



Science & Technology
Facilities Council

Solutions for Global Challenges **An Overview of STFC's Futures Programme**

Catherine Ewart

ASPERA Underground Synergies Workshop

Durham University

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Research Council Funding

STFC is an independent, non-departmental public body of the Department for Business, Innovation and Skills (DBIS).

HM Government (& HM Treasury)





STFC sites and facilities



Joint Astronomy Centre
Hawaii



Isaac Newton Group of Telescopes
La Palma

UK Astronomy Technology Centre
Edinburgh, Scotland



Polaris House
Swindon, Wiltshire



Chilbolton Observatory
Stockbridge, Hampshire



Daresbury Laboratory
Daresbury Science and Innovation Campus
Warrington, Cheshire



Rutherford Appleton Laboratory
Harwell Science and Innovation Campus
Didcot, Oxfordshire



+ grants to UK universities and research at CERN, ESO, ESRF and ILL



Solutions for global challenges

- STFC's vision is to maximise the impact of our knowledge, skills, facilities, and resources for the benefit of the UK and its people.
- STFC's strategy is to increasingly align its research facilities, technology development and expertise to these global challenges and the cross council programme priorities:
 - Energy; Global Uncertainties; Lifelong Health & Wellbeing; Living with Environmental Change; and Global Food Security.
- The Futures Programme is STFC's response to ensuring that the skills and technology originally developed to address fundamental research questions are being harnessed effectively to provide solutions to the global challenges in four areas:
 - Energy
 - Environment
 - Healthcare
 - Security



What does the Futures Programme do?

- Provides ***strategic advice*** on how STFC can address the global challenges and conducts horizon scanning in these areas
- Initiates ***projects and programmes*** based on STFC strengths and capabilities (in the National Laboratories, grant-funded university groups and international subscriptions) to find technology and knowledge-based solutions to the global challenges
- Builds the ***partnerships*** necessary to form the right collaborations in the global challenge areas
- Provides ***strategic funding*** where appropriate to leverage additional funding (co-funding) and to enable STFC researchers to bridge the “credibility gap”



A collaborative approach

- Delivering the Futures Programme requires working in partnership and collaboration:
 - STFC staff
 - researchers funded by STFC grants, fellowships and studentships
 - facility users
 - other funders
- Unlikely that solutions will arise from single disciplines
- STFC should not take the lead but should be contributing effectively as a partner



Futures Theme Leaders

Futures Theme Leaders are critical to programme success:

- They *understand the problems*, priorities and opportunities within their respective domains of expertise
- They are *well connected* into their respective stakeholder communities at a senior level and are influential within it
- They *identify the most important problems* that match STFC capabilities
- They *broker* projects, programmes or partnerships to develop new approaches and solutions to these problems – *piloting* new approaches where appropriate
- They *monitor* progress towards programme and project goals



How can STFC contribute?

➤ **Facilities**

- ISIS, Diamond, Central Laser Facility, ESRF and ILL.

➤ **Technology**

- Detectors, sensors, instrumentation, data acquisition.

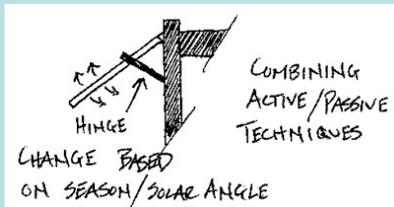
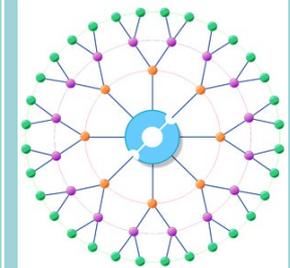
➤ **Expertise**

- Simulation, modelling, visualisation, e-science (the ability to collect, process and share previously unimaginably large datasets – using technologies in many cases driven by the requirements of particle physics).



Pilot funding schemes

- **Global Challenge Networks**
- Cohesive community networks to exploit investment in skills, technology and research infrastructure, provide input to strategy, facilitate the formation of challenge-led project teams and share knowledge and expertise.



- **Global Challenge Concepts**
- Up to £50k to bring innovative technology and applications from STFC's programme relevant to the Global Challenge areas to a 'proof of concept' stage, in readiness to access external funding.

- **Global Challenge Studentships**
- To support the transfer of research, expertise and technology from capabilities developed within the STFC national laboratories and STFC grant-funded programmes into the global challenge areas, thereby translating these capabilities into real impact.
- To start to grow a community of interdisciplinary researchers capable of providing solutions to the global challenges.



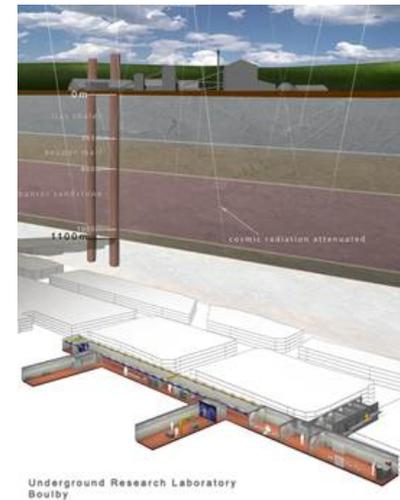


Case study

Muon tomography for monitoring Carbon Capture and Storage

Boulby Underground Laboratory

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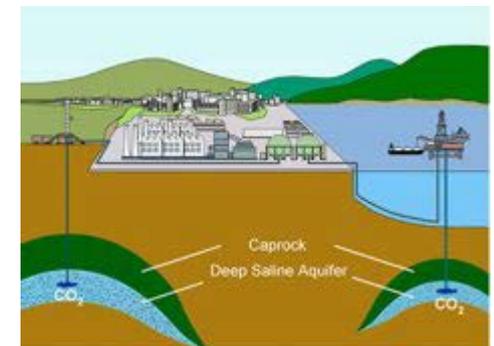
Environment studies

- Boulby mine and the deep underground science facility
- Environment Studies at Boulby
 - SKY – cosmic rays, aerosols & climate
 - Ultra-low background gamma spectroscopy
 - Muon tomography for Carbon Capture & Storage
 - Geomicrobiology/Astrobiology studies
 - Miscellaneous Geology/Geoscience



Muon tomography

- Muon tomography for carbon capture and storage - CCS
- Potential for cheap, reliable, practical real-time long term monitoring
- Huge importance to industry and environment
- Boulby site & skills uniquely well suited for development & testing
- Using a technique developed for particle physics
- Using a facility originally developed for dark matter research
- Has attracted investment from industry and government (DECC £1.4m)





The Futures Team

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Questions?