

Twinkle: a visible and near-infrared space-based observatory for exoplanet and solar system spectroscopy

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The Twinkle Space Mission is a space-based observatory that has been conceived to measure the atmospheric composition of exoplanets, study bright stars and brown dwarfs, and reveal the surface mineralogy of solar system objects. The satellite is based on a high-heritage platform and will carry a 0.45 m telescope with a visible and near-infrared spectrograph providing simultaneous wavelength coverage from 0.5 - 4.5 μ m. The spacecraft will be launched into a Sun-synchronous low-Earth polar orbit and will operate for a baseline lifetime of seven years.

Twinkle will have the capability to provide high-quality infrared spectroscopic characterisation of the atmospheres of hundreds of bright exoplanets, covering a wide range of planetary types. It will also be capable of providing phase curves for hot, short-period planets around bright stars and of providing ultra-precise photometric light curves to accurately constrain orbital parameters, including ephemerides and TTVs/TDVs present in multi-planet systems.

Twinkle is available for researchers around the globe in two ways:

1) joining its collaborative multi-year survey programme, which will observe hundreds of exoplanets and solar system objects; and

2) accessing dedicated telescope time on the spacecraft, which can be freely scheduled for any combination of science cases.

I will present an overview of Twinkle's capabilities and discuss some example exoplanet surveys to highlight the broad range of targets the mission could observe, demonstrating the huge scientific potential of the spacecraft.

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