

The SPECULOOS project: hunting for habitable exoplanets around the nearest very-low-mass stars

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Confined for centuries to the rank of pure speculation, the existence of life beyond our solar system is now at the edge of gaining its status of testable scientific hypothesis. Since the first discovery of a planet in orbit around another Sun-like star in 1995, more than three thousands of such exoplanets have been detected at an ever increasing rate. Eagerly awaited, the next major step in this young field of research will be the first detailed studies of temperate terrestrial exoplanets, notably the exploration of their atmospheric compositions for possible chemical traces of life. In this context, the nearest “ultracool dwarf” stars, i.e. stars of the lowest-mass kind, are particularly interesting targets for an exoplanet search, as their properties should make possible the detailed atmospheric characterization of temperate planets as small as the Earth -and even smaller- with upcoming astronomical facilities. In this talk, I will present SPECULOOS (Search for habitable Planets Eclipsing ULtra-coOL Stars), a new project that aims to search for terrestrial planets around the nearest ultracool dwarf stars. It is based on a network of robotic telescopes whose cores are the SPECULOOS-South and SPECULOOS-North Observatories that have just started their observations in the Atacama Desert (Chile) and in Tenerife (Canary Islands). The high scientific potential of the project is already well established, thanks to the recent discovery of the amazing TRAPPIST-1 (aka SPECULOOS-1) system by its prototype ongoing in Chile since 2011. In the second part of my talk, I will review the ongoing study of this fascinating planetary system, and its exciting perspectives.

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