



Postdoctoral position on Uranus and Neptune atmospheric modeling

The Laboratoire de Météorologie Dynamique (LMD), located on Sorbonne Université (Paris, France), invites applications for a postdoctoral position on Uranus and Neptune atmospheric modeling. The position is funded by the ANR (Agence Nationale pour la Recherche) grant “Simulations and Observations of Uranus and Neptune atmospheric Dynamics (SOUND)”. The SOUND project addresses fundamental questions regarding the atmospheric physics of Uranus and Neptune, in particular i) atmospheric circulation (waves, jets, ...), storm activity and the methane cycle using circulation models at the global scale or at the regional scale and ii) characterizing stratospheric winds and temperatures from observations. This first aspect is the main topic of the postdoctoral position.

We are looking for a someone to contribute to the development of the Uranus and Neptune version of our Generic Planetary Circulation Model (PCM), a 3D versatile model developed at LMD in strong collaboration with other laboratories (LAB, LESIA...). The ice giant version of the PCM, based on our Saturn and Jupiter models [Spiga et al., 2020, Guerlet et al., 2020] is already operational but needs further developments. Depending on the candidate's background and interests, several areas can be explored: add methane clouds and haze microphysics ; test a gravity wave parametrization and study its impact on stratospheric thermal structure and dynamics ; or account for convective plumes and study their impact on the general circulation. The candidate will rely on existing modules available within our team or collaborations (eg. adapting the Titan cloud and haze microphysics to Uranus; or the Mars and Saturn gravity wave parametrization to Neptune; etc.). Access to several hundred thousands of computing hours on a national facility has already been secured. The candidate can also count on in-house developed tools to analyze the GCM outputs, for instance related to spectral decomposition of wave modes, or the study of wave-mean zonal flow interactions. Comparisons with observations (including recent ones by the JWST, or with ALMA) will be done to validate and interpret the model results.

The applicant will join the “Planeto” team at LMD, composed of six permanent researchers and a dozen of engineers, postdocs and PhDs working on all solar system atmospheres and exoplanet ones, both on modeling and observational aspects. Within the SOUND project, the candidate will also collaborate closely with teams at the Laboratoire d'Astrophysique de Bordeaux and the LESIA at the Observatory of Paris. Diversity, work ethics and good work/personal life balance are important values shared by our collaborators. There are possibilities to practice sport for free or take French classes on the university campus. You are enthusiastic, curious, you work with rigor, and, while you are autonomous, you are also a team player with good interpersonal communication skills: join our team!

Applicants should have a PhD in planetary science, atmospheric physics or astrophysics. Experience conducting research on (giant) planet atmospheres ; atmospheric modeling ; good programming skills (eg. fortran, python, ...); experience with collaborative tools (Git / svn) and good English level are among the desirable assets for the position.

The postdoctoral position is awarded for 18 months (plus a potential 6 month extension), starting ideally in spring 2023 (the 1st of April, May or June), with some flexibility. Applications received until 31 January, 2023 will receive full consideration. Applicants should send a CV (including publication list), a cover letter stating their research accomplishments, interests in the project and date of availability, and 1 to 3 contact information for references to sandrine.guerlet@lmd.ipsl.fr