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# A summary of the payload design for ARIEL

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## Abstract

The Atmospheric Remote-Sensing Infrared Exoplanet Large-survey (ARIEL) has been selected in March 2018 by ESA to be the next Cosmic Vision medium-class space mission (M4) due for launch in 2028. ARIEL will perform precise spectroscopy of ~ 1000 known transiting exoplanets using its metre-class telescope during a 4 years nominal lifetime, with a goal of 6 years of operation. The payload is provided by a nationally funded consortium with participation from teams from 14 ESA member states.

Three spectrometers cover without gaps a portion of the electromagnetic spectrum from a wavelength of 1.2 μm to 7.8 μm, with low resolution in the near-IR (R>10) and medium/low resolution in the mid-IR (R = 30-200). A three bands photometer completes the spectral coverage in the 0.5 to 1.2 μm spectral region, and it is used as a fine control guidance system as well as for science. The payload is designed to perform primary and secondary transit spectroscopy, and to measure spectrally resolved phase curves, with a photometric stability of < 100 ppm (goal of ~10 ppm).

From its orbit around the L2 Lagrange point, ARIEL data will enable us to obtain the first statistically significant spectroscopic survey of hot and warm planets. These are an ideal laboratory in which to study the chemistry, formation and evolution processes of exoplanets, to constrain the thermodynamics, composition and structure of their atmospheres, and to investigate the properties of clouds.

This paper presents the overview of the payload design foreseen for the mission, identifies the key driving requirements and outlines the expected performance.