Science Board (PPAN) Update

Professor Keith Grainge
Chair, Science Board (PPAN)

Overview

I. SB membership and structure
II. Infrastructure Fund cuts
III. IPPP, PPT CG, ATLAS
IV. STFC future
V. PPAN prioritisation

Membership of Science Board (PPAN)

Keith Grainge (Chair)
Martin Bauer (Deputy Chair)
Tracey Berry
John Bridges
Alison Bruce
Anthony Challinor
Judith Croston
Gavin Davies
Ineke De Moortel
Francesca Di Lodovico
Monica D'Onofrio
Tim Gershon
Anne Green
David Jenkins
Seb Oliver
Iain Steele
Patrick Sutton

- 6 Particle Physicists
- 6 Astronomers
- 2 Nuclear Physicists
- 2 Astro-Particle Physicists

Many thanks to George Efstathiou, who stepped down at end 2025

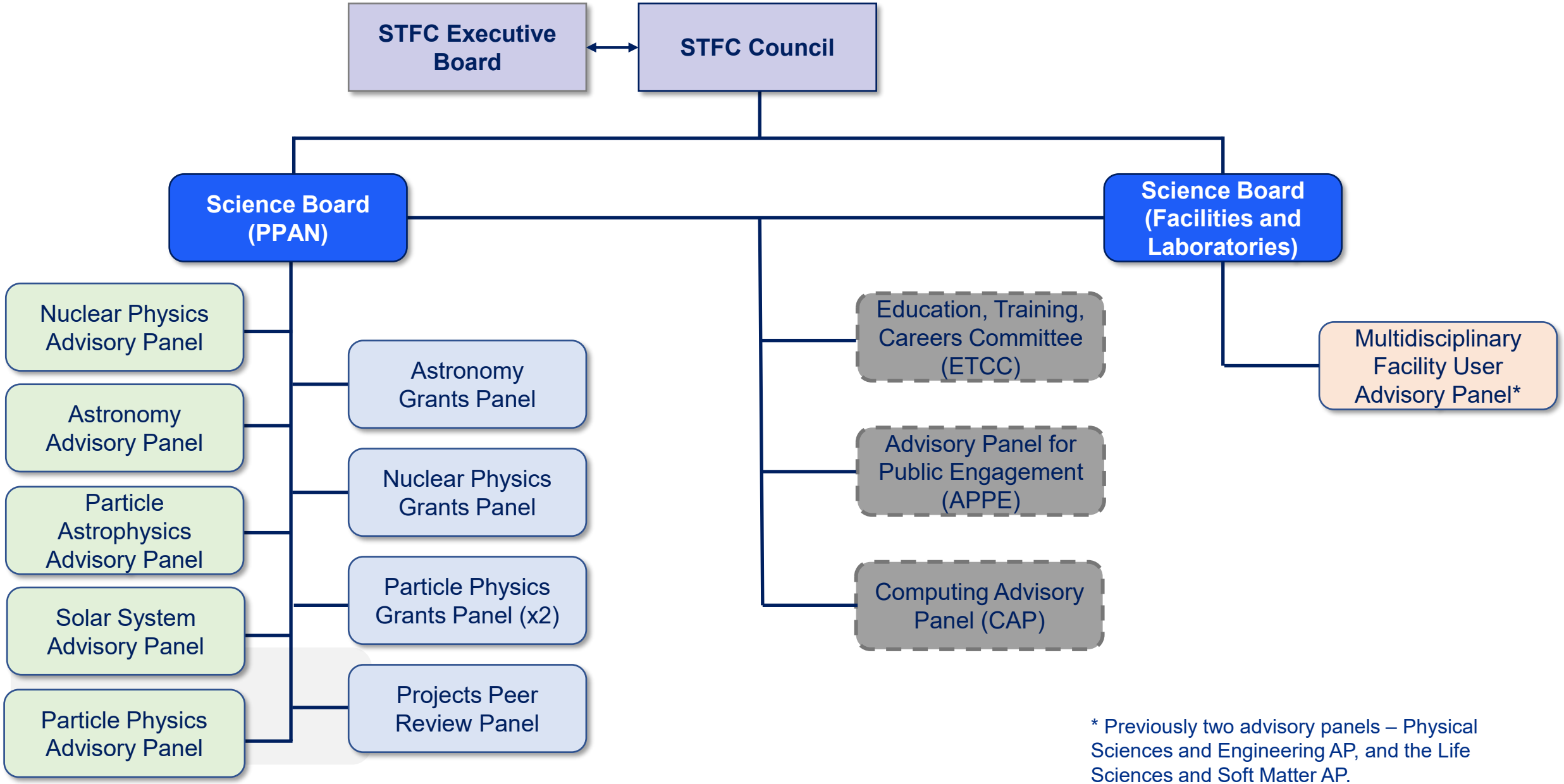
Seeking 4 new members of SB PPAN
Closing date 27th April

- particle physics (theory)
- astronomy (solar physics, solar system)
- particle physics (neutrino physics)
- particle astrophysics (gravitational waves)

STFC Office: **Laura Woodward**
Claire Jones

https://www.ukri.org/who-we-are/stfc/how-we-are-governed/advisory-boards/science-board/

STFC Science Advisory Structure



* Previously two advisory panels – Physical Sciences and Engineering AP, and the Life Sciences and Soft Matter AP.

Infrastructure Fund cuts – LHCb

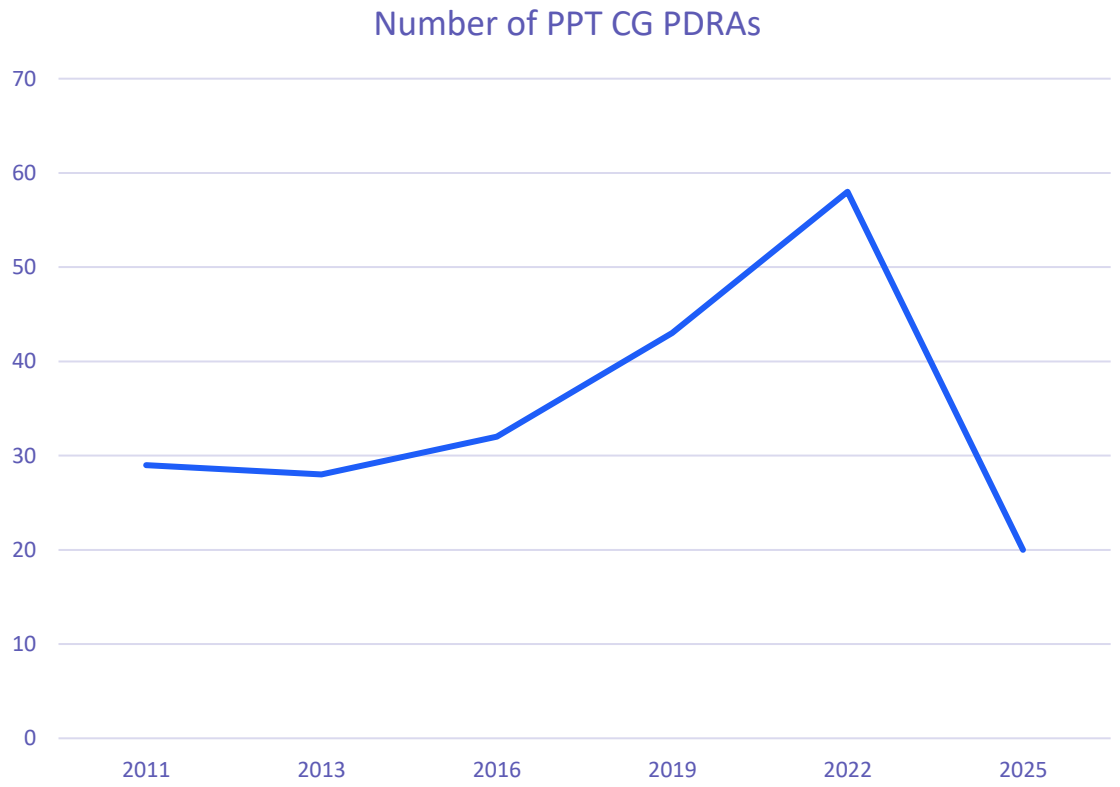
- Both EIC and LHCb identified for support under the UKRI Infrastructure Fund
  - Recommendations followed great deal of review, including both Science Board & TAAB
  - SB PPAN not consulted on decision to cut LHCb IF
- IF contribution shown at CERN Resources Review Board
- UK IF funding catalyst for international LHCb upgrade project; UK contribution at ~20% level
  - LHCb is world flagship project in this field
    - **Withdrawal risks collapsing entire upgrade**
- Planned to be the PP construction project for 2030s
  - Loss of technical skills and technology development
  - Pathfinder for next facility
- Inconsistent with UKRI supporting CERN mission
  - Or indeed UK supporting European PP strategy

Infrastructure Fund cuts – EIC

- Both EIC and LHCb identified for support under the UKRI Infrastructure Fund
  - Recommendations followed great deal of review, including both Science Board & TAAB
  - SB PPAN not consulted on decision to cut EIC
- New facility under construction at Brookhaven, US
- Probe key questions related to how quantum chromodynamics (QCD) binds hadrons and nuclei
- Withdrawal will have a major impact on international project
  - Will damage UK's reputation as a reliable partner
- Loss of industrial engagement and opportunities in the UK
- Loss of involvement in the main future facility for a significant part of the UK nuclear physics community
- Impact on NP has been disproportionate to a small community
  - Regarded as devastating by the NP community
  - Annual funding was projected to be not dissimilar to CG
- Only long-term project in nuclear physics beyond 2027/28

Particle Physics Theory & IPPP

- PPT CG and IPPP review panels reported to SB PPAN
- Precipitous drop in PPT PDRAs
  - Disappearance of 2022 uplift
  - Cuts across all PPAN grant lines
  - Substantial increase in overheads
  - No longer possible to reduce applicant time to preserve volume
- Impossible to implement PPT CG panel recommendations
  - Missed intl recruitment deadline
  - Well documented impact on ECRs
    - Entire year of ECR talent lost to UK



- In 2019 includes IPPP core and research
- In 2022 includes IPPP research

ATLAS Upgrade

- Request for £16.5M for ATLAS upgrade 2026-31 (5 years)
  - PPRP recommendation that the upgrade be funded in full
- Insufficient funds; available budget planning line of £13M
  - SB PPAN recognized the importance of the Upgrade
  - Recommended that the Upgrade be funded at the level of £13M
  - Recommended that project management be preserved
  - Recommended focus on completing MoU hardware commitments
- Impact on TDAQ and Software & Computing
  - Insufficient to meet the full scope of the UK's MoU commitments
  - Risk to data-taking in early Run-4
  - Loss of UK skills, leadership and influence

Cuts across PPAN

- Grant lines
  - Astronomy Small Awards delayed 3 then 6 months; PDRAs 68→48, 45
  - Astronomy Large Awards delayed 3 then 12 months; no call 2025/26
  - Particle Physics (E) 2 yr award rather than 4, PDRAs funded for 18 months
  - Particle Physics (T) PDRAs 58→19.5; some awards only for 1 year.
  - Grav Waves many posts awarded for 1.5 years (30% cut in funding)
- Projects paused / withdrawn
  - QTFP
  - H3+Beams (new project, not funded)
  - AWAKE (withdrawal from next phase)
  - HL-LHC (Crab cavities completed; no involvement in commissioning)
  - Swift-HEP (withdrawal from next phase; sustainability impact)
  - GridPP7 hardware (unlikely to meet UK pledge to wLCG)
  - DRD (new project, not funded; R&D at some level needed for future)
  - Medium scale DM experiment (DarkSPHERE)
  - BlueMuse (new project, peer review stopped)
  - Legacy Infrastructure for Euclid-UK (new project, peer review stopped)
  - Reduced UK pledge to international SKA SRCNet
- Cuts to ATLAS and CMS upgrades
- IF cuts to LHCb and EIC
- (2nd generation instrumentation for ELT not submitted to Wave 4 IF)

Speculation of a potential merger of PPAN and EPSRC

- **SB PPAN very strongly recommend against such a merger**
- PPAN science is typically long term, multi-national and uses large state-of-the-art equipment built by the same community, or a very closely linked one, that subsequently operates and exploits the equipment
- Very different to typical EPSRC-style research, which is typically shorter term, more opportunity-driven and more individual
- Supporting PPAN science alongside major facilities can work effectively, provided that clear and robust partitions are maintained
- SB PPAN considers that integrating PPAN science into EPSRC would weaken the structures that sustain UK leadership in nuclear physics, particle physics and astronomy
- UKRI, STFC, DSIT, UKSA and the wider space STFC community are striving to better co-ordinate and prioritise Space-related science, including through SpaceFrontiers2035. Merging EPSRC and PPAN would throw that process into confusion

Bucket 1 prioritisation

- Unprecedented financial challenge, worse than the 2008 cuts
  - SB PPAN consider 30% cuts would be catastrophic to PPAN science
- The call for new SoIs is currently paused
- Significant damage already to grant lines; further cuts required
  - Proformas sent to 48 “projects” funded by STFC in PPAN area
  - Balance projects against grant lines; “Talent” & International Subscriptions ring fenced
- SB PPAN preparing multiple scenarios
  - Flat-cash, 10%, 20%, 30% cuts
  - Narrative detailing impacts to accompany each scenario
- Need to balance scientific return, risk profile, strategic support
- Timescale very short
  - Scenarios to go to EB on 11th June
  - Impact narratives to inform decision on final budget
- “… clear that there will be no reduction in in PPAN post-doc numbers”
  - Important to understand how this ministerial commitment affects prioritisation

48 STFC Bucket 1 line items

ATLAS experiment M&OA	IPPP	ELT instrumentation	Simons Observatory Ops
ATLAS upgrade	HL-LHC	e-MERLIN/JIVE/spectrum	Widefield Astro CASU
LHCb experiment M&OA	XLZD	GAIA CU9	Widefield Astro WFAU
LHCb upgrade	PPD NL	GOTO Ops	HARPS3 Ops
CMS experiment M&OA	Boulby	HIPERCAM / ULTRACAM	NRT
CMS upgrade	AGATA	JCMT support	ING Staff & Ops
HyperK common fund	ALICE	Liverpool Telescope	ATC
T2K common fund	EIC	LOFAR	Next Gen Grav Waves
DUNE	FAIR	LSST Vera Rubin	LIGO Ops
LBNF/DUNE target	ALMA Regional Centre	NGTS	DiRAC
LBNF/DUNE PIP II	BISON	ukSKA Regional Centre	IRIS
GridPP	CUBES	SKA Constuction	QTFP

Prioritisation proforma

- 12 questions in total concerning:
  - Experiment objectives, timeline, stakeholders, science drivers
  - Scale of investment
    - Impacts of flat-cash, -20%, -40% and -60% pa wrt 2024/25
  - International context and UK leadership
  - Project linkages and compute infrastructure requirements
  - Technical capabilities and skills
  - Publication, output & oversubscription statistics
  - “Anything else that you would like to bring to the attention of SB”
- Responses from all 48 projects received and distributed to SB PPAN by 10th March

Prioritisation plan

- Community input from Advisory Panels during 3rd, 4th March meetings
  - Complements existing Roadmap documents and 2024 updates
  - Many useful steers; grant lines a top priority throughout PPAN
- Proformas sent to all ongoing projects
  - Opportunity to make case and give an update
  - The finance section includes reduced / delayed funding scenarios.
- Proforma assessment by subcommittees discussions, with Introducers for each project. Now complete.
  - Factual questions that require clarification posed to project leads
- Subcommittee meetings to bring together the key findings
  - Output is triage of projects (April 16th)
- Advisory Panel Chairs to join the subsequent meetings to create scenarios and produce impacts narrative together with Council observers
  - April 17th, May 1st,6th,20th, 21st
  - Holistic view of interdependencies, cumulative effects, and long-term capability risk
  - Possibility to seek additional input as necessary
- Final recommendations to EB to be owned by SB PPAN
  - SB(F&L) are conducting their own prioritisation process and joint discussions will ensure alignment

Summary

- The PPAN programme faces a significant financial challenge
  - Part of the wider challenge facing STFC
  - Impact assessment narratives will help determine final budget
- SB PPAN now producing scenarios for the rest of this SR period
  - Community input from APs already received
  - AP Chairs to join scenario development meetings
  - Proformas will allow prioritisation of projects & balance with grant lines
- Very difficult choices to be made
- Public statements by Sir Ian Chapman and Lord Vallance indicate that the level of cuts on PPAN has not yet been decided

Principles for prioritisation

Top level points – more nuance in document:

1. Scientific excellence, UK leadership, value for money are priorities
2. Uniform cuts across the whole programme are to be avoided
3. Grant lines should be set and protected
4. Consider balance of impact on science areas, particularly for smaller communities
5. Projects with similar science goals or capabilities should be considered together
6. Appropriate balance of small / large projects, but this balance is different in each area
7. Decisions should be made to optimise health of programme over a 10-year timescale
   - Consider balance of impact on ECRs against other priorities in the programme
8. Avoid rescinding awarded grants
9. Protect studentship numbers proportional to the size of the rest of the programme
10. Meet international commitments, but tension against diversity in the programme
11. Aim for the best possible return from international subscriptions
12. Consider alignment between STFC and other UK facilities, particularly space science