

Increasing use of research equipment and facilities

The University of Oxford has carried out a range of initiatives to increase the intensity of research equipment and facilities use. The Oxford EPSRC Block Grant Committee funded 17 initiatives, with grants (normally up to £10k) matched by local cash and / or in-kind support. The project aimed to stimulate new approaches to support new science and greater utilisation of facilities across the world-class research base, helping to reduce costs and share scarce resources.

Project outputs

EPSRC funding has helped to:

- Enhance capacity and sensitivity (Physics SQUID-based magnetometer)
- Train new users (Materials; JEOL instrument)
- Set up internet booking (Biochem, BMG-PherastarFS platerreader)
- Reactivate Differential Scanning Calorimeter (DSC) and thermogravimetric analysis (TGA) systems and incorporate them into the X-ray Crystallography SRF
- Enable material researchers to study high temperature structural phenomena ('Supernova' single-crystal diffractometer SRF)
- Establish new collaborations between Engineering Science, DPAG, Oncology and NDORMS (multiphoton microscope, Eng Sci)
- Make undergraduate lab instruments open to researchers.

Key benefits: better effectiveness, efficiency and sharing

These small allocations of funding have:

- Increased effectiveness (machines available at higher capacity; new science through collaborations across disciplines)
- Increased efficiency (e.g. machines operational for extended periods, remote access)
- Stimulated new approaches to sharing equipment, which will have benefits in the longer term.

Case studies: sharing facilities and extending capacity

These two examples illustrate how the initiatives helped to drive productive efficiencies.

1. Providing access to more research groups

This project involved relocating £300,000 worth of laser fabrication equipment to a larger laboratory in order to provide access for several research groups. Previously, the system was based in a small laboratory and was capable of supporting only one project. The relocation has increased the capacity of this system so that it can now support several lines of research. Higher capacity is being achieved by running systems simultaneously through separate beam lines.

The new facility is being set up as an SRF (small research facility) and will enable the university to expand the number of experimental projects it can support as well as the user base. The extra space also permits a more flexible system design that facilitates rapid changeover between applications.

Outcomes and benefits

- The relocated equipment is central to several research streams that will enable scientific and technological advances through projects within the university and with external collaborators.
- Current applied research projects involve researchers from four departments alongside Engineering (Chemistry; Materials; Atomic Laser Physics, Astrophysics).
- Estimated use time per month is now up from 60% to 80%.
- The system also supports its original role in the development of new optical methods for laser machining. The new arrangements permit the parallel development of applications and methods with reduced downtime.

2. Extending operational capacity

This initiative extended the operational capacity of an NMR spectrometer to allow multiple-sample data collection overnight. It added a new design of automated sample changer to an NMR spectrometer that previously had no robotic capabilities. This allows multiple samples to be queued and analysed under automation without user intervention after initial system configuration. As a result, the instrument can be used during periods when it would otherwise be unattended, most notably overnight.

The sample changer can accommodate up to 16 samples and thus significantly enhances the operational hours of the spectrometer and increases its overall sample throughput.

Benefits

- The changer will allow the SRF staff to collect data on multiple samples during overnight periods and thus improve the efficiency of the analytical services provided across its existing user base.
- The higher sample throughput this allows will mean service time saved on the instrument can be made available to suitably trained research chemists, thus further promoting their research activities.

About the University of Oxford

The University of Oxford is internationally renowned for the quality and diversity of its research. Oxford scientists undertake world-leading research: making fundamental new discoveries and applying cutting-edge knowledge to the major societal challenges of the day; developing new energy solutions or improved cancer treatments; understanding climate change processes and preserving biodiversity.

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