

Jeudi 19 octobre 2023 à 11h (IAS, bâtiment 121, salle 1-2-3)

Measuring the thermal emission of TRAPPIST-1's innermost planets using the JWST

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The TRAPPIST-1 system is composed of seven Earth-sized rocky planets around an ultra-cool star, three of which orbit within the habitable zone. Remarkably, these planets are currently the best-known terrestrial planets after the Earth, Mars, Venus, and Mercury (in terms of masses, radii and orbital parameters) and the most amenable targets for the first characterization of temperate rocky worlds with the James Webb Space Telescope (JWST). In particular, the two inner planets have irradiances large enough to enable the measurement of their dayside's thermal emission by observing secondary eclipses -when the planet passes behind the star as seen from the observer- in the infrared. In this talk I will first give a short review of our current knowledge of the system. I will then present the observations of the two innermost planets, TRAPPIST-1 b and c, with the Mid InfraRed Instrument (MIRI) on-board the JWST, including the most recent unpublished observations (July 2023). Finally, I will show how these measurements help us reveal the presence or absence of an atmosphere around these planets, and in the latter scenario how they can be used to constrain the surface composition of the planets.