



ID de Contribution: 27

Type: **Oral presentation**

## **Unveiling the Cosmic Dawn: numerical simulations and machine learning to analyse the first billion years of the Universe**

*jeudi 29 février 2024 17:30 (15 minutes)*

My PhD project aims at improving the modelling of the Cosmic Dawn ( $z \sim 25$  to 10) and the Epoch of Reionization ( $z \sim 10$  to 6), periods in the history of the Universe that corresponds to the birth of the very first galaxies, and at developing novel methods for extracting model parameters from current and future 21cm observations by e.g. NenuFAR/LOFAR/HERA/SKA. To do so, I present LoReLi, a public dataset now containing 10 000 21cm signals computed from radiative hydrodynamics Licorice simulations. I will discuss the design of machine-learning-based inference pipelines and their applications to the latest measurements of the HERA interferometer, showing that “cold” reionization scenarios are unlikely to accurately represent our Universe.

### **Astrophysics Field**

Cosmology

### **Day constraints**

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**Classification de Session:** Session 8