News story: UK team to lead European mission to study new planets

The ARIEL (Atmospheric Remote-sensing Infrared Exoplanet Large-survey) mission was selected today as the next European Space Agency (ESA) science mission, putting UK leadership at the heart of research into planets that lie outside our solar system – exoplanets.

Thousands of exoplanets have now been discovered with a huge diversity of masses, sizes and orbits, but very little is known about their chemical composition, formation, or their evolutionary links to their host stars.

ARIEL will carry out the first ever large-scale survey of exoplanets specifically to examine their atmospheres. It will study hot, Jupiter-size planets close to their stars, and so will help scientists understand the key processes which form planetary systems and affect how they evolve.

Science Minister Sam Gyimah said:

“Space is our final frontier and, working with UCL, we want to be at the forefront of discovering new planets. British involvement in this incredibly exciting new mission demonstrates how integral our world-leading scientific expertise is in solving some of space’s greatest mysteries.

“The UK is a go-to destination for research and discovery, being home to some of the brightest and best talent. Through our modern Industrial Strategy and record funding for R&D, increasing investment to around £12 billion by 2021, we will continue to do all we can to boost our world-leading science sector and build a Britain fit for the future.”

ESA’s Science Programme Committee chose ARIEL for the fourth medium class science mission (M4) in its Cosmic Vision Programme. Subject to further review, the UK Space Agency will provide a multi-million pound investment package to support UK leadership of the project.

Dr Graham Turnock, Chief Executive of the UK Space Agency, said:

“It is thanks to the world-leading skills of our innovative space community that a UK-led consortium has been chosen to take forward the next ESA science mission. This demonstrates what a vital role we continue to play in European collaboration on research in space.

“The ARIEL mission is a prime example of the scientific innovation underpinning the wider economy. It relies on the UK’s science and engineering expertise, which are at the forefront of the Government’s Industrial Strategy.”

The mission’s Principal Investigator is Professor Giovanna Tinetti, from University College London, who will lead the mission science. STFC RAL Space will manage the overall European consortium building the payload, which will

be assembled and tested in Harwell, Oxfordshire. Other UK involvement will come from Cardiff University, Oxford University and the UK Astronomy Technology Centre. UK industry can also expect to be involved in the satellite’s construction and operations.

Prof Giovanna Tinetti of UCL said:

“Although we’ve now discovered around 3800 planets orbiting other stars, the nature of these exoplanets remains largely mysterious. ARIEL will study a statistically large sample of exoplanets to give us a truly representative picture of what these planets are like. This will enable us to answer questions about how the chemistry of a planet links to the environment in which it forms, and how its birth and evolution are affected by its parent star.”

The ARIEL Consortium Project Manager, Paul Eccleston, of STFC RAL Space, said:

“It is wonderful news that ESA have selected ARIEL for the next medium class science mission. The team are very excited to have the opportunity to realise the mission we’ve been developing for the last two years. ARIEL will revolutionise our understanding of how planetary systems form and evolve, helping us put our own solar system into context and compare it to our neighbours in the galaxy.”

The UK’s central roles in ARIEL build on our international leadership in astronomy and planetary science, and will complement the science being delivered by the European Space Agency’s Gaia and PLATO missions, and by the NASA-led James Webb Space Telescope, all missions with major UK involvement.