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1 Editorial

Welcome to Edition 204 of ExoPlanet News!

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 continue looking forward to your paper abstracts, job ads or meeting announcements. Also, special announcements are 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, July 14th (with a submission deadline ending on Sunday, July 12th, 2026 CEST).

Haiyang Wang
Jeanne Davoult
Leander Schlarmann
Timm-Emanuel Riesen

2 Abstracts of refereed papers

TIC-65910228 b / NGTS-38 b, a 180 day transiting warm super-Jupiter

T. Rodel¹, et al.

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Monthly Notices of the Royal Astronomical Society, Accepted (arxiv:2602.12977)

We present the discovery of TIC-65910228 b/NGTS-38 b, a giant exoplanet with a radius of $1.081 \pm 0.047 R_J$ and a mass of $4.77^{+0.39}_{-0.37} M_J$ on a long-period (180.52797 ± 0.00036 day), moderately eccentric ($e=0.3086 \pm 0.010$) orbit transiting a bright ($V=10.230 \pm 0.020$ mag) metal rich ($[Fe/H]=0.33 \pm 0.09$ 'dex') F6V-F7V type host star. The planet was initially detected from a single transit in *TESS* Sector 33. A photometric monitoring campaign of 228 nights with NGTS detected a transit egress of the planet, which together with spectroscopic radial velocity monitoring with CORALIE and HARPS identified an orbital period of 180.5 d. These radial velocity measurements also showed the mass of the companion to be planetary. Additional transit observations coordinated by the *TESS* follow-up observing program allowed further confirmation and refinement of this period. With its relatively cool equilibrium temperature of 457 ± 11 K, NGTS-38 b joins a small but growing population of well characterised transiting warm-Jupiters and has one of the longest periods of any discovered to date. The target is situated in the LOPS2 field of the upcoming *PLATO* mission which will allow for greater refinement of the system parameters and potential for the discovery of additional companions too small and/or too long-period to be seen by *TESS* or NGTS. NGTS-38 b's bright host star and wide orbital separation make it an attractive target for further study, including potential measurement of its spin-orbit alignment or targeted exomoon/ring searches.

Download/Website: https://scixplorer.org/link_gateway/2026arXiv260212977R/EPRINT_PDF

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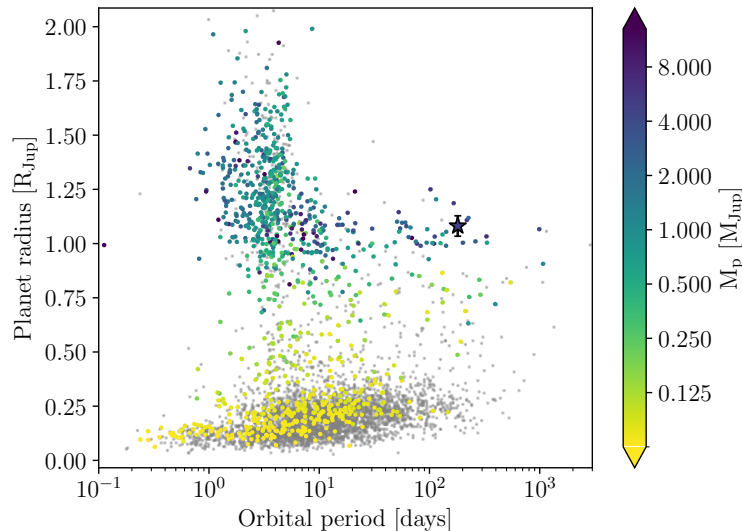


Figure 1: Plot of orbital period against radius for all confirmed transiting exoplanets. Planets with a period, radius and mass constrained to within 1%, 10% and 25% respectively are coloured according to their mass. NGTS-38 b is shown as a black bordered star.

Planetary formation tracks on the Hertzsprung–Russell diagram: Visualising the processes of giant planet growth

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Astronomy & Astrophysics, in press (arXiv:2605.18950)

The Hertzsprung–Russell Diagram (HRD) has been a cornerstone of astrophysics, illustrating the relationships between stars’ luminosity and effective temperature. Although HRDs have been instrumental in understanding stellar evolution, they have not been often applied to planetary formation. In this work, we extend the HRD framework to visualise planet formation, offering a novel perspective on the physical processes involved. Specifically, we investigate how gas and solid accretion, cooling and contraction, and orbital migration shape these tracks under different formation scenarios. Thereto, we use the Bern model to calculate the interior structure of planets during their entire formation and evolution. Additionally, we couple this for the first time to the results of radiation-hydrodynamical simulations to calculate dynamically the accretion shock heating efficiency, providing insight into the cold- and hot-start ambiguity. The resulting planetary HRDs show three branches, each representing a distinct planet formation phase. The first phase, the ascending branch, is heavily influenced by the size of the smallest accreted bodies and the associated solid accretion rate and also orbital migration. HR tracks in this phase are directed steeply upward. For in-situ planetesimal accretion, one finds analytically $L \propto T^8$. The second phase, the planetary horizontal branch, starts when the gas accretion rate becomes disk-limited and the planet detaches from the disk, subsequently contracting rapidly. The planets move nearly horizontally to the left, with hot accretion, more massive planets, and a pebble accretion scenario leading to an upward bending. The planetary interiors are nearly an ideal gas at detachment, but the increasing electron degeneracy lets the central temperatures decrease, stabilising the radii and halting the rapid movement to the left. The third phase, the descending branch, starts when the effective temperature begins to decrease. In this phase, gas accretion stops and planets join classical constant-mass cooling tracks. The radius changes only weakly, making these tracks go diagonally downwards, with $L \sim T^4$. Also, there is substantial similarity between our analysed tracks, data from synthetic populations, and observational data. Planetary HRDs offer a unique way to link young planets’ luminosities and effective temperatures to their formation physics, with pebble and planetesimal accretion producing distinct early-time tracks. Comparisons to currently directly-imaged planets are broadly consistent with our tracks, since these objects are mostly non-accreting or near the end of formation and thus expected to follow standard post-formation cooling evolution. However, observationally populating the short-lived early horizontal branch or ascending branch will be challenging, and interpreting embedded, actively accreting planets will require models that include accretion-shock emission and circumplanetary-disk reprocessing.

Download/Website: <https://arxiv.org/abs/2605.18950>

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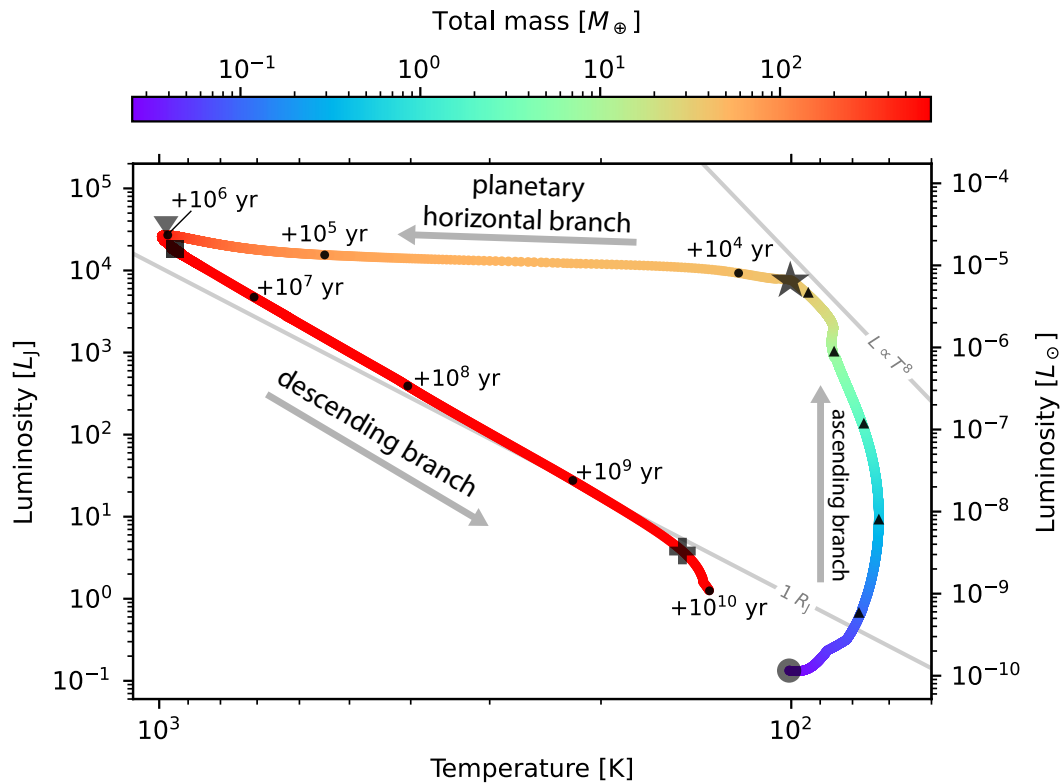


Figure 2: HR diagram track of a nominal giant planet (final mass of $2.2 M_J$), showing its surface temperature and total luminosity. Highlighted key moments show the start point (●), detachment (★), the point of maximum luminosity (▼), disk dispersal (■), and the age of Jupiter (+). In the ascending branch small black triangles (▲) show linearly spaced time indicators every Myr. The black dots (●) represent post-detachment intervals equally spaced in $\log(\text{time})$. Grey reference lines show two trends: an analytically derived slope due to planetesimal accretion (labelled with $L \propto T^8$), and a constant-radius track for $R_p = 1 R_J$, which approximates a cooling planet in the evolutionary phase before stellar irradiation becomes relevant (last downturn).

Lithium-rich M-dwarfs at the ZAMS: Evidence for planetary engulfment?

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Monthly Notices of the Royal Astronomical Society, published (2026arXiv260525747J)

We identify 6 early M-dwarfs, in 3 open clusters (NGC 2451a, Blanco 1 and NGC 2516) at ages of 50-200 Myr, that are anomalously enriched in lithium compared with Li-depleted siblings of similar spectral type. The Li-rich outliers represent 2-3 per cent of stars with $3560 < T_{\text{eff}}/\text{K} < 4045$ in clusters at those ages but are otherwise indistinguishable in their positions, parallaxes and kinematics from other cluster members; their placement in absolute colour-magnitude diagrams is incompatible with being much younger Li-rich interlopers, only one shows evidence of binarity and they are all slow rotators. The enhanced Li abundances are consistent with the engulfment of 3-10 M_{\oplus} of volatile-depleted planetary material after the formation of a radiative core has ended rapid pre main sequence Li depletion. Published planetary formation simulations featuring engulfment via dynamical interactions, and the preponderance of Earth-like exoplanets in close orbits around M-dwarfs, offer some support to this scenario. The observed occurrence rate would be a lower limit to the frequency with which such engulfment events occur between ages of $\sim (30 - 200)$ Myr, that depends in the timescale for ongoing Li depletion at the ZAMS.

Download/Website: <https://arxiv.org/abs/2605.25747>

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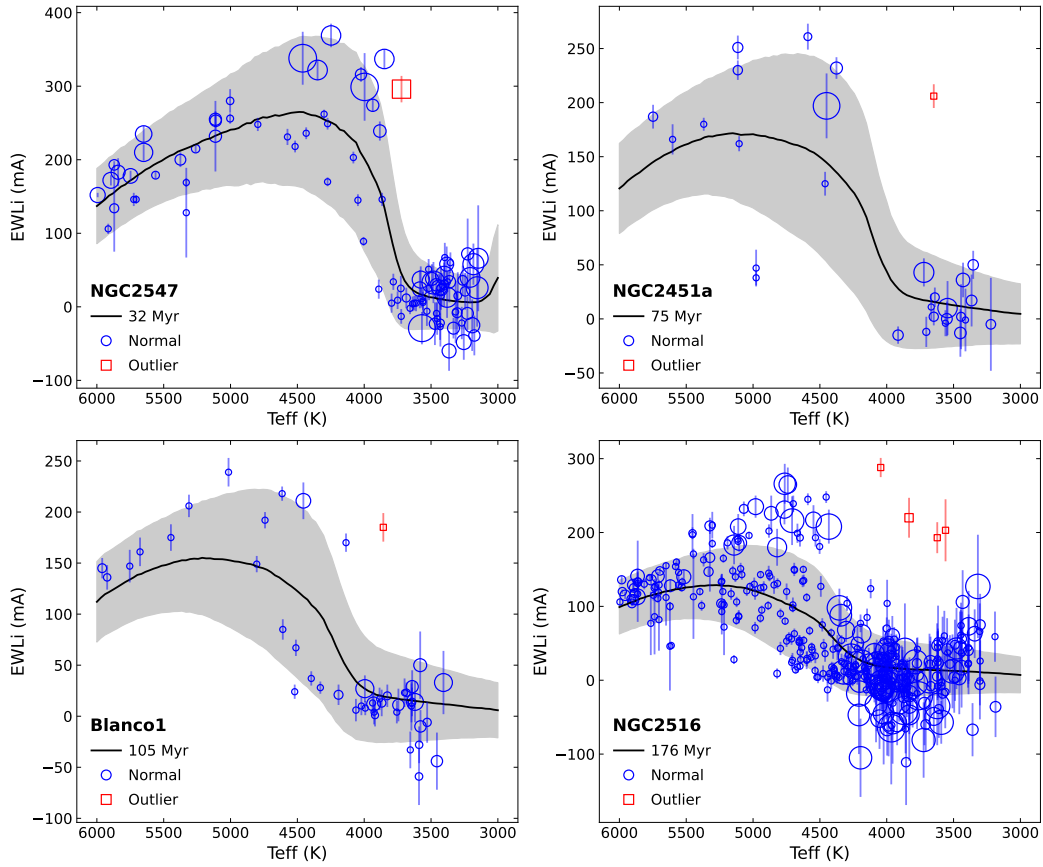


Figure 3: The EWLi- T_{eff} data for the four clusters where Li-rich outliers are detected (identified by red squares). The symbol diameter scales as $d = d_{\text{min}} + 3 \log_{10}(v \sin i / \text{km s}^{-1})$, with $d = d_{\text{min}}$ for $v \sin i \leq 10 \text{ km s}^{-1}$. The solid curves show the most likely EAGLES isochrones fitted to all the cluster data and the grey shaded regions represent the EAGLES model estimate of the 1σ normal intrinsic dispersion of EWLi at that age.

Mechanisms of Superrotation in Slowly-Rotating and Tidally-Locked Planets

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Plan. Sci. J., in press

Superrotation is a common feature of quickly rotating gas giants (e.g., Jupiter), slowly rotating planetary bodies (e.g., Titan), and tidally-locked planets. In this paper we compare and contrast the mechanisms of superrotation in slow rotators and tidally-locked planets. We cover a wide range of planetary properties, in particular varying the thermal Rossby number Ro_T (controlled by planetary size, rotation rate, and instellation) and a radiative relaxation timescale T_{rad} (which parameterizes atmospheric optical thickness). We use a two-level primitive-equation model that contains the principal mechanisms for superrotation in both regimes yet remains analytically tractable. Linearizations of the model elucidate the behavior of superrotation-inducing eddies. In tidally-locked planets a baroclinic Matsuno–Gill-like structure arises in response to the zonal heating asymmetry but only produces superrotation when low-level drag is present. Nonlinear integrations further explore the superrotating regimes and exhibit significant time variability even in statistical equilibrium. Not all tidally-locked regimes superrotate: subrotation arises at high T_{rad} (optically thick atmospheres) and weak low-level drag. On axisymmetrically-forced slow rotators, superrotation is ubiquitously linked to a previously identified Rossby–Kelvin instability. The instability itself is also linked to the spin-up of superrotation in some tidally-locked regimes. Finally, we explore the continuous transition in the mechanisms of superrotation from axisymmetrically-forced to tidally-locked planets by applying a progressively stronger asymmetric equatorial forcing. The Matsuno–Gill pattern quickly dominates over traveling planetary Rossby–Kelvin waves in forcing superrotation, although both mechanisms can coexist. These results provide a unified view of superrotation mechanisms across a wide range of planetary bodies.

Download/Website: <https://iopscience.iop.org/article/10.3847/PSJ/ae5c96/pdf>

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Jets and Superrotation in Deep and Shallow Planetary Atmospheres

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Phil Trans. Roy. Soc, accepted

Zonal flows in planetary atmospheres are ubiquitous, and nearly all the planets in the Solar System have flows that are zonally rather than meridionally aligned. *Jets*, which are essentially concentrated streams of fluid that are distinct from a more quiescent background, are less common but can also be found in both deep and shallow atmospheres. Superrotation, which in most circumstances simply means prograde motion (relative to the planetary rotation) at the equator, is less common but can be found in both deep and shallow planetary atmospheres, and in both quickly and slowly-rotating atmospheres: Jupiter, Saturn, Venus and Titan all have superrotating atmospheres. Jets, especially superrotating jets, imply some form of ‘antidiffusion’ of momentum, meaning that momentum (or angular momentum) must be transported upgradient. This article discusses some of the mechanisms that give rise to jets and superrotation in both deep and shallow planetary atmospheres, on both slow and fast rotators, contrasting and comparing the processes involved. Topics discussed include the roles of convection in deep atmospheres, geometric and topographic β -effects, potential-vorticity homogenization, wave–mean-flow interaction and tidal locking in exoplanets.

Download/Website: <http://arxiv.org/abs/2606.00443>

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ExoplaNeT accRetion mOnitoring sPectroscopic surveY (ENTROPY) III. Optical He I line profiles of the accreting super Jupiter Delorme 1 (AB)b

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Astronomy & Astrophysics, published (2026arXiv260500289V)

Context. Observations of helium emission lines from classical T Tauri stars at high resolution ($R_\lambda > 10,000$) offer great potential, showing distinct profile characteristics that help probe regions within the accretion geometry untapped by hydrogen lines. Parallel studies in the planetary-mass regime have not been explored. **Aims.** We investigate helium line emission from the nearby (47 pc), wide orbit (~ 84 au), $\sim 13 M_{\text{Jup}}$, accreting circumbinary companion Delorme 1 (AB)b and analyse the resolved profile characteristics to infer clues to line origin.

Methods. We obtained high signal-to-noise spectra of the target over 33 exposures with VLT/UVES over near-ultraviolet to optical wavelengths at high resolution ($R_\lambda \sim 50,000$). We studied the helium line profiles in the spectra and compared them to helium emission recorded from both accreting and non-accreting young stellar objects.

Results. We detected seven neutral helium (He I) lines $\lambda\lambda 3890, 4027, 4473, 4923, 5017, 5877, 6680$ at high confidence ($> 5\sigma$), with notable flux variation between epochs. The line profiles of He I $\lambda\lambda 5877, 4923, 4473, 4027$ show clear asymmetry, with a narrow component at ~ 0 km s⁻¹ and a broad component redshifted by ~ 15 km s⁻¹. The accretion luminosity ($1.3^{+1.6}_{-0.7} \times 10^{-5} L_\odot$) and mass accretion rate ($0.7^{+0.9}_{-0.4} \times 10^{-8} M_{\text{Jup}} \text{ yr}^{-1}$) obtained from median He I line luminosities using empirical scaling relations from stars are comparable but slightly higher than from the target’s ultraviolet excess emission.

Conclusions. The protoplanet Delorme 1 (AB)b exhibits asymmetric He I lines similar to classical T Tauri stars, but with much smaller widths for the narrow and broad components. The triplet–singlet line ratio, a strong correlation with ultraviolet excess and the near-zero, redshifted velocities obtained for the narrow component suggest that it originates within the post-shock region, close to the planet surface. The persistent redshift of the broad component, its line width, and velocity correlation with the narrow component imply an origin within the shock structure, closer to the shock front. Emission seems to be dominated by accretion based on the obtained accretion luminosities, but a contribution from chromospheric activity may be present.

Download/Website: <https://doi.org/10.1051/0004-6361/202558444>

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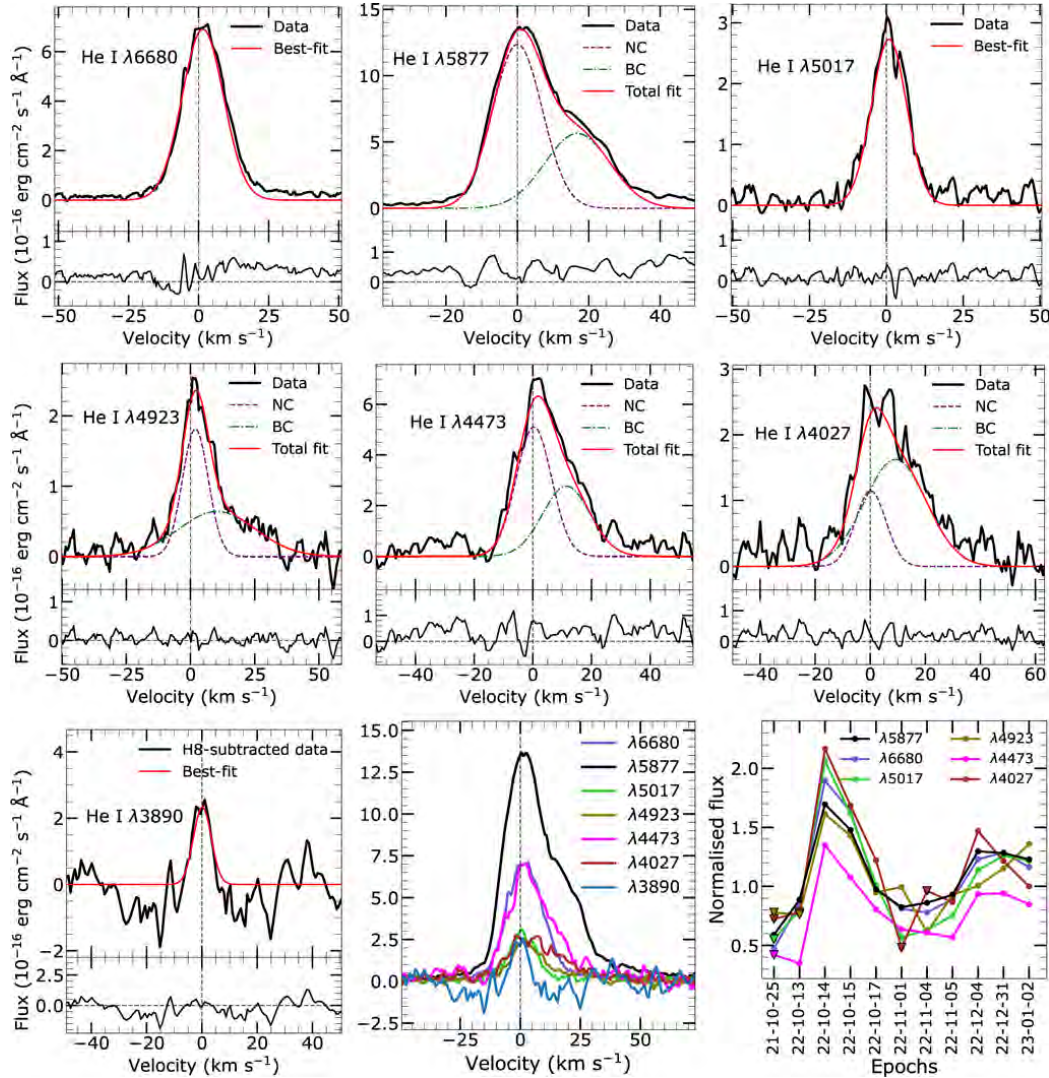


Figure 4: Resolved profiles of He I emission lines (black) from Delorme 1 (AB)b detected from its grand median spectrum in this work. The red curve shows the least- χ^2 fit to the line profile, composed of either pure NC or with the addition of a BC. In case of the latter, the red curve represents the total profile fit. Residual from the fit is shown in the bottom sub-panel of each line plot. The line profile for $\lambda 3890$ (bottom left) is obtained after the Balmer line H8 was modelled and subtracted from the data. The bottom middle panel shows all the He I lines plotted against respective velocity scales, demonstrating relative strength and asymmetry. The bottom right panel illustrates the variability of their integrated line flux in time, normalised with respect to the corresponding grand median values. Downward triangles represent tentative detections with confidence between $1 - 3\sigma$. The y-axis for all panels except the bottom right shows the flux in units of $10^{-16} \text{ erg cm}^{-2} \text{ s}^{-1} \text{ \AA}^{-1}$.

3 Exoplanet Archives

May 2026 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, June 9, 2026

Note: Unless otherwise noted, all planetary and stellar data mentioned in the news are in the Planetary Systems Table, which provides a single location for all self-consistent planetary solutions, and its companion table the Planetary Systems Composite Parameters, which offers a more complete table of parameters combined from multiple references and calculations. Links to other tables and System Overview pages are embedded in the news text.

May 21, 2026

New Atmospheric Spectra for a sub-Neptune Companion to a Hot Jupiter

This week's 21 new spectra include four of TOI-1130 b, a sub-Neptune found inside the orbit of hot Jupiter TOI-1130 c. The new JWST transmission spectra support a theory that both planets formed and built up their atmospheres beyond the frost line before migrating in. Learn more about this planetary odd couple in the MIT media release and discovery paper, then check the Atmospheric Spectroscopy Table for the data.

There are also new spectra for COCONUTS-2 b, KELT-20 b, LTT 9779 b, NGTS-2 b, WASP-18 b, WASP-96 b, and WASP-127 b.

The new planets are TOI-237 c, TOI-4311 b & c, and XO-2 c. We've also added new data for KELT-20 b, LTT 9779 b, NGTS-2 b, WASP-18 b, XO-2 N b, and XO-2 S b & c.

May 14, 2026

More Data and More Accessible System Overviews

This week's update has one planet—an eccentric hot Jupiter called TOI-159 b—as well as new data for six planets and new spectra for another six.

The planets with new parameters are 2MASS J0249-0557 c, COCONUTS-2 b, eps Ind A b, HIP 41378 f, K2-370 b, and TOI-2374 b.

The planets with new spectra in the Atmospheric Spectroscopy Table are: HAT-P-41 b, HAT-P-44 b, HD 106315 c, HIP 41378 b, LTT 1445 A b, and TOI-824 b.

System Overview Updates

We've tuned up the System Overview pages to be more compatible with screen readers and other assistive technology. Users are now able to navigate the pages with their keyboard's Tab key instead of relying on a mouse. Other recent updates include:

- Clicking the in-page navigation links to the page's sub-sections (i.e., Notes, Parameters, Bibliography, etc.) takes you directly to the section. Also, the navigation links are pinned to the top of the page so you can jump directly to another sub-section.
- The Expand/Collapse All button is pinned to the far-right side of the in-page navigation menu.
- The Architecture and Discovery Information section at the top of the page is more clear, and redundant information has been removed.
- Redundant links in the Bibliography have been removed.

Let us know what you think!

May 7, 2026

Eight New Planets, Including a super-Earth in a Dynamically Unstable System

This week's eight new planets feature TOI-201 d, the third planet in a system whose orbits are constantly changing, providing a unique opportunity to observe and understand exoplanet system dynamics. Learn more in the IAC media release and discovery paper, as well as another paper that independently discovered the planet.

The other new planets are TIC 183374187 b, TOI-1752 b & c, and TOI-5624 c, d, e, & f. There are also new data for 22 planets, including parameters for WASP-96 b that a user submitted with our Published Data Upload tool!

The other planets with new data are GJ 357 b, GJ 1132 b & c, GJ 1252 b, HD 260655 b, HD 206893 b & c, HD 97658 b, HIP 41378 b, c, & g, Kappa And b, L 98-59 b & c, LHS 1140 c, LTT 3780 b & c, TOI-201 b & c, TOI-270 b, TOI-5624 b, and WASP-96 b.

There are also 18 new spectra for the following planets in the Atmospheric Spectroscopy Table: BD+60 1417 b, HD 97658 b, Kappa And b, Kepler-51 b & d, L98-59 b, and WASP-96 b.

Download/Website: <https://exoplanetarchive.ipac.caltech.edu>

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4 Others

New features of the CHEOPS Guest Observers Running Call

European Space Agency (ESA)

The European Space Agency's (ESA's) Characterising Exoplanet Satellite (CHEOPS) mission foresees to launch its new **Running Call** on the 1st of July of 2026, subject to the approval of the mission extension from 2027 to 2029. Observers can continue to apply to the Discretionary Programme (DP) until then.

Key Dates: The Running Call is foreseen to open on the **1 July of 2026 (12:00 CEST)** and accept observing proposals continuously during the Extended Mission 2 (2027 to 2029).

Scientific Opportunities: CHEOPS provides observers with access to space-based ultra-high precision photometry. Research areas include the observations of exoplanet transits, eclipse, occultations, phase curves, exomoons, ring structures, stellar activity, and Solar System objects, among others.

Larger sky area available: Since the reduction of the Sun Exclusion Angle to 115 degrees on October of 2025, CHEOPS can now observe over 75% of the sky and features an overlap with the PLATO field of 47% (compared to the previous 32%) and 50% with the Kepler field (compared to 17% previously).

Other novelties in the Running Call:

- Two types of programmes:
 - regular programmes (up to 120 orbits)
 - large programmes (between 120 and 500 orbits)
- Longer time-baseline: observers can apply for observations in 2026 until end of September and then for observations from 2027 to 2029, both included, from October 2026. Observations should start within 6 months of proposal deadline.

Find out more about this opportunity via <https://www.cosmos.esa.int/web/cheops-guest-observers-programme>. We look forward to receiving your observing proposals and advancing our understanding of exoplanetary and stellar systems.

Happy proposing!

Contact: `cheops-support@cosmos.esa.int`

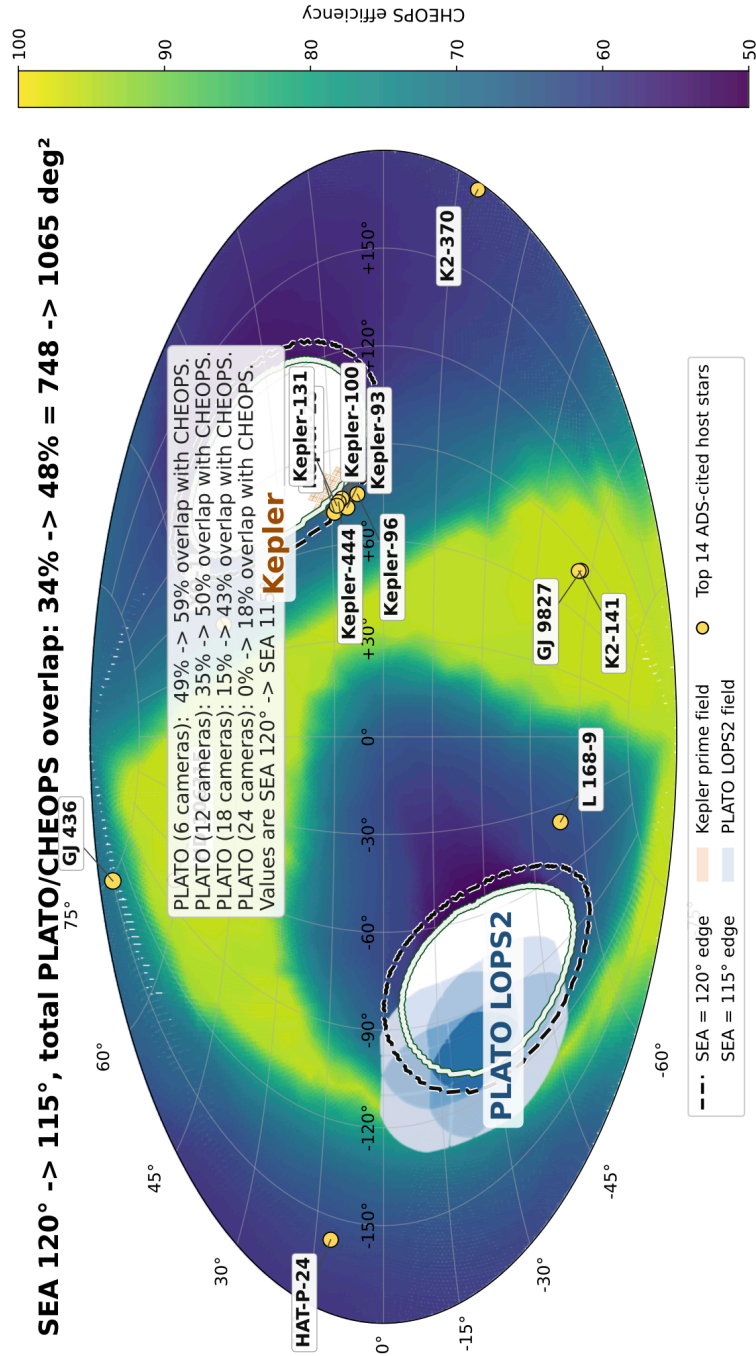


Figure 5: New sky areas observable by CHEOPS and efficiency map including the extended area given by the new Sun Exclusion Angle of 115 degrees, including the overlap with the Kepler and PLATO fields and a few known interesting targets.

5 As seen on astro-ph

The following list contains exoplanet related entries appearing on astro-ph in May 2026.

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.

May 2026

- astro-ph/2605.00100: **The dark and featureless surface of rocky exoplanet LHS 3844 b from JWST mid-infrared spectroscopy** by *Sebastian Zieba et al.*
- astro-ph/2605.00170: **Smaller Than Earth Habitability Model (STEHM): The Lower Size Limit for Atmosphere Retention in the Habitable Zone** by *Michelle L. Hill et al.*
- astro-ph/2605.00289: **ExoplaNeT accRetion mOnitoring sPectroscopic surveY (ENTROPY) III. Optical He I line profiles of the accreting super Jupiter Delorme 1 (AB)b** by *Gayathri Viswanath et al.*
- astro-ph/2605.00700: **The Rocky Planet Picture Show: Implementation of Surface Reflection and Emission in POSEIDON with Application to and Interpretation of JWST Data** by *Elijah Mullens et al.*
- astro-ph/2605.01012: **Chemistry and Isotope Ratios of Substellar Atmospheres in the β Pictoris Young Moving Group** by *Yurou Liu et al.*
- astro-ph/2605.01955: **On the Dust Substructures Triggered by Two Super-Earths Migrating in Low-viscosity Disks** by *Zijia Cui, Ewa Szuszkiewicz*
- astro-ph/2605.02766: **Characterizing the bolometric-photoevaporative transition in young sub-Neptunes with radiation-hydrodynamic simulations** by *William Misener et al.*
- astro-ph/2605.02818: **Outstanding Questions in Giant Planet Theory** by *Ravit Helled*
- astro-ph/2605.02996: **Wave interference as the origin of the cyclic magnetorotational dynamo in accretion disks: insights from weakly nonlinear theory and local shearing box simulations** by *Uddipan Banik et al.*
- astro-ph/2605.03009: **The ALMA survey to Resolve exoKuiper belt Substructures (ARKS) XI: Gas-dust interactions and radial offsets between micron and millimetre-sized grains** by *J. Olofsson et al.*
- astro-ph/2605.04149: **TOI-159 b: an eccentric hot-Jupiter planet around a young, pulsating γ Doradus star** by *G. Mantovan et al.*
- astro-ph/2605.03994: **Synergistic Effects of Ocean Salinity and Planetary Obliquity Enhance Habitability of Cold Exo-Earths** by *Kyle Batra et al.*
- astro-ph/2605.04187: **Impact of Climate States and Seasons on Future Exo-Earth Observations** by *Kyle Batra et al.*
- astro-ph/2605.03719: **A public dataset of Ariel simulated observations for developing exoplanetary atmosphere data reduction pipelines** by *Lorenzo V. Mugnai et al.*
- astro-ph/2605.03508: **The ESO SupJup Survey. X. A carbon isotope contrast in the young ROXs 12 system** by *N. Grasser et al.*
- astro-ph/2605.03741: **PALEOS: Multiphase Equations of State and Mass-Radius Relations for Exoplanet Interiors** by *Mara Attia et al.*
- astro-ph/2605.04423: **Modeling Volcanic Plume Heights Across Exoplanet Atmospheres: Insights from TRAPPIST-1** by *Prabal Saxena, Thomas Fauchez*
- astro-ph/2605.04456: **Beyond the α model: scaling the wind-driven accretion rate in protoplanetary disks using systematic non-ideal magnetohydrodynamical simulations** by *Haruhi Enomoto et al.*
- astro-ph/2605.04587: **Mitigating stellar radial velocity jitter using orthogonal activity indices and a time-aware neural network** by *Jordi Blanco-Pozo et al.*
- astro-ph/2605.04840: **Earth and Mars interior structures set by re-melting of the first solid mantle** by *Antonio Manjón-Cabeza Córdoba et al.*
- astro-ph/2605.04869: **Exploration of the inner region of the system HD 142527** by *T. M. H. Tran et al.*

- astro-ph/2605.04936: **Horizontal transport as a source of disequilibrium chemistry on the nightside of a hot exoplanet** by *Vivien Parmentier et al.*
- astro-ph/2605.05068: **The NUV transit of XO-3 b** by *Raven Cilley et al.*
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