Update from Science Board

APP and HEP Town Meeting
March 2018

A brief update on recent activities since Sheffield Town Meeting in 2017.

Sean Freeman

The University of Manchester

The abridged version:
Scientific overview, assessment and advice

- *Stewart Boogert, Royal Holloway*
- João Cabral, Imperial College London
- Bill Chaplin, University of Birmingham
- *Peter Clarke, University of Edinburgh*
- Bill David, University of Oxford and RAL
- *Christine Davies, University of Glasgow*
- Rory Duncan, Heriot Watt University
- Karen Edler, University of Bath
- Sean Freeman (Chair) University of Manchester
- Chris Hawes, Oxford Brooks
- Ofer Lahav, University College London
- Jayne Lawrence (Deputy Chair) University of Manchester
- Paul McKenna, Strathclyde
- *Andy Parker, University of Cambridge*
- Don Pollacco, University of Warwick
- *Tara Shears, University of Liverpool*

STFC Office: Trish Mullins

Colleagues from the non-Core SB membership, from Advisory Panels and from the communities have helped with a variety of tasks including project reviews, Programmatic Reviews and Balance of Programmes.

Environment:

- CSR-2016 (relative calibration) – pretty good compared to other areas of Government.
- CSR-2016 (absolute calibration) – continuing flat cash for the core of the Science Budget, indicative budgets for the last two years.
- Growth in Science Budget has ODA requirements –
  Newton and Global Research Challenges Fund (GCRF).
- Autumn Statement 2016: further growth in Science Budget also has industrial requirements –
  Industrial Strategy Challenge Fund (ISCF)
- Turbulence – BREXIT.
  – Changes in Government; new minister.
  – Changes in the landscape with UKRI.
- Good news – Some extra resource funding (£5M pa) to protect international commitments and early R&D.
  – Likely extra £10M DiRAC and £4M e-Infrastructure expected.

What has Science Board discussed since last year?

We do talk across the whole of STFC scientific activities including astronomy, space science, nuclear physics, neutron facilities, light sources…

Some common threads in SB discussions have been:

- Excellence of the science that is being done across the whole programme.
- Increasing importance of computing (HPC, HTP, data analytics…) in most areas.
- Extreme difficulties of flat cash – lack of resource is really biting – programme feels impressive but narrow.
- Worries about maintaining an already very focussed programme and making sure that new opportunities are realised.
- Stark contrast between an unprecedented increase in the Science Budget and RCUK Core Programmes under unprecedented financial pressure.
- Concern and uncertainty over BREXIT.

…but here concentrate on topics relevant to APP and HEP.

Exploitation and Project Grants

Experimental Particle Physics Consolidated Grants Round 2018: Deadline now passed and PPGP will report to Science Board once the peer review is complete.

Project Peer Review: Awarded projects in 2017:

- DUNE Pre-construction phase.
- Hyper-K Pre-construction phase.

Currently proceeding through project review:

- ATLAS Phase II Upgrade – financial approval sought from STFC Council.
- CMS Phase II Upgrade – with PPRP.
- eEDM – with PPRP.

Priority to be considered as part of the Programme Evaluation:

- Advanced LIGO.
- Production Phase of CTA.
- R&D for Next Generation Dark Matter Searches.

Unfortunately unable to support other recently proposed projects despite high scientific quality.

Computing

Science Board discussed and gave comments on a draft of the *STFC e-infrastructure strategy* – report identifies key e-infrastructure challenges facing STFC/UK research, and how these might be tackled. Intended as input into a UK-wide e-infrastructure strategy and investment roadmap.

DiRAC 2.5 Operations Review – to prioritise activities and consider how to maximise UK capability and leadership, within a defined funding envelope while supporting the STFC computing programme.

At the last SB meeting, received a presentation on the *Science Case for DiRAC 3*. SB strongly endorsed the wide-ranging and diverse case, which addresses aspects of practically all areas within the PPAN science programme.

Advisory Panels

Claire Shepherd-Themistocleous (Chair PPAP) joined SB as part of the annual series of meetings and gave an updates on AP activities, science programmes and opportunities, and raised concerns and issues.

Concerns raised of any potential growth in CDT mechanisms at the expense of funding for quota studentships. Note the potential for *additional* funding for a CDT in detector development. Concern about the levels of funding for the core programme, worries about the best way to access funding provided by GCRF and ISCF, and about how to inform Government of these issues.

Chamkaur Ghag and David Colling will join SB in the coming months to discuss PAAP and CAP activities.

All APs participated with SB members in a workshop in January to begin the process of updating the PPAN Science Challenge Questions – followed up with a meeting of AP Chairs and SB in Feb. The process of revision should be completed by late spring.

APs also gave input to the Skills Balance of Programmes, which should be published imminently.

Accelerator Strategic Review

SB gave input at several stages during this science-driven review which will act as a basis to develop STFC strategy for accelerator research, development and delivery, to ensure UK maintains world-class capabilities.

The Review Panel chaired by Stewart Boogert found a broad and vibrant current programme. Roadmaps have been developed for the thematic areas: Neutron Sources; Light Sources; Particle and Nuclear Physics Machines; Novel Accelerators; Industrial, Medical, Defence and Security Applications.
Report will be available soon.

Particle Theory Review

SB noted that the PPT programme was world-leading and had strength in all thematic areas of activity - the community have significant funding from the European Research Council.

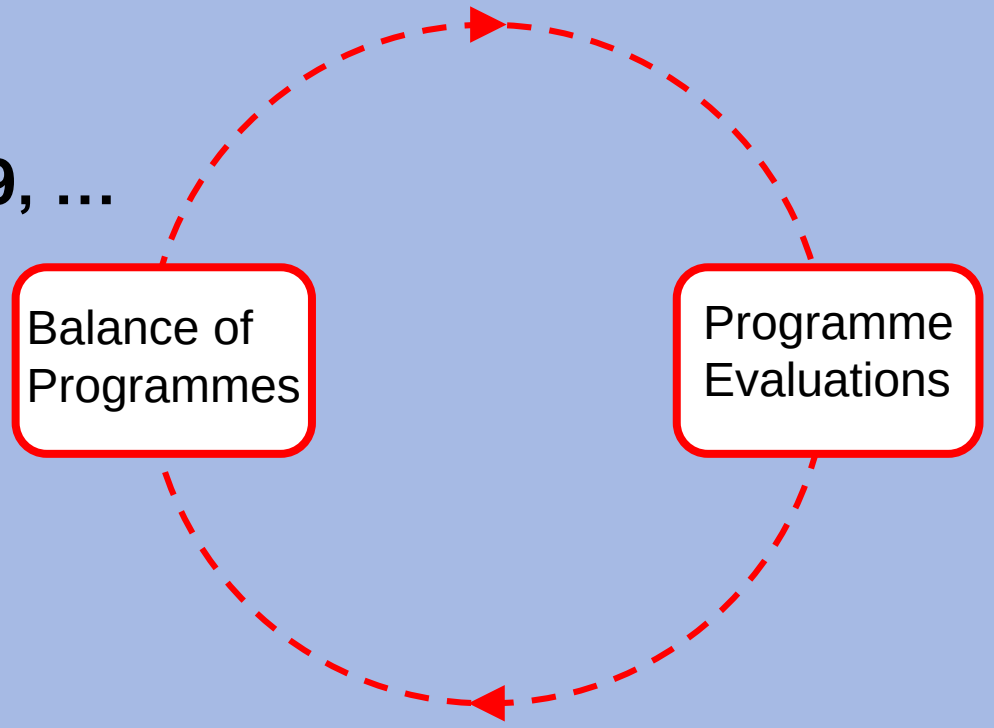
The review panel emphasized strongly the constrained STFC funding, which has led to significant impact on levels of PDRA funding. Both reliance on EU funding and the low level of STFC PDRA support introduce risk in sustaining the current programme.

Findings will be fed into the Programme Evaluation.

PPAN Balance of Programmes and Programme Evaluations

Aim: “to look at the portfolio and science strategy to define a balanced programme of excellent science within a realistic financial planning envelope for each scientific discipline”

2016, 2019, …



Computing	Q4 2017
Astroparticle	**Q1 2018**
Nuclear	Q2 2018
Particle	**Q3 2018**
Astrophysics	Q3 2018
Accelerators	Q4 2018

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Paul Alexander
Andreas Juettner
Ofer Lahav (chair)
Victoria Martin
Andrew McNab
Jacky Pallas
Andrew Sansum
Debra Sijacki
First meeting 22/1/18

Richard Battye
Garret Cotter
Giles Hammond
Alex Murphy
Tara Shears (chair)
Morgan Wascko
First meeting 1/3/18

Ofer Lahav (chair)
To be appointed
First meeting tba

Mike Bentley
Maria Borge
Jon Billowes
Alison Bruce
Jordi Jose
Peter Jones
Don Pollacco (chair)
Paul Stevenson
First meeting 23/3/18

~ 6 months for each evaluation
Chairs from SB to help with continuity

Specific tasks:

- Rank projects/experiments and outline scientific priorities within the area.
- Provide advice on the shape of the programme.
- Examine funding levels for new ideas and technology development.
- Consider how to best ensure appropriate support for exploitation and return on investment for STFC-funded projects.
- Consider consequences of flat cash, $\pm$10% funding over the next 5 years.
- Consider whether each project sits within the appropriate research area for future budgetary tensioning.

Input from advisory panels, experiment and project PIs, but make use of relevant up to date material and trying not to overburden community with requests

The outcome of the programme evaluations will be published and available to the community.

More information: http://www.stfc.ac.uk/about-us/our-purpose-and-priorities/planning-and-strategy/programme-evaluation/balance-of-programme-exercise-ppan/

Some final thoughts…

- ALL STFC PPAN Programmes are making a strong impact: excellent publications, strong leadership, important non-academic “impact”. For example, UK A, PP and NP all in the top 4 for field-normalized citations in period 2014-16.
- Core of the Science Budget is still flat cash – utterly toxic.
- Careful arguments – flat cash for seven years, but still world leading?
- Careful arguments – money for science has unprecedented increases?
- STFC-supported science and facilities: “uniquely” international, “uniquely” collaborative, “uniquely” long time scales. This needs emphasis within UKRI.
- Lots of strings with ISCF and GCRF – needs creative thinking to access them, but they aren’t a replacement for core science funding.
- There’s a lot going on – but need to keep doing excellent science, the essential part of any argument at any level whether to a funding agency or to Government, but the latter will ask about impact.