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Habitable planets in the solar neighbourhood

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Decades of radial velocity and transit searches have led to a reasonably complete picture of the planets in the solar neighbourhood. We know of planets around 50% of nearby stars and, interestingly, most of them are of terrestrial nature, highlighting the very high occurrence rate (more than 1 planet per star on average). A number of such planets orbit within the habitable zones of their stars, therefore with the potential to have surface liquid water and, perhaps, sustain a biosphere. The CARMENES instrument, mounted on the 3.5-m telescope of the Calar Alto observatory in Almería, Spain, has been a major contributor to performing such complete census of our planetary vicinity. In this talk, I will provide a description of the distribution of known nearby exoplanets, with particular emphasis on those that are similar to Earth. I will describe the instrumentation that has led to this knowledge and also provide an outlook of future prospects for atmospheric characterisation and eventual search for biosignatures.

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