Issue 50 – Nov 27th, 2025

ExoClock Newsletter

Dear ExoClock participants,

Hope you are all doing well! We have several updates and exciting announcements while we are happy to see that our community is growing further!

We would like also to welcome the new members!

We send out a newsletter like this every two to three months, while you can read the past newsletters, watch the past meetings, and have access to other educational material at:

www.exoclock.space/users/material

We ***have a Slack channel*** *for more direct communication and if you want to join, follow this link:*

https://join.slack.com/t/exoclock/shared_invite/zt-1t5l875v6-x0s8s553kT8nbCvbyo7boA

In this newsletter, we discuss:

1. Announcements

1.1 Fifth Annual ExoClock Meeting

Our 5th Annual ExoClock Meeting took place in October in Madrid, hosted by the Polytechnic University of Madrid. We welcomed ~60 attendees in person and ~60 more online - thank you all for joining us, whether in person or from afar!

This year's meeting, similar to last year, was held alongside the Ariel Consortium meeting at the same venue, giving us a great chance to catch up with many Ariel scientists face-to-face.

Highlights:

- Inspiring presentations from ExoClock members, Ariel researchers, and partners covering case studies, project updates, and the science behind the scenes.

- We shared the new ExoClock strategy, discussed upcoming priorities, and outlined next steps for 2026.

- Plenty of time for Q&A, feedback, and brainstorming.

You can find the full programme here:
https://www.exoclock.space/annual_meetings

If you missed a session, recordings will be uploaded on the website soon - we'll keep you posted.
As always, your feedback matters! If you attended (in person or online), we'd really value your thoughts. Please take a minute to fill out the form. And thanks to everyone who's already done it!
https://docs.google.com/forms/d/e/1FAIpQLSdse6qGndwCav6i_ZgoRV2TEaR7CQ2zRkjvEXlY-F0bwT2BTg/viewform?usp=sharing&ouid=107601329913541610951

Here's our group photo from Madrid—what a fantastic day!

"Group photo of ExoClock participants at the 5th Annual Meeting, Polytechnic University of Madrid, 3–4 October 2025."

1.2 A new chapter: A non-profit organisation to support all ExoClock activities

To support ExoClock's growth and long-term sustainability, after over 6 years of being run mainly voluntarily, we've now formally established a non-profit organisation dedicated to ExoClock activities. With the community expanding (now 2000+ registered participants) and our needs scaling up, your support helps us maintain and improve the tools, programs, coordination, and resources the project relies on.

You can support ExoClock financially here:

https://www.exoclock.space/donate

Please share this news with anyone - individuals, astronomy associations, or communities who might be interested in participating in our mission and supporting ExoClock. We're happy to answer questions and will keep doing our best to grow the project and its activities!

If you are member of an organisation, university or institute, we are open for opportunities to establish our collaboration and become more sustainable. Please contact us to further discussions!

1.3 Ariel Open Conference

The Ariel open conference will happen in Didcot, UK between the **17th and 19th of March 2026**. The conference is open to registrations and abstract submissions for talk or poster presentations. We will also prepare an event related to ExoClock in central London, but the exact location and dates will be announced later.

The deadline for the abstract submission is the **30th of November** while registration ends on the **15th of February:**

https://arielmission.space/index.php/ariel-open-conference-2026/

1.4 ExoClock Unlocked - 2026 Edition

ExoClock Unlocked is our hands-on program for astronomy enthusiasts who don't have access to observing equipment but want to contribute to real exoplanet research. No telescope required and no prior experience needed. If you're curious and motivated to learn, you're more than welcome to join. The program is open to everyone - students, amateur astronomers, and citizen scientists - from any background and any country.

Working with remote telescopes, thanks to the generous support of the Las Cumbres Observatory (LCO) and our own Nostos Observatory in Greece, participants observe exoplanet transits and support ESA's Ariel mission, which will study the atmospheres of distant worlds.

How it works:

- Monthly online training seminars
- Guided remote observations using user-friendly tools
- Data analysis with step-by-step support and educational materials
- Earn a certificate for successful observations and your contribution to the ExoClock project and the Ariel mission

Last year at a glance:

- We welcomed 47 participants from around the world - Spain, France, the United Kingdom, Colombia, the United States, Japan, Egypt, and more - with a wide range of backgrounds. Most had no previous experience in exoplanet observing before joining (but now they do!). Working in teams of four, they successfully observed 12 exoplanet transits of high importance, helping to refine the ephemerides of these planets.

The application is open, please fill out the form on this page:
https://www.exoclock.space/exoclock_unlocked

Deadline: 15 December 2025

Participation fee: €300 for the full program (all seminars). This covers resources, organizational work, and observing time. If you'd like to participate, please submit the application form and we'll follow up with payment details later. There will be available two fee waivers for two students from underrepresented countries.

Please share this opportunity with your communities, clubs, classrooms, anyone who might enjoy discovering the science behind exoplanets and who may not have access to observational equipment, while contributing to a real space mission!

1.5 Synchronous observations campaigns

Synchronous Observations are used to observe simultaneously transit observations of challenging exoplanet targets in an effort to increase the S/N. These are often cases where single-site observations may be insufficient due to low signal-to-noise ratios, long transit durations, or other observational difficulties.

By observing the same transit from multiple locations at the same time, we ensure better coverage and data reliability, helping to confirm transits and refine ephemerides for otherwise hard-to-characterize systems.

We will have another campaign on the **4th of December for K2-136c, a hight-priority target.**

Please note down the date and if you have clear skies, go ahead and observe it!

- The transit happens between **4th of December, 21:24 UTC** and **Friday the 5th of December 03:00 UTC.**

- Use a red photometric filter, a luminance filter, or no filter at all.

- Join the campaign if you have a **telescope of 8 in. or larger**.

- Remember that the transit will not appear in your scheduler! In order to check whether the transit is observable from your location at the exact time, please use the exoworldsspies scheduler: https://www.exoworldsspies.com/en/scheduler/
  You have to indicate a telescope of **28 inches**, otherwise it will not appear.

- If you manage to observe the transit, please submit the light curve as usual to ExoClock and include the comment: "This is part of the synchronous campaign".

2. ‘Exoplanet CV of HD 189733b’

These CV articles aim to enrich your background knowledge on the Ariel candidates. The articles feature one exoplanet each month and are written by our literature team. This month we are featuring **HD 189733b**. The article is attached in the next page. Enjoy!

Clear Skies,
the ExoClock team

“CV” of HD 189733b

by Ioannis Rompas, ExoClock Literature team member, Aristotle University of Thessaloniki.

Meet HD 189733b – A Glass-Raining Hot Jupiter!

Picture a world where years last just over two Earth days, the skies shine in deep blue hues, and winds carry molten glass across a superheated atmosphere. Doesn’t sound very friendly, right? That world is HD 189733b — one of the most studied exoplanets to date, and for good reason.

Located just 64.5 light-years away in the constellation Vulpecula, HD 189733b is a textbook hot Jupiter. It orbits a K-type star every 2.2 days and has a mass and radius slightly larger than Jupiter (1.13 M_J, 1.14 R_J) (Bouchy et al., 2005). Due to its tight orbit, it is tidally locked — always showing the same face to its star. The result? A dayside temperature of approximately 940°C and a cooler but still overheated nightside with temperature reaching over 650°C (Knutson et al., 2007), fuelling furious winds that are estimated to reach up to 9000 km/h! (Masson et al., 2024).

But it’s not just the weather that fascinates astronomers. HD 189733b’s atmosphere has been the focus of numerous studies, with confirmed detections of H_2O (Tinetti et al. 2007), CO, and CO_2 (de Kok et al. 2013) as well as a debated detection of CH_4 (Swain et al., 2008) (Figure 1).

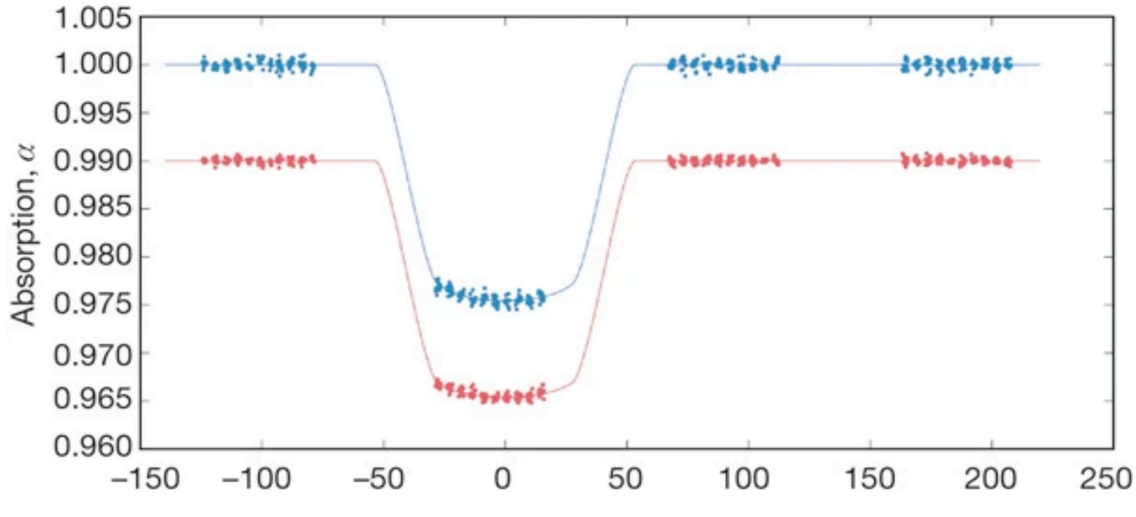

Figure 1: Transit light curve of HD 189733b from the Hubble Space Telescope (Figure 6, Swain et al. (2008)). The blue and red lines roughly correspond to the H and K astronomical bands of 1.6–1.8 μm and 2.0–2.4 μm, respectively. It was through analysing these curves that Swain et al. (2008) proposed a possible methane detection.

Beyond the clouds, ultraviolet observations have revealed that the planet is actively losing part of its atmosphere — a process driven by the strong radiation from its host star and a sign of intense star-planet interaction (Lecavelier des Etangs et al., 2010).

One of the planet’s most iconic features is its striking blue appearance, due to high-altitude silicate haze particles that scatter blue light (Evans et al., 2013). These tiny silicate grains, possibly glass-like in composition (Lecavelier des Etangs et al., 2008), condense in cooler regions and are then transported by the aforementioned powerful winds — leading to the poetic notion of “glass rain”.

This hot Jupiter is also a long-standing favourite in the ExoClock project. Its bright host star (V = 7.7), short orbital period (2.2 days), and deep transits (~2.4%) make it an excellent target even for small telescopes (ExoClock Database). In fact, over 60 observations have been contributed to the ExoClock database so far, many of them recent. These observations are vital: they help maintain accurate ephemerides, identify potential transit timing variations (TTVs), and support future atmospheric studies — especially by ESA's Ariel mission.

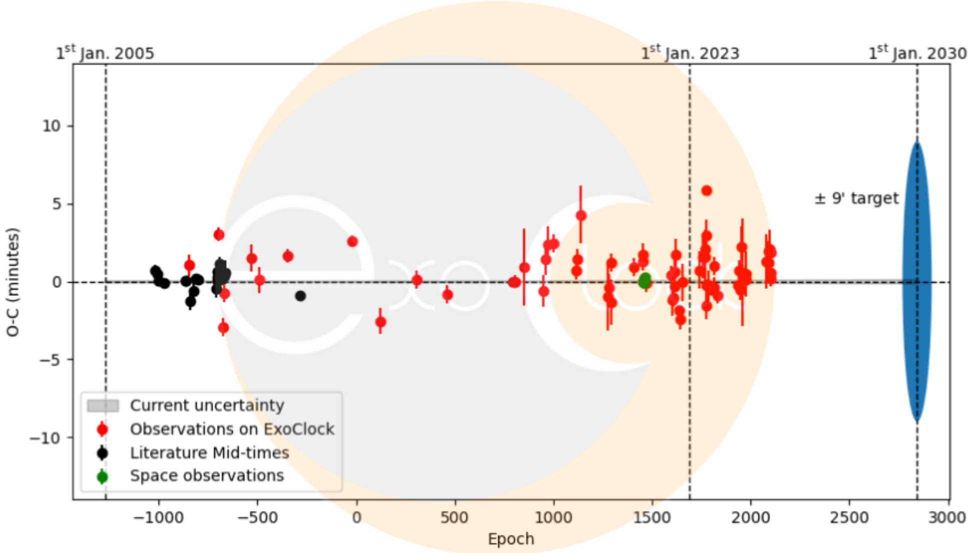

Figure 2: Observations of the HD 189733 b transits from the Exoclock database

Despite being extensively studied, HD 189733b is far from boring. Its shifting weather patterns, dynamic atmosphere, and strong interactions with its star ensure it remains a truly exciting planet to observe — whether you're a seasoned astronomer or just starting out with a backyard telescope.

References

[1] Bouchy et al. 2005 (https://ui.adsabs.harvard.edu/abs/2005A&A...444L..15B/abstract)
[2] Knutson et al. 2007 (https://ui.adsabs.harvard.edu/abs/2007Natur.447..183K/abstract)
[3] Tinetti et al. 2007 (https://ui.adsabs.harvard.edu/abs/2007Natur.448..169T/abstract)
[4] de Kok et al. 2013 (https://ui.adsabs.harvard.edu/abs/2013A%26A...554A..82D/abstract)
[5] Swain et al. 2008 (https://ui.adsabs.harvard.edu/abs/2008Natur.452..329S/abstract)
[6] Lecavelier Des Etangs et al. 2008 (https://ui.adsabs.harvard.edu/abs/2008A&A...481L..83L/abstract)
[7] Evans et al. 2013 (https://ui.adsabs.harvard.edu/abs/2013ApJ...772L..16E/abstract)
[8] Masson et al. 2024 (https://ui.adsabs.harvard.edu/abs/2024arXiv240609225M/abstract)