MEDIA RELEASE

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UK astronomers get front-row seats for groundbreaking movie of the cosmos

The decade-long wait for UK astronomers ends as the NSF–DOE Vera C. Rubin Observatory reveals dazzling first images.

As the Vera C. Rubin Observatory prepares to showcase its stunning first images on 23 June 2025, researchers across the UK are celebrating their role in the most ambitious sky survey to date. The Rubin Observatory's Legacy Survey of Space and Time, or LSST, will reveal the secrets of the cosmos over the next decade, creating an ultra-wide ultra-high-definition time-lapse record of our Universe.

Enabled by an investment of £23 million from the Science and Technology Facilities Council (STFC), UK astronomers and software developers have been preparing the hardware and software needed to analyse the petabytes of data that the survey will produce to enable groundbreaking science that will enhance our understanding of the cosmos.

The UK is the second largest international contributor to the multinational project, putting UK astronomers at the forefront when it comes to exploiting this unique window on the Universe.

Data innovation

The UK is also playing a significant role in the management and processing of the unprecedented amounts of data that Rubin will produce. The UK will host one of three international data facilities and process around 1.5 million images, capturing around 10 billion stars and galaxies. When complete, the full 10-year survey is expected to rack up as much as 500 petabytes of data. The UK's science portal for the international community is capable of connecting around 1,500 astronomers with UK Digital Research Infrastructure to support the exploitation of this uniquely rich and detailed view of the Universe.

The ultimate movie of the night sky

Conceived in the 1990s, Rubin is the first of its kind: its mirror design, camera size and sensitivity, telescope speed, and computing infrastructure are each in an entirely new category. Over the next 10

years, Rubin will perform the Legacy Survey of Space and Time (LSST) using the LSST Camera and the Simonyi Survey Telescope. By repeatedly scanning the sky for ten years, the observatory will deliver a treasure trove of discoveries: asteroids and comets, pulsating stars, and supernova explosions. Science operations are expected to start towards the end of 2025.

Dr Aprajita Verma, Senior Researcher at the University of Oxford and Rubin Observatory In-kind Program Lead, says the wide range of UK activity providing value to the Rubin Observatory and the US community represents the UK's commitment to the Legacy Survey of Space and Time: "The UK contribution enables our large scientific community to receive proprietary data access in return and – importantly – allows us to engage and collaborate with international colleagues on a wide range of scientific questions that Rubin data will address."

Professor Bob Mann, Professor of Survey Astronomy, University of Edinburgh and LSST:UK Project Leader said: "UK researchers have been contributing to the scientific and technical preparation for the Rubin LSST for more than ten years. These exciting First Look images show that everything is working well and reassure us that we have a decade's worth of wonderful data coming our way, with which UK astronomers will do great science."

"First Look is a beautiful glimpse of what is to come during the Rubin/LSST era," said Professor Graham Smith, Professor of Physics and Astronomy, University of Birmingham, and the LSST:UK Project Scientist. "LSST:UK is making major contributions to the software pipelines on which scientific breakthroughs depend; it's also a key player in the global infrastructure that will alert the whole world to exciting new discoveries of moving and exploding objects."

For more information

To request an interview with a team member, contact Eleanor O'Kane, LSST:UK Communications Officer. Email: eokane@roe.ac.uk Tel: 07766 687274.

For more information about the UK's contribution to Rubin-LSST, visit www.lsst.ac.uk

General Rubin press images, video and other media assets can be downloaded immediately from the Rubin Multimedia resources page. First Look images are under embargo until 11.30 am US EDT / 4.30 pm UK on 23 June. Contact eokane@roe.ac.uk for details.

NOTES FOR EDITORS

- To date, UK participation in the Rubin LSST has been funded by £23 million of investment by the Science and Technology Facilities Council (STFC), part of UK Research and Innovation. Computational resources used by LSST:UK are provided through the STFC-funded IRIS (www.iris.ac.uk) project.

- Formed in 2014, the LSST:UK Consortium is made up of 36 partners representing all major UK astronomy research groups. Inspired by the breadth of scientific impact Rubin's sky survey promises, researchers across the UK joined together more than a decade ago to coordinate UK involvement in the Rubin LSST.

- The LSST:UK Consortium has created the LSST:UK Science Centre (LUSC), a distributed team of researchers and software developers addressing scientific and technical challenges that will enable astronomers to make discoveries within the multi-Petabyte dataset produced by LSST.

- For more information about LSST:UK visit www.lsst.ac.uk.

- The Science and Technology Facilities Council (STFC) supports research in astronomy, physics and space science, and operates world-class research facilities for the UK.

About the NSF–DOE Vera C. Rubin Observatory

- The NSF–DOE Vera C. Rubin Observatory is jointly funded by the U.S. National Science Foundation and the U.S. Department of Energy's Office of Science. Rubin Observatory is a joint Programme of NSF NOIRLab and DOE's SLAC National Accelerator Laboratory.

- Rubin's 3200-megapixel camera is the world's largest digital camera. It's the size of a car and weighs around 2,800kg.

- During its 10-year survey, Rubin will catalogue an estimated 17 billion stars, 20 billion galaxies, and millions of transients – more objects than there are living people on earth.

- Over a decade, Rubin data processing will generate which is equivalent to the total amount of content written in every language throughout human history.

- Each image taken by the camera is so large it would take a wall of 400 ultra-high-definition TV screens to display.