



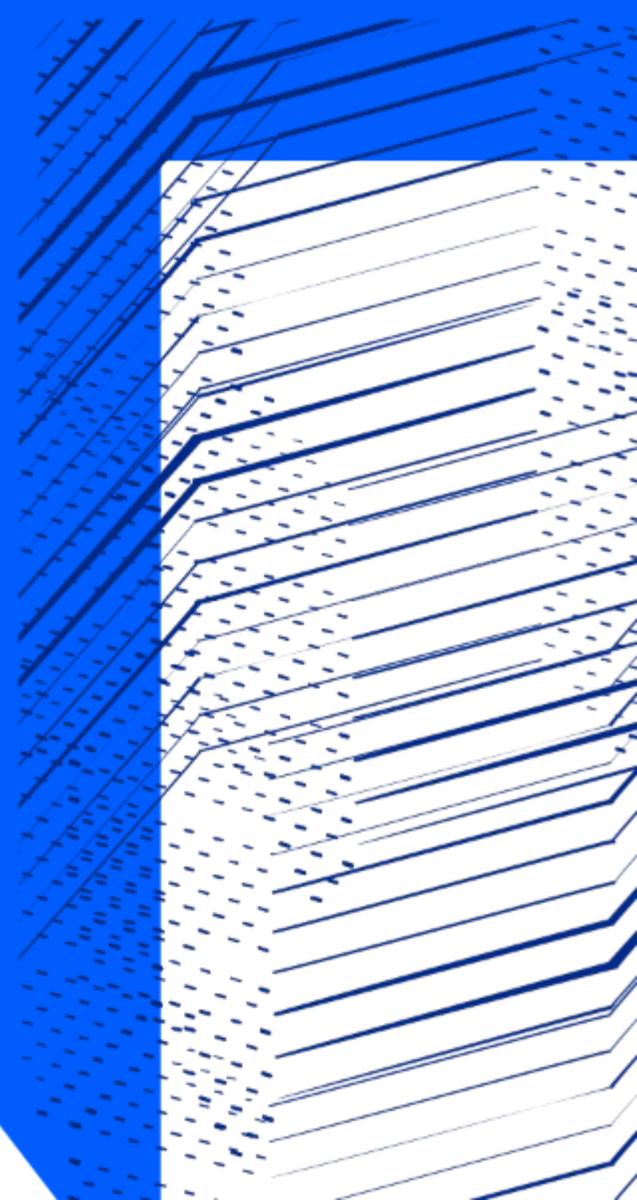
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STFC Update

RAS Forum

Professor Mark Thomson
Executive Chair

23 May 2022



STFC's is a complex organisation

STFC's split personality:

- Science Funding: fundamental research in particle physics, astrophysics, nuclear physics and space science
- Managing relationships with major international research facilities
- Science Delivery: operating UK's major multi-disciplinary research facilities and national laboratory capabilities

Annual budget of ~£800m and 2,650 staff

- approx. 30% of UKRI staff
- >85% are scientists, engineers and technicians
- **1660** at the Rutherford Appleton Lab





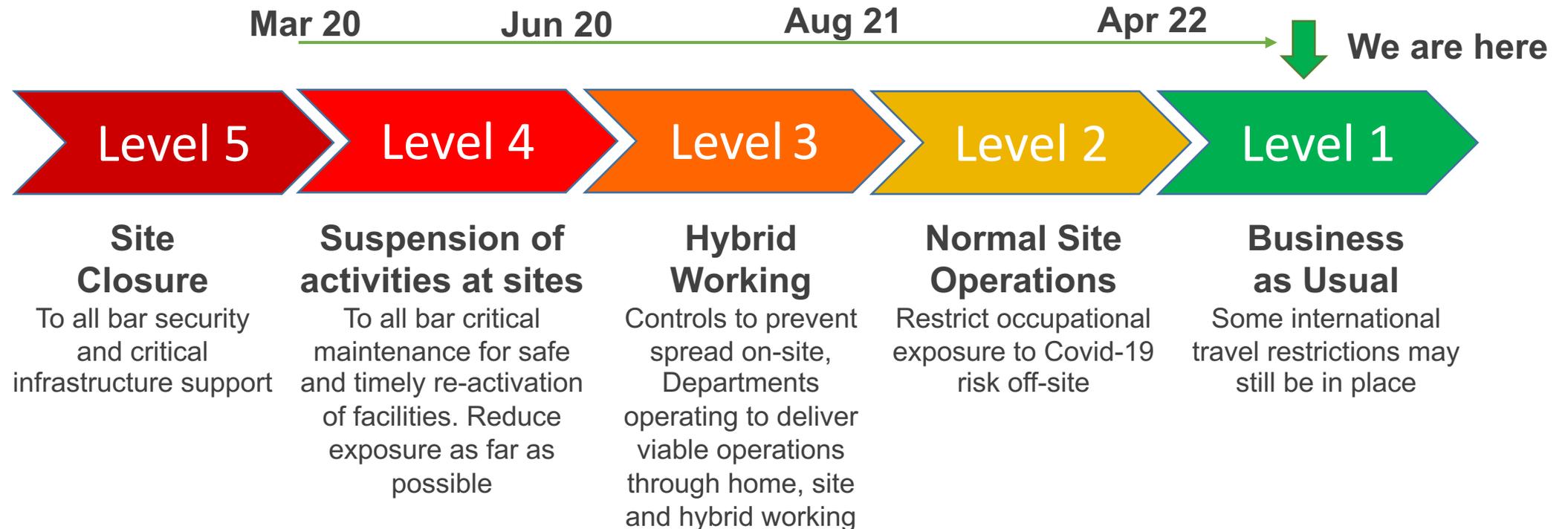
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STFC and Covid Recovery



Return to BAU operations

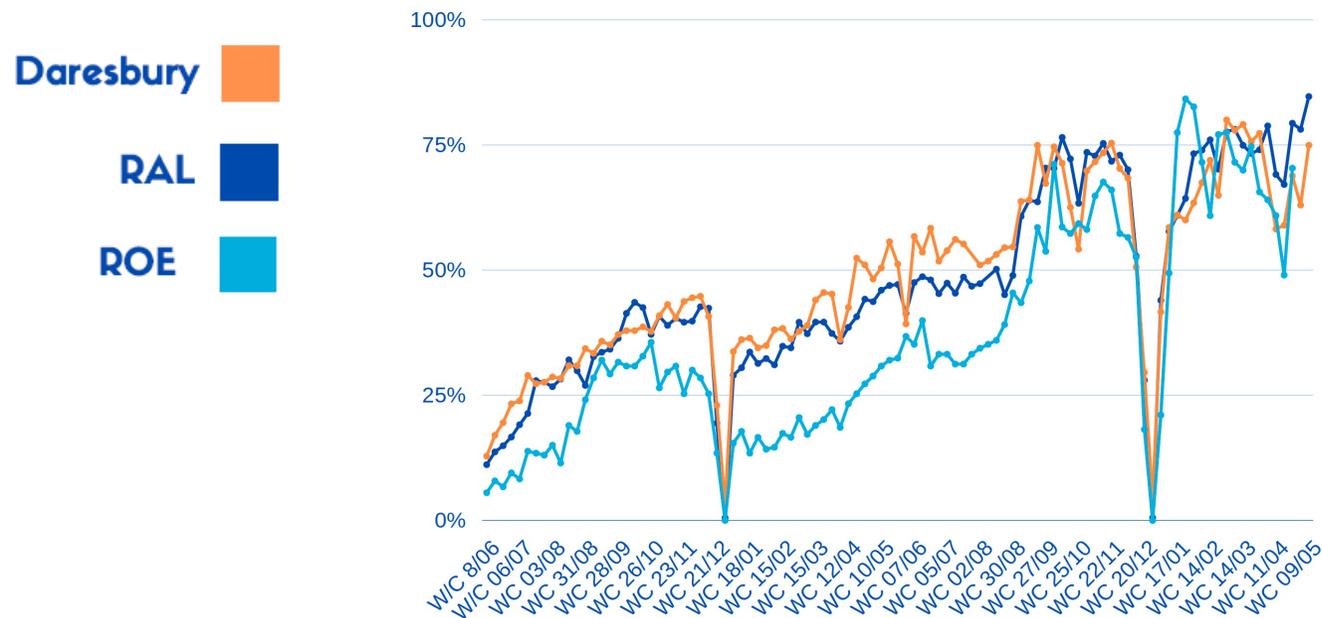
Our sites remained “open” throughout the pandemic with various levels of restrictions. The success of the vaccine programme means that we have now returned to “business-as-usual” operations



STFC site occupancy

Now at ~80% occupancy at STFC sites, c.f. 90% pre-pandemic

- all specific Covid measures removed on April 1



Our policy throughout has been to be as “open” as safely possible

- This has minimised project delays and enable science operations to return asap



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General Update



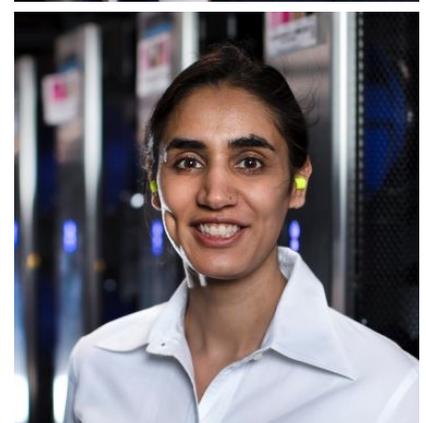
Appointments

STFC Executive

- Professor Mark Thomson re-appointed as Executive Chair of STFC for a further two years from April 1 2022 to March 31 2024
- Sadly, Tom Britten, Chief Operating Officer passed away 25 April

STFC Council

- Two new Council members joined 1 April:
 - Hitesh Thakrar, an experienced investor in the technology sector
 - Angeli Möller, Data & AI in healthcare professional
- STFC Council now has gender parity and over 40% ethnic diversity



Equality, Diversity and Inclusion

EDI remains a key priority for STFC & UKRI:

- UKRI's vision is for a research and innovation system that:
 - everyone feels included, is heard, respected and able to be their real self
 - different people, ideas, ways of thinking, skills and perspectives are valued
 - people and ideas thrive, are supported and encouraged
 - everyone can participate in, contribute to, and benefit from, our investments in research and innovation.
- The draft UKRI EDI strategy completed consultation on 28 March with over 260 responses. The Strategy will be published later this year
- STFC is developing the next phase of our EDI action plan – **action focused**
- We want to improve diversity across all our advisory boards and peer review panels
 - looking to our communities to help



Major construction projects

Rutherford Appleton Laboratory

- National Satellite Test Facility (NSTF)
 - >£100M investment in new world-class facility
 - Nearing completion
- Extreme Photonics Application Centre (EPAC)
 - £80M investment in world-leading laser facility
 - Building complete, laser system is now the priority
- National Quantum Computing Centre (NQCC)
 - £90M investment in new QC centre
 - Construction now started

Daresbury Laboratory

- Hartree National Centre for Digital Innovation
 - £200M investment in industry-focused AI/Supercomputing
 - Includes new super-computer centre



Horizon Europe

Update

- The government position remains that the UK wishes to associate to Horizon Europe and is ready to do so
- Current complicated by wider negotiations
- In the interim, UK entities are eligible and encouraged to continue applying for Horizon Europe funding through the usual means
- On Tuesday 15 March, the government announced an extension to the Horizon Europe UKRI funding guarantee
 - This covers first and second wave of eligible, successful UK applicants to the Horizon Europe programme, who have been unable to sign grant agreements with the EU
- In parallel, BEIS is leading on Plan B, including Horizon Europe alternatives

Ukraine and Science

Minister Freeman announced government policy on scientific collaboration with Russia on 27th March

- “Our aim is to introduce measures that will negatively impact the Russian state, and individuals and organisations with links to the Kremlin, but not to sanction individual scientists or innovators with benign research interests.”



What this means for STFC as an organisation (under review):

- STFC and STFC departments will not enter any new collaborations with Russian institutes or businesses
- all existing links between STFC and Russian **institutes** will be suspended
- visits to STFC sites from researchers at Russian institutes should be cancelled
- scientific collaborations between individual STFC staff and **individual researchers** based in Russian institutes will be considered on a case-by-case basis



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Astronomy Highlights

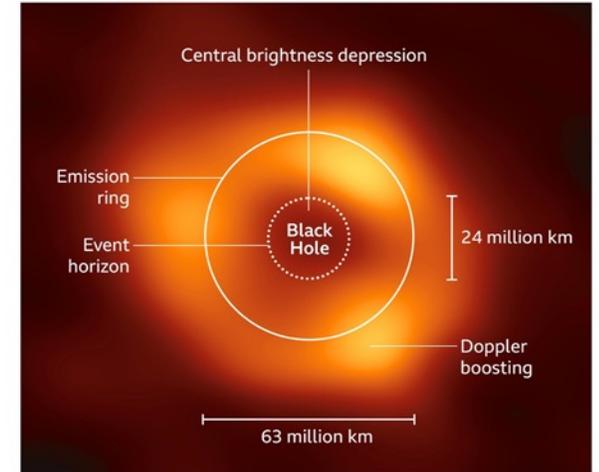


Astronomy

First image of black hole in the centre of our galaxy

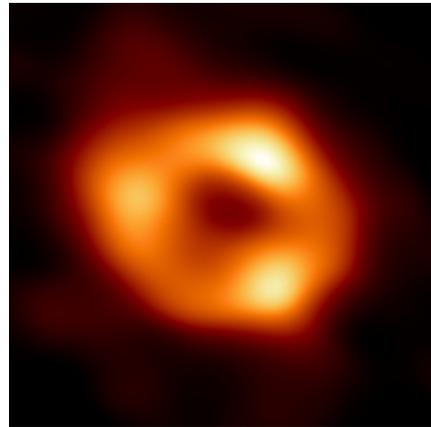
- UK astronomers, as part of an international team, helped bring to life the first image of the black hole at the centre of the Milky Way.
- The result provides the first direct visual evidence that the object known as Sagittarius A* (Sgr A*) is indeed a black hole.
- The observation was made possible due to STFC's contribution to JCMT and essential instrumentation on the Atacama Large Millimeter/Submillimeter Array (ALMA).

Deciphering the image of Sagittarius A*



Source: EHT collaboration

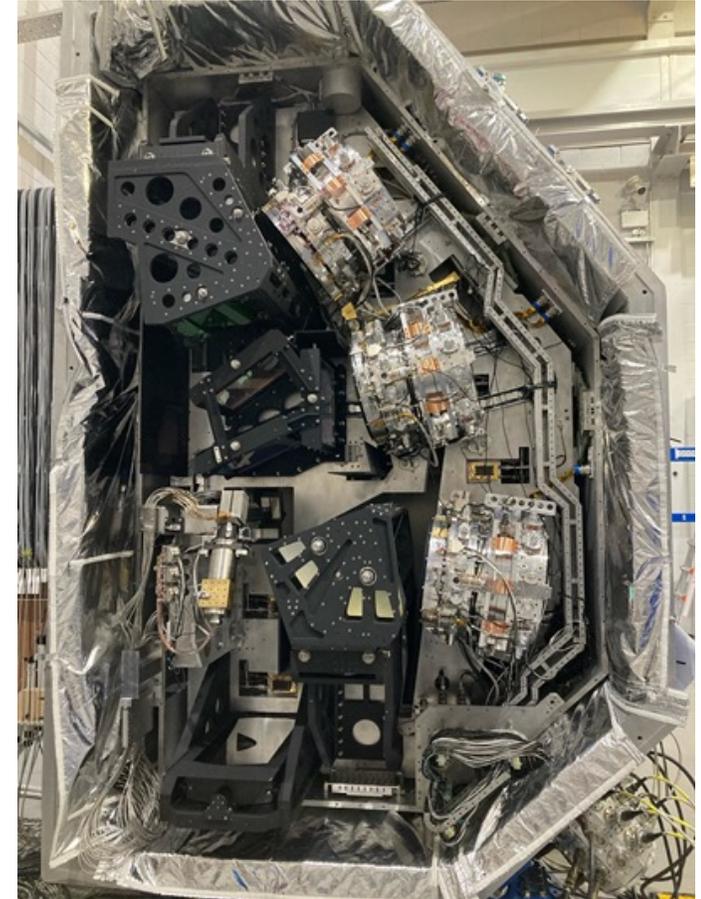
BBC



ESO

Headlines

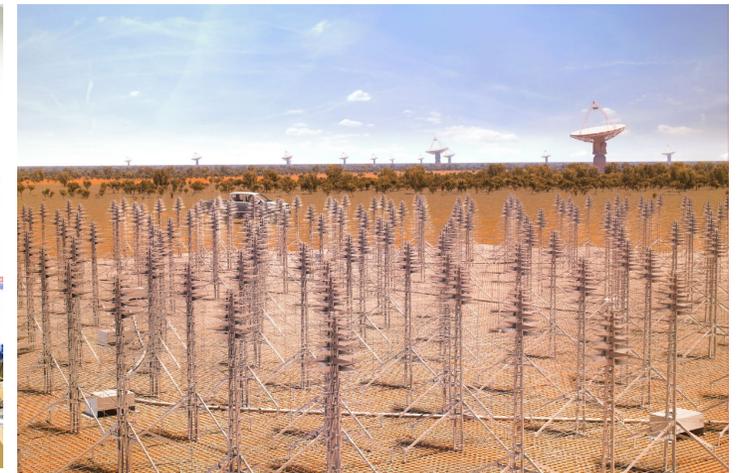
- ELT construction work in Chile ramping up with most of the materials for the dome delivered to site.
- UK ESO Impact study published in February – demonstrates strong science, commercial and societal impact
- ESO operational and development costs are increasing in face of inflation. Full impact not clear, but likely to be felt downstream
- MOONS making huge steps and on track for acceptance in 2023
- ERIS from UKATC being commissioned in Chile
- HARMONI working through ‘red flag issues’
- STFC’s PPRP to review all ELT development programme over the summer, including MOSAIC and Andes



SKAO

Headlines

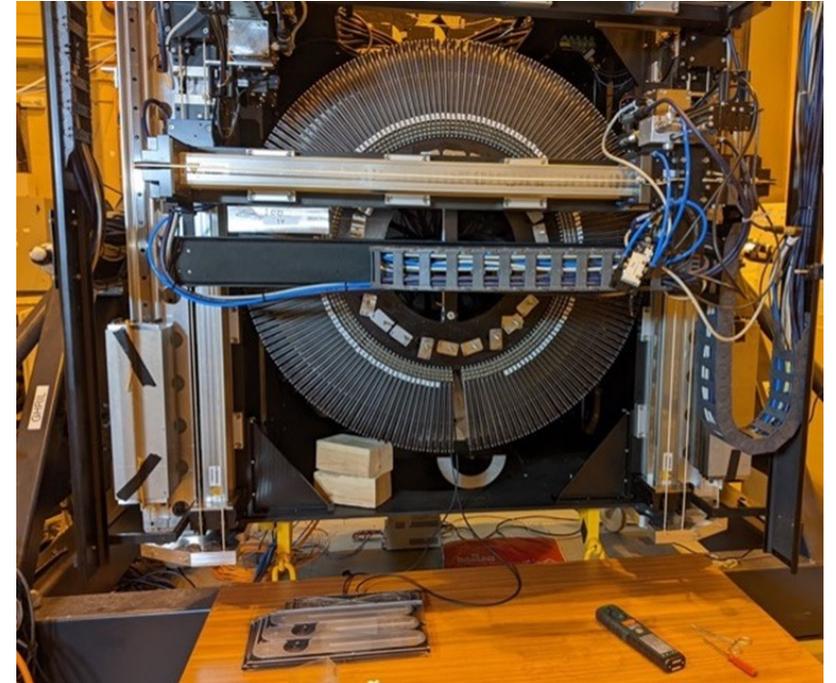
- SKA welcomed Switzerland as latest member: Council met at Jodrell in March.
- UK awarded several contracts for construction – up to £35M so far
- UK SKA Regional Centre bids are being invited – will be major hub for UK science support related to SKA
- SKA prominent in campaign to ensure quiet skies to enable radio astronomy to continue in era of mega-constellations of satellites



Other Project news

Headlines

- WEAVE integration and commissioning on-going. Full installation on telescope by early June.
- PPRP reviewing next steps for UK Rubin programme – will be followed by formal agreement with DoE/NSF etc for UK access rights – will be UK Astronomy's 3rd biggest ground-based project
- Simons Observatory UK: part funded to begin preparation work, await UKRI IF scheme outcome.
- In last year we have approved contributions to: NRT, GOTO, CUBES, MARVEL, ASTEP and SPECULOOS support, MCAO development and capital for e-MERLIN – all within a flat budget through completion / tail off of other projects



Strategy

Headlines

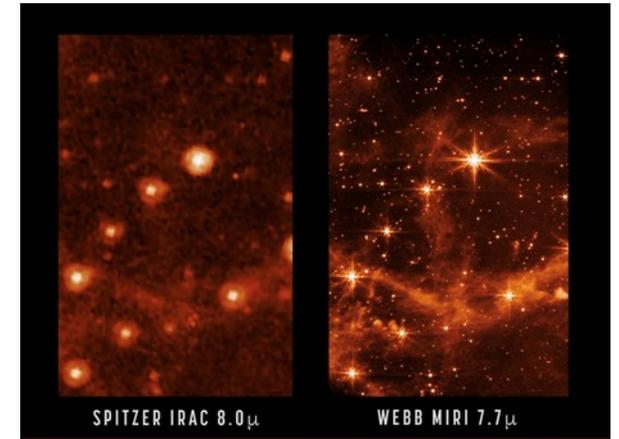
- Advisory Panels are focused on completing their Roadmaps for Astronomy and for Solar Systems science – community consultations on-going. Hope to complete by early summer. Will advise STFC and its Science Board on priorities for the coming years
- STFC continues to lead the delivery of the European Science Vision and Roadmap via Astronet, buoyed by the addition of new members including Ireland, Portugal and Denmark. Lead editor is Amelie Saintonge from UCL but UK well-represented on various science-led panels. Will be aligned with recent ESA and US strategic reports
- Draft will be presented at EA Society meeting in late June, publication in Sept/Oct.
- Working with UKSA to coordinate inputs to the ESA Ministerial, to the future UK national and ESA programmes and delivery of the National Space Strategy



Space Science

Headlines

- STFC and UKSA chief execs met in April to coordinate high level priorities – including development of space clusters, roll out of NSTF, work with innovation
- The third STFC Webb Fellow has been confirmed – Henrik Melin (Leicester) joins Olivia Jones (Edinburgh) and Emma Curtis-Lake (Herts) - powerful team to exploit science and outreach from UK investment in Webb
- Over £400k invested by STFC and UKSA in novel technologies for future space missions in 2021. Hope to repeat in 2022 but will have new STFC Technology Scheme - open to space-related tech applications
- Science Board will consider options for next ESA missions (F2, M7) in the summer



Consolidated Grants

STFC review of the Consolidated Grants process

- Implementation Panel (chaired by Jim Wild) - detailed plans for the roll out of a revised scheme are underway.
- Next step is a community consultation town meeting/webinar at UCL on 13 June – details on Astrocommunity. Then some tweaking and approval via Science Board etc.
- Hope to have in place for 2023 grants round.
- Main features of new scheme:
 - Individual grants could be one PI and one PDRA, focused on a distinct project
 - Large grants could be a series of related projects (theme), with several PIs and optionally more than one host department
 - Applications will be allowed more frequently (no three year lock out) but there will still be demand management. Options for that will be presented in June.
 - Likely that Individual proposals will be fund/not fund – no changes to request.

Fellowships and Studentships

Dual role – supporting research and development of the individual

- 10 Ernest Rutherford Fellowships awarded – announced in March
- 11 Stephen Hawking Fellows announced last year – NB one of the first fellows Dr Ziri Younsi has hit the headlines recently with the coverage from EHT
- Outcome of Round 6 of FLFs to be announced before end of May
- ETCC carrying out a light touch review of fellowships
- We have awarded 5 centres for doctoral training in data intensive science
- 220 Doctoral Students on DTPs awarded for students starting in October
- UKRI has also been conducting a consultation on the Postgraduate Research New Deal Consultation closed on 17 May and we will be considering responses.



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Funding, financial sustainability and more



Context: Spending Review 2021

BEIS Allocations

- BEIS research and development budgets announced 14 March
- Headline figures:

	2022/23 (£m)	2023/24 (£m)	2024/25 (£m)	Total (£m)
UKRI	7,908	8,373	8,865	25,146
BEIS Programmes*	3,798	3,866	3,894	11,558
UK Contribution to EU Programmes**	2,349	2,321	2,113	6,783

* Includes ODA, ** includes Horizon Europe and Euratom Research and Training

Context: Spending Review 2021

What does it mean for UKRI?

- SR outcome should be viewed positively, particularly given the wider economic background
 - strong message from government about its commitment to research and innovation
- FY22/23 allocation is slightly lower than FY21/22, but core R&D has been protected
- Positive trends in FY23/24 and FY24/25 – new opportunities across UKRI
- UKRI has given indicative allocations to councils and cross-cutting funding lines, but these are subject to BEIS ministerial sign off
 - Not 100% certain, but now a good picture of finances in the next three years

3-year settlement makes a big difference

Context: Spending Review 2021



What it could mean for STFC?

Slightly speculative as the devil is in the details

- Things are going to be very tight in FY22/23
 - electricity cost inflation is a challenge
 - overall budgets are very tight, but the situation is manageable
- **Facilities:** aim to operate ISIS ,CLF and Diamond at full capacity in 22/23
 - further energy cost increases in FY23/24 and FY24/25 are a risk
- **Infrastructure:** aim to initiate a number of **infrastructure projects**, **subject to funding** through the UKRI infrastructure fund and infrastructure fund prioritisation
 - **could** include Diamond-II, ISIS Endeavour, Simons Observatory, ...
- **Core Programme:** strong desire to provide an uplift in national particle physics, nuclear physics and astronomy consolidated grants in FY23/24 and FY24/25
 - exploring what might be possible, but “sustainability” arguments are clear

Sustainability of the PPAN programmes

Over the past 10 years

- international subscriptions have increased, e.g. CERN up by 40% ↑
- budgets have been essentially “flat” and costs of research have increased, e.g. PDRA costs up by over 40%
 - purchasing power of UK PPAN programmes have decreased by approximately 30%



Impact over 10 years

- number of PDRAs supported through CG has decreased by about 20% ↓
 - at a time when the numbers of academics in PPAN areas have increased
- to protect numbers of early career researchers, STFC has:
 - reduced low TRL technology development to almost zero ↓
 - squeezed academic FEC ↓

A tipping point for national programmes?

I do not believe the current situation is sustainable

- all levers (R&D and FEC “flexibility”) have been used up
- if trends continue for another 5 or 10 years...

Require a different approach (PP as an example, similar for AP)

- As part of STFC’s SR input, I argued that we need to think about **our international subscriptions (CERN)** and **national PP programme** as a single programme, e.g. UK investment in particle physics
 - our **national programme** (e.g. consolidated grants) leverages the value from the (significantly larger) **international subscriptions**
 - a relatively small (e.g. 1 – 2 %) “above-inflationary” increase in the **total programme** (national + international), **directed at our national programme** has a very large impact
- The economic marginal productivity case for increased investment in our national programme is compelling

What are we doing

We have

- Reduced some non-core activities, will take advantage of cross-UKRI initiatives

We will

- **Rebalance** our current R&D and commercialization activities, which are currently skewed heavily towards commercialization
 - rapidly ramp up a new “PRD-like” blue-skies technology R&D scheme, aiming for ~£2.5m pa within this SR period – call should be announced soon
 - matched by a simplified the approach to funding commercialization activities and look to build stronger pathway to Innovate UK

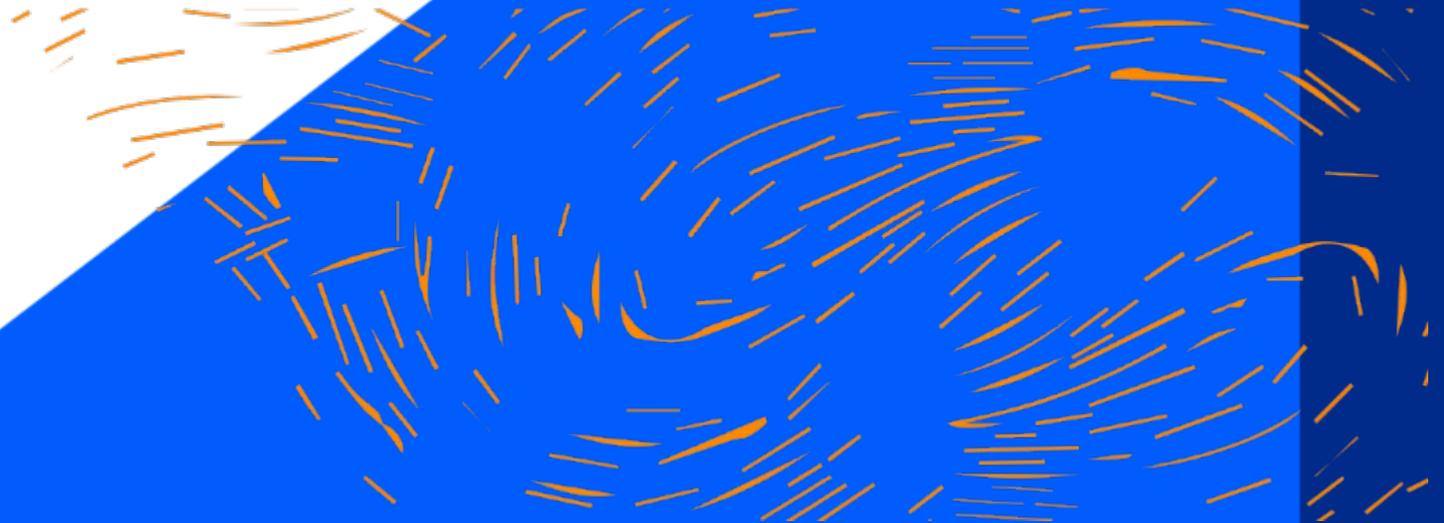
Subject to affordability (post SR), we are *planning* to:

- prioritise year-on-year “above inflationary” increases in **CG funding**, starting from FY23/24:
 - this will leverage more value from international subscriptions



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Summary



Summary and outlook

Positive news

- Returning to (new) normal working and in-person meetings
- We will soon have 3-year spending review allocations to STFC
 - overall picture is reasonably positive
 - not just a roll-over of funding or activities
- UKRI Infrastructure Fund provides a route for investment in research and innovation infrastructure across the entire research system from astronomy to social sciences

Concerns

- Direct and indirect impacts of the Russian invasion of Ukraine
- **Inflationary pressures**

Overall

- Given the challenges of the last few years, STFC is in a pretty good place – multiple reasons for optimism



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Questions?