

The Lasers for Science Facility

At the Central Laser Facility (CLF), STFC, UK

The [Lasers for Science Facility](#) (LSF) is part of the [CLF](#) and consists of [Octopus](#) (laser-based microscopy for bio-imaging), [Ultra](#) (ultrafast spectroscopy) and [Artemis](#) (imaging and spectroscopy with extreme ultraviolet light).

A one-of-a-kind facility

The LSF is an open-access national user facility and operates a “free at point of use” access model, with access awarded through independent peer review. It is internationally recognised and offers unique or bespoke capabilities that are unavailable elsewhere in the UK, Europe, and in some instances globally.

User access

- delivers 186 weeks of peer-reviewed access in approx. 60 experiments each year
- 1.7 times over-subscribed at access calls
- 318 departments of 156 institutions (76 in UK) have accessed the LSF in past decade
- all Russell Group universities except LSE have used the LSF
- publications include collaborations with 178 organisations, including 67 UK organisations and 111 international partners
- 13 user groups have gained access to the EU XFEL thanks to proof-of-concept experiments conducted at the Artemis Facility since 2019

Outputs

- produces around 50 scientific publications each year
- approx. 30% of publications produced over the last five years have appeared in journals with a Citation Impact Factor of 7 or above
- These high impact journals include:
 - Physical Review Letters
 - Science Advances
 - Journal of the American Chemical Society
 - Nano Letters
 - Nature Communications
 - PNAS
 - Chemical Science
 - Nature Neuroscience

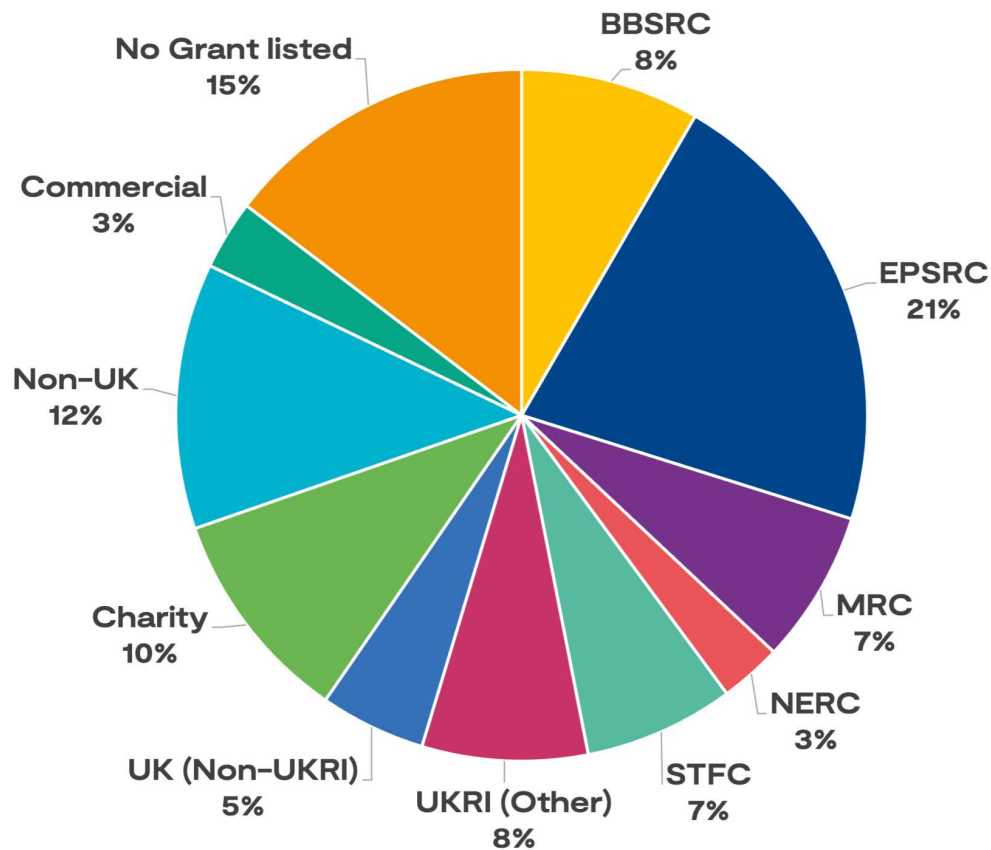
Support for funded research

- over the last 5 years, LSF has supported researchers who have been awarded over 80 UKRI grants totalling more than £110M in value

- 60% of facility access supported UKRI grant-funded research
- 14% of access has non-UK funding, including the European Commission, BMBF, CNRS, CNR, NSF and NIST

Percentages of LSF access by principal investigator grant sponsor

2020-2026



Income and investment

- £4.2M annual operating budget (including staff costs)
- total installed Capital value of approx. £35M. UKRI, STFC, EPSRC, BBSRC funded
- received £17.2M from the UKRI infrastructure fund for the [HiLUX upgrade](#) over 2023-2028
- funding from CRUK, The Guy Foundation, Wellcome Trust

Research areas

The research areas below have been categorised under some of the key sectors mentioned in the HM government's modern industrial strategy. However, much of our research fits into multiple categories.

Life Sciences

Biology, biomedicine and health

- cellular and molecular biology (cancer, kidney disease, immune signalling)
- mechanistic understanding of health and disease

Biophotonics and photomedicine

- light-matter interactions in biological systems
- physics-driven approaches to biology and medicine

Advanced Manufacturing, Digital and Technology

Chemical dynamics and photochemistry

- ultrafast chemical and photophysical processes (photovoltaics)
- fundamental understanding of how molecules behave over time

Materials and energy science

- functional materials (polymers, nanomaterials, metal complexes)
- 2D surfaces and quantum materials
- semiconductors

Electrochemistry and interface science

- electrode-electrolyte interfaces (batteries)
- surface reactions and interfacial dynamics
- links chemistry to real-world devices and processes

Soft matter and complex systems

- liquids, droplets, thin films, and nanoscale interfaces
- fundamental behaviour of disordered and interfacial systems

Biomaterials and bioengineering

- hydrogels, organoids, and tissue models
- enables translational and regenerative applications

Clean Energy

Catalysis and sustainable chemistry

- photocatalysis and electrocatalysis
- industrial and energy-relevant reaction mechanisms (photovoltaics)

Environmental and atmospheric science

- aerosols and atmospheric chemistry
- pollutant photochemistry and degradation
- environmental health impacts (e.g. air pollution effects)

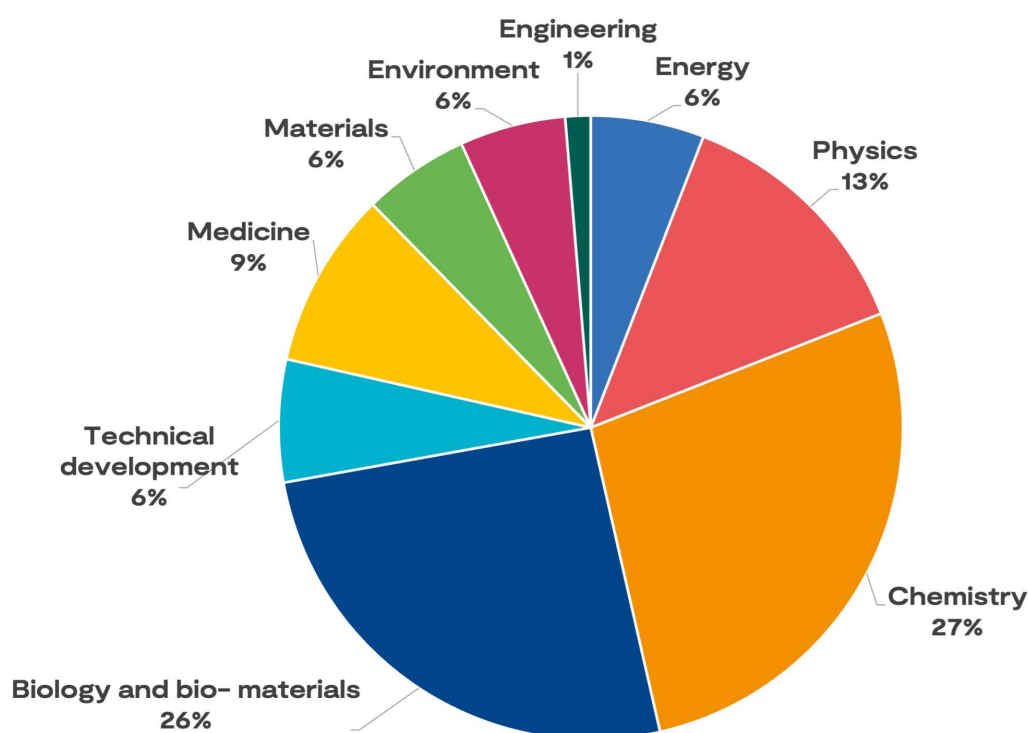
Industry and innovation

- The LSF is the home of [Cobalt, STFC's most successful spinout](#), which was acquired by Agilent and played a significant role in attracting Agilent to the Harwell Campus
- The technique behind Cobalt continues to be used in innovative academic and industrial research, including in medicine, cultural heritage, art, defence and security
- 3% commercial access

International links

- 111 international partners spanning 32 countries across six continents
- funded access for EU and international users provided through Horizon Europe's Laserlab-Europe and Lasers4EU programmes
- collaborations with other international facilities including EuXFEL, LCLS, MAX IV, SACLA, ELI-Alps and ELI Beamlines

Percentages of LSF access by research discipline 2020-2026



Case studies

Visit the [Lasers for Science Facility webpage](#) or scan the QR code and scroll to the end to find a list of LSF case studies.

