ExoPlanet News
An Electronic Newsletter

No. 188, 11 February 2025

Editors: L. Schlarmann, H. Wang, D. Angerhausen, J. Davoult, & 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 188 of the 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 the next month, we look 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 March 11th, 2025.

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

Leander Schlarmann
Daniel Angerhausen
Haiyang Wang
Jeanne Davoult
Timm-Emanuel Riesen

2 Abstracts of refereed papers

An Alternating Minimization Algorithm with Trajectory for Direct Exoplanet Detection – The AMAT Algorithm

H. Daglayan[1], *S. Vary*[2], *O. Absil*[3], *V. Christiaens*[3], *N. Gillis*[4], *L. Jacques*[1], *V. Leplat*[5], *P.-A. Absil*[1]

[1] ICTEAM Institute, UCLouvain, 1348 Louvain-la-Neuve, Belgium
[2] Department of Statistics, University of Oxford, Oxford, United Kingdom
[3] STAR Institute, Université de Liège, 4000 Liège, Belgium
[4] Dept. of Mathematics and Operational Research, University of Mons, Mons, Belgium
[5] Innopolis University, Innopolis, Russia

Astronomy & Astrophysics, published (2024A&A...692A.126D)

Effective image post-processing algorithms are vital for the successful direct imaging of exoplanets. Standard PSF subtraction methods use techniques based on a low-rank approximation to separate the rotating planet signal from the quasi-static speckles, and rely on signal-to-noise ratio maps to detect the planet. These steps do not interact or feed each other, leading to potential limitations in the accuracy and efficiency of exoplanet detection. We aim to develop a novel approach that iteratively finds the flux of the planet and the low-rank approximation of quasi-static signals, in an attempt to improve upon current PSF subtraction techniques. In this study, we extend the standard L2 norm minimization paradigm to an L1 norm minimization framework to better account for noise statistics in the high contrast images. Then, we propose a new method, referred to as Alternating Minimization Algorithm with Trajectory (AMAT), that makes a more advanced use of estimating the low-rank approximation of the speckle field and the planet flux by alternating between them and utilizing both L1 and L2 norms. For the L1 norm minimization, we propose using L1 norm low-rank approximation (L1-LRA), a low-rank approximation computed using an exact block-cyclic coordinate descent method, while we use randomized singular value decomposition for the L2 norm minimization. Additionally, we enhance the visibility of the planet signal using a likelihood ratio as a postprocessing step. Numerical experiments performed on a VLT/SPHERE-IRDIS dataset show the potential of AMAT to improve upon the existing approaches in terms of higher S/N, sensitivity limits (contrast curves), and receiver operating characteristic (ROC) curves. Moreover, for a systematic comparison, we used datasets from the exoplanet data challenge to compare our algorithm to other algorithms in the challenge, and AMAT with likelihood ratio map performs better than most algorithms tested on the exoplanet data challenge.

Download/Website: `https://arxiv.org/abs/2410.06310`

Contact: `pa.absil@uclouvain.be`

Wavelength-dependent far-infrared polarization of HL Tau observed with SOFIA/HAWC+

M. Lietzow-Sinjen, S. Wolf, R. Brunngräber
Institute of Theoretical Physics and Astrophysics, Kiel University, Leibnizstr. 15, 24118 Kiel, Germany

Astronomy & Astrophysics, in press (arXiv:2501.16873)

We present the first polarimetric observations of a circumstellar disk in the far-infrared wavelength range. We report flux and linear polarization measurements of the young stellar object HL Tau in the bands A (53 μm), C (89 μm), D (155 μm), and E (216 μm) with the High-resolution Airborne Wideband Camera-plus (HAWC+) on board of the Stratospheric Observatory for Infrared Astronomy (SOFIA). The orientation of the polarization vectors is strongly wavelength-dependent and can be attributed to different wavelength-dependent polarization mechanisms in the disk and its local environment. In bands A, C, and D (53 μm to 155 μm), the orientation of the polarization is roughly consistent with a value of 114° at the maximum emission. Hereby, the magnetic field direction is close to that of the spin axis of the disk. In contrast, in band E (216 μm), the orientation is nearly parallel to the minor axis of the projection of the inclined disk. Based on a viscous accretion disk model combined with a surrounding envelope, we performed polarized three-dimensional Monte Carlo radiative transfer simulations. In particular, we considered polarization due to emission and absorption by aligned dust grains, and polarization due to scattering of the thermal reemission (self-scattering). At wavelengths of 53 μm, 89 μm, and 155 μm, we were able to reproduce the observed orientation of the polarization vectors. Here, the origin of polarization is consistent with polarized emission by aligned non-spherical dust grains. In contrast, at a wavelength of 216 μm, the polarization pattern could not be fully matched, however, applying self-scattering and assuming dust grain radii up to 35 μm, we were able to reproduce the flip in the orientation of polarization. We conclude that the polarization is caused by dichroic emission of aligned dust grains in the envelope, while at longer wavelengths, the envelope becomes transparent and the polarization is dominated by self-scattering in the disk.

Download/Website: `https://doi.org/10.1051/0004-6361/202450165`

Contact: `mlietzow@astrophysik.uni-kiel.de`

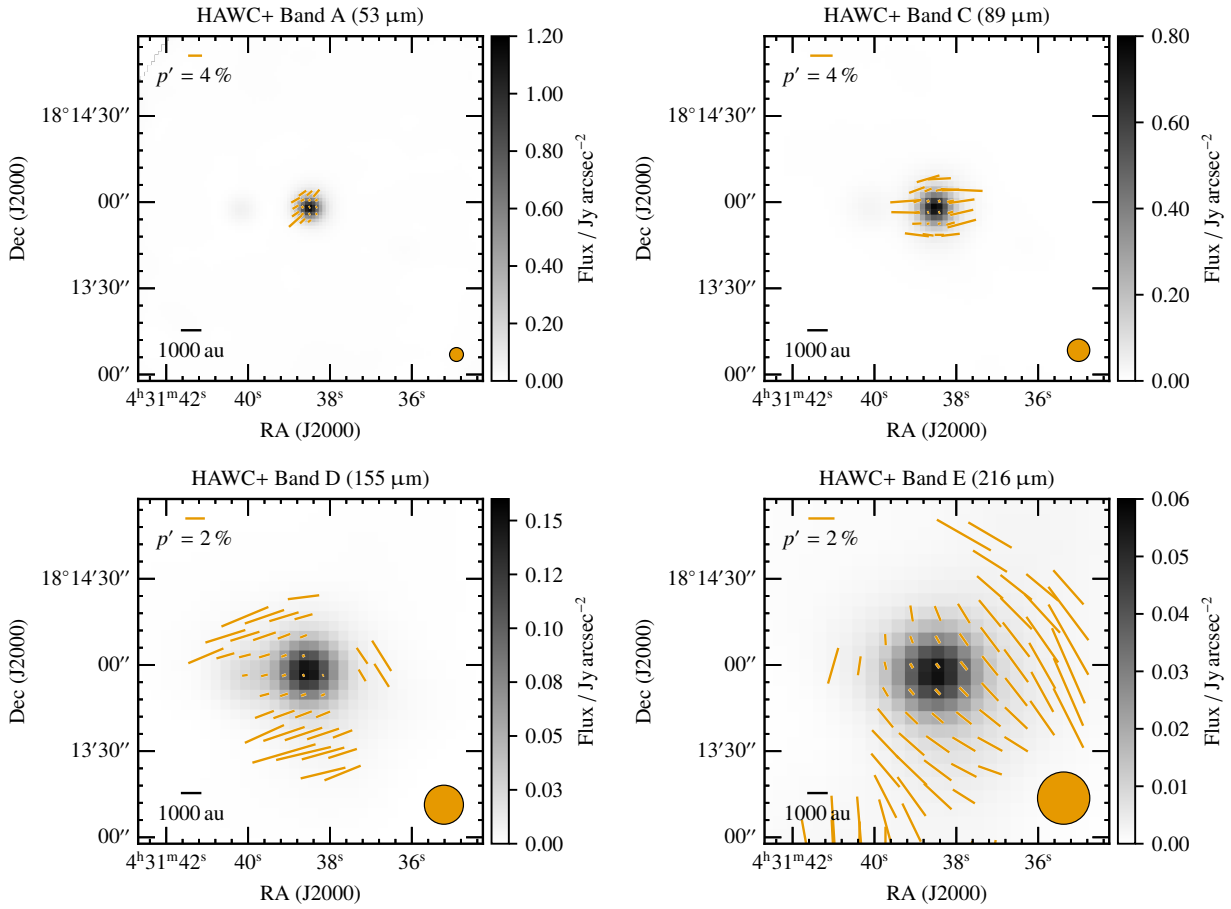

Figure 1: SOFIA/HAWC+ polarization maps of HL Tau in band A (53 μm, top left), band C (89 μm, top right), band D (155 μm, bottom left), and band E (216 μm, bottom right). The surface brightness (gray scale) is given in units of Jy arcsec^{-2} and is overlaid with polarization vectors in orange. The length and orientation of the vectors give the degree and angle of polarization, respectively. The beam size (FWHM) at each corresponding SOFIA/HAWC+ wavelength band is indicated in the respective lower right corner. The scale bar (1000 au) corresponds to an assumed distance of HL Tau of 140 pc. The images are cropped to an image size of 2 arcmin $\times$ 2 arcmin.

Deep high-resolution L band spectroscopy in the β Pictoris planetary system

M. Janson[1], J. Wehrung-Montpezat[1,2], A. Wehrhahn[1], A. Brandeker[1], G. Viswanath[1], P. Molliére[3], T. Stolker[4]

[1] Department of Astronomy, Stockholm University, AlbaNova University Center, 10691 Stockholm, Sweden
[2] École Polytechnique, Institut Polytechnique de Paris, 91120 Palaiseau, France
[3] Max-Planck-Institut für Astronomie, Königstuhl 17, D-69117 Heidelberg, Germany
[4] Leiden Observatory, Leiden University, Niels Bohrweg 2, 2333 CA Leiden, The Netherlands

Astronomy & Astrophysics, in press (arXiv:2501.08445)

The β Pictoris system, with its two directly imaged planets β Pic b and β Pic c and its well characterised debris disk, is a prime target for detailed characterisation of young planetary systems. Here, we present high-resolution and high-contrast LM band spectroscopy with CRIRES+ of the system, primarily for the purpose of atmospheric characterisation of β Pic b. We developed methods for determining slit geometry and wavelength calibration based on telluric absorption and emission lines, as well as methods for point spread function (PSF) modelling and subtraction, and artificial planet injection, in order to extract and characterise planet spectra at a high signal-to-noise ratio (S/N) and spectral fidelity. Through cross-correlation with model spectra, we detected H_2O absorption for planet b in each of the 13 individual observations spanning four different spectral settings. This provides a clear confirmation of previously detected water absorption, and allowed us to derive an exquisite precision on the rotational velocity of β Pic b, $v_{\rm rot} = 20.36 \pm 0.31$ km/s, which is consistent within error bars with previous determinations. We also observed a tentative H_2O cross-correlation peak at the expected position and velocity of planet c; the feature is however not at a statistically significant level. Despite a higher sensitivity to SiO than earlier studies, we do not confirm a tentative SiO feature previously reported for planet b. When combining data from different epochs and different observing modes for the strong H_2O feature of planet b, we find that the S/N grows considerably faster when sets of different spectral settings are combined, compared to when multiple data sets of the same spectral setting are combined. This implies that maximising spectral coverage is often more important than maximising integration depth when investigating exoplanetary atmospheres using cross-correlation techniques.

Download/Website: `https://arxiv.org/abs/2501.08445`

Contact: `markus.janson@astro.su.se`

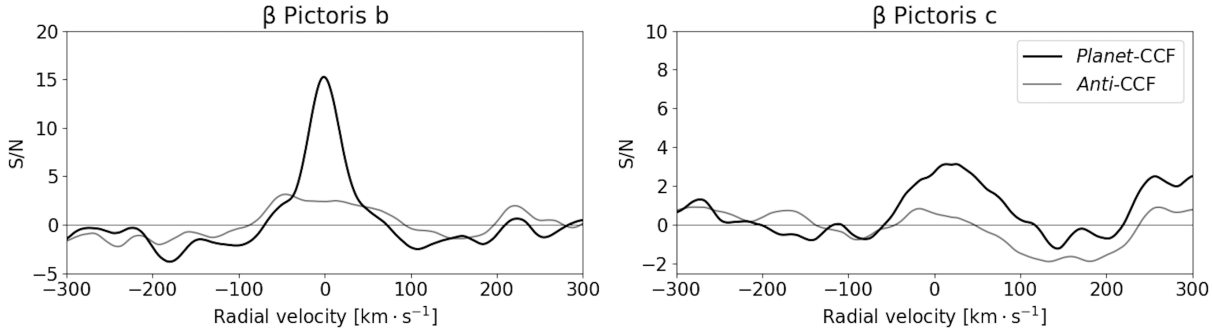

Figure 2: Cross-correlation functions of β Pic b (left) and c (right). The black lines are the cross-correlation functions at the locations of the planets, while the grey lines are the corresponding functions at the exact opposite side of the star relative to the planets. Note the different scaling on the y-axes between the two panels. Planet b is clearly detected, while planet c shows a bump that can only be seen as a tentative feature.

Three Worlds in One: Venus as a Natural Laboratory for the Effect of Rotation Period on Atmospheric Circulation

M.Cohen[1,2]*, J. Holmes*[1]*, S.Lewis*[1]*, M.Patel*[1]*, S. Lebonnois*[3]

[1] School of Physical Sciences, The Open University, Milton Keynes, MK7 6AA, UK
[2] National Centre for Atmospheric Science, The University of St Andrews, St Andrews, KY16 9TS, UK
[3] Laboratoire de Météorologie Dynamique (LMD/IPSL), Sorbonne Université, ENS, PSL Research University, Institut Polytechnique de Paris, CNRS, Paris, France

The Astrophysical Journal Letters, published

Because of its rotation period of 243 days, Venus is considered a slowly rotating planet. However, its persistent superrotating atmospheric jets, which increase in speed from surface to cloud tops, effectively set a faster rotation speed than the surface rotation. Using the Venus Planetary Climate Model and wind measurements taken by the Pioneer Venus entry probes, we show that the Rossby radius of deformation of the atmosphere varies with height. The atmosphere falls into three circulation regimes: (1) from the surface to 20 km, the Rossby radius of deformation exceeds the planetary radius and no Rossby waves form; (2) from 20 to 50 km, the tropical Rossby radius becomes smaller than the planetary radius, and a circulation regime characterized by a superrotating equatorial jet and mid-latitude Rossby gyres appears; (3) from 50 to 70 km, the extratropical Rossby radius becomes smaller than the planetary radius, the jet develops mid-latitude maxima, and the Rossby gyres shift to high latitudes. Studies of exoplanetary circulation regimes as a function of rotation period have repeatedly shown a similar progression. While observing the circulations of exoplanets to confirm these predictions is not currently possible, the presence of different circulation regimes on Venus and their dependence on altitude could be tested by observing campaigns. Such evidence would be the first observational support for the theory connecting differences in planetary rotation periods to circulation regime transitions and would ground predictions of exoplanet circulations in a validated framework.

Download/Website: `https://iopscience.iop.org/article/10.3847/2041-8213/adade9`

Contact: `mjc42@st-andrews.ac.uk`

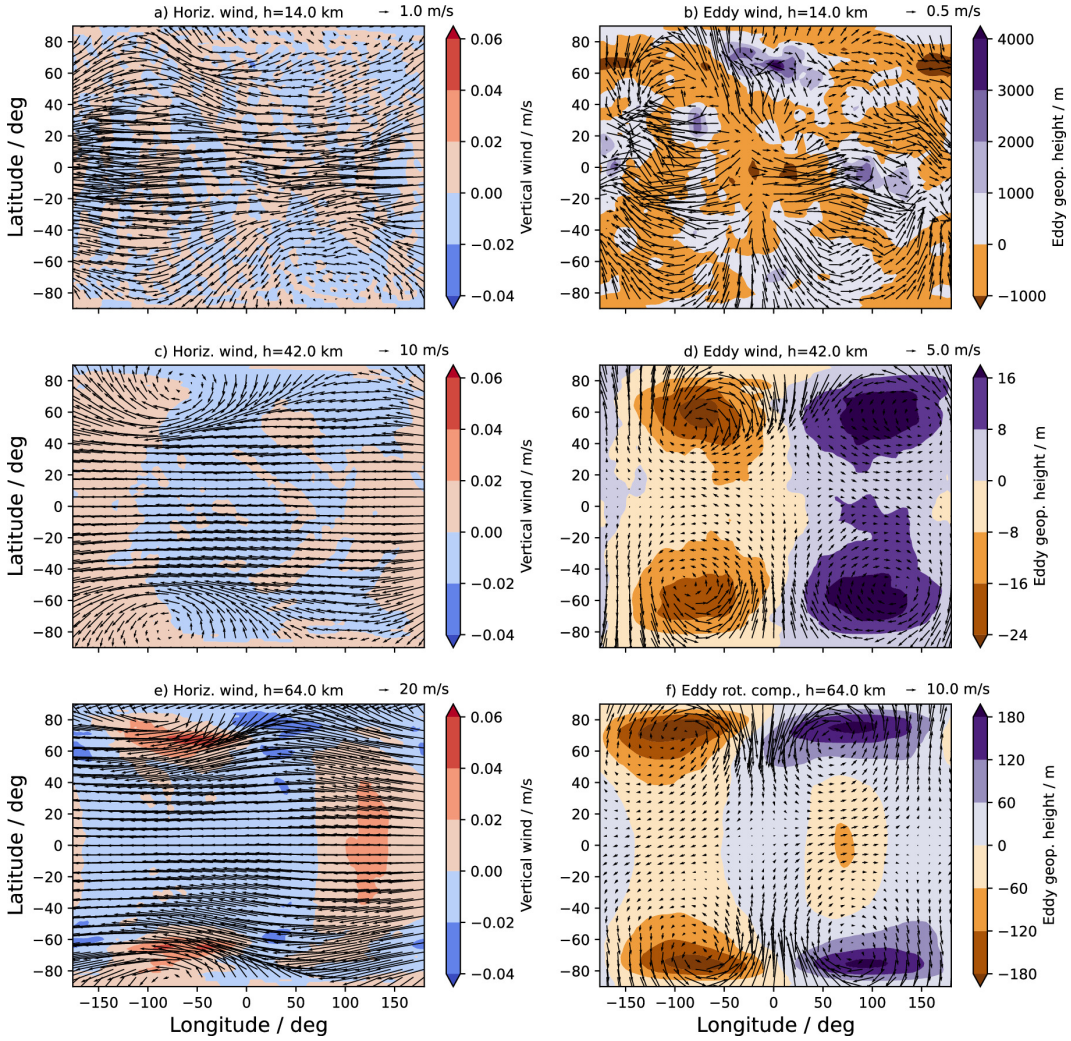

Figure 3: Left column: horizontal (quivers) and vertical (colors) wind at three different altitudes in the VPCM simulation. Right column: eddy winds and eddy geopotential height at the same three altitudes. In b) and d), the eddy wind is the wind field minus the zonal mean. In f), the wind vectors shown are the eddy rotational component derived from a Helmholtz decomposition of the flow. All figures represent a snapshot taken at an identical simulation time with local noon at 135E.

3 Jobs and Positions

PhD Opportunities in Interdisciplinary Space Sciences and Planetary Research (YRP@Graz)

Young Researcher Program in interdisciplinary space science and planetary research (YRP@Graz)

* Space Research Institute of the Austrian Academy of Sciences, Graz, Austria
* University of Graz, Graz, Austria
* Graz University of Technology, Graz, Austria

Graz, Summer 2025

The Young Researcher Program YRP@Graz welcomes applications for PhD positions, supported by the Space Research Institute of the Austrian Academy of Sciences, the University of Graz, and the Graz University of Technology.

The application process has two stages with which we aim to decrease selection biases: The first stage of the application process is anonymised, the second stage takes the form of an interview. To apply for these positions, an anonymous questionnaire (use weblink below) has to be filled in. No further documents are required at this stage of the application process. The form includes among others questions about scientific skills, the candidate's master thesis, information on master courses taken, asks for a statement of interest and a statement about research integrity. Please, submit the form no later than **March 11th, 2025**.

We seek excellent candidates with a strong background in natural sciences. Successful candidates must hold a Master's degree in physics, astrophysics, geosciences, computational chemistry or equivalent at the latest by the starting date of the position but preferably at the time of application. Previous experience on aspects of astrophysics and related fields, and a track record of team work will be beneficial for the selection, as will experience in computational coding and scientific publishing. The appointment can begin **July 01st, 2025**, and will aim for minimum of three years.

The six offered projects are:

- Next Generation Exoplanet Cloud Formation Model
- Coronal dimmings as signatures for CMEs
- Towards an all-sky ion composition detector for the Saturnian system
- Simulation of Deuterium in and above the Venus Atmosphere
- Observations of magnetic buoyancy signatures in the Earth's magnetotail
- Rossby waves in stars

Details about the offered projects and the application process can be found here:

`https://www.oeaw.ac.at/en/iwf/research/young-researcher-program/phd-students`

We are looking forward hearing from you!

Download/Website: `https://www.oeaw.ac.at/en/iwf/research/young-researcher-program`

Contact: `ruth-sophie.taubner@oeaw.ac.at`

Open tenure-track position

Antígona Segura

Mexico City, Mexico, After August, 2025

One position for astrobiology related research, including exoplanet characterization and habitability, in the Department of Plasma Physics and Radiation-MatterInteraction at the Instituto de Ciencias Nucleares (ICN). ICN is a leading research institute at UNAM, one of the most prestigious universities in Latin America. Our faculty conducts research in diverse areas, including nuclear and atomic, high-energy, plasma, and mathematical physics, gravitation and field theory, astronomy, optics, data science, and chemistry, among others. Deadline for applications: April 4, 2025.
We call on women scientists and scientists from historically underrepresented groups to participate in this process. One of ICN's strategic goals is to expand the plurality of its academic community.

Download/Website: `https://secretaria.nucleares.unam.mx/convocatorias/abiertas/`

Contact: `fabio@nucleares.unam.mx, sriacad@nucleares.unam.mx`

4 Conferences and Workshops

EPRV 6 workshop announcement (Extremely Precise Radial Velocities)

Susana Barros and Nuno Santos for the SOC and the LOC

Porto, Portugal, 30 June - 3 July 2025

Dear community,

We are happy to announce that the abstract submission and registration for the workshop **Sixth workshop on Extremely Precise Radial Velocities (EPRV6)**, 30 June - 03 July 2025, Porto, Portugal is now open (https://www.iastro.pt/eprv6). The abstract submission deadline is the 31st of March.

High resolution spectroscopy and Doppler Radial Velocities (RV) are one of the main battle-horses of exoplanet research. Over the last years, a number of new instruments were commissioned and developed. The data analysis techniques have also been upgraded, with particular improvement on the correction of stellar variability. It is thus a great time to come together to discuss these advancements and pave the way for the next step in RV precision.

Following the tradition of previous workshops, EPRV 6 will provide the latest news on extreme precision RV, focusing on:

- New instrumentation developments and challenges
- Data reduction and post-processing
- Stellar (and solar) variability, and methods of mitigation
- New results in exoplanet research using high-resolution spectroscopy

The maximum attendance (in person) will be 200 persons. The conference will be hybrid, with a reduced fee for online attendance.

Best wishes

Susana Barros and Nuno Santos for the SOC and the LOC

Download/Website: `https://www.iastro.pt/eprv6`

Contact: `eprv6@iastro.pt`

5 Others

Introducing Physics and Astronomy Reports

Timothy Banks

Istanbul University, 2025

A new journal's editors are excited to announce the recent launch of *Physics and Astronomy Reports*, an open-access, peer-reviewed international journal dedicated to advancing scientific knowledge in the fields of physics and astronomy. Published semi-annually in June and December, the journal aims to provide a platform for high-quality, original research and comprehensive reviews. The inaugural issue was released in 2023.

Physics and Astronomy Reports welcomes submissions from research groups with a particular focus on stellar and exoplanet astronomy. The journal publishes original research articles, invited review articles, and, in special issues approved by the editorial board, high-quality conference proceedings. All submissions must be written in English.

The journal is fully funded by Istanbul University, meaning there are no article processing charges (APCs) or fees for any articles. This ensures that the journal remains open and accessible to all contributors, without any financial barriers. The journal follows a rigorous double-blind peer-review process to ensure the highest academic standards.

For more information on submission guidelines and the journal's scope, please visit: Author Guidelines (`https://iupress.istanbul.edu.tr/en/journal/par/information/author-guidelines`).

The journal editors look forward to receiving your contributions!

Download/Website: *`https://iupress.istanbul.edu.tr/en/journal/par/home`*

Contact: `par@istanbul.edu.tr`

6 As seen on astro-ph

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

January 2025

astro-ph/2501.00104: **First unambiguous detection of ammonia in the atmosphere of a planetary mass companion with JWST/MIRI coronagraphs** *by Mathilde Mâlin et al.*
astro-ph/2501.00609: **Detection of H2O and CO2 in the Atmosphere of the Hot Super-Neptune WASP-166b with JWST** *by Andrew W. Mayo et al.*
astro-ph/2501.01122: **Probing exoplanetary magnetism via atomic alignment effect** *by M. Rumenskikh et al.*
astro-ph/2501.01387: **A Planet as the Possible Cause of the HD 181327 Debris Disk Asymmetry** *by Chris Fox, Paul Wiegert*
astro-ph/2501.01484: **Sequencing Silicates in the IRS Debris Disk Catalog I: Methodology for Unsupervised Clustering** *by Cicero X. Lu et al.*
astro-ph/2501.01498: **TOI-421 b: A Hot Sub-Neptune with a Haze-Free, Low Mean Molecular Weight Atmosphere** *by Brian Davenport et al.*
astro-ph/2501.01551: **Photometry of outer Solar System objects from the Dark Energy Survey II: a joint analysis of trans-Neptunian absolute magnitudes, colors, lightcurves and dynamics** *by Pedro H. Bernardinelli et al.*
astro-ph/2501.02081: **Statistical trends in JWST transiting exoplanet atmospheres** *by Guangwei Fu et al.*
astro-ph/2501.02050: **Sporadic Dips from Extended Debris Transiting the Metal-Rich White Dwarf SBSS 1232+563** *by J. J. Hermes et al.*
astro-ph/2501.01912: **Exoplanet Detection via Differentiable Rendering** *by Brandon Y. Feng et al.*
astro-ph/2501.02193: **MOA-2022-BLG-033Lb, KMT-2023-BLG-0119Lb, and KMT-2023-BLG-1896Lb: Three low mass-ratio microlensing planets detected through dip signals** *by Cheongho Han et al.*
astro-ph/2501.02215: **Planetary Edge Trends (PET). I. The Inner Edge-Stellar Mass Correlation** *by Meng-Fei Sun et al.*
astro-ph/2501.02272: **TOI-6038 A b: A dense sub-Saturn in the transition regime between the Neptunian ridge and savanna** *by Sanjay Baliwal et al.*
astro-ph/2501.03345: **Formation of super-Earths and mini-Neptunes from rings of planetesimals** *by Sho Shibata, Andre Izidoro*
astro-ph/2501.03322: **Twinkle: A GPU-based binary-lens microlensing code with contour integration method** *by Suwei Wang et al.*
astro-ph/2501.03214: **Superhabitable Planets Around Mid-Type K Dwarf Stars Enhance Simulated JWST Observability and Surface Habitability** *by Iva Vilović et al.*
astro-ph/2501.03143: **Dynamics of the Beta Pictoris planetary system and possibility of an additional planet** *by A. Lacquement et al.*
astro-ph/2501.02864: **High-temperature measurements of acetylene VUV absorption cross sections and application to warm exoplanet atmospheres** *by Benjamin Fleury et al.*
astro-ph/2501.03019: **An Independent Search for Small Long-period Planets in Kepler Data I: Detection Pipeline** *by Oryna Ivashtenko, Barak Zackay*
astro-ph/2501.04083: **Detecting Exomoons in Free-Floating-Planet Events from Space-based Microlensing Surveys** *by Hao-Zhu Fu, Subo Dong*
astro-ph/2501.03844: **An absolute mass, precise age, and hints of planetary winds for WASP-121 A and b from a JWST NIRSpec phase curve** *by David K. Sing et al.*
astro-ph/2501.03998: **Tracing the Winds: A Uniform Interpretation of Helium Escape in Exoplanets from Archival Spectroscopic Observations** *by Patrick McCreery et al.*

astro-ph/2501.03716: **Connection between planetary He I λ10830 Å absorption and extreme-ultraviolet emission of planet-host stars** *by J. Sanz-Forcada et al.*

astro-ph/2501.03685: **Characterizing WASP-43b's interior structure: unveiling tidal decay and apsidal motion** *by Lia Marta Bernabò et al.*

astro-ph/2501.03803: **TOI-5108 b and TOI 5786 b: Two transiting sub-Saturns detected and characterized with TESS, MaHPS and SOPHIE** *by Luis Thomas et al.*

astro-ph/2501.04866: **Identifying Flare Locations Through Exoplanet Transit Occultations** *by Tayt Armitage et al.*

astro-ph/2501.04834: **Detectability of Emission from Exoplanet Outflows Calculated by pyTPCI, a New 1D Radiation-Hydrodynamic Code** *by Riley Rosener et al.*

astro-ph/2501.04692: **A study of the frequency and characteristics of stellar companions and Jupiter-like planets in nearby open clusters** *by R. Gratton et al.*

astro-ph/2501.04737: **Network and Kinetics-based Biosignatures: Implications for the Putative Habitable World Observatory Design** *by Theresa Fisher et al.*

astro-ph/2501.04350: **Influence of Planetary Rotation on Supersonic Flow of Lava Planets: A Two-Dimensional Horizontal Model Analysis** *by Zhuo-Yang Song et al.*

astro-ph/2501.04383: **Confirmation of four hot Jupiters detected by TESS using follow-up spectroscopy from MaHPS at Wendelstein together with NEID and TRES** *by Juliana Ehrhardt et al.*

astro-ph/2501.05615: **Stellar obliquities of eight close-in gas giant exoplanets** *by J. Zak et al.*

astro-ph/2501.05506: **Planet formation and long-term stability in a very eccentric stellar binary** *by Jakob Stegmann et al.*

astro-ph/2501.05517: **The two-dimensional pressure structure of the HD 163296 protoplanetary disk as probed by multi-molecule kinematics** *by V. Pezzotta et al.*

astro-ph/2501.05316: **The CO-Fuelled Time Machine: Tracing Birth Conditions and Terrestrial Planet Formation Outcomes in HD 163296 through Pebble Drift-induced CO Enhancements** *by Joe Williams, Sebastiaan Krijt*

astro-ph/2501.05297: **The Role of Atmospheric Composition in Defining the Habitable Zone Limits and Supporting E. coli Growth** *by Asena Kuzucan et al.*

astro-ph/2501.05172: **Impact of photoevaporative winds in chemical models of externally irradiated protoplanetary disks** *by Luke Keyte, Thomas J. Haworth*

astro-ph/2501.05114: **The ESO SupJup Survey V: Exploring Atmospheric Variability and Orbit of the Super-Jupiter AB Pictoris b with CRIRES+** *by Siddharth Gandhi et al.*

astro-ph/2501.06342: **The TESS-Keck Survey XXIV: Outer Giants may be More Prevalent in the Presence of Inner Small Planets** *by Judah Van Zandt et al.*

astro-ph/2501.06358: **From Stability to Instability: Characterizing the Eccentricities of Multi-planet Systems in the California Kepler Survey as a Means of Studying Stability** *by Matthew J. Doty et al.*

astro-ph/2501.05913: **Dust processing in the terrestrial planet-forming region of the PDS 70 disk** *by Yao Liu et al.*

astro-ph/2501.06149: **Understanding what helium absorption tells us about atmospheric escape from exoplanets** *by Giulia Ballabio, James E. Owen*

astro-ph/2501.05704: **Exoplanet Ephemerides Change Observations (ExoEcho). I. Transit Timing Analysis of Thirty-Seven Exoplanets using HST/WFC3 Data** *by Xinyue Ma et al.*

astro-ph/2501.06301: **Deep radio interferometric search for decametre radio emission from the exoplanet Tau Boötis b** *by C. M. Cordun et al.*

astro-ph/2501.05866: **Extreme exomoons in WASP-49 Ab: dynamics and detectability** *by Mario Sucerquia, Nicolás Cuello.*

astro-ph/2501.06395: **The heating efficiency of hot Jupiters from a data-driven perspective** *by Sheng Jin et al.*

astro-ph/2501.06462: **Polycyclic Aromatic Hydrocarbons (PAHs) as an Extraterrestrial Atmospheric Technosignature** *by Dwaipayan Dubey et al.*

astro-ph/2501.07402: **Is planetary inward migration responsible for GJ 504's fast rotation and bright X-ray luminosity? New constraints from eROSITA** *by C. Pezzotti et al.*
astro-ph/2501.07687: **The PLATO field selection process. II. Characterization of LOPS2, the first long-pointing field** *by V. Nascimbeni et al.*
astro-ph/2501.07633: **The coexistence of the streaming instability and the vertical shear instability in protoplanetary disks: Scale-dependence of dust diffusion** *by Urs Schäfer et al.*
astro-ph/2501.07520: **Three-dimensional transport of solids in a protoplanetary disk containing a growing giant planet** *by Eric Van Clepper et al.*
astro-ph/2501.07403: **Dusty disks as safe havens for terrestrial planets: Effect of the back-reaction of solid material on gas** *by Zs. Regály et al.*
astro-ph/2501.07313: **X-ray activity of nearby G-, K-, and M-type stars and implications for planet habitability around M stars** *by E. Zhu, T. Preibisch*
astro-ph/2501.07142: **Study of Migration of Giant Planets and Formation of Populations of Distant Trans-Neptunian Objects in the Nice Model** *by V. V. Emel'yanenko*
astro-ph/2501.07976: **High-Contrast Imaging: Hide and Seek with Exoplanets** *by Riccardo Claudi, Dino Mesa*
astro-ph/2501.08191: **Architecture Classification for Extrasolar Planetary Systems** *by Alex R. Howe et al.*
astro-ph/2501.08294: **Vertical CO surfaces as a probe for protoplanetary disk mass and carbon depletion** *by T. Paneque-Carreño et al.*
astro-ph/2501.08301: **A Disintegrating Rocky World Shrouded in Dust and Gas: Mid-IR Observations of K2-22b using JWST** *by Nick Tusay et al.*
astro-ph/2501.08463: **Kinetic and photochemical disequilibrium in the potentially carbon-rich atmosphere of the warm-Jupiter WASP-69b** *by Nidhi Bangera et al.*
astro-ph/2501.09152: **Background exoplanet candidates in the original Kepler field** *by John Bienias, Robert Szabo*
astro-ph/2501.09095: **A Pair of Dynamically Interacting Sub-Neptunes Around TOI-6054** *by Maxwell A. Kroft et al.*
astro-ph/2501.09058: **REsolved ALMA and SMA Observations of Nearby Stars (REASONS): A population of 74 resolved planetesimal belts at millimetre wavelengths** *by L. Matrà et al.*
astro-ph/2501.08992: **Empirical Constraints on Tidal Dissipation in Exoplanet Host Stars** *by Sarah C. Millholland et al.*
astro-ph/2501.08722: **Interplay between tidal flows and magnetic fields in nonlinear simulations of stellar and planetary convective envelopes** *by Aurélie Astoul, Adrian J. Barker*
astro-ph/2501.09792: **Dust dynamics in radially convective regions of protoplanetary disks** *by Min-Kai Lin, Marius Lehmann*
astro-ph/2501.09795: **11 New Transiting Brown Dwarfs and Very Low Mass Stars from TESS** *by Noah Vowell et al.*
astro-ph/2501.09644: **Planetary Rhythms: Synchronous Circulation on Variably Irradiated Asynchronous Planets** *by Deepayan Banik*
astro-ph/2501.09494: **On the robustness of exoplanet atmospheric detections: insights from extensive simulations** *by A. Sánchez-López, Ana P. Millán*
astro-ph/2501.10121: **Discovery of Jet-Bubble-Disk Interaction: Jet Feedback on a Protoplanetary Disk via an Expanding Bubble in WSB 52** *by Masataka Aizawa et al.*
astro-ph/2501.10488: **Searching for substellar companion candidates with Gaia. III. Search for companions to members of young associations** *by A. -M. Lagrange et al.*
astro-ph/2501.10512: **The rapid formation of macromolecules in irradiated ice of protoplanetary disk dust traps** *by Niels F. W. Ligterink et al.*
astro-ph/2501.10571: **Near-circular orbits for planets around M/K-type stars with Earth-like sizes and instellations** *by David Kipping et al.*
astro-ph/2501.10594: **Accurate and thermodynamically consistent hydrogen equation of state for planetary**

modeling with flow matching *by Hao Xie et al.*

astro-ph/2501.09963: **Unveiling the Interior Structure and Thermal Evolution of Super-Earth GJ 486b** *by Chandan K. Sahu et al.*

astro-ph/2501.11658: **Nonlinear analysis of gravitational instability in a 3D gaseous disc** *by Joshua J. Brown, Gordon I. Ogilvie*

astro-ph/2501.11660: **Where in the Milky Way Do Exoplanets Preferentially Form?** *by Joana Teixeira et al.*

astro-ph/2501.11667: **A One-Dimensional Energy Balance Model Parameterization for the Formation of CO2 Ice on the Surfaces of Eccentric Extrasolar Planets** *by Vidya Venkatesan et al.*

astro-ph/2501.11686: **The centimeter emission from planet-forming disks in Taurus** *by Antonio Garufi et al.*

astro-ph/2501.12002: **The SPHERE infrared survey for exoplanets (SHINE). V. Complete observations, data reduction and analysis, detection performances, and final results** *by A. Chomez et al.*

astro-ph/2501.13214: **Formation of Giant Planets** *by Andrew N. Youdin, Zhaohuan Zhu*

astro-ph/2501.13166: **Properties of Free Floating Planets Ejected through Planet-Planet Scattering** *by Hareesh Gautham Bhaskar, Hagai Perets*

astro-ph/2501.12650: **Resonance Capture and Stability Analysis for Planet Pairs under Type I Disk Migration** *by Linghong Lin et al.*

astro-ph/2501.12809: **ExoSim 2: the new Exoplanet Observation Simulator applied to the Ariel space mission** *by Lorenzo V. Mugnai et al.*

astro-ph/2501.14016: **Highly reflective white clouds on the western dayside of an exo-Neptune** *by Louis-Philippe Coulombe et al.*

astro-ph/2501.14054: **Probing the Limits of Habitability: A Catalog of Rocky Exoplanets in the Habitable Zone** *by Abigail Bohl et al.*

astro-ph/2501.14100: **JWST 1.5 μm and 4.8 μm Photometry of Y Dwarfs** *by Loïc Albert et al.*

astro-ph/2501.13809: **Exoplanet Occurrence Rate with Age for FGK Stars in Kepler** *by Maryum Sayeed et al.*

astro-ph/2501.13575: **Transit-timing variations in the AU Mic system observed with CHEOPS** *by Á. Boldog et al.*

astro-ph/2501.13877: **Dust characterization of protoplanetary disks: a guide to multi-wavelength analyses and accurate dust mass measurements** *by Elena M. Viscardi et al.*

astro-ph/2501.14596: **JWST COMPASS: NIRSpec/G395H Transmission Observations of the Super-Earth TOI-776b** *by Lili Alderson et al.*

astro-ph/2501.14858: **Monte Carlo post-processing for radiation hydro simulations of accreting planets in protoplanetary disks** *by Anton Krieger et al.*

astro-ph/2501.15017: **SPOCK 2.0: Update to the FeatureClassifier in the Stability of Planetary Orbital Configurations Klassifier** *by Elio Thadhani et al.*

astro-ph/2501.15609: **Redistribution of ices between grain populations in protostellar envelopes. Only the coldest grains get ices** *by Juris Kalvāns*

astro-ph/2501.16429: **Orbital Modeling of HII 1348B: An Eccentric Young Substellar Companion in the Pleiades** *by Gabriel Weible et al.*

astro-ph/2501.16554: **Searching for GEMS: Discovery and Characterization of Two Brown Dwarfs Around M Dwarfs** *by Alexander Larsen et al.*

astro-ph/2501.16484: **JWST Reveals Varied Origins Between Jupiter's Irregular Satellites** *by Benjamin N. L. Sharkey et al.*

astro-ph/2501.16452: **archNEMESIS: an open-source Python package for analysis of planetary atmospheric spectra** *by Juan Alday et al.*

astro-ph/2501.16402: **Dangerous dust clouds above lunar surface** *by Oleksiy V. Arkhypov, Maxim L. Khodachenko*

astro-ph/2501.16133: **Will nanodust reappear in STEREO/WAVES data?** *by Nicole Meyer-Vernet*

astro-ph/2501.16169: **Quantifying the Impact of the Dust Torque on the Migration of Low-mass Planets II: The Role of Pebble Accretion in Planet Growth within a Global Planet Formation Model** *by Octavio*

M. Guilera et al.

astro-ph/2501.17232: **Dynamics of small, constant size particles in a protoplanetary disk with an embedded protoplanet** *by Ellen M. Price et al.*

astro-ph/2501.17272: **A closer look at LTT 9779b: The ESPRESSO endeavour to pierce the atmospheric veil** *by R. Ramírez Reyes et al.*

astro-ph/2501.17241: **Carving the Edges of the Rocky Planet Population** *by Eve J. Lee, James E. Owen*

astro-ph/2501.17055: **Viscous circumbinary protoplanetary discs – II. Disc effects on the binary orbit** *by Anna B. T. Penzlin et al.*

astro-ph/2501.17092: **Revisiting the multi-planetary system of the nearby star HD 20794: Confirmation of a low-mass planet in the habitable zone of a nearby G-dwarf** *by N. Nari et al.*

astro-ph/2501.16873: **Wavelength-dependent far-infrared polarization of HL Tau observed with SOFIA/HAWC+** *by Moritz Lietzow-Sinjen et al.*

astro-ph/2501.17948: **Tracing the Inner Edge of the Habitable Zone with Sulfur Chemistry** *by Sean Jordan et al.*

astro-ph/2501.17857: **Planetesimal formation in a pressure bump induced by infall** *by Haichen Zhao et al.*

astro-ph/2501.17508: **The growth of super-large pre-planetary pebbles to an impact erosion limit** *by J. Teiser et al.*

astro-ph/2501.17728: **The role of cloud particle properties on WASP-39b transmission spectrum based on JWST/NIRSpec observations** *by J. Roy-Perez et al.*

astro-ph/2501.18700: **Updated Mass, Eccentricity, and Tidal Heating Constraints for the Earth-sized Planet LP 791-18 d** *by Michael Greklek-McKeon et al.*

astro-ph/2501.18680: **Evidence for a volcanic atmosphere on the sub-Earth L98-59b** *by Aaron Bello-Arufe et al.*

astro-ph/2501.18348: **Characterising the multiple protostellar system VLA 1623-2417 with JWST, ALMA and VLA: outflow origins, dust growth and an unsettled disk** *by Isaac C. Radley et al.*

astro-ph/2501.18477: **A Comprehensive Reanalysis of K2-18 b's JWST NIRISS+NIRSpec Transmission Spectrum** *by Stephen P. Schmidt et al.*