



ID de Contribution: 29

Type: Oral presentation

## Modeling the atmospheric circulation of Uranus and Neptune

*lundi 8 février 2021 14:30 (15 minutes)*

Since the end of the 1980s, observations collected by Voyager 2, large ground-based telescopes and space telescopes (notably Hubble Space Telescope) have revealed that Uranus and Neptune are cold but very active worlds. Indeed, the observations revealed intense jet streams and strong meteorological activity (dark spots or bright cloud features). It's on Neptune where we find the fastest zonal tropospheric winds of the solar system (~400 m/s).

In addition, their atmospheres are home to numerous hydrocarbons that form aerosol mists in the lower stratosphere. Methane also condenses in these very cold environments, forming a cloud layer at the tropopause and a hydrogen sulfide cloud layer is suspected at the upper troposphere. Many observations document the properties of these mists and clouds, as well as their spatial distribution, but few microphysical models have been developed, and none couple microphysics to dynamics. The impact of these aerosols on the climate of Uranus and Neptune thus remains uncertain.

Today, the physical and microphysical processes that govern the atmosphere of Uranus and Neptune are still unknown.

The objective of this thesis is to reproduce and understand the atmospheric circulation of these atmospheres and the microphysics of aerosols using a GCM (Global Climate Model). This will include studying the role of waves and instabilities in the establishment of jet streams and the vertical structure and size distribution of aerosols with the observations.

### Field

Planetology (including small bodies and exoplanets)

### Day constaints

I will not be able to make my presentation on the 9th of February (between 9h30 am and 12h30 pm) and the 12th of February (between 9h30 am and 12h30 pm).

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**Classification de Session:** Talk

**Classification de thématique:** Astrophysics