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# STFC Public Engagement



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# Outline

- STFC Public Engagement Strategy
- Funding
- Subject-specific projects
- Direct engagement at the National Laboratories
- Summary

# Public Engagement Team

## Inspire and Involve!

- Stimulating and responding to public interest in research and its outcomes
- Linking STFC science and technology with young people
- Capacity building:
  - Support for researchers
  - Embedding PE in funded research
- Engaging publics with the STFC National Laboratories





# Audiences

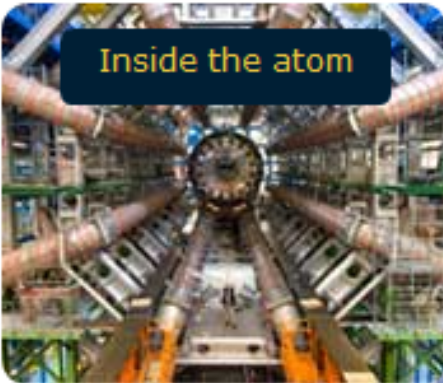
## Equality and Diversity in Engagement

- Engagement in science and technology should be open to all!
- Target under-represented audiences:
  - Girls and young women in engineering and physics
  - Groups in areas geographically from STEM activity
  - Schools underperforming in STEM

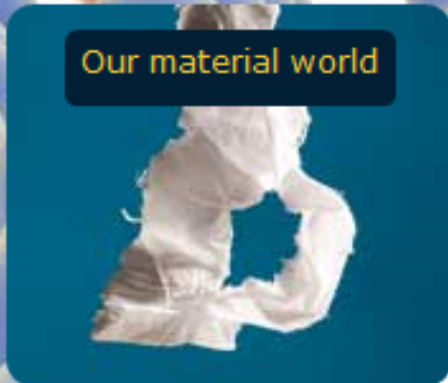




# Engagement Themes



**Inside the atom**  
using the biggest  
experiments in the world to  
understand the smallest  
building blocks of the  
Universe





# Public Engagement with Science and Technology

Strategic Plan 2013 - 2016



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# Funding



- STFC, Small Awards. Funds for small, local or 'pilot' projects promoting STFC science and technology.
- STFC, Large Awards. Funds for projects which are expected to have a significant regional or national impact.
- STFC/IoP/IET Schools Grant Scheme. Funds to enrich the teaching and learning of physics, astronomy and engineering.





# Fellowships

- Aimed at those with significant research experience who have demonstrated a track record in outreach/communications work



- The Fellowships purchase a proportion of a researcher's time to enable them to concentrate more on public engagement activities which will have a significant national or regional impact



# Fellowships



Dr Cristina Lazzeroni, University of Birmingham

- Create interactions between University researchers, school communities and the broader public, to give as large an audience as possible the chance to be involved with hands-on particle-physics activities.

Prof Alan Barr, University of Oxford

- Citizen Science for the Large Hadron Collider: analyse the data from the ATLAS experiment, to identify features which may be indicative of particles or processes not yet known to science.



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# Training Support

- Bursaries for Royal Society media and communications workshops
- Support for British Science Association media fellowships
- Royal Society Summer Exhibition Grants





# RS Summer Exhibition



- For the past two years STFC have supported exhibitions on the Higgs Boson presented by ~20 UK particle physics groups.
- In 2014 STFC also supported the 'X-appeal' exhibit which explains how Diamond is used to study dinosaurs.



# Travelling Exhibitions

- LHC on tour
  - life size replica of the LHC
- Exhibited at venues from to Big Bang Fair
- Staffed by STFC and the UK particle physics community
- Travelled more than 4,244 miles, wowing 600,000 people





# Free Resources

### What is next for the LHC?

### Beth sydd nesaf i'r LHC?

### Dè an ath-rud airson an LHC?

### A TUNNEL TO THE BEGINNING OF TIME

### BIG QUESTIONS: BIG EXPERIMENT

THE LARGE HADRON COLLIDER, CERN

**WHERE'S THE ANTIMATTER?**  
 Antimatter is real and the LHC can make it both matter and antimatter were created in the Big Bang, but we see mostly matter now. What happened to the antimatter?

**WHY DO PARTICLES HAVE MASS?**  
 Why do some particles have mass while others don't? What makes this difference? The discovery of the Higgs Particle helps us understand this.

**WHAT IS OUR UNIVERSE MADE OF?**  
 90% of our Universe is missing. Some of it may be stuff that scientists call 'dark matter'. Can the LHC find it?

**WHAT HAPPENED IN THE BIG BANG?**  
 What was the Universe made of before the matter we see around us formed? The LHC can recreate the conditions existing during the first billionth of a second after the big bang.

### SUPPORT FOR TEACHERS

A guide to resources, support and contacts relevant to all secondary school and college age groups and linked to the national curricula and post-16 specifications.

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## THE LITTLE BOOK OF THE BIG BANG

### OF THE BIG BANG

## A BIG SCIENTIFIC ADVENTURE

Everything you always wanted to know about the LARGE HADRON COLLIDER but were afraid to ask

## CERN

Seeking  
Uniting  
Advancing  
Training

### THE UK CONTRIBUTION

The UK is playing a leading role in the LHC and its experiments. The project has been a major success for the UK and its scientists. The LHC is a world-class facility and the UK has made a significant contribution to its success.

### International collaboration

The LHC is a truly international project. It is the result of a long and successful collaboration between scientists from many different countries. The UK has been a key partner in this collaboration.

### Technology benefits

The LHC has led to many technological advances. These include superconducting magnets, particle detectors, and data processing systems. Many of these technologies have found their way into other areas of science and industry.

### Further information

For more information about the LHC and its experiments, visit the CERN website or contact your local Science and Technology Facilities Council office.

### Science & Technology Facilities Council

www.stfc.ac.uk



# Website

The screenshot shows the website for the Science & Technology Facilities Council. The header includes the council's logo and name, navigation links for Media enquiries, Careers, Log in, and Sign up, and a search bar. A secondary navigation bar highlights 'Public Engagement' among other categories like Funding, Research, Innovation, Skills, News, Events and Publications, and About Us. The main content area features a large image of a particle accelerator tunnel. Below this, a 'PUBLIC ENGAGEMENT' sidebar lists various resources such as 'Great Stuff for Schools', 'Rutherford Appleton Laboratory', and 'Borrow the Moon'. The main article is titled 'Particle Physics for you' and includes sections for 'What is Particle Physics?' and 'Particle Physics Masterclasses'. A right-hand sidebar contains 'BACKGROUND' information on 'Science Discipline' and 'PARTICLE PHYSICS FOR YOU CASE STUDIES'.

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Funding Research Innovation Skills **Public Engagement** News, Events and Publications About Us

**PUBLIC ENGAGEMENT**

**PUBLIC ENGAGEMENT**

Great Stuff for Schools

Rutherford Appleton Laboratory

Daresbury Laboratory

UK Astronomy Technology Centre

Borrow the Moon

See the Science

Public Engagement Funding

Get Involved

Explore our science

**Particle Physics for you**

**What is Particle Physics?**

Particle physics is the study of the fundamental constituents of matter and the forces of nature. This section is for everyone who wants to find out more.

**Particle Physics Masterclasses**

Masterclasses are one day events that give sixth form students (and their teachers!) the chance to learn about particle physics from the scientists that are actually doing the research. Co-ordinated by the Institute of Physics, and run by researchers from a range of institutes up and down the country, the classes are designed to provide excellent support for the material on Particle Physics that is in many 16+ curricula.

Since the programme began in 1997 the particle physics masterclasses

**BACKGROUND**

**Science Discipline**

Particle Physics

**PARTICLE PHYSICS FOR YOU CASE STUDIES**

Smaller, affordable particle accelerators for healthcare and security

# Borrow the Moon!

## If you can't go to the Moon...

- For one week, schools, museums and clubs can borrow samples of Moon rock brought back to Earth by the Apollo astronauts and meteorite samples (one of which is a piece of Mars).



# Explore Your Universe!

## Atoms to Astrophysics



- Partnership with the Association for Science & Discovery Centres
- 10 Centres equipped to deliver inspiring activities based on STFC stories and technologies
- Now expanding to 10 more centres through phase 2
- Engaged with 156,880 children and adults over two years

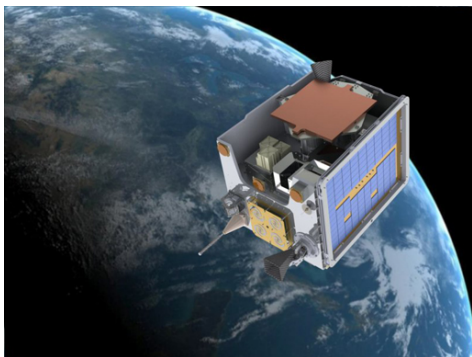
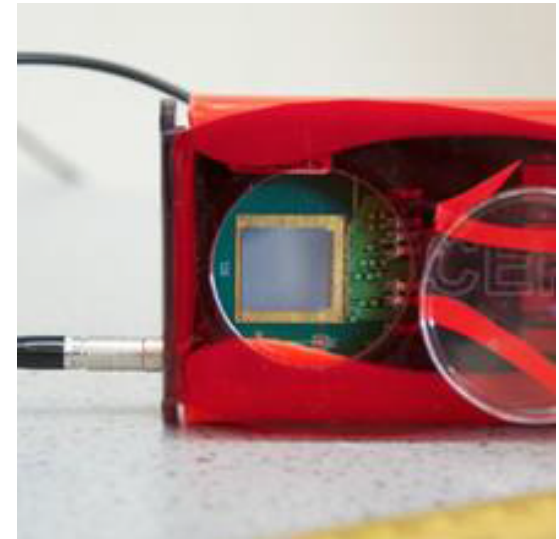




# CERN@school

## Bringing CERN into the classroom

- Uses pixel detector chips from the Medipix Collaboration at CERN
- Engage students and teachers with real research equipment and data
- To develop research based learning as part of students' experience of physics



<http://cernatschool.web.cern.ch>



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# Masterclasses

## Hands on Particle Physics

- One day events for GCSE and A Level students held at 20 sites across the UK
- 12 Universities and Labs also participate in international masterclasses
- This year 100 students attended 'remote' masterclasses held at sites away from PP groups



# National Laboratories

## Direct Engagement - Science & Technology

- Three main sites:
  - Rutherford Appleton Laboratory
  - Daresbury Laboratory
  - UK Astronomy Technology Centre



- AIMS:
  - Use our unique facilities and enthusiastic STEM Ambassadors to engage young people and the public
  - Provide an inspiring context for teachers of STEM subjects





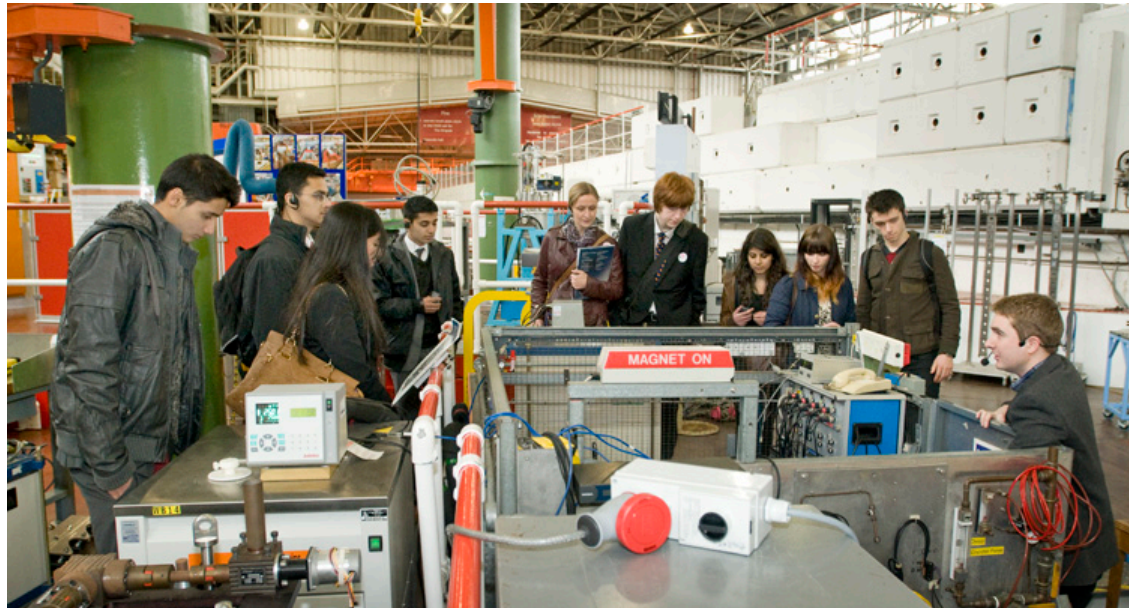
# National Laboratories: Activities

- Training for staff
  - STEM Ambassadors
  - Explore Your Universe
- School visits
  - Education A
  - Starlab and
  - Ada Lovelac
- Careers days a
  - Science in Y
  - School even



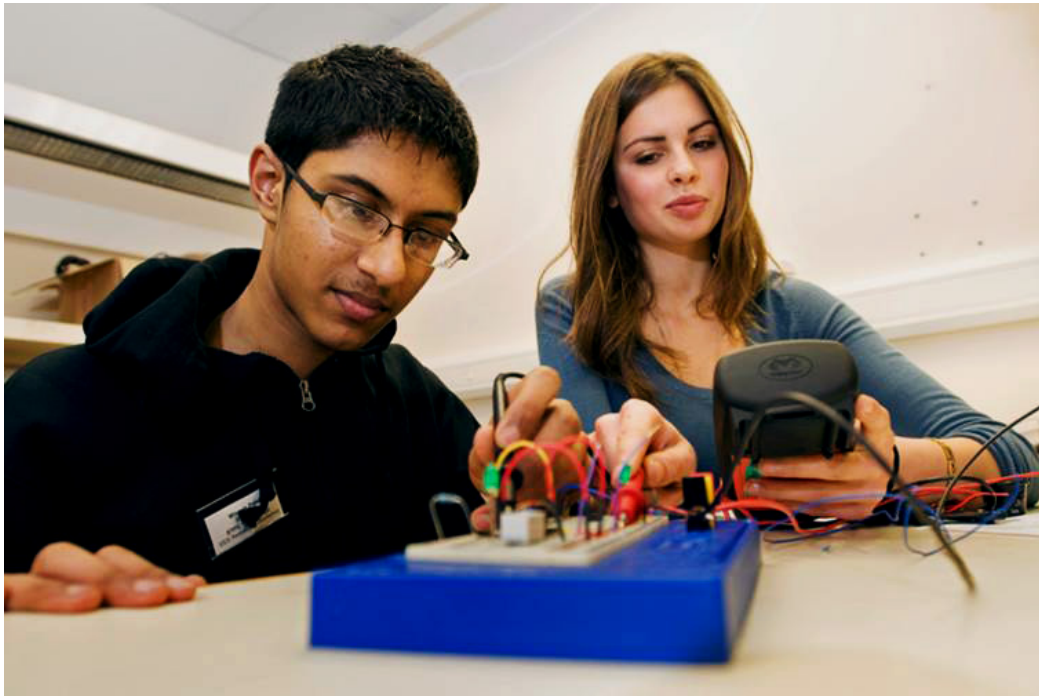
# Masterclasses

- RAL and Daresbury both run Particle Physics Masterclasses
  - Rutherford Appleton Laboratory: 720 places over four days
  - Daresbury Laboratory: 360 places over three days



# Work experience

- All three sites run work experience programmes
  - Rutherford Appleton Laboratory: 110 placements in 2013-4
  - Daresbury Laboratory: 42 placements in 2013-4
  - UK ATC: 20 placements in 2013-4





# Working with teachers

- Leading the development of a national programme of training workshops for teachers
  - Using National Labs and our themes as an exciting context for teaching



# Impact

## STFC Public Engagement Programme

- Estimated participants engaged per year:
  - 18,000 teachers
  - 91,000 primary students
  - 243,000 secondary students
  - 1,100,000 general public
- Grants and Fellowships:
  - 32 awarded to the value of £626,000



# Inspire and Involve

- Public Engagement is a key part of STFC's strategy
- The Large Hadron Collider and the discovery of the Higgs have captured the public and young people's imagination
- We have an opportunity to encourage the pursuit of STEM subjects

