Observations and modelling of exoplanetary atmospheres

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It is now accepted that exoplanets are ubiquitous. However little is known about those planets we have detected beyond the fact they exist and their location. For a minority, we know their weight, size and orbital parameters. How do we progress from here?

Key observables to understand the nature of planets are the chemical composition and state of their atmosphere. Pioneering results were obtained in the past couple of decades with Hubble, Spitzer and ground-based facilities, enabling the detection of ionic, atomic and molecular species and of the planet's thermal structure.

With the arrival of improved or dedicated instruments in the coming decade (JWST, ARIEL, Twinkle, ELT, TMT), planetary science will expand beyond the narrow boundaries of our Solar System to encompass our whole Galaxy. These dedicated missions will enable the use of the atmospheric chemical composition and structure as powerful diagnostics of the history, formation mechanisms and evolution of gaseous and rocky exoplanets.

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