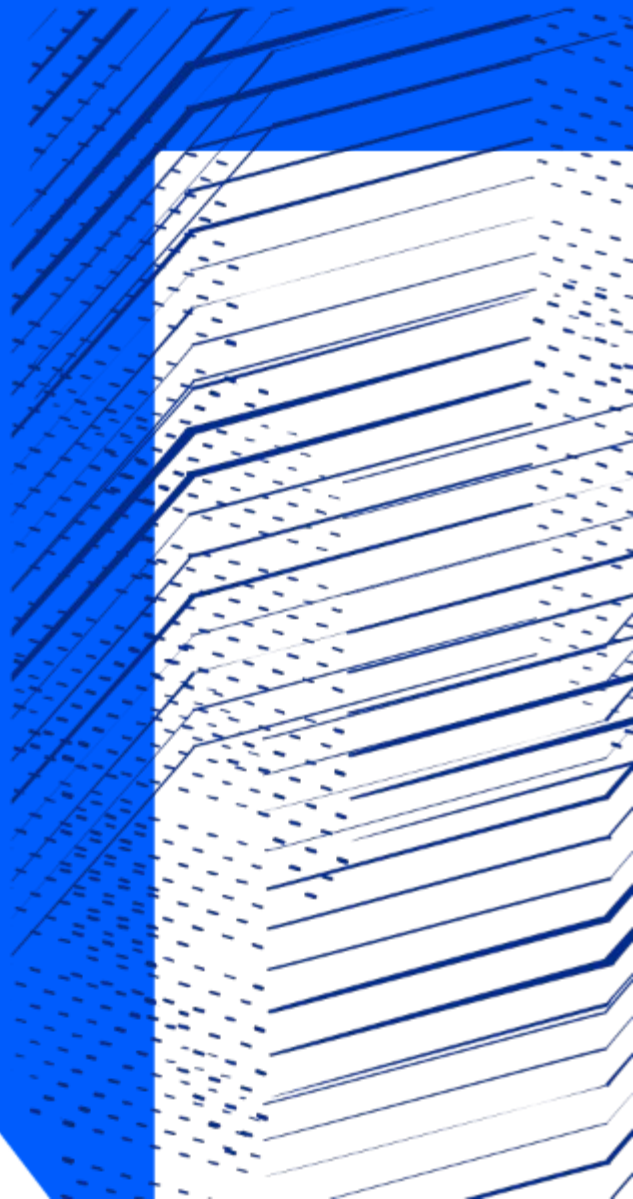
Science and Technology Facilities Council

Particle Physics Theory Town Hall

Professor Grahame Blair
Executive Director Programmes

14 December 2023



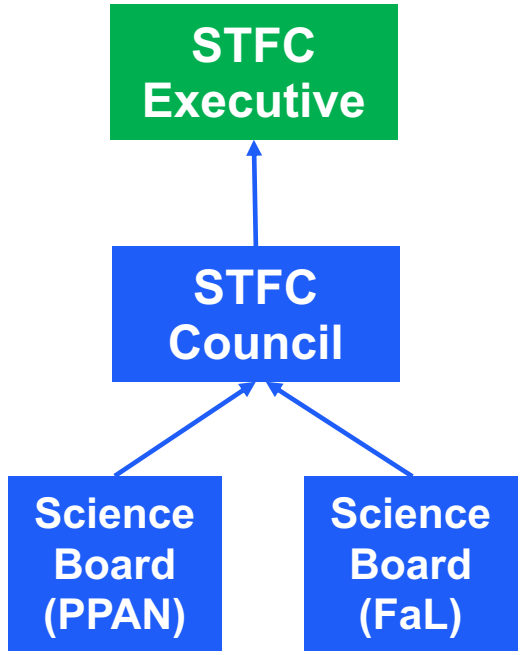
Science and Technology Facilities Council

Rebooting Science Board

Improving our governance structures

Overall Structure

- **STFC Executive Chair and STFC Executive Board**
  - Decision-making with responsibility for STFC budgets
- **STFC Council**
  - Advisory to STFC Exec Chair and STFC Exec Board
  - Our **top-level advisory body** where all aspects of STFC come together, PPAN, Facilities and Laboratories, Innovation, …
- **Two New STFC Science Boards**
  - Major change to enable more *focused and detailed* scientific/technology advice to STFC Council
  - Charged to deliver **prioritised roadmaps** within financial envelope
  - Chairs: Keith Grainge (PPAN) and Jacqui Cole (Facilities & Labs)



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Science Board (PPAN)

Key functions

- Providing strategic scientific advice on the STFC Particle Physics, Astronomy and Nuclear Physics (PPAN) programme
- Providing strategic policy advice including development of a **long-term prioritised roadmap** to set the guiderails on future investments
- Prioritising projects/programmes **within the context of the 10-year plan** including:
  - Taking account of health and breadth of discipline
  - Maintaining appropriate support to ensure return on past investments
  - Exploiting UK leadership and capability in strategically important areas
  - Removing funding silos within core programme, e.g., particle astrophysics.
  - Engaging in future projects
- Referring projects/programmes to peer review

Developing the PPAN Roadmap

The PPAN Roadmap comprises three main elements:

- Assessment of the research landscape
  - external PPAN research landscape (nationally and internationally)
  - current state of the PPAN programmes, including current investments and UK capability
  - balance across exploitation, capital investments, R&D, early careers
  - risks/pressures associated with current investments
- Future vision
  - advise on the vision for the future programme
  - consider science drivers e.g. technology development, laboratory infrastructure, building capability/skills, impact/value
  - ask *'What does the ideal programme look like in 10 years?'*
- Recommendations on the programme and funding in context of the 10-year plan.

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Funding Update

Our 3-year strategy: FY22/23 – FY24/25

What we are doing:

- An increase of £19 million over this SR period for STFC-supported frontier research programmes ➡ **very significant uplift to Consolidated Grants**
  - e.g. 39 additional PDRAs to 17 university groups in particle physics experiment + proportionate uplift in particle physics theory
- **UKRI Infrastructure Funding for:** SKAO, US Simons Observatory (in Chile), and "preliminary funding" for the ELT and next generation GW
- Investment in novel technologies
  - new early-TRL R&D scheme – rising to £2.5m per annum
  - new (simplified) commercialisation scheme
- Commitment to maintain numbers of PhD students despite increased costs (stipends)

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Other Progress: Infrastructure Fund

Developing future infrastructure opportunities: IF scoping funding

- **Boulby Underground Laboratory: Dark Matter and more** – £2.8 million total
- **Diamond-II scoping project** – £5.3 million total
- **Electron-Ion Collider (EIC) scoping project** – £2.9 million total
- **Ion Therapy Research Facility scoping project** – £2 million total
- **ISIS-II feasibility, design studies and R&D** – £5.1 million total
- **Relativistic Ultrafast Electron Diffraction and Imaging (RUEDI) scoping project** – £3 million total (funded via EPSRC) to be based at Daresbury
- **XFEL: conceptual design and options analysis** – £3.2 million total
- **Next generation Gravitational Waves** – £8 million total
- **Second generation ELT instruments** – £6 million total

These projects provide a pipeline of potential future investment opportunities

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Forward plan for PPAN

We have an initial "rolling" 10-year plan for the entire PPAN programme

- We have **started** to address the imbalance between our national investment and international subscriptions (CG uplift) - applies to all PPAN areas
- FY23/24 and FY24/25 uplifts are reversing previous trends, but this is not the end
- The current aim:

Annual costs/funding relative to 2022	This SR		Planning line for next SR		
	FY23/24	FY24/25	FY25/26	FY26/27	FY27/28
Required uplift (CG + R&D)	+£6M	+£13M	*+£18M*	*+£24M*	*+£30M*
Early-stage R&D funding	£1M	£2.5M	*~£3M*	*~£4M*	*~£4M*

- This approach will restore PDRA numbers to levels last seen in ~2010
  - affordability will require continued internal prioritization of activities
  - + some changes to the way we work, e.g. increased leverage of UKRI-wide initiatives such as the Infrastructure Fund

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Early careers

Equality, Diversity & Inclusion (EDI) Update

Recent letter from Secretary of State (published on X) relating to comments from members of a newly formed Research England EDI advisory body

- **STFC remains committed to EDI – there is no change to our commitment or actions**
- UKRI CEO, Ottoline Leyser also confirmed, at STFC's Council meeting in November, that UKRI remains committed to EDI as this is essential for a healthy research & innovation ecosystem

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Doctoral Studentships and Stipends

Update

- STFC have issued DTP numbers for October 2023 starts and indicative numbers for October 2024 starts – 220 studentships awarded
- UKRI has announced uplifts to the minimum stipend level which is currently £18,622 per year
  - this was strongly supported by all research councils but discussions about potential future increases are ongoing
- STFC Council has discussed student numbers
  - strong steer to maintain the *balance* between student numbers and the rest of the programme
  - for students start this Spending Review period (2023 and 2024) we are committed to maintaining numbers at, or close to, existing levels but future stipend increases and changes to collective funding may mean we are unable to maintain at current levels for next SR

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Fellowship Programmes - update

Reminder, the main fellowship programmes for STFC are

- Ernest Rutherford Fellowships (STFC):
  - A large number of applications received again this year (173)
  - Many thanks to colleagues for helping with the peer review – This year using the funding service for applications
- Stephen Hawking Fellowships (joint EPSRC/STFC): Was launched in 2018 with a budget of £15m for 5 years.
- UKRI Future Leaders Fellowship
  - Round 7 just announced, Round 8 being peer reviewed and rounds 9 and 10 announced. 75 new Future Leaders Fellows and upcoming rounds announced – UKRI
  - Discussions commenced in collective talent about future UKRI fellowship offerings

UKRI & Collective Talent Funding

UKRI will transition to collective working across £2bn of talent initiatives:

- Update published recently https://www.ukri.org/news/update-on-collective-talent-funding/
- Main points are
  - There will be a core offer that will apply to all UKRI students – introduced in stages with first stage being to publish a statement of expectations in the new year
  - Reduction of our main number of schemes to 2
    - Doctoral Landscape awards – broad flexible funding with awards shaped to meet needs of discipline
  - Doctoral Focal awards funding for research training in specific tightly focused themes or challenges
- About to start on fellowships

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The Funding Service

Applying for UKRI funding is changing

UKRI's "Simpler and Better Funding" (SBF) programme aims to create an easy-to-use funding service that supports all involved in research funding

- From the new year, council funding opportunities will be launched and managed in The Funding Service (TFS).
- During 2023, we are still running some opportunities in Je-S while ramping up the schemes supported on TFS.
- Why are we doing this?
  - currently UKRI supports multiple funding systems with users having to interact with several different systems and processes to apply for funding.
  - the IT backbone of the current Je-S systems will not be supported in future.
- The goal is that UKRI operates a single, consistent user-centred service that reduces the burden of finding, applying for and managing research funding.

What is the Funding Service?

- UKRI are delivering a **service** and a **platform**.

The service offers:

- **A simpler logical model** for opportunities
- **Simplified policies** for opportunities and awards
- Reduced variation or **single guidance** for applicants and assessors
- A **reduced number of opportunity types**
- **Reduced bureaucracy**: applicants are asked only once for information needed for assessment
- **Standard questions** across opportunities and councils
- **Fewer attachments**
- **Fewer administrative checks**, such as for font sizes or page counts
- **Far fewer returns for amendment** as result of procedural errors
- Requests for capability information using the **R4RI structure** and logic

The platform offers:

- **Consistent look and feel** regardless of opportunity or council
- **Digital submission of applications**, making more data available to UKRI analysts
- An easier and more intuitive user journey, with **guidance at the point where it is needed**
- In-system **management of workflows**, minimising off-system working
- A much lower learning curve, **making the system more accessible**
- **Fewer ways to make procedural errors**
- The possibility to **set up opportunities in hours** vs weeks
- The ability for UKRI **opportunity owners to set up and manage opportunities themselves**
- The **ability to change the service** to accommodate new needs

Introducing a new set of common grant roles

- UKRI wants to widen the diversity of people and ideas who can be funded
- A new set of standard grant roles will offer greater consistency across UKRI opportunities
- Check the opportunity guidance to see which roles are available on our **website**

✓ **Everyone previously eligible to apply for funding will continue to be able to do so.**

12 harmonised roles:

- project lead
- project co-lead UK
- project co-lead (international)
- researcher co-lead
- fellow
- grant manager
- research and innovation associate
- visiting researcher
- specialist
- technician
- doctoral student
- professional enabling staff

The new roles available

- Three completely new roles are now available in the Funding Service:
  - **Grant Manager** and,
  - **Professional Enabling staff** which will allow us to recognise professional enabling roles and professional grant managers more easily
  - **Specialist** which covers a range of non-technical roles such as survey specialists and graphic designers

- These new roles, along with the ‘Technician’ role are now eligible to attract indirect and estates costs. This addresses a financial barrier to research organisations’ investing in technical and specialist roles, capabilities, and career pathways.

- The changes to costings apply to both the Funding Service and Je-S/Siebel for all opportunities launched from 22 May 2023.

Full guidance on the new roles and costings is available on the UKRI **website**

You can read the previous announcement on our website.

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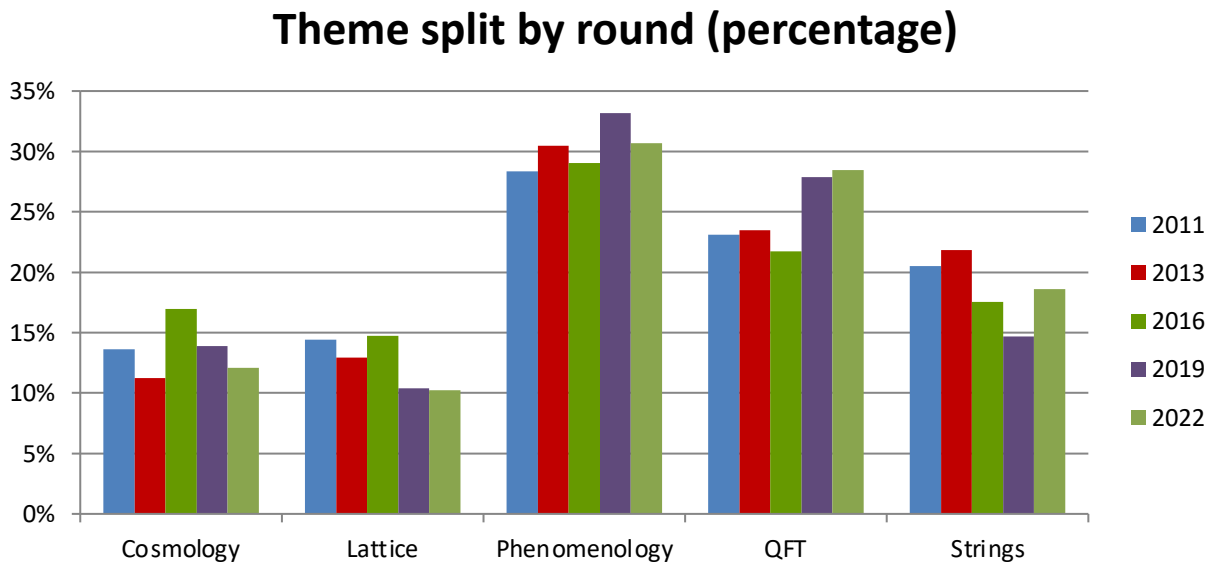
Particle Physics Programme

PP Theory Panel Membership

Claudia de Rham (Chair)	**Imperial**
Daniel Maitre (Deputy Chair)	**IPPP/Durham**
Gert Aarts	Swansea
Sakura Schafer-Nameki	Oxford
Susha Parameswaran	Liverpool
Bobby Acharya	KCL
Ben Gripaios	Cambridge
Daniel Litim	Sussex
Andreas Brandhuber	QMUL
Roman Zwicky	Edinburgh

PP Theory Community Trends

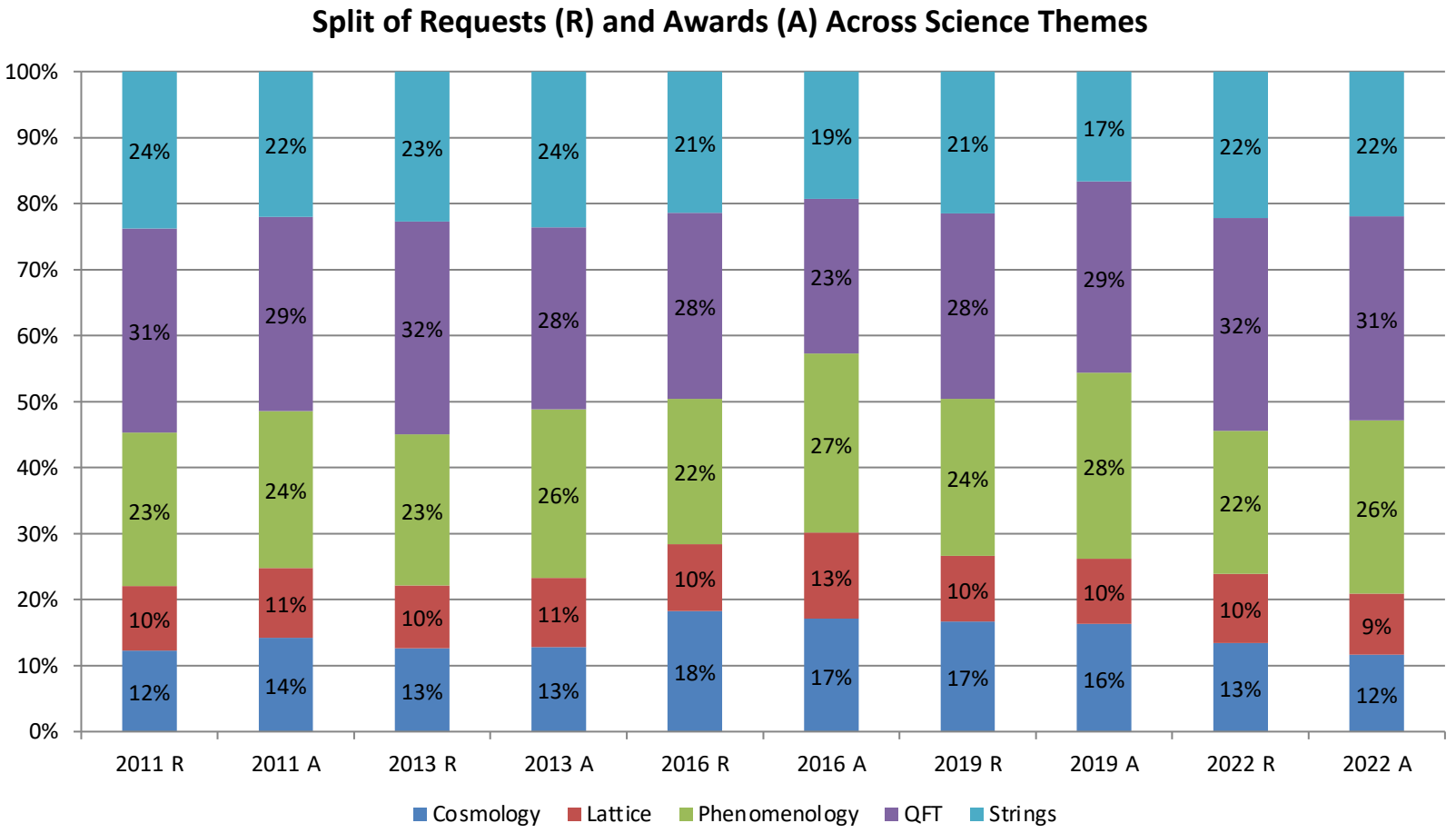
- CG announced in October 2022 resulting in £22.1M over three years to 20 institutions (inc consortia)
  - **Awarded 58.3 FTE PDRA**
  - **Awarded 173 academics**



University groups	2011[1]	2013	2016	2019[6]	2022[7]
Number of proposals	18	17	18	18	20
Consortium proposals	4	5	6	5	5
Budget	£14.6M	£15.2M	£15M	£20M	£21M
Number of academics bidding for non-zero academic time	163	176	186	222	243
Number of academics funded	146	161	134	153	173
Maximum academic time awarded	20%	20%	20%	8%	4%
Average academic time award (among non-zero awards)	14%	16%	13%	8%	4%
Number of PDRAs per year (FTE)	29.3	28	32	43	58.33
Ratio of PDRAs per bidding academic	0.18	0.16	0.17	0.19	0.24
Ratio of PDRAs per funded academic	-	0.17	0.23	0.28	0.34
Number of bidding academics per RA	5.6	6.3	5.8	5.2	4.17

[6] From CG2019 the figure includes the core and research programme of the IPPP
[7] From CG2022 the figure excludes the core programme of the IPPP

PP Theory Community: Academic FTE



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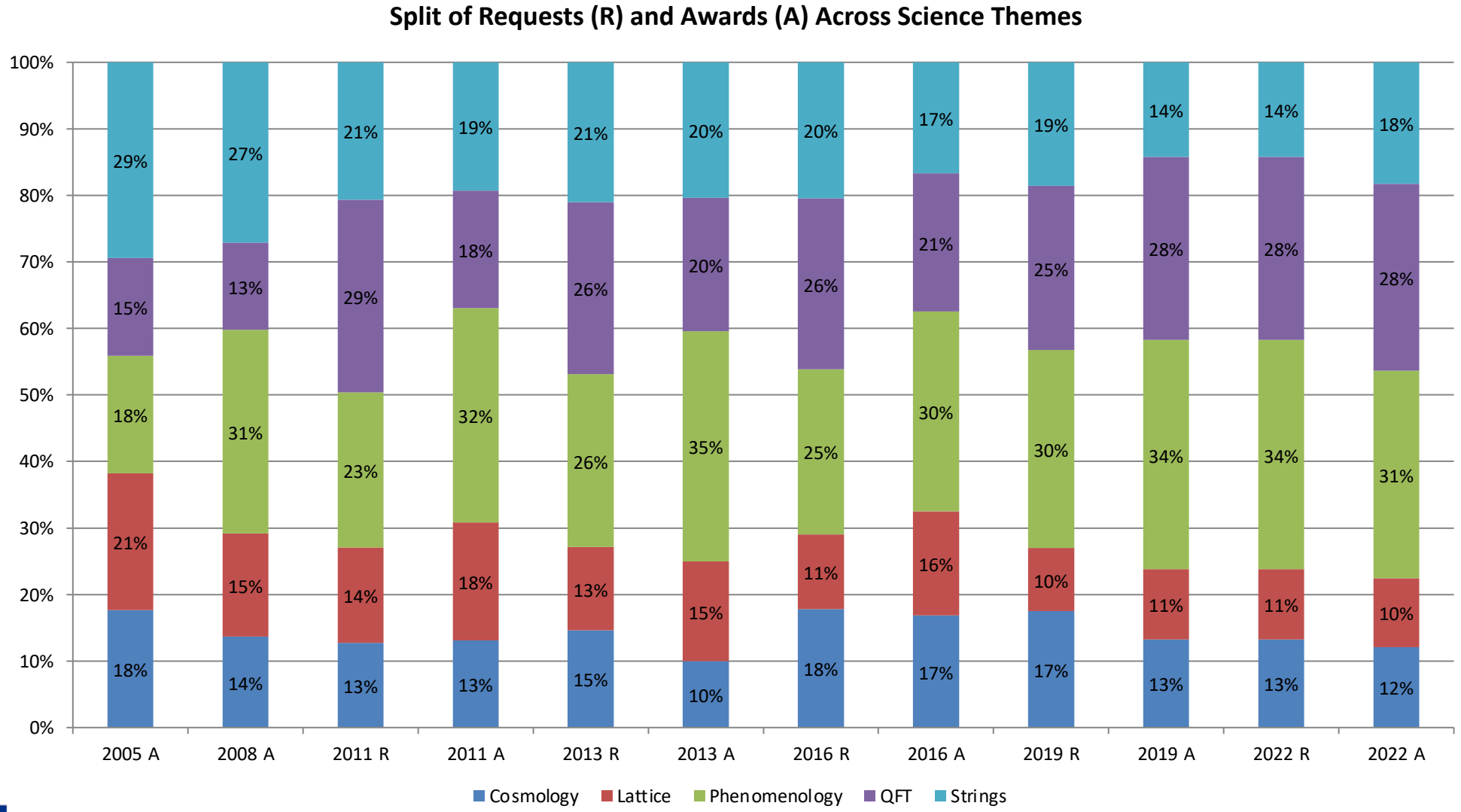
PP Theory Community: PDRA FTE



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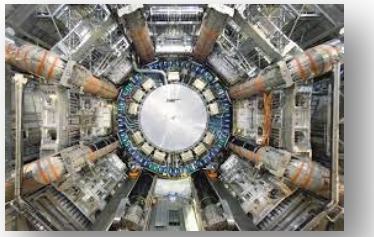
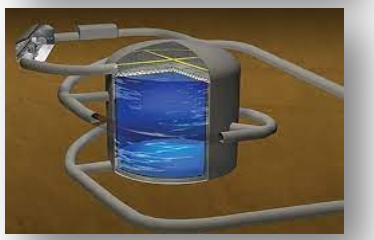
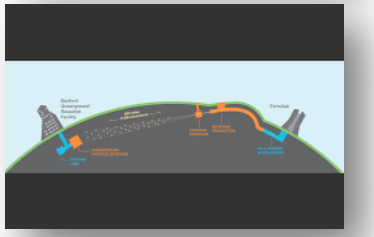
Major Project Updates

- **ATLAS Upgrade Phase II construction** in progress
- **LHCb Upgrade II** transitioning from R&D towards pre-construction. Supported by the UKRI Infrastructure Fund from 2024/25 at a level of £49.4M – finalising the peer review
- **CMS** extended funding until 30 March 2025. Peer review in 2024
- **LBNF/DUNE** subprojects **PIP-II and DUNE completed midterm reviews. DUNE** has now split into **RS&DC project, APA project** and **DAQ project** and undergoing peer review.
- **Hyper-K construction** awarded £15.5M from UKRI Infrastructure Fund and progressing well.







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Major Project Updates (cont'd)

- **DiRAC –** next three years of investment has been awarded in the hardware to maintain research at the cutting edge but aware of the pressures on cost of energy
- **GridPP7** – peer review completed and grants being processed
- **ECT* -** recognised as an important contribution with continued support.
- New UK DRI Infrastructure investment (includes DiRAC, AIRR, DAWN, pre-Exascale); a federated approach is being developed to benefit across UK science.

ECT*
EUROPEAN CENTRE FOR THEORETICAL STUDIES IN NUCLEAR PHYSICS AND RELATED AREAS

Trusted Research and Innovation (TR&I)

The UKRI Trusted Research campaign has been developed by the Centre for the Protection of National Infrastructure (CPNI) and the National Cyber Security Centre (NCSC) to raise awareness of the risks associated with research collaborations.

- The UKRI TR&I work programme has been established in response to the increasing need across the sector to:
  - Collaborate safely and with full knowledge about our international partners
  - Using collaboration with our partners to develop opportunities and overcome threats
  - Protect STFC's intellectual property and benefitting from international collaborations
  - Minimise the risks associated with operating within a global R&I ecosystem while maximising the opportunities
  - Ensure STFC operate within ours and out partners' legal frameworks

- **As part of the next CG proposal, groups may be asked questions around trusted research that is associated with the experiments that their researchers participate in.**

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Trusted research and innovation – UKRI

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UKRI Visions & Infrastructure

Scope of the Infrastructure Fund

- Aimed at supporting **significant investments that enable a step change in research and innovation infrastructure**
- Focusses on **infrastructure providing an international- or national-level capability**.
- **Funding is time bound to cover the costs of the significant change in capability** – it does not support longer-term maintenance needs, operational costs or uplifts beyond the life of the proposal.
- The infrastructure **must provide access, resources or related services to the wider, community outside the infrastructure institution itself** (e.g. the host institution and the funding partners).

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Projects in STFC science areas

Project	Science Area	Total [£m]	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
Full proposals															
Hyper-Kamiokande (Hyper-K)	Particle Physics	15.5													
The Square Kilometre Array (SKAO)	Astronomy	66.7													
Simons Observatory (SO:UK)	Astronomy	17.9													
Large Hadron Collider beauty (LHCb) 2030+	Particle Physics	49.5													
Preliminary proposals															
Electron-Ion Collider (EIC)	Nuclear Physics	3.0													
Boulby Underground Laboratory – Dark Matter and Beyond	Nuclear Physics, Particle Astrophysics, Particle Physics	2.8													
Ion Therapy Research Facility (ITRF)	Accelerators, links to medical applications	2.0													
Next-Gen GW: The next generation gravitational-wave observatory infrastructure	Particle Astrophysics	8.0													
UK ELT: The next generation instrumentation suite for the Extremely Large Telescope	Astronomy	6.8													

Multidisciplinary facility projects

Project	Science Area	Total [£m]	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
Full proposals															
Diamond-II	Multidisciplinary	296.6													
Vulcan 2020 – Science in Extremes	Multidisciplinary	59.7													
Endeavour	Multidisciplinary	73.5													
HiLUX	Multidisciplinary	17.2													
Preliminary proposals															
Diamond-II	Multidisciplinary	5.3													
ISIS-II Feasibility, Design Studies and R&D - 'Phase 1.2'	Multidisciplinary	5.1													
X-ray Free Electron Laser (XFEL) - Conceptual Design and Options analysis	Multidisciplinary	3.2													

Future waves of the Fund

- Preliminary proposal process runs annually
- Full proposal process every second year
- **Full proposal process will inform next Spending Review**

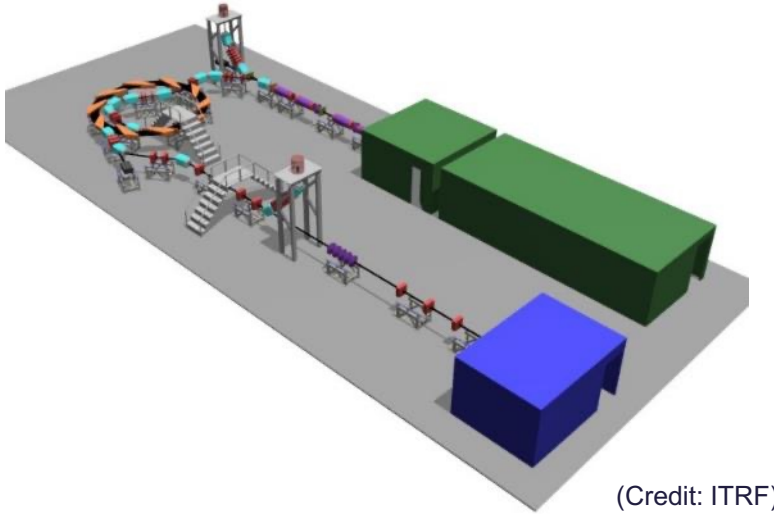
Spending Review period (budgets allocated)

W3 Full Project Business Case Development

Need to manage expectations for future rounds of UKRI IF as close to limit set in SR

Visions: Scope

- Visions is primarily looking to target concepts that have **multidisciplinarity** and **government priorities** as their focus
- Visions is also the initial entry route for identifying and developing new large-scale infrastructure projects – so Visions also welcomes **single-discipline infrastructure concepts**
- The majority of programmes going through Visions will be of a scale **greater than £5M**
- All concepts must:
  - Have the potential to create a step change in national or international level capability
  - Hold appeal beyond any individual research group and
  - Be compelling to the wider research and innovation communities that would deliver and/or benefit from the concept.



(Credit: ITRF)

Visions provides an ongoing, open, opportunity with no specific deadline for submissions

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Visions: Assessment criteria

1. Is the concept going to deliver a step-change for the Research and Innovation community?
2. Is the proposal timely within the current strategic landscape?

Assessment is undertaken by a panel comprising STFC staff plus a member from each Science Board - Panel Chair is a senior representative from STFC's communities

- The review process **does not prioritise concepts for funding** but determines which ideas have the potential to be developed further
- The Visions process **does not aim to provide a detailed technical assessment** of any concept or duplicate existing processes (e.g. PPRP)
- The **level of review is appropriate to the outcomes of the scheme** (this step is pre-consideration for any funding)

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visions@stfc.ukri.org
https://www.ukri.org/about-us/stfc/stfc-visions/

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Summary

- Many positive developments for the areas of PPAN
- Consolidated grants received an uplift, including Theory
- New infrastructure projects for UK participation in next generation experiments
- Positive developments in DRI and AI for Science.
- Starting to make the case for PPAN into the next Spending Review.

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Questions?

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Thank you

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The Funding Service – Training Materials

- Training Materials for Applicants

- Completing an application in the Funding Service – YouTube
- How to find an opportunity in the Funding Finder – YouTube
- How to apply for an opportunity in the Funding Service - YouTube

- Training Materials for Research Offices

- Research Offices - Submission Process and Managing Applications – YouTube
- Research Offices - Resources and Costs – YouTube
- Research Offices - Administrators and the Funding Service – YouTube

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