An Updated Mission Reference Sample for ARIEL

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ARIEL (Atmospheric Remote-sensing Infrared Exoplanet Large-survey) has been selected as the next ESA medium-class science mission and is due for launch in 2028. During its 4-year mission, ARIEL aims to observe 1000 exoplanets ranging from Jupiter and Neptune-size down to super-Earth size in the visible and the infrared with its meter-class telescope.

The analysis of ARIEL spectra and photometric data will deliver a homogenous catalogue of planetary spectra which will allow the extraction of the chemical fingerprints of gases and condensates in the planet's atmosphere, including the elemental composition for the most favourable targets. It will also enable the study of thermal and scattering properties of the atmosphere as the planet orbit around the star.

An updated study of the suitability of currently-known exoplanets for study with ARIEL has been undertaken. A recent prediction of the TESS yield has resulted in simulated targets around a catalogue of stars and these have also been included to create a list of potential targets. This list of planets has been utilised to form an example Mission Reference Sample to determine whether ARIEL's mission goals could be met from this planetary population.

We find that ARIEL should be able to observe ∼1000 planets at various resolutions over the primary mission life. This sample of the exoplanet population has a diverse range of sizes, temperatures and stellar hosts. The target list will continue to evolve as new planets are discovered.

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