

LSST:UK key messages

for use in press and partner activity

LSST:UK and the Vera C. Rubin Observatory Legacy Survey of Space and Time

Through its contribution to the Rubin Observatory's 10-year Legacy Survey of Space and Time (LSST), the UK is helping to revolutionise the way we explore the cosmos.

On 23 June 2025, the first images from the NSF–DOE Vera C. Rubin Observatory were revealed to the world in a 'First Look' event. This event heralded a new era in astronomy.

The reveal on 23 June marks the first chance for the world to see how Rubin will bring the cosmos alive over the next decade. Full science operations are planned to begin in late 2025.

LSST:UK key messages

LSST:UK is enabling the UK to participate in one of the most ambitious science projects planned for the next decade.

The potential scientific impact of Rubin LSST led researchers across the country to form the LSST:UK Consortium in 2014, to coordinate UK involvement in the Rubin LSST. The Consortium has 36 partners, representing all major UK astronomy research groups; see them all here: lsst.ac.uk/about/consortium

Across all 36 LSST:UK institutions, astronomers and software developers are developing ways to interpret and mine the petabytes of Rubin data that are to come. This work will enable groundbreaking science that enhances our understanding of the universe.

The UK is the second biggest international contributor to Rubin through an in-kind contribution funded by the Science and Technology Facilities Council (STFC). Thanks to an investment of £23 million, UK scientists will be among the first to access Rubin's data.

LSST:UK key messages (contd)

In addition to the science contribution, the UK has significant role in the management and processing of the unprecedented amounts of Rubin data.

Through LSST:UK, the UK will:

- process around 1.5 million images, capturing around 10 billion stars and galaxies
- have a full copy of the survey, expected to be 200 Petabytes in size – two hundred quadrillion data points) requiring as much storage as half-a-million 4K Hollywood movies.
- host a science portal for the international community capable connecting around 1,500 astronomers with UK Digital Research Infrastructure to support their exploitation of this uniquely rich and detailed view of the Universe.
- host one of three international data access centres (IDACs); the others are in the US and France. See next slide for more on the UK IDAC.

About the UK

LSST:UK has built an Independent Data Access Centre, hosted at the Advanced Computing Facility at the University of Edinburgh: a platform to help astronomers get the most out of LSST.

- The IDAC uses state-of-the-art cloud technology and software, enabling scientists to employ big-data and machine-learning analysis to answers big questions about our universe.
- Being co-locating with world-class research computing services, such as the ARCHER2 National Supercomputing Service and the Edinburgh International Data Facility (EIDF) mean astronomers have the tools they need to do world-leading astronomy and cosmology research.

Rubin Observatory key messages

By repeatedly scanning the sky for a decade, the Rubin Observatory will create an ultra-wide ultra-high-definition time-lapse record. This unique movie will bring the night sky to life, yielding a treasure trove of discoveries: asteroids and comets, pulsating stars, and supernova explosions.

Over the next decade, Rubin will perform the Legacy Survey of Space and Time (LSST) using the LSST Camera – the largest camera ever built – and the Simonyi Survey Telescope.

The huge amount of data that Rubin will capture will help us understand our Universe better, chronicle its evolution, delve into the mysteries of dark energy and dark matter, and reveal answers to questions we have yet to imagine.

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.

One Observatory - Boundless Discoveries

NSF-DOE Vera C. Rubin Observatory

KEY SCIENCE AREAS

Milky Way Structure & Formation

How did the Milky Way form and evolve? Rubin will help us make the best map of our home galaxy yet.



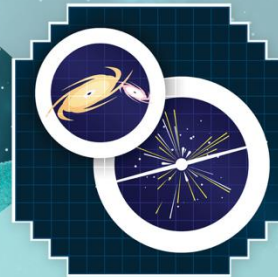
Solar System Census

What will a detailed inventory of our Solar System reveal that we couldn't see before? Rubin will show us millions of new asteroids and comets, and so much more.



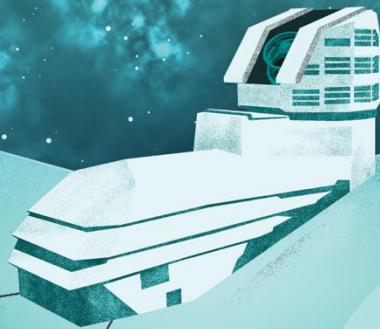
Dark Matter & Dark Energy

They make up 95% of our Universe, but what are they... and what are they doing? Rubin is a brand new tool to help us learn more about their nature & behavior.



The Changing Sky

What can we learn from dynamic events like pulsating stars and supernova explosions? Rubin will bring the night sky to life, yielding a treasure trove of discoveries.

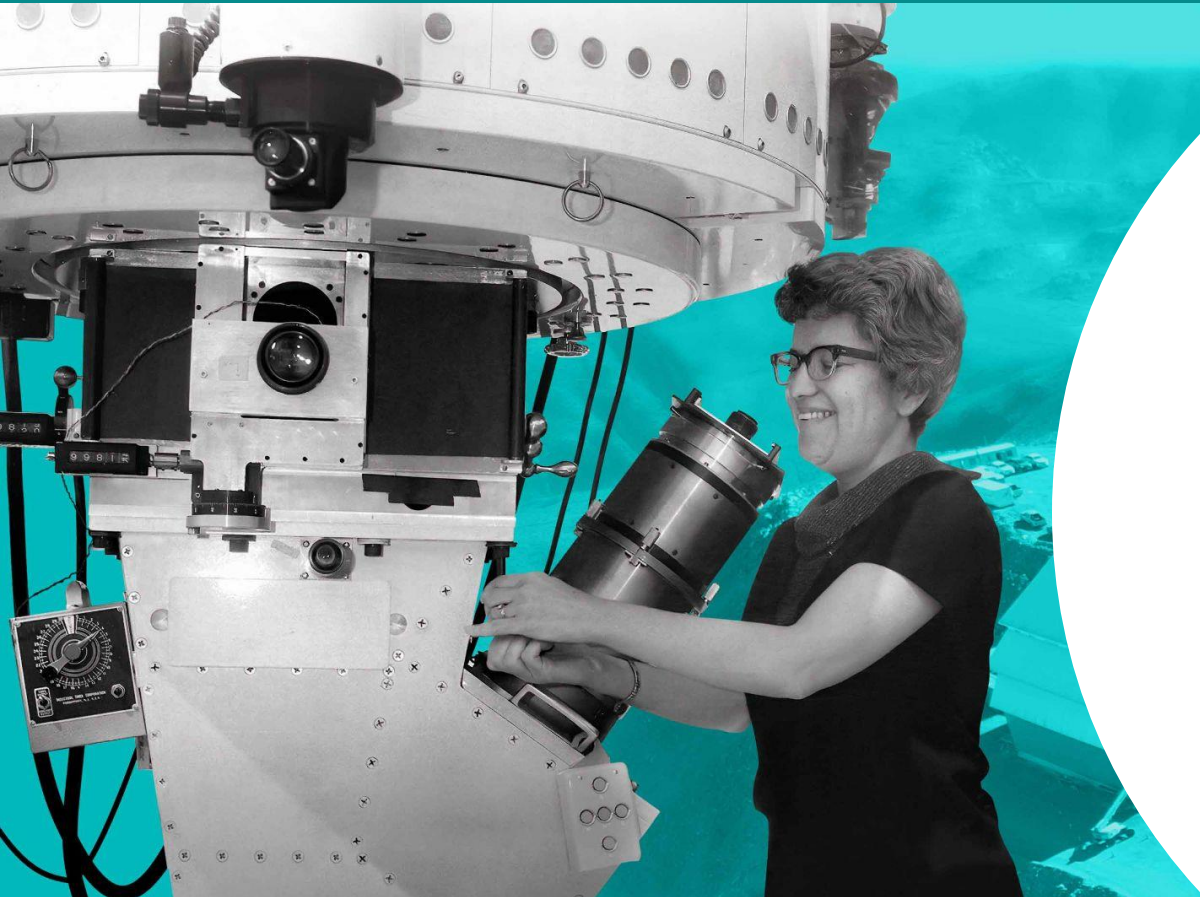


Fun Rubin facts

- The observatory's 3200-megapixel camera is **the world's largest digital camera**. It's the size of a car and weighs around 2,800kg.
- Each night the observatory will produce approximately 20 terabytes of data – that's **more data than three years of streaming video**, or 50 years of streaming music.
- 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 around 500 petabytes, which is **equivalent to the total amount of content written in every language throughout human history**.

The Rubin Observatory is located in Chile, on a mountain called Cerro Pachón. The observatory sits 2,647 metres above sea level.

About Vera C. Rubin



Dr. Vera C. Rubin (1928-2016) was a pioneering American astronomer. Her work profoundly changed the way we understand the Universe.

Her most significant contribution to science was her groundbreaking work on dark matter.

Rubin funding information and naming guide

The NSF–DOE Vera C. Rubin Observatory is funded by the U.S. National Science Foundation (NSF) and the U.S. Department of Energy's Office of Science (DOE/SC).

NSF–DOE Vera C. Rubin Observatory Name guidelines

First reference: NSF-DOE Vera C. Rubin Observatory

For subsequent references, use any of the following:

- Vera C. Rubin Observatory
- Rubin Observatory
- Rubin



Useful links

Visit the [LSST:UK website](https://www.lsst.ac.uk) for more information about the UK contribution to Rubin.

www.lsst.ac.uk

[Rubin media kit](https://rubinobservatory.org/media) – accessible information about every aspect of the Rubin Observatory

[Rubin multimedia resources](https://rubin.canto.com/v/Resources/landing?viewIndex=2). All resources can be downloaded and must be accompanied by with the provided credit.

<https://rubin.canto.com/v/Resources/landing?viewIndex=2>

Social media

LSST:UK

Blue Sky: [lsstuk.bsky.social](https://bsky.app/profile/lsstuk.bsky.social)

LinkedIn: [lsstuk](https://www.linkedin.com/company/lsstuk)

Vera C. Rubin Observatory

Blue Sky: [vrubinobs.bsky.social](https://bsky.app/profile/vrubinobs.bsky.social)

X: [VRubinObs](https://twitter.com/VRubinObs)

Rubin hashtag: #CapturetheCosmos

Contact for further information

Eleanor O'Kane
LSST:UK Communications
Officer

Email: eokane@roe.ac.uk

Mobile: 07766 687274

RubinObs/NOIRLab/SLAC/NSF/DOE/AURA/T. Lange

