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Type: **Oral presentation**

## The climate of Early Mars

*mardi 9 février 2021 15:00 (15 minutes)*

How Mars was during its first billion years is one of the most intriguing question in our understanding of the Solar System. The planet was host of a tremendous amount of liquid water flowing on the surface throughout the Noachian era, approximatively 4Gya. Geomorphological observations is the main evidence for liquid water since valley networks and lakes are still visible on the surface, although dry nowadays. With current and future missions to Mars, we are also now able to study mineralogy and to perform in-situ analysis of the martian soil, providing new pieces for the Early Mars puzzle.

In the context of a faint young sun, radiating 75% of the actual solar energy around 3.8Gya, maintaining a global temperature above 0°C is challenging. In order to deciphering this paradox, the scientific community has been using a variety of models including 3-D GCMs (Global Climate Models). These models try to closely reproduce the physics of the atmosphere, providing a powerful tool for the comprehension of planetary climates. We present here a quick overview of the Martian climate during this period called Noachian. We also describe the previous studies performed during the last decades of Early Mars climate modeling and finally focus on the main objectives of my PhD research. Future work includes the exploration of different scenarios with a new ambitious high-resolution model: the Mars Evolution Model.

### Field

Planetology (including small bodies and exoplanets)

### Day constraints

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