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Particle Physics Community Meeting 2012

Professor John Womersley
Chief Executive, Science and Technology Facilities Council

3 April 2012

Outline

- Updates on STFC and on the programme
- Looking forward to the next Comprehensive Spending Review

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New STFC senior management structure

JOHN WOMERSLEY
Chief Executive

JANET SEED Acting Executive Director, Programmes	ANDREW TAYLOR Executive Director, National Laboratories	GORDON STEWART Executive Director, Corporate Services	JANE TIRARD Executive Director, Finance	TIM BESTWICK Executive Director, Business and Innovation	SHARON COSGROVE Executive Director, Strategy and Communication
Astronomy Particle Physics Nuclear Phys Science Board ESRF, ILL Diamond Futures External Innov. Public engagement Education and Training ING, JAC	SUSAN SMITH Head of DL ISIS CLF RAL Space Technology (UKATC, NPG) ASTeC PPD Scientific Computing	HR Safety, Health and Environment Legal Services Estates Corporate ICT	Financial Accounting Financial Management Governance	Business Development Innovation Campus Development	Strategy Performance Planning Communications International

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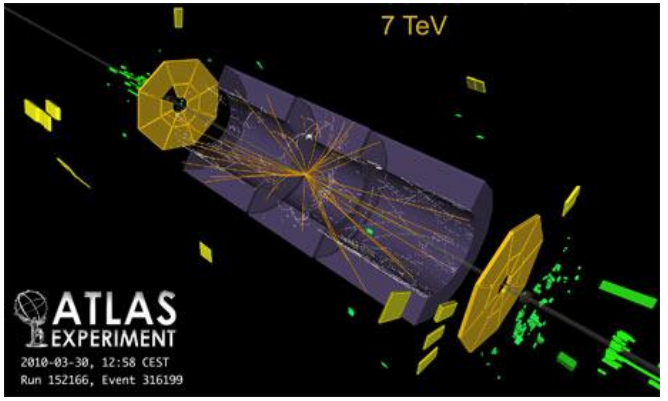
Particle Physics

- Our highest priority in particle physics is the exploitation of the Large Hadron Collider at CERN.
  - ATLAS, CMS and LHCb (and ALICE) experiments
  - GridPP
- The ATLAS and CMS upgrades are highest priority projects
- Exploring neutrino mass and mixing with T2K and SuperNEMO



LHC

- During 2011, the LHC has started to shed light on some of the big science questions, including hints of the existence of the Higgs Boson and placing challenging limits on physics beyond the standard model.
- Following the Technical Shutdown the LHC is now operating at 4 TeV per beam
  - experiments have been able to progress their data analysis but Grid computing resources likely to be stretched in 2012.
- Proposals for the UK participation in the Phase 1 construction and Phase 2 R&D for the ATLAS and CMS upgrade programmes will be considered in 2012.
- We are in discussion with LHCb UK concerning the LHCb upgrade

Neutrino Physics

- The international T2K project at JPARC in Japan, in which the UK holds key leadership roles, is a world leading experiment for the study of neutrino oscillations
  - Initial operation of T2K was interrupted by the earthquake in March 2011, but the accelerator, beamline and experiment have now been restored, and the experiment began taking data again in Q1 2012.
- We are supporting the Demonstrator phase of the SuperNEMO project, a UK-France led experiment to search for neutrinoless double-beta decay
  - Aim is to demonstrate it can meet the required sensitivity before a final decision on participation in the detector construction project.

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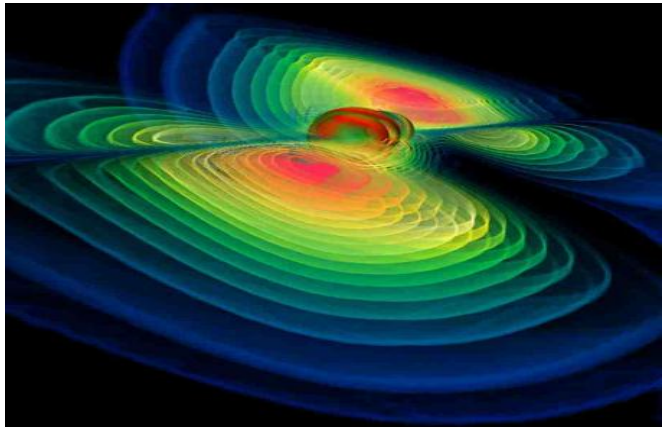
Particle Astrophysics

- In the coming decade we expect to directly detect, for the first time, gravitational waves from distant cosmic phenomena
  - Exploitation of ground-based Gravitational Wave Detectors
  - Advanced LIGO
- Opportunity to fund future activity in direct detection of dark matter and high energy gamma rays at a modest level
  - focused R&D



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Particle Astrophysics

- Science Board has recommended funding for a 3 year R&D programme for CTA
  - This will place the UK in a strong position to lead the high-energy component of CTA in the construction phase and ensure future access to data for the UK scientific community
- Science Board also endorsed Dark Matter as a strategically important area of research for the UK, and has set up a Sub-Group to work with the Community to develop a coordinated strategy for UK involvement that could potentially position the UK for leadership roles in direct dark matter searches.
  - will report back to the Science Board at its meeting in July.

Advanced LIGO

- The LIGO international collaboration have been considering relocating one of the AdLIGO interferometers in the US to India to extend the scientific reach of the detector array.
- Strong science case has now been supported by the outcome of an intensive feasibility study that meets the necessary short-term requirements for the LIGO-India project to move forward.

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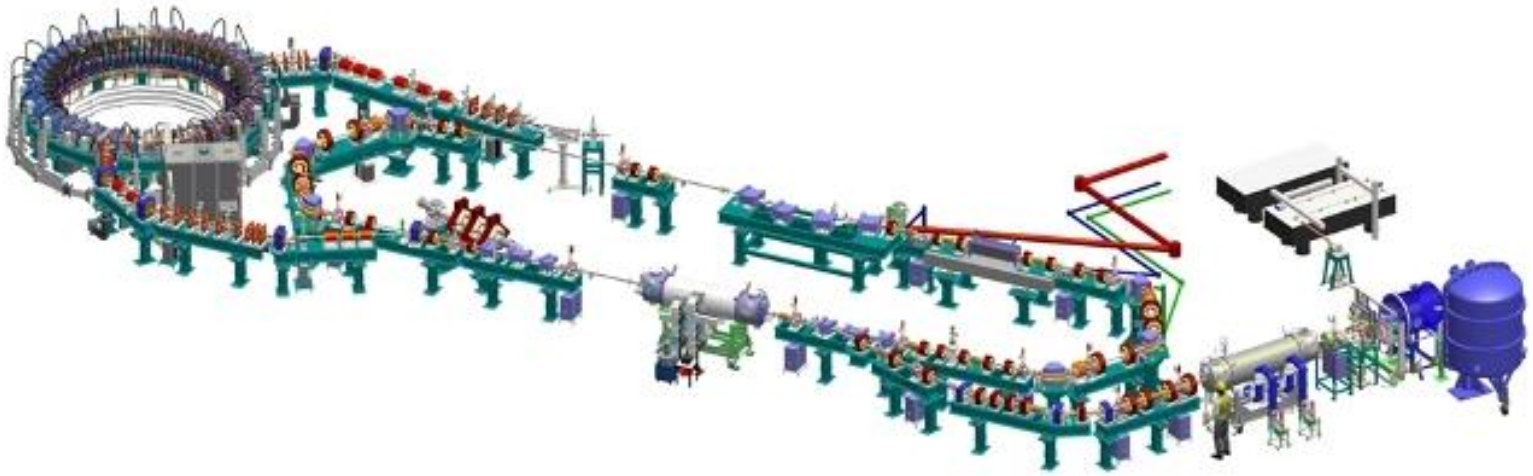
Accelerator R&D

- The Accelerator Strategy Board continues to provide strategic programme advice
  - Set out the strategy, programme and future funding level for electron, laser-plasma and proton accelerator R&D
  - Review STFC's accelerator R&D programme, including future funding for John Adams Institute and High Power Proton Accelerator work this summer
  - Good progress continues to be made



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Accelerator R&D

- In 2011, STFC reviewed accelerator proposals for MICE, FETS and Target Studies and core support for the John Adams Institute
- The mid-term review of the Cockcroft Institute and a review the science programme managed by STFC's accelerator department, ASTEC, took place in March.
  - looked at the scientific focus and strategy of the two institutes, the quality of their future work programme, as well as the synergies gained through collaboration.
- The outcome of the reviews will be reported to the Science Board meeting in July. These reviews complete the evaluation of STFC's accelerator R&D programme.

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Consolidated Grants

- Existing standard and rolling grant mechanisms have now been replaced by a single consolidated grant scheme
  - Not a major change for Particle Physics
  - Continued support for core posts and R&D and early stage technology development in universities
- 2011 PPGP Theory grants round was one of the first to use consolidated grants mechanism
  - Some points of clarification needed but overall has worked well.
- Wakeham re-investment will help us to maintain support for this round, though funding remains tight and we will likely be unable to support all the excellent science proposed

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Consolidated Grants

- Strategic guidance from PPAN on need for some additional small scale activities to keep options for the future and some vitality in the programme
  - Flexibility for Grants Panel to award a small amount of FTE and travel to new activities (or existing activities currently not supported by STFC) where a strong science case made
- Sharp reduction in STFC capital allocation post-CSR means capital for grants will be limited by available funding
  - options to manage impact of reduced capital being considered
- Need to coordinate the consolidated grants round with the ATLAS and CMS upgrade proposals.
- Grants round progressing well, but outcome will need to be presented to SB at its July meeting so timescales are tight.

Education and Training

- Departmental studentship quota allocations for 2012 and 2013 starters have now been announced.
- ETCC is commencing a light touch review of the algorithm, looking in particular at the impact of changes in the levels of academic time and PDRAs funded in recent grant rounds.
- Ernest Rutherford Fellowship interviews have been held and 13 candidates offered awards. These new Fellows will be invited to bid for Ernest Rutherford grant funding, with a 31 July closing date.
- Funding for the Studentship Enhancement Programme (STEP), provided in the last batch of training grants, starts 1 April. Responsibility for allocating awards rests with Departments.
- Five new CASE awards announced in February.

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STFC Innovations

- The CLASP Security Call has had its full proposal review meeting.
- Of the 35 expressions of interest 10 were developed into full proposals and after the presentations on the 6th and 7th of March we expect to fund six.
- We will be announcing a new CLASP call for 2012 very shortly - this will be on the environment theme.

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Programmatic Review 2013

- Overseen by Science Board with community input through the advisory panels
- The goal is not to shrink the programme or to fit within a reduced budget
  - This is a process to optimise our science programme
  - Includes both identification of future opportunities and realisation of where science productivity may have passed its peak
  - Will include consideration of issues such as fraction of spend on grants vs. projects vs. students
- Best position ourselves for next CSR

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Terms of Reference

- Evaluate the recent, current, and likely future scientific excellence, operational effectiveness, and impact of the scientific aspects of each of STFC's programmes;
- Identify any aspects of STFC's programmes that are less well-matched to the Council's strategy and to make recommendations concerning the future of these activities;
- Consider future programme opportunities and make recommendations on how these could be taken forward;
- Evaluate the balance of STFC's programmes and to recommend a future research portfolio

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Outline

- Updates on STFC and on the programme
- Looking forward to the next Comprehensive Spending Review

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The next 3-4 years

- We have a reasonably well-defined (and sustainable) science programme and priorities for 2011-15
  - We should look for imaginative and affordable ways to broaden it where we can
  - Additional capital opportunities: e.g. £15M for particle physics and astronomy HPC in 2011/12
- We need to deliver on our commitments to government from CSR 2010
  - Our strategy: Research, Innovation and Skills
  - Restructuring and Reorganisation

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Preparing for the ~~2014~~ 2013? CSR

- Every possibility of an early spending review – and it could be unpleasant
- More political than 2010 – government parties will be starting to think about the election
- Need to start collecting the evidence base now
  - "Already used" arguments lose their force
  - Need both case studies and anecdotes and broad surveys and data collection
- Programmatic review starting – will review the timetable to ensure we're ready for 2013

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One Possible Timeline

Purely speculative at this point!

- Spring 2013: Triennial Review of Research Councils
  - Government reviewing efficiency and appropriateness of all of its delivery methods
  - Will be asking “How many research councils?”

- April – Autumn 2013: Comprehensive Spending Review?

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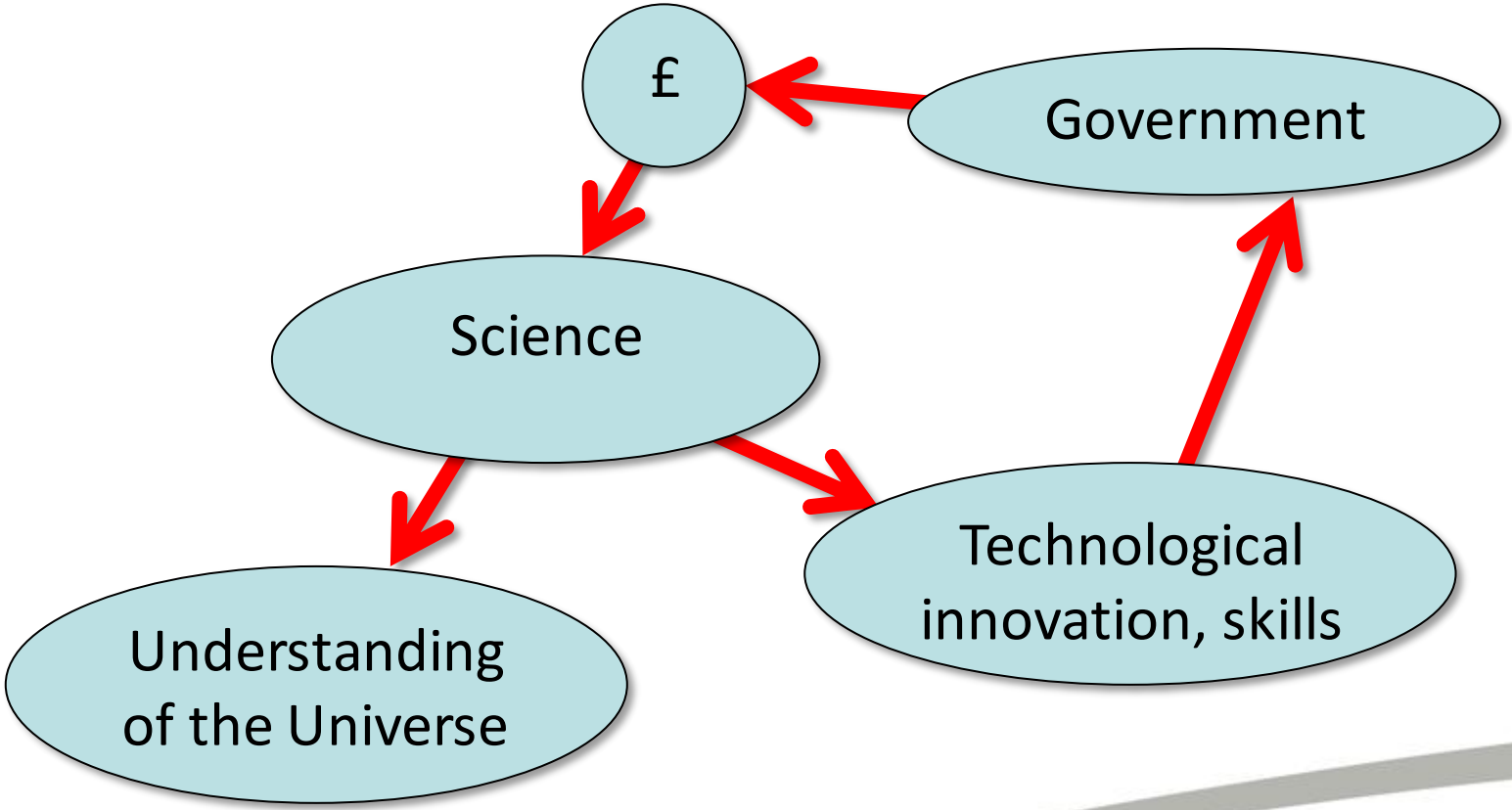
Why does government support science?



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The best of times

- Very high level of government support for science
  - Though based on pragmatism, what it can do for the economy, not on a love of learning
- Great interest in fundamental physics
  - Higgs at CERN, neutrinos (not) faster than light, Dark Energy Nobel Prize, etc.
- Applications for physics courses at university in 2012 are up 8.3% - despite overall decrease (8.7%) in applications

18 August 2011 Last updated at 12:30

Has physics become cool again?

In his column for the BBC News website, science correspondent Pallab Ghosh looks at what's behind the increase in A-level students studying physics at university.

Figures published this morning, show an increase for the fifth consecutive year in the number of students studying A-level physics. According to the Institute of Physics, for the first time since 2002, physics is back in the top ten most popular subjects.

The award winning comedy show Big Bang Theory celebrates rather than derides "geeks"

The total number of students entered for physics A-level has increased by 6.1%, from 30,976 in 2010 to 32,860 in 2011. Applications for physics courses at university are also up by more than 17% on last year and astronomy is up by a whopping 40%.

Commentators believe that this increase is partly due to students thinking more about their future employment prospects - but some suggest that the surge in interest may be because physics has become "cool" again.

The stereotype image of the physicist as socially inept individuals with bad haircuts and no dress sense has made way for "geek chic" epitomised by Professor Brian Cox and his hugely popular Wonders of the Solar System and Universe series.

The president of the Institute of Physics (IoP), Professor Sir Peter Knight talks about the "Cox effect" inspiring a new generation of physicists. But IoP policy analysts, such as Tajinder Panesor, were taken aback by the huge rise in applications for physics courses this year.

"To be honest with you we don't really understand that. We're delighted, but we can't quite put our finger on why that is," he says.

> **The geeks are on the march again!"**
>
> Professor Jim Al-Khalili
> Guildford University

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STFC travelling exhibition comes to BIS at 1 Victoria Street

UK research quality remains extremely high

Astronomy

Year	No of pubs (world ranking)	Citation impact (world ranking)
2008	2075 (2nd)	10.06 (2nd)
2009	2256 (2nd)	11.37 (1st)
2010	2411 (2nd)	11.79 (1st)

Particle physics

Year	No of pubs (world ranking)	Citation impact (world ranking)
2008	1127 (4th)	8.35 (1st)
2009	1047 (3rd)	8.99 (1st)
2010	1030 (4th)	9.23 (1st)

Nuclear physics

Year	No of pubs (world ranking)	Citation impact (world ranking)
2008	372 (7th)	6.47 (2nd)
2009	347 (7th)	6.99 (2nd)
2010	347 (7th)	6.74 (2nd)

Or the worst of times

- In 2010 we did a much better job explaining the impact of what we do, but we did not promise radical new ways of working (either for the research council or the community)
  - Not clear to me that this approach will be good enough in the next spending review
  - UK economy is likely to still be flat
  - CSR “will be looking for further cuts”
- Community buy-in to “impact agenda” is still limited – but we need your ideas and input

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Update on e-Val

- Pilot study – July 2010
- Data collection – Feb-May 2011
- Data used for reporting during 2011/12
- Panel review of system/questions – November 2011
- Revisions to system – December – May 2012
- User testing of revised system – Summer 2012
- Second data collection – Autumn 2012

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In summary

- High level of government support for science – but comes with expectations
- We can demonstrate the excellence of our science, public interest and increased university applications
- The next spending review will most likely be sooner - and more challenging - than we expected
  - Work on the evidence base
  - What if we need to do more than just describe the impact that we have – how can we propose to have more?

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