ExoPlanet News
An Electronic Newsletter

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Editors: L. Schlarmann, J. Davoult, H. Wang, & T.-E. Riesen
NCCR PlanetS, Gesellschaftsstrasse 6, CH-3012 Bern, Switzerland

exoplanetnews@nccr-planets.ch
https://nccr-planets.ch/exoplanetnews

Contents

1 Editorial

Welcome to Edition 194 of ExoPlanet News!

This month, as usual, we bring you abstracts of scientific papers, job ads, conference announcements, and an overview of exoplanet-related articles on astro-ph. Thanks a lot to all of you who contributed to this issue of the newsletter!

For next month, we look forward to continuing receiving your submissions of paper abstracts, job ads, or meeting announcements. Special announcements are also welcome. As always, we would also be happy to receive feedback concerning the newsletter. The LaTeX template (v2.0) for submitting contributions, as well as all previous editions of ExoPlanet News, can be found on the ExoPlanet News webpage (`https://nccr-planets.ch/exoplanetnews/`).

The next issue will appear on Tuesday, September 9th (with a submission deadline ending on Sun September 7th, 2025 CEST).

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

Leander Schlarmann
Haiyang Wang
Jeanne Davoult
Timm-Emanuel Riesen

2 Abstracts of refereed papers

First scientific results of the Near-Infrared Planet Searcher NIRPS

The first scientific results of the high-resolution near-infrared spectrograph NIRPS (Near Infra-Red Planet Searcher) are published in the journal Astronomy & Astrophysics. In operation at the ESO La Silla 3.6m telescope since April 2023, and working in tandem with HARPS, NIRPS is a new ESO facility that offers exceptional performance for the detection of exoplanets orbiting M dwarfs and for studying exoplanet atmospheres. It is the first spectrograph operating in the near infrared that reaches similar results to state-of-the-art spectrographs operating in the visible, such as HARPS. The NIRPS consortium brought together new technologies and advanced signal processing algorithms to push the instrument to an unprecedented level of performance. In its first semester of operation, NIRPS has already made major discoveries. These findings mark a new level of precision in the infrared observations, proving NIRPS's power to unveil small, potentially habitable worlds around nearby stars in our cosmic backyard.

NIRPS joining HARPS at ESO 3.6m. On-sky performance and science objectives
F. Bouchy, R. Doyon, F. Pepe, C. Melo, E. Artigau et al, 2025, A&A, 700, A10
Download/Website: `https://www.aanda.org/10.1051/0004-6361/202453341`

NIRPS detection of delayed atmospheric escape from the warm and misaligned Saturn-mass exoplanet WASP-69b
R. Allart, Y. Carteret,. V. Bourrier, L. Mignon, F. Baron et al, 2025, A&A, 700, A7
Download/Website: `https://www.aanda.org/10.1051/0004-6361/202452525`

Diving into the planetary system of Proxima with NIRPS. Breaking the metre per second barrier in the infrared
A. Suarez Mascareno, E. Artigau, L. Mignon, X. Delfosse, N. Cook, et al. 2025, A&A, 700, A11
Download/Website: `https://www.aanda.org/10.1051/0004-6361/202553728`

Hydride ion continuum hides absorption signatures in the NIRPS near-infrared transmission spectrum of the ultra-hot gas giant WASP-189b
V. Vaulato, S. Pelletier, D. Ehrenreich, R. Allart, E. Cristo et al. 2025, A&A, 700, A9
Download/Website: `https://www.aanda.org/10.1051/0004-6361/202452972`

Studying the variability of the He triplet to understand the detection limits of evaporating exoplanet atmospheres
S. Mercier, X. Dumusque, V. Bourrier, K. Al Moulla, M. Crétignier et al. 2025, A&A, 700, A8
Download/Website: `https://www.aanda.org/10.1051/0004-6361/202452856`

Blind search for activity-sensitive lines in the near-infrared using HARPS and NIRPS observations of Proxima and Gl 581
J. Gomes da Silva, E. Delgado-Mena, N.C. Santos, T. Monteiro, P. Larue et al. 2025, A&A, in press
Download/Website: `https://arxiv.org/pdf/2507.21262`

Contact: `francois.bouchy@unige.ch`

BEBOP VII. SOPHIE discovery of BEBOP-3b, a circumbinary giant planet on an eccentric orbit

T.A. Baycroft,[1] *A. Santerne,*[2] *A.H.M.J. Triaud,*[1] *N. Heidari,*[3] *D. Sebastian,*[1] *Y. T. Davis,*[1] *A.C.M. Correia,*[4,5] *L. Sairam,*[6] *A.V. Freckelton,*[1] *A. Adamson,*[1] *I. Boisse,*[2] *G.A.L. Coleman,*[7] *G. Dransfield,*[8,9] *J. Faria,*[10] *S. Grouffal,*[2] *N. Hara,*[2] *G. Hébrard,*[3] *V. Kunovac,*[11,12] *D.V. Martin,*[13] *P.F.L. Maxted,*[14] *R.P. Nelson,*[7] *M.G. Scott,*[1] *O.J. Scutt,*[1] *M.R. Standing*[15]

[1] School of Physics and Astronomy, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK
[2] Aix Marseille Univ, CNRS, CNES, LAM, Marseille, France
[3] Institut d'astrophysique de Paris, UMR 7095 CNRS université Pierre et Marie Curie, 98 bis, boulevard Arago, 75014 Paris, France
[4] CFisUC, Departamento de Fisica, Universidade de Coimbra, 3004-516 Coimbra, Portugal
[5] IMCCE, UMR8028 CNRS, Observatoire de Paris, PSL Université, 77avenue Denfert-Rochereau, 75014 , Paris, France
[6] Institute of Astronomy, University of Cambridge, Madingley road, Cambridge, CB3 0HA, UK
[7] Astronomy Unit, Department of Physics and Astronomy, Queen Mary University of London, Mile End Road, London, E1 4NS, UK
[8] Department of Astrophysics, University of Oxford, Denys Wilkinson Building, Keble Road, Oxford OX1 3RH, UK
[9] Magdalen College, University of Oxford, Oxford OX1 4AU, UK
[10] Observatoire Astronomique de l'Université de Genève, Chemin Pegasi 51, CH-1290 Versoix, Switzerland
[11] Department of Physics, University of Warwick, Coventry CV4 7AL, UK
[12] Centre for Exoplanets and Habitability, University of Warwick, Gibbet Hill Road, Coventry CV4 7AL, UK
[13] Department of Physics and Astronomy, Tufts University, 574 Boston Avenue, Medford, MA 02155, USA
[14] Astrophysics Group, Keele University, Keele, Staffordshire, ST5 5BG, UK
[15] European Space Agency (ESA), European Space Astronomy Centre (ESAC), Camino Bajo del Castillo s/n, E-28692 Villanueva de la Cañada, Madrid, Spain

MNRAS, published (2025MNRAS.541.2801B)

Planetary systems orbiting close binaries are valuable testing grounds for planet formation and migration models. More detections with good mass measurements are needed. We present a new planet discovered during the BEBOP survey for circumbinary exoplanets using radial velocities. We use data taken with the SOPHIE spectrograph at the Observatoire de Haute-Provence, and perform a spectroscopic analysis to obtain high precision radial velocities. This planet is the first radial velocity detection of a previously unknown circumbinary system. The planet has a mass of $0.56\ \mathrm{M_{Jup}}$ and orbits its host binary in 550 days with an eccentricity of 0.25. Compared to most of the previously known circumbinary planets, BEBOP-3b has a long period (relative to the binary) and a high eccentricity. There also is a candidate outer planet with a ~ 1400 day orbital period. We test the stability of potential further candidate signals inside the orbit of BEBOP-3b, and demonstrate that there are stable orbital solutions for planets near the instability region which is where the Kepler circumbinary planets are located. We also use our data to obtain independent dynamical masses for the two stellar components of the eclipsing binary using high resolution cross-correlation spectroscopy, and compare those results to a more traditional approach, finding them compatible with one another.

Download/Website: `https://arxiv.org/pdf/2506.14615`

Contact: `thomasbaycroftastro@gmail.com`

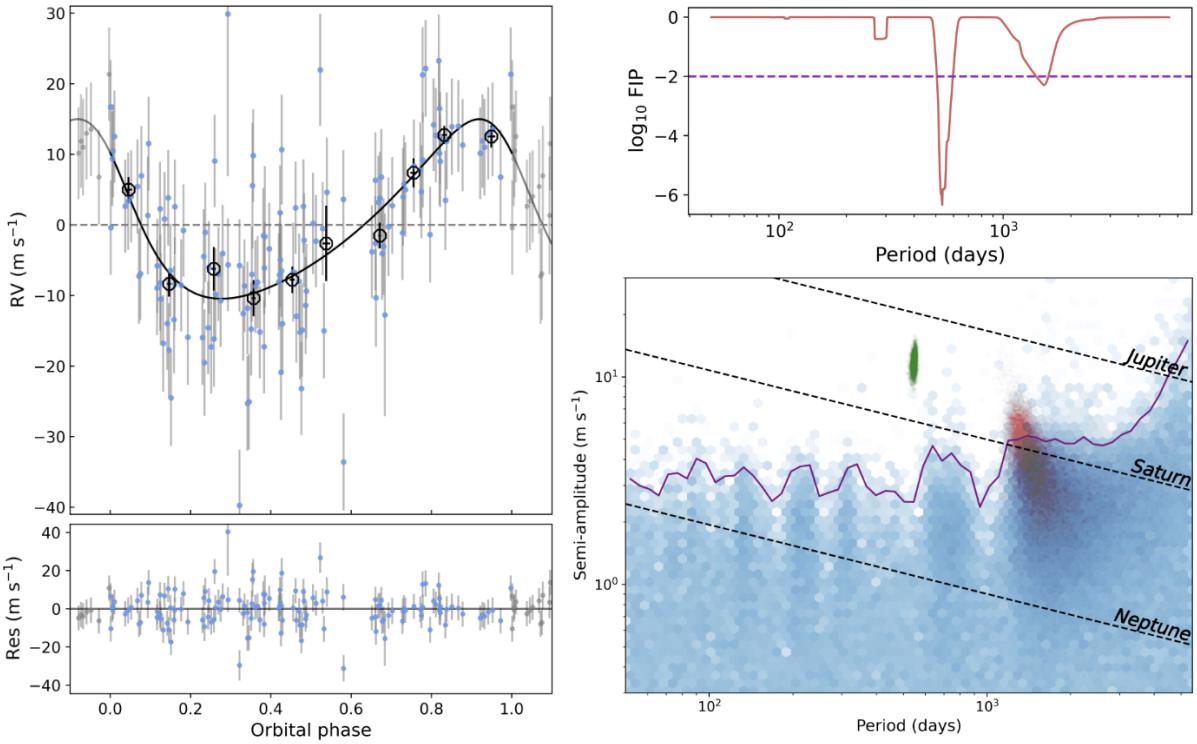

Figure 1: Left: Phased RV plot of BEBOP-3 b, with the residuals below. The parameters for the planet shown are the maximum-likelihood solution. The binned RV data are shown to guide the eye. Top right: False Inclusion Probability (FIP) periodogram. The dashed purple line is at a 1% false inclusion probability. Bottom right: Detection limit for BEBOP-3. In blue, the posterior density of the `kima` run forced to fit a signal, with planet b removed. The posterior distribution from the `kima` radial velocity analysis is shown in green for planet-b ($N_p = 1$ model) and that for the candidate outer signal ($N_p = 2$ model) is shown in red. Dashed lines show expected signals of solar-system mass planets.

The Hot-Neptune Initiative (HONEI) I. Two hot sub-Neptunes on a close-in eccentric orbit (TOI-5800 b) and a farther-out circular orbit (TOI-5817 b)

L. Naponiello[1], S. Vissapragada[2], A. S. Bonomo[1], M.-L. Steinmeyer[3], S. Filomeno[4,5,6], V. D'Orazi[5,7,8], C. Dorn[3], A. Sozzetti[1], L. Mancini[4,1,9], A. F. Lanza[10], K. Biazzo[5], C. N. Watkins[11], G. Hébrard[12,13], J. J. Lissauer[14], S. B. Howell[14], D. R. Ciardi[15], G. Mantovan[16,7], et al.

[1] INAF – Osservatorio Astrofisico di Torino, Via Osservatorio 20, 10025 Pino Torinese, Italy
[2] Carnegie Science Observatories, 813 Santa Barbara Street, Pasadena, CA 91101, USA
[3] Institute for Particle Physics and Astrophysics, ETH Zürich, Otto-Stern-Weg 5, 8093 Zürich, Switzerland
[4] INAF – Osservatorio Astronomico di Roma, Monte Porzio Catone, Italy
[5] Department of Physics, University of Rome "Tor Vergata", Via della Ricerca Scientifica 1, 00133 Rome, Italy
[6] La Sapienza University of Rome, Department of Physics, Piazzale Aldo Moro 2, 00185 Rome, Italy
[7] INAF – Osservatorio Astronomico di Padova, Vicolo dell'Osservatorio 5, I-35122 Padova, Italy
[8] Fulbright Visiting Research Scholar, Dept. of Astronomy, University of Texas, Speedway 2515, Austin, Texas, USA
[9] Max-Planck-Institut für Astronomie, Heidelberg, Germany
[10] INAF – Osservatorio Astrofisico di Catania, Via S. Sofia 78, 95123 Catania, Italy
[11] Center for Astrophysics | Harvard & Smithsonian, 60 Garden Street, Cambridge, MA 02138, USA
[12] Institut d'astrophysique de Paris, UMR7095 CNRS, Université Pierre & Marie Curie, 98bis bv. Arago, 75014 Paris, France
[13] Observatoire de Haute-Provence, CNRS, Université d'Aix-Marseille, 04870 Saint-Michel-l'Observatoire, France
[14] NASA Ames Research Center, Moffett Field, CA 94035, USA
[15] NASA Exoplanet Science Institute, IPAC, California Institute of Technology, Pasadena, CA 91125, USA
[16] Centro di Ateneo di Studi e Attività Spaziali "G. Colombo" – Università di Padova, I-35131, Padova, Italy

Astronomy & Astrophysics, Accepted (arXiv:2505.10123)

Neptune-sized exoplanets are key targets for atmospheric studies, yet their formation and evolution remain poorly understood due to their diverse characteristics and limited sample size. The so-called Neptune desert, a region of parameter space with a dearth of short-period sub- to super-Neptunes, is a critical testbed for theories of atmospheric escape and migration. The HONEI programme aims to confirm and characterise the best Neptune-sized candidates for composition, atmospheric, and population studies. By measuring planetary masses with high precision, we want to provide the community with optimal targets whose atmosphere can be effectively explored with the *James Webb* Space Telescope or by ground-based high-resolution spectroscopy. For this purpose, we started a radial velocity follow-up campaign, using the twin high-precision spectrographs HARPS and HARPS-N to measure the masses of TESS Neptune-sized candidates and confirm their planetary nature. In this first paper of the series, we confirm the planetary nature of two candidates: TOI-5800 b and TOI-5817 b. TOI-5800 b is a hot sub-Neptune ($R_{\rm p} = 2.46^{+0.18}_{-0.16}\,R_\oplus$, $M_{\rm p} = 9.5^{+1.7}_{-1.9}\,M_\oplus$, $\rho = 3.46^{+1.02}_{-0.90}\,{\rm g\,cm^{-3}}$, $T_{\rm eq} = 1108 \pm 20$ K) located at the lower edges of the Neptune desert ($P = 2.628$ days) and is the most eccentric planet ($e \sim 0.3$) ever found with $P < 3$ d. TOI-5800 b is expected to still be in the tidal migration phase with its parent star, a K3 V dwarf ($V = 9.6$ mag), although its eccentricity could arise from interactions with another object in the system. Having a high transmission spectroscopy metric (${\rm TSM} = 103^{+35}_{-22}$), it represents a prime target for future atmospheric characterisation. TOI-5817 b is a relatively hot sub-Neptune ($R_{\rm p} = 3.08 \pm 0.14\,R_\oplus$, $M_{\rm p} = 10.3^{+1.4}_{-1.3}\,M_\oplus$, $\rho = 1.93^{+0.41}_{-0.34}\,{\rm g\,cm^{-3}}$, $T_{\rm eq} = 950^{+21}_{-18}$ K) located in the Neptune savanna ($P = 15.610$ d), on a circular orbit around a bright G2 IV-V star ($V = 8.7$ mag). Despite a lower ${\rm TSM} = 56^{+11}_{-9}$, it is a potential target for atmospheric follow-up in the context of sub-Neptunes with $P > 15$ days. Finally, we find that if the difference in the planet densities are mainly due to different gas mass fractions, there will be an order of magnitude difference in the predicted atmospheric carbon-to-oxygen ratios, a prediction that can be tested with atmospheric follow-up observations.

Download/Website: `https://arxiv.org/abs/2505.10123`

Contact: `luca.naponiello@inaf.it`

The Hot-Neptune Initiative (HONEI) II. TOI-5795 b: A hot super-Neptune orbiting a metal-poor star

F. Manni[1,2], L. Naponiello[2], L. Mancini[1,2,3], S. Vissapragada[5], K. Biazzo[4], A. S. Bonomo[2], D. Polychroni[2], D. Turrini[2], D. Locci[6], A. Maggio[6], V. D'Orazi[1], M. Damasso[2] et al.

[1] Department of Physics, University of Rome "Tor Vergata", Via della Ricerca Scientifica 1, 00133 Rome, Italy
[2] INAF – Turin Astrophysical Observatory, via Osservatorio 20, 10025 Pino Torinese, Italy
[3] Max Planck Institute for Astronomy, Königstuhl 17, 69117 Heidelberg, Germany
[4] INAF – Osservatorio Astronomico di Roma, via Frascati 33, 00040 Monte Porzio Catone (RM), Italy
[5] Carnegie Science Observatories, 813 Santa Barbara Street, Pasadena, CA 91101, USA
[6] Centro di Ateneo di Studi e Attività Spaziali "G. Colombo" – Università degli Studi di Padova, IT-35131, Padova

Astronomy & Astrophysics, Accepted (arXiv:2507.23413)

The formation of Neptune planets with orbital periods less than 10 days remains uncertain. They might have developed similarly to their longer-period counterparts, emerged from rare collisions between smaller planets, or could be the remnant cores of stripped giant planets. Characterizing a large number of them is important to advance our understanding of how they form and evolve. We aimed at confirming the planetary nature and characterizing the physical and orbital properties of a close-in Neptune-type transiting exoplanet candidate revealed by TESS around the star TOI-5795 (V = 10.7 mag), 162 pc away from the Sun. We monitored TOI-5795 with the HARPS spectrograph and jointly analyzed the radial velocity measurements and TESS photometry. We found that the parent star is a metal-poor ($[\mathrm{Fe/H}] = -0.27 \pm 0.07$), G3 V star ($T_{\rm eff} = 5718 \pm 50$ K), with a radius of $R_\star = 1.082 \pm 0.026\,R_\odot$, a mass of $M_\star = 0.901^{+0.055}_{-0.037}\,M_\odot$ and an age of $10.2^{+2.5}_{-3.3}$ Gyr. We confirmed the planetary nature of the candidate, which, in particular, has an orbital period of $P_{\rm orb} = 6.1406325 \pm 0.0000054$ days and an orbital eccentricity compatible with zero. Having a mass of $23.66^{+4.09}_{-4.60}\,M_\oplus$, a radius of $5.62 \pm 0.11\,R_\oplus$ and an equilibrium temperature of 1136 ± 18 K, it can be considered as a hot super-Neptune at the edge of the so-called Neptune ridge. The transmission spectroscopy metric of TOI-5795 b is ≈ 100, which makes it an interesting target for probing the chemical composition of its atmosphere. We simulated planet-formation processes but found almost no successful matches to the observed planet's mass and orbit, suggesting that post-formation dynamical events may have shaped its current state. We also performed an atmospheric-evolution study of TOI-5795 b finding that this planet likely experienced significant atmospheric stripping due to prolonged high-energy irradiation from its parent star.

Download/Website: `https://arxiv.org/abs/2507.23413`

Contact: `luca.naponiello@inaf.it`

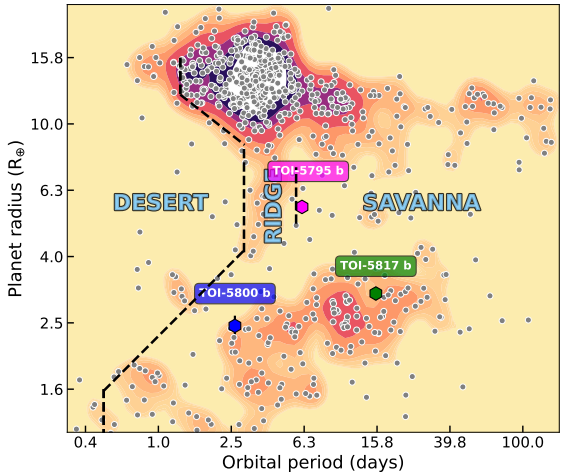

Figure 2: Radius-period diagram of close-in exoplanets with mass and radius known with an accuracy of at least $5\,\sigma$. The data were collected from the NASA Exoplanet Archive on 13/02/2025. The error bars have been suppressed for clarity. The positions of TOI-5795 b, TOI-5800 b and TOI-5817 b are highlighted together with the population-based boundaries of the Neptunian desert, ridge, and savanna.

The New Generation Planetary Population Synthesis (NGPPS) VIII. Impact of host star metallicity on planet occurrence rates, orbital periods, eccentricities, and radius valley morphology

Di-Chang Chen[1,2,3,4], *Christoph Mordasini*[2,5], *Alexandre Emsenhuber*[2], *Remo Burn*[6], *Ji-Wei Xie*[3,4], *Ji-Lin Zhou*[3,4]

[1] School of Physics and Astronomy, Sun Yat-sen University, Zhuhai 519082, China
[2] Division of Space Research and Planetary Sciences, University of Bern, Sidlerstrasse 5, 3012 Bern, Switzerland
[3] School of Astronomy and Space Science, Nanjing University, Nanjing 210023, China
[4] Key Laboratory of Modern Astronomy and Astrophysics, Ministry of Education, Nanjing 210023, China
[5] Center for Space and Habitability, University of Bern, Gesellschaftsstrasse 6, 3012 Bern, Switzerland
[6] Max-Planck-Institut für Astronomie, Königstuhl 17, Heidelberg, 69117, Germany

Astronomy & Astrophysics, accepted (arxiv: 2507.09874)

The dust-to-gas ratio in the protoplanetary disk, which is likely imprinted into the host star metallicity, is a property that plays a crucial role during planet formation. We aim at constraining planet formation and evolution processes by statistically analysing planetary systems generated by the Generation III Bern model, comparing with the correlations derived from observational samples. Using synthetic planets biased to observational completeness, we find that (1) the occurrence rates of large giant planets and Neptune-size planets are positively correlated with [Fe/H], while small sub-Earths exhibit an anti-correlation. In between, for sub-Neptune and super-Earth, the occurrence rate first increases and then decreases with increasing [Fe/H] with an inflection point at 0.1 dex. (2) Planets with orbital periods shorter than ten days are more likely to be found around stars with higher metallicity, and this tendency weakens with increasing planet radius. (3) Both giant planets and small planets exhibit a positive correlation between the eccentricity and [Fe/H], which could be explained by the self-excitation and perturbation of outer giant planets. (4) The radius valley deepens and becomes more prominent with increasing [Fe/H], accompanied by a lower super-Earth-to-sub-Neptune ratio. Furthermore, the average radius of the planets above the valley increases with [Fe/H]. Our nominal model successfully reproduces many observed correlations with stellar metallicity, supporting the description of physical processes and parameters included in the Bern model. Quantitatively, the dependences of orbital eccentricity and period on [Fe/H] predicted by the synthetic population is however significantly weaker than observed. This discrepancy suggests that long-term dynamical interactions between planets, along with the impact of binaries/companions, can drive the system towards a dynamically hotter state.

Download/Website: `https://arxiv.org/abs/2507.09874`

Contact: `chendch28@mail.sysu.edu.cn`

3 Jobs and Positions

Call for Expression of Interest to become a member of the ESA Science Advisory Structure

European Space Agency (ESA)

Dear Colleague,

ESA's Director of Science has the pleasure of inviting you to respond to the call for expressions of interest to become a member of the Astronomy Working Group (AWG)/Solar System and Exploration Working Group (SSEWG) and/or Space Science Advisory Committee (SSAC).
The Call, containing the necessary information about the SSAC, AWG and SSEWG, the tasks of the members of each committee/group, and the information needed by proposers, can be found at:

`https://www.cosmos.esa.int/web/expression-of-interest-for-science-advisory-members-2025`

The Call will close on **03 September 2025 at 12:00 hrs (noon) CET**. Applications must be submitted electronically to ESA as indicated at the link above.
We would appreciate if you could circulate this Announcement to interested colleagues within your institute.

On behalf of Prof. Carole Mundell
ESA's Director of Science

Download/Website: *`https://www.cosmos.esa.int/web/\expression-of-interest-for-science-advisory-members-2025`*

Courtois Scientific Vanguard Fund UdeM FAS Postdoctoral Fellowship at the Trottier Institute for Research on Exoplanets (IREx)

Prof. René Doyon

Montréal, Canada, Starting date: January to September 2026

The Trottier Institute for Research on Exoplanets (IREx) at the Université de Montréal invites applications for the **Courtois Scientific Vanguard Fund of the Faculty of Arts and Sciences Postdoctoral Competition**. Candidates in experimental, observational, or theoretical astrophysics related to exoplanets or astronomical instrumentation are encouraged to apply.

Six (6) fellowships are available in the natural and formal sciences (including, but not limited to, astrophysics), for **3 years**, offering a salary of up to **CAD$76,000/year** and research funds up to **CAD$30,000/year**, subject to justification.

Deadline: September 23, 2025, 11:59 p.m. (ET)

Applicants must have obtained their Ph.D. within the last 5 years (6 with justification) and hold **Canadian citizenship**, **permanent residency**, or a **valid (or pending) work permit**. Please note it is possible to apply without any of these, but they will need to apply and obtain a work permit before the start date (between Jan. and Sept. 2026).

The research proposal must be original and integrated with a Faculty of Arts and Science researcher in natural/formal sciences. A faculty member must confirm their willingness to supervise. **For that matter, astrophysicists working in exoplanet science should contact IREx director René Doyon at `irex-applications@umontreal.ca` as soon as possible.**

See full details online: `https://exoplanetes.umontreal.ca/en/job/courtois/`.

IREx (`https://exoplanetes.umontreal.ca/en/`) is a dynamic team of over 60 researchers across Quebec, Canada (UdeM, McGill, Bishop's, Université Laval, Montreal Planetarium) working on cutting-edge observational, theoretical, and instrumental projects related to exoplanets. The team is deeply involved in major international efforts, including the *James Webb Space Telescope*, SPIRou, and NIRPS, with privileged access to data from these instruments.

IREx also leads a strong science communication and outreach program, training researchers who excel both scientifically and as communicators.

We value diversity, equity, and inclusion, and strongly encourage applications from underrepresented groups in physics. Our EDI committee supports the integration of these individuals into our research environment.

Download/Website: `https://exoplanetes.umontreal.ca/en/job/courtois/\`

Contact: `irex-applications@umontreal.ca`

4 Conferences and Workshops

Observation and Characterization of Extrasolar Planets

(Splinter Session at the 2025 Annual Meeting of the Astronomische Gesellschaft)

René Heller[1,2], Eike Guenther[3], Ravit Helled[4], Paul Mollière[5], Nadine Nettelmann[6], Lisa Nortmann[2], Andreas Quirrenbach[7,8]

[1] Max-Planck-Institut für Sonnensystemforschung, Göttingen, Deutschland
[2] Institut für Astrophysik und Geophysik Göttingen, Deutschland
[3] Thüringer Landessternwarte, Tautenburg, Deutschland
[4] Universität Zürich, Schweiz
[5] Max-Planck-Institut für Astronomie, Heidelberg, Deutschland
[6] Universität Rostock, Deutschland
[7] Zentrum für Astronomie der Universität Heidelberg, Deutschland
[8] Landessternwarte Königstuhl, Deutschland

Görlitz, Germany, 16. - 17. September 2025

The call for abstracts is now open for the "Observation and Characterization of Extrasolar Planets" splinter session of this year's Annual Meeting of the Astronomische Gesellschaft.

The current deadline for registration and abstract submission is 31 July 2025, but see the meeting website `https://ag2025.astronomische-gesellschaft.de/abstracts.php` for any updates.

Our splinter session will take place on 16./17. September 2025 in the beautiful city of Görlitz, very close to the German border with the Czech Republic and Poland.

Session abstract:

The restless motion of extrasolar planets around their host stars is a key property to discover and study them in detail. About 5800 exoplanets have been confirmed through 2024 and missions like Kepler, K2, TESS, and in the near future PLATO, are discovering thousands of new planet candidates. With the wealth of high-sensitivity data from JWST, and the ELT on the horizon, our understanding of these exoplanets and their atmospheres is rapidly evolving. This session aims at bringing the exoplanet community in Germany and its neighboring countries together to present recent advances in the techniques and results of exoplanets detection and characterization. The topics of this session include, but are not limited to,

- exoplanet observations / discoveries
- interpretation of exoplanet surveys
- observations and modeling of exoplanetary atmospheres
- exoplanet-exoplanet interaction and transit timing variations
- orbital evolution from tides, spin-orbit effects, stellar binaries etc.
- exoplanet characterization (composition, internal structure)
- formation and evolution of exoplanets.

The connection of these topics with ongoing/upcoming ground-based monitoring campaigns and space missions will be particularly relevant.

`https://ag2025.astronomische-gesellschaft.de/view_splinter.php?session=ExoPlanets`

Contact: `heller@mps.mpg.de`

5 Others

ESO Expanding Horizons Call for White Papers Launched

H. M. Cegla[1]*, on behalf of the ESO Senior Science Committee*

[1] Department of Physics, University of Warwick, Gibbet Hill Road, Coventry CV4 7AL, UK

https://next.eso.org/call-for-white-papers/, Submission Deadline: 15 December 2025

What science questions will astronomy need to answer in the 2040s? **Submit your White Papers by 15 December 2025**. Under its Expanding Horizons initiative, ESO has initiated the process of selecting its next transformational facility, to start operations in the 2040s. This process is overseen by a Senior Science Committee (SSC), whose current focus is to identify the key scientific challenges that will face astronomy in the 2040s. Understanding what these science challenges are will ensure that science will be a driving factor in later identifying the facility.

To encourage discussion of Expanding Horizons as broadly as possible across the astronomical community, and to help the SSC identify these key future astronomical challenges, the SSC and ESO are inviting researchers at all career stages to submit White Papers in response to this call. This input will also be used to define the key scientific themes to be discussed at an Expanding Horizons workshop, planned for the first half of 2026.

Further information about the Call and structure of the White Papers is available at the link below. The submission form will be made available soon on the same webpage.

Download/Website: `https://next.eso.org/call-for-white-papers/`

Contact: `https://next.eso.org/contact-us/`

6 As seen on astro-ph

The following list contains exoplanet related entries appearing on astro-ph in July 2025.
Disclaimer: The hyperlinks to the astro-ph articles are provided for the convenience of the reader, but the ExoPlanet News cannot be responsible for their accuracy and perpetuity.

July 2025

astro-ph/2507.00165: **Prebiosignatures with the Habitable Worlds Observatory (HWO)** *by Sukrit Ranjan et al.*
astro-ph/2507.08824: **On the relative humidity of the atmosphere** *by Raymond T. Pierrehumbert et al.*
astro-ph/2507.00122: **SMA and NOEMA reveal asymmetric sub-structure in the protoplanetary disk of IRAS23077+6707** *by Joshua B. Lovell et al.*
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