

Ariel undergoes the UK's first space acoustic tests

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Ariel, the European Space Agency's next-generation mission to observe the chemical makeup of distant extrasolar planets, underwent tests designed to simulate the intense acoustic environment of rocket launch at the National Satellite Test Facility (NSTF).

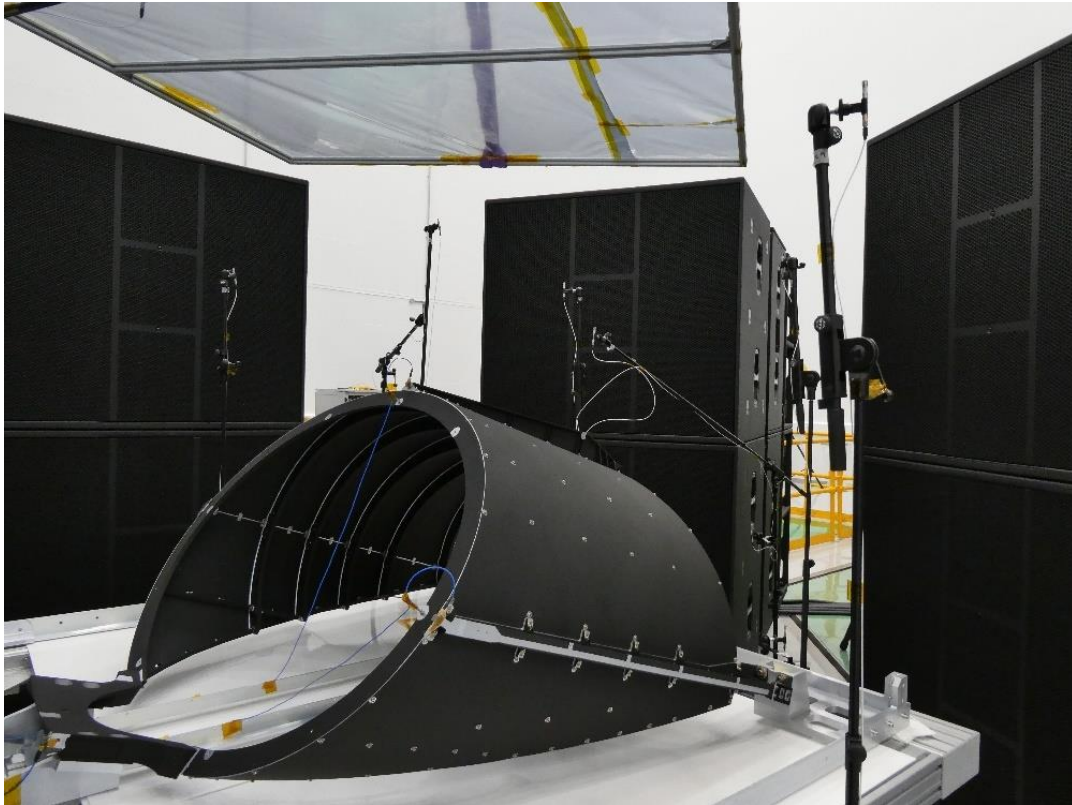


Teams from RAL Space, Active Space Technologies and the European Space Agency setting up acoustic tests in the NSTF. Credit: STFC RAL Space

Operated by STFC RAL Space, the National Satellite Test Facility (NSTF) was established to ensure that spacecraft up to 7 tonnes can withstand the harsh conditions of launch and space. The NSTF's Dynamics Suite is home to 48 large speakers and amplifiers which can be configured to simulate the incredibly loud acoustic environment typical of a rocket launch. This testing, known as direct field acoustic noise (DFAN) testing, is vital to ensure the structural integrity of space components.

The NSTF team has successfully completed its first DFAN tests conducted on components for the Ariel space telescope, marking a significant milestone for the facility and the UK space sector. While many of the NSTF's capabilities build on RAL Space's existing expertise in space testing, acoustic tests of this kind are a new frontier – both for the organisation and for the UK.

“The successful completion of these DFAN tests is a crucial milestone, not just for RAL Space but for the wider UK sector”, says Dr Ian Horsfall, Dynamics Group Leader at RAL Space. “Our team has done outstanding work extending our capability to test spacecraft components under these conditions that are as close to reality as possible. This achievement is a significant step forward for the NSTF and will benefit many future missions.”

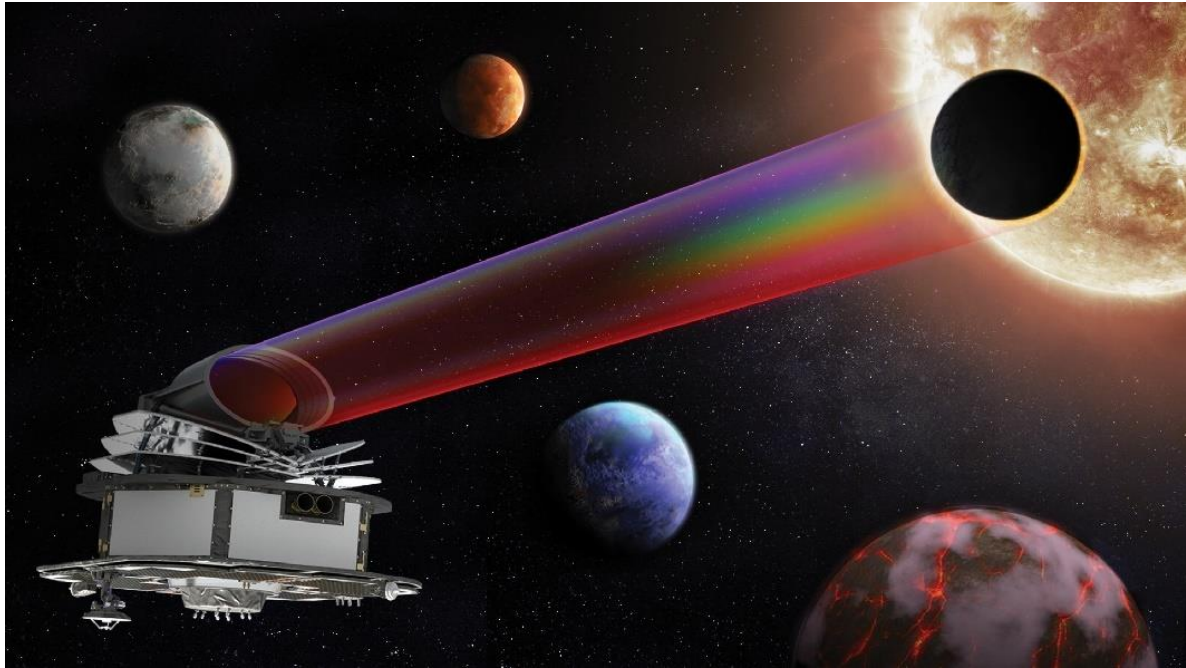


The Ariel baffle's engineering qualification model set up for DFAN tests. Credit: STFC RAL Space

The component undergoing DFAN testing was the Ariel telescope baffle's engineering qualification model (EQM), built by Active Space Technologies (Portugal). While this particular model won't fly on the final spacecraft, it serves as an essential step in validating the design and construction before the final flight model is assembled. After these acoustic tests, the baffle EQM will undergo further testing in RAL Space's thermal vacuum test facilities to ensure it can withstand the extreme conditions of space.

Ariel will study the chemistry of around 1000 planets outside our solar system, with RAL Space leading the mission's international payload consortium, and University College London leading the mission science. These roles are funded and supported by over £30m of funding from the UK Space Agency.

“The Ariel Payload Team at RAL Space were very excited to participate and observe this test”, says Dr Rachel Drummond, Ariel UK National Project Manager at RAL Space. “Not only does it offer valuable lessons for testing the full Ariel payload's structural model later in the year, but it's fantastic to see the various components coming together from our partners across Europe.”



Artist's impression of the Ariel telescope in space, with the baffle visible on top of the spacecraft. Credit: ESA

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Ariel Consortium Logo

Ariel

Ariel, a mission to answer fundamental questions about how planetary systems form and evolve, is a European Space Agency (ESA) medium-class science mission due for launch in 2029. During a 4-year mission, Ariel will observe up to 1000 planets orbiting distant stars in visible and infrared wavelengths to study how they formed and how they evolve. It is the first mission dedicated to measuring the chemistry and thermal structures of exoplanet atmospheres, enabling planetary science far beyond the boundaries of the Solar System.

Ariel Consortium

The Ariel consortium includes more than 50 institutes from 16 ESA member state countries, including **the UK, France, Italy, Poland, Belgium, Spain, Austria, Denmark, Hungary, Portugal, Ireland, Czech Republic, the Netherlands, Norway, Sweden, Estonia** – plus contributions from **the US (NASA), Canada (CSA), and Japan (JAXA)**.

All relevant links and socials available at: <https://linktr.ee/arieltelescope>