Observing exoplanet atmospheres in PLATO era

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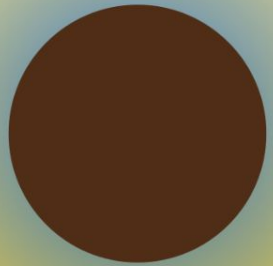
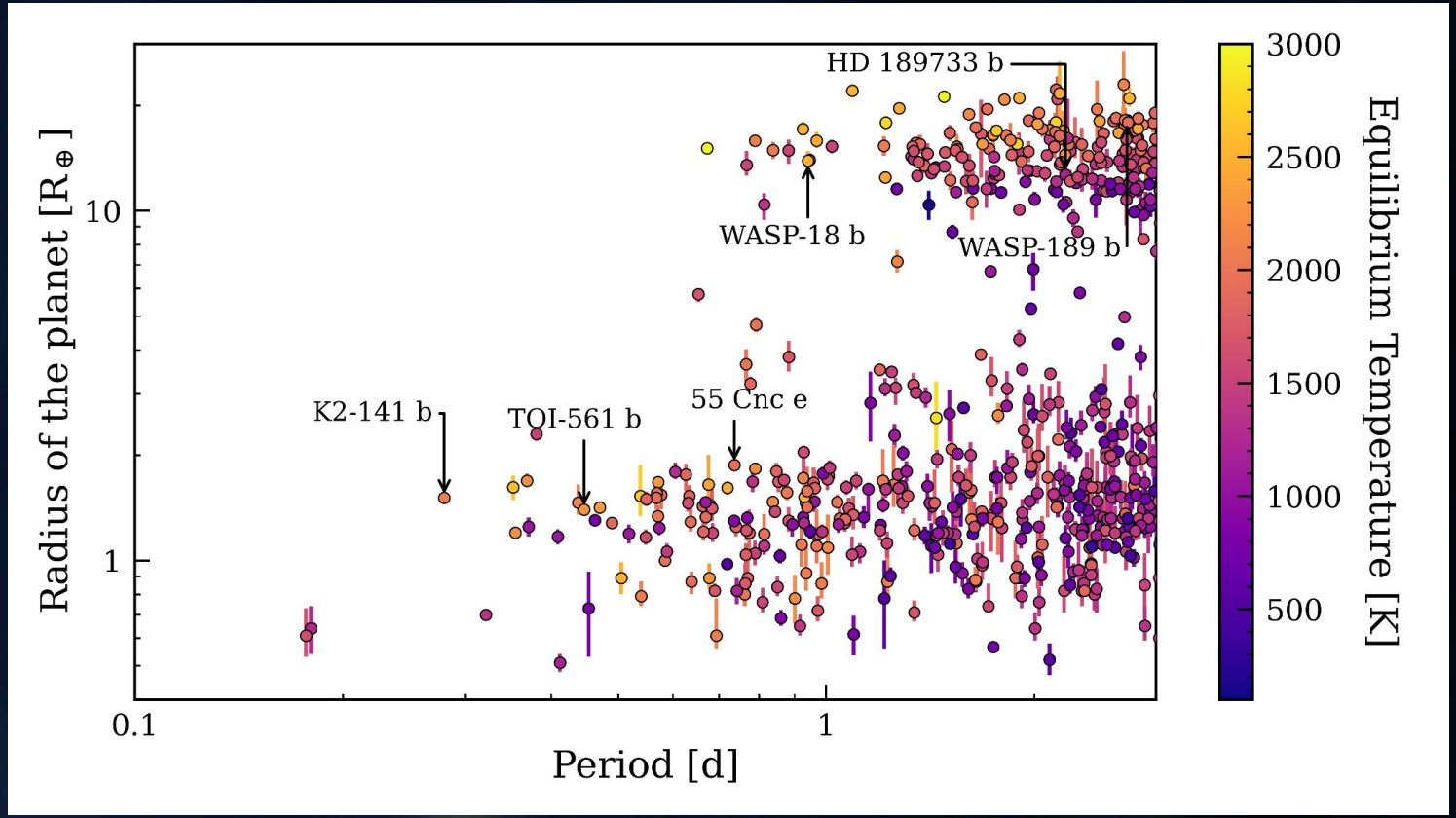
On behalf of
Phase curve working group (M. Lendl & J.-M. Désert)
WP 116 700 – Cloud and Gas Chemistry of Planetary Atmospheres (C. Helling)
WP 116 800 – 3D Exoplanet Climate modelling (L. Carone)

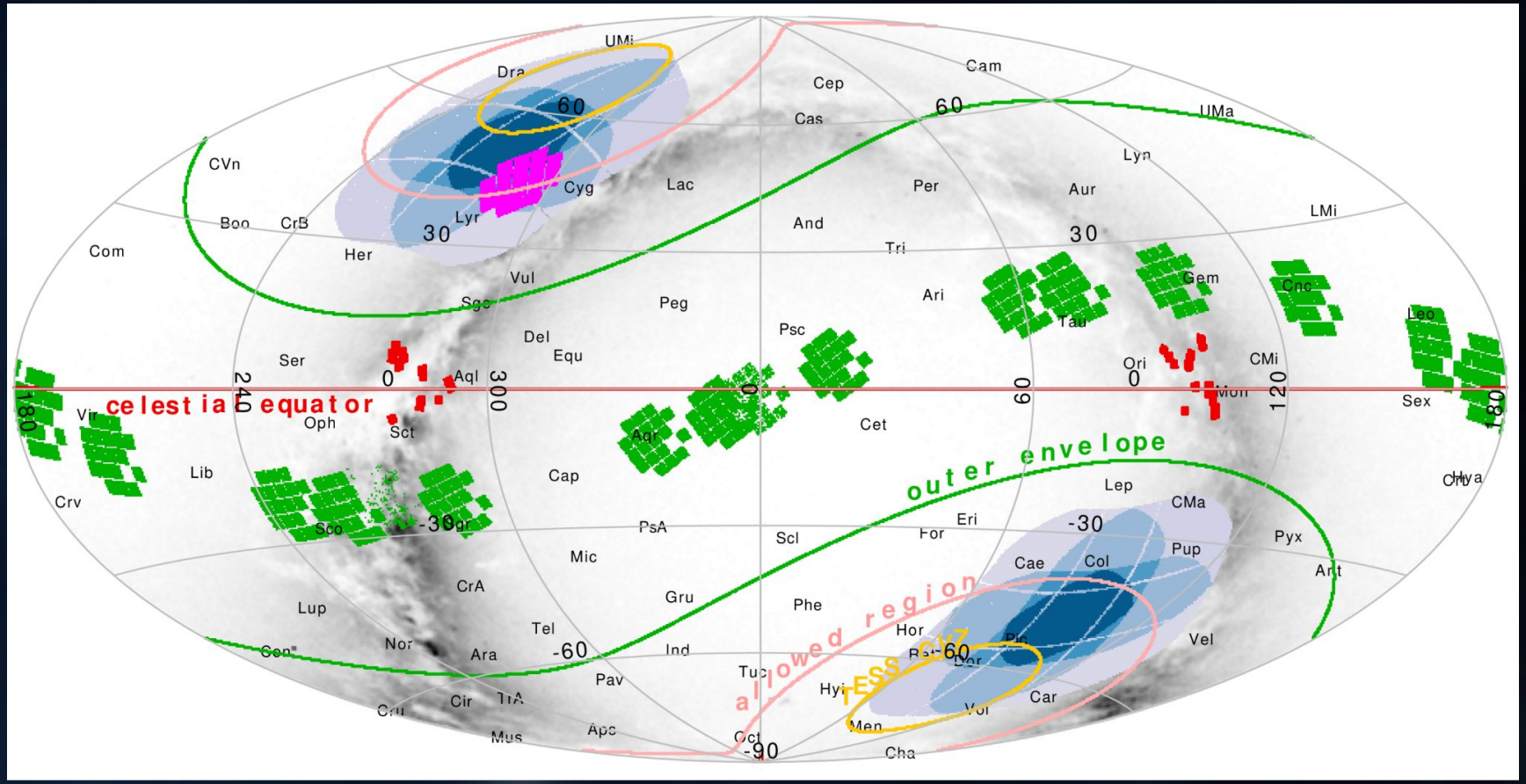


Population of known exoplanets and place of close-in planets in it



Data from NASA Exoplanet Archive, May 2025

The PLATO fields



Nascimbeni, V., Piotto, G., N., Cabrera, J., et al. 2025, A&A, 694, A313

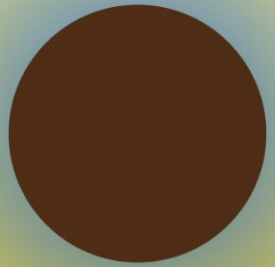
Science goals

Global parameters affecting the observables.

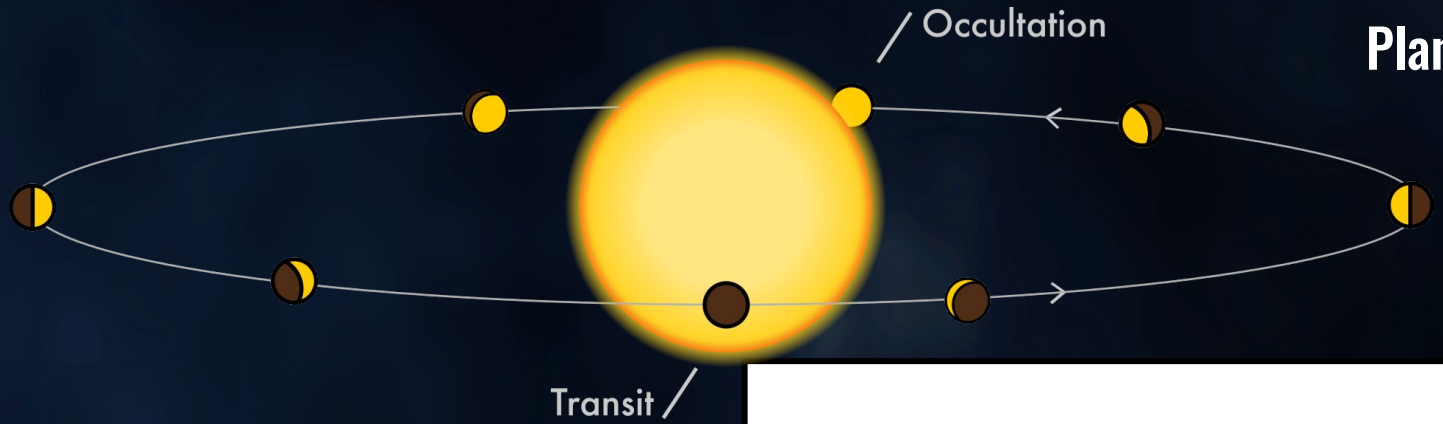
Atmospheric variability

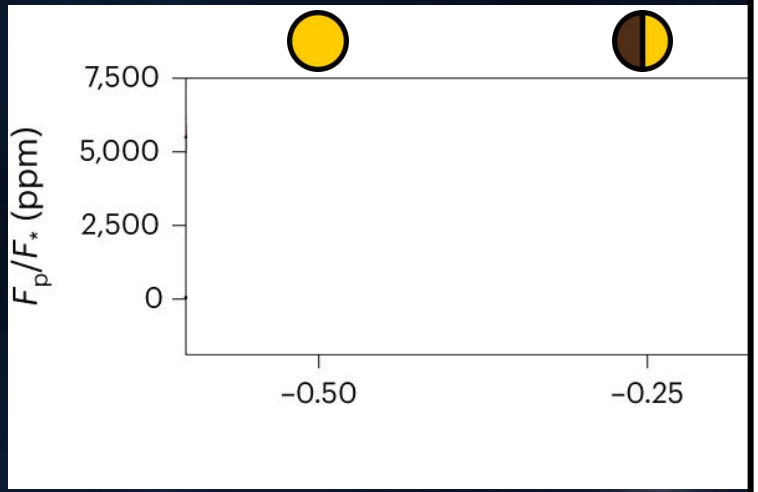
What determines the inhomogeneous atmospheres on gas giants?

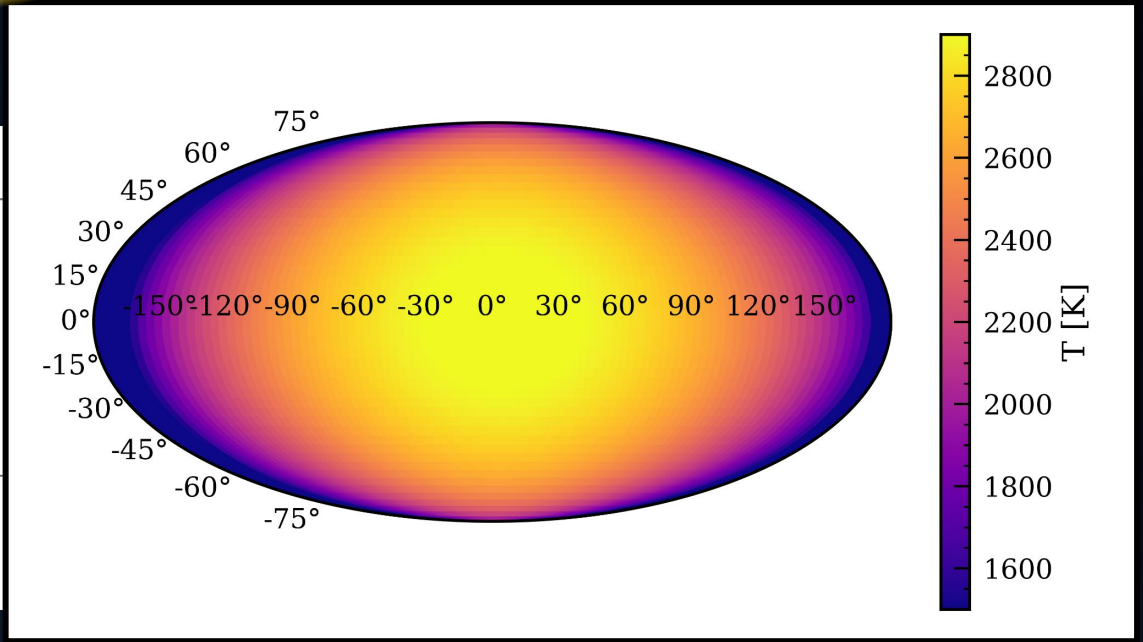
What affects the geometric albedo of gas giants?



Planetary phase curves

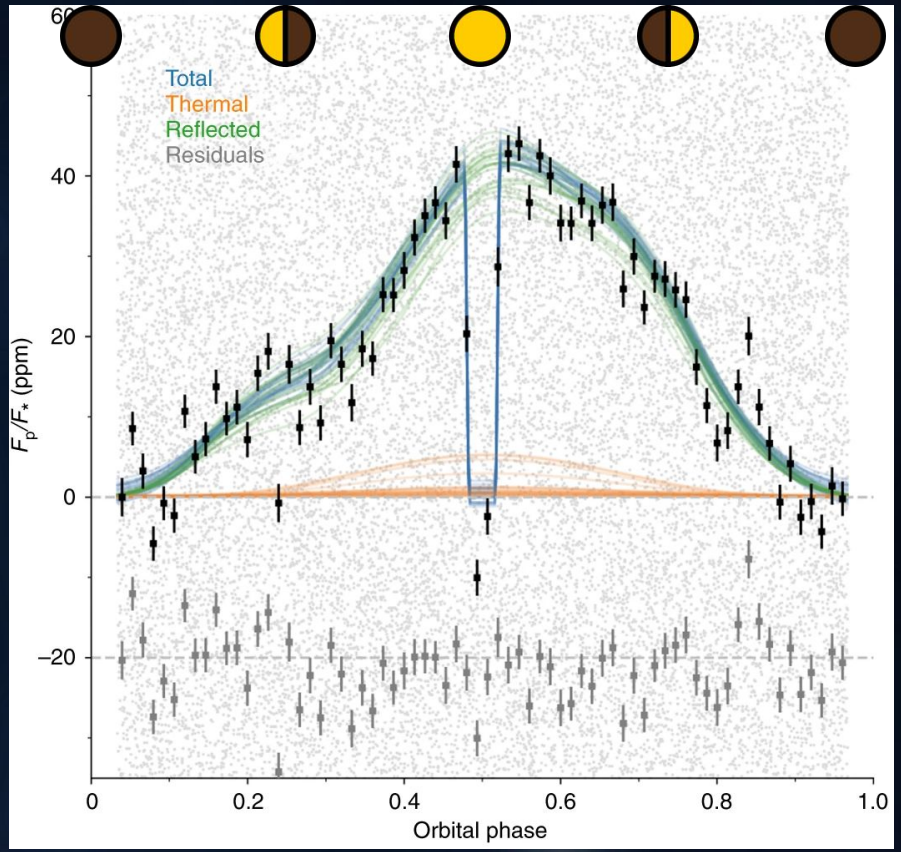






Bell, T. J., Crouzet, N., Cubillos, P. E., et al. 2024, NatAstron, 8, 879

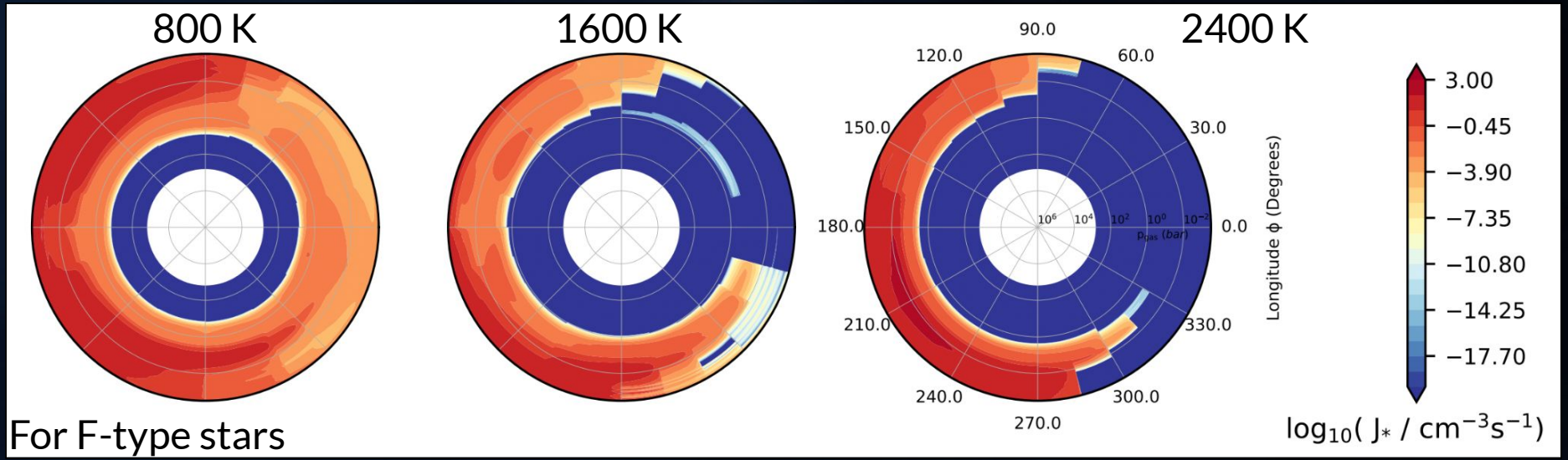
Planetary phase curves in the optical



Asymmetric light curve because of inhomogeneous cloud coverage on the planet.

Heng, K., Morris, B. M. & Kitzmann, D. 2021, NatAstron, 5, 1001

Inhomogeneous cloud coverage: models



Helling, C., Samra, D., Lewis, D., et al., 2023. A&A, 671, A122

Unfortunately, I cannot share all slides because the material may not be public.

However, if you are interested in the activities of the phase curve working group, here's the link to Confluence page of the group (you need to be a PLATO consortium member to access the page): https://s2e2.cosmos.esa.int/confluence/pages/viewpage.action?pageId=646611671.

If you are interested in joining the phase curve working group, please send an email to Monika Lendl (monika.lendl@unige.ch) and Jean-Michel Désert (J.M.L.B.Desert@uva.nl), or send me an email and I will put you in touch with them!