**Jeudi 15 Janvier 2026 à 11h (IAS)**

## Validation, Characterization and Populations of (mostly) small exoplanets

**Léna Parc (Observatoire de Genève)**

In this seminar, I will present an overview of my PhD work on the characterization of exoplanets, with a focus on understanding the diversity of small planets. I will introduce the PlanetS catalog, a curated sample of transiting planets with precise masses and radii. Using this catalog, we show that the transition between rocky super-Earths and volatile-rich sub-Neptunes around M-dwarfs is smoother than previously thought, with the radius valley becoming less pronounced. The transition also depends on stellar type, reflecting differences in formation and evolution.

I will highlight the role of high-precision spectrographs such as NIRPS, HARPS, and ESPRESSO in expanding the sample of well-characterized small planets. The TOI-756 system illustrates this: we confirmed the transiting sub-Neptune TOI-756 b, discovered an outer eccentric giant planet, and detected hints of an additional companion, showcasing the complex architectures around M-dwarfs. I will also discuss multi-planet systems TOI-4336 A and TOI-4342, whose precise masses and densities from ESPRESSO radial velocities reveal a range of compositions from rocky to volatile-rich, and are excellent targets for future JWST atmospheric studies.

Finally, I will present results from the long-term CORALIE programs, which follow transiting planets to search for additional companions and better understand system architectures.

Overall, this seminar illustrates how combining precise validation, characterization, and population studies provides insights into the formation, evolution, and diversity of exoplanets.