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Sulle atmosfere esoplanetarie

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"The study of exoplanetary atmospheres represents one of the most exciting frontiers in modern astrophysics. By analyzing their composition, thermal structure, and dynamical properties, we can gain deep insights into the diversity of extrasolar planets and assess the potential for habitable conditions beyond our Solar System.

A wide range of observational techniques is currently employed to investigate exoplanets, using both low- and high-resolution spectroscopy. Transmission and emission spectroscopy, phase curves, and direct imaging allow us to probe different atmospheric properties across various classes of planets. In addition to space telescopes such as Hubble, Spitzer, and the more recent James Webb Space Telescope (JWST), ground-based instruments like HARPS at the ESO 3.6m telescope, HARPS-N at the Telescopio Nazionale Galileo (TNG), and ESPRESSO at the VLT are playing a key role in atmospheric characterization. In particular, high-resolution spectroscopy enables the detection of faint molecular features and the study of atmospheric dynamics with remarkable precision.

Looking ahead, future missions such as ESA's Ariel and PLATO are set to greatly expand our atmospheric survey capabilities, with Ariel specifically designed for large-scale spectroscopic observations. At the same time, upcoming ground-based observatories like the Extremely Large Telescope (ELT), equipped with the high-resolution spectrograph ANDES, will offer unprecedented resolution and sensitivity, opening new windows onto the physics and chemistry of distant worlds. Together, these projects represent a true scientific relay, carrying us forward in our quest to understand the nature and evolution of planets beyond the Solar System."

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