ATMOSPHERic Investigation of eXoplanets

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Résumé

More than 5000 exoplanets have been discovered in the last decade and this number keeps increasing, especially with the TESS satellite. We now have access to many statistics on the mass-radius diagram of planets, the distribution according to stellar type or the average number of planets per star. However, for the same density, two planets can have very different physical characteristics. Current research on exoplanets is therefore directed towards the atmospheric characterisation of exoplanets in order to lift the degeneracy and understand the formation and evolution of planetary systems. The characterization can be performed either with satellites, such as JWST, or with ground-based high resolution velocimeter. The " SpectroPolarimètre InfraRouge " (SPIRou) is a state-of-the-art instrument particularly suited to this task but even with the latest instruments, the planetary signal is drowned under different sources of noise and requires a complex data analysis to be unveiled. In this talk, I will detail the technique to characterize exoplanets through high resolution spectroscopy. I will present the ATMOSPHERIX consortium, a French consortium of 27 researchers specialists of exoplanet observation, theory and stellar simulations, interseted in the characterisation of exoplanetary atmospheres and initially created to exploit at best SPIRou capacities. I will detail the first results we obtained with our observations, as well as the physics that can be constrained through atmospheric characterization.

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