.ly/31RMROW`), DMPP-2b (`http://bit.ly/31OSEoH`), DMPP-3 A b (`http://bit.ly/2Hm0tc8`), HD 80653 b (`http://bit.ly/3bD2gXR`), and TOI-813 b (`http://bit.ly/2OPw2yQ`). (If you prefer the old overview interface, you can access them through the Explore the Archive search box on the home page.)

This week's additions bring the total confirmed planet count to **4,116**.

January 17, 2020

New Planets for The New Year

We're starting 2020 with FOUR new planets in our NEW overviews alpha release! Check out G 9-40 b (`http://bit.ly/39uAvyY`), XO-7 b (`http://bit.ly/3bA7vYy`), USco1621 b (`http://bit.ly/2w8KTOq`), and USco1556 b (`http://bit.ly/2HmEtOa`). (If you prefer the old overview interface, you can access them through the Explore the Archive search box on the home page.)

This week's additions bring the total confirmed planet count to **4,108**.

Download/Website: `https://exoplanetarchive.ipac.caltech.edu`
Contact: `mharbut@caltech.edu`

6 As seen on astro-ph

List of exoplanet related entries seen on astro-ph during January 2020.

January 2020

astro-ph/2001.00049: **High-resolution Spectra and Biosignatures of Earth-like Planets Transiting White Dwarfs** by *Thea Kozakis, Zifan Lin, Lisa Kaltenegger*

astro-ph/2001.00050: **High resolution Spectra of Earth-Like Planets Orbiting Red Giant Host Stars** by *Thea Kozakis, Lisa Kaltenegger*

astro-ph/2001.00055: **Deflating Super-Puffs: Impact of Photochemical Hazes on the Observed Mass-Radius Relationship of Low Mass Planets** by *Peter Gao, Xi Zhang*

astro-ph/2001.00085: **How planetary surfaces can shape the climate of habitable exoplanets** by *Jack Madden, Lisa Kaltenegger*

astro-ph/2001.00148: **Evidence for planetary hypothesis for PTFO 8-8695b with five-year optical/infrared monitoring observations** by *Yuta Tanimoto et al.*

astro-ph/2001.00949: **Post-main-sequence debris from rotation-induced YORP break-up of small bodies II: multiple fissions, internal strengths and binary production** by *Dimitri Veras, Daniel J. Scheeres*

astro-ph/2001.00951: **Realistic On-the-fly Outcomes of Planetary Collisions II: Bringing Machine Learning to N-body Simulations** by *Alexandre Emsenhuber et al.*

astro-ph/2001.00952: **The First Habitable Zone Earth-sized Planet from TESS. I: Validation of the TOI-700 System** by *Emily A. Gilbert et al.*

astro-ph/2001.00954: **The First Habitable Zone Earth-Sized Planet From TESS II: Spitzer Confirms TOI-700 d** by *Joseph E. Rodriguez et al.*

astro-ph/2001.00955: **The First Habitable Zone Earth-sized Planet from TESS. III: Climate States and Characterization Prospects for TOI-700 d** by *Gabrielle Suissa et al.*

astro-ph/2001.01299: **The evolutionary track of H/He envelope in the observed population of sub-Neptunes and Super-Earths planets** by *Raissa Estrela et al.*

astro-ph/2001.01338: **Detectability of Molecular Signatures on TRAPPIST-1e through Transmission Spectroscopy Simulated for Future Space-Based Observatories** by *Daria Pidhorodetska et al.*

astro-ph/2001.01361: **Sensitive Probing of Exoplanetary Oxygen via Mid Infrared Collisional Absorption** by *Thomas J. Fauchez et al.*

astro-ph/2001.01438: **Earth-Like: An education & outreach tool for exploring the diversity of planets like our own** by *Elizabeth J. Tasker*

astro-ph/2001.01759: **A Rotation Rate for the Planetary-Mass Companion DH Tau b** by *Jerry W. Xuan et al.*

astro-ph/2001.02217: **An ultra-short period rocky super-Earth orbiting the G2-star HD 80653** by *G. Frustagli et al.*