



IRIS Digital Research Infrastructure: an update

J. Hays, IRIS Science Director

IRIS Collaboration Meeting

January 2023



iris eInfrastructure for Research and Innovation for STFC

IRIS is a cooperative community
bringing together STFC
computing interests

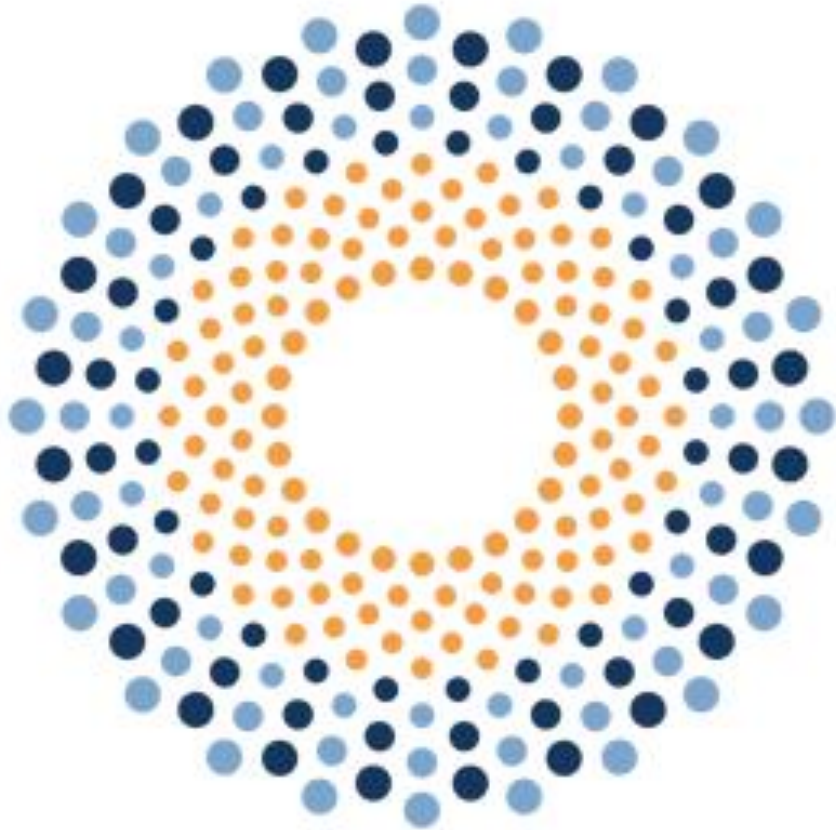
Formed bottom up by
science communities and
compute providers

Works closely with STFC but
run by the community





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Particle Physics: GridPP, non-LHC experiments, SWIFTHEP
Astro: LOFAR, LSST, EUCLID, SKA, GAIA, Simonds Observatory
Astro-particle: LZ, Advanced-LIGO, CTA
Nuclear Physics
DiRAC HPC Facility

STFC Scientific Computing Department
Diamond Light Source
ISIS Neutron Source
Central Laser Facility
CCFE
SciML
.... Others...

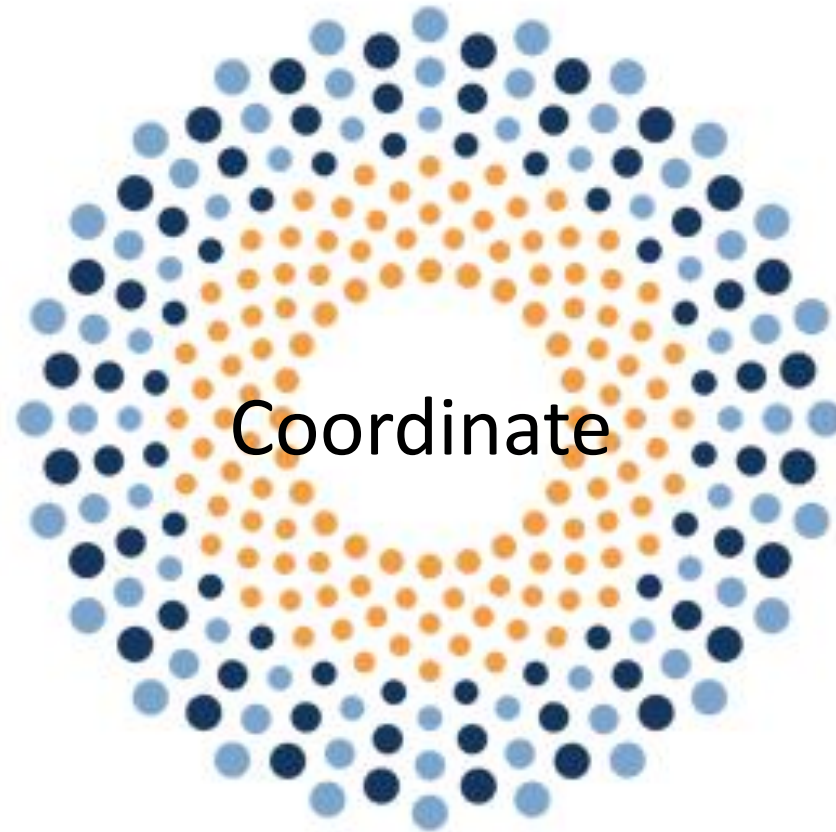


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Build infrastructure

Invest in
computing
hardware

Support digital asset creation



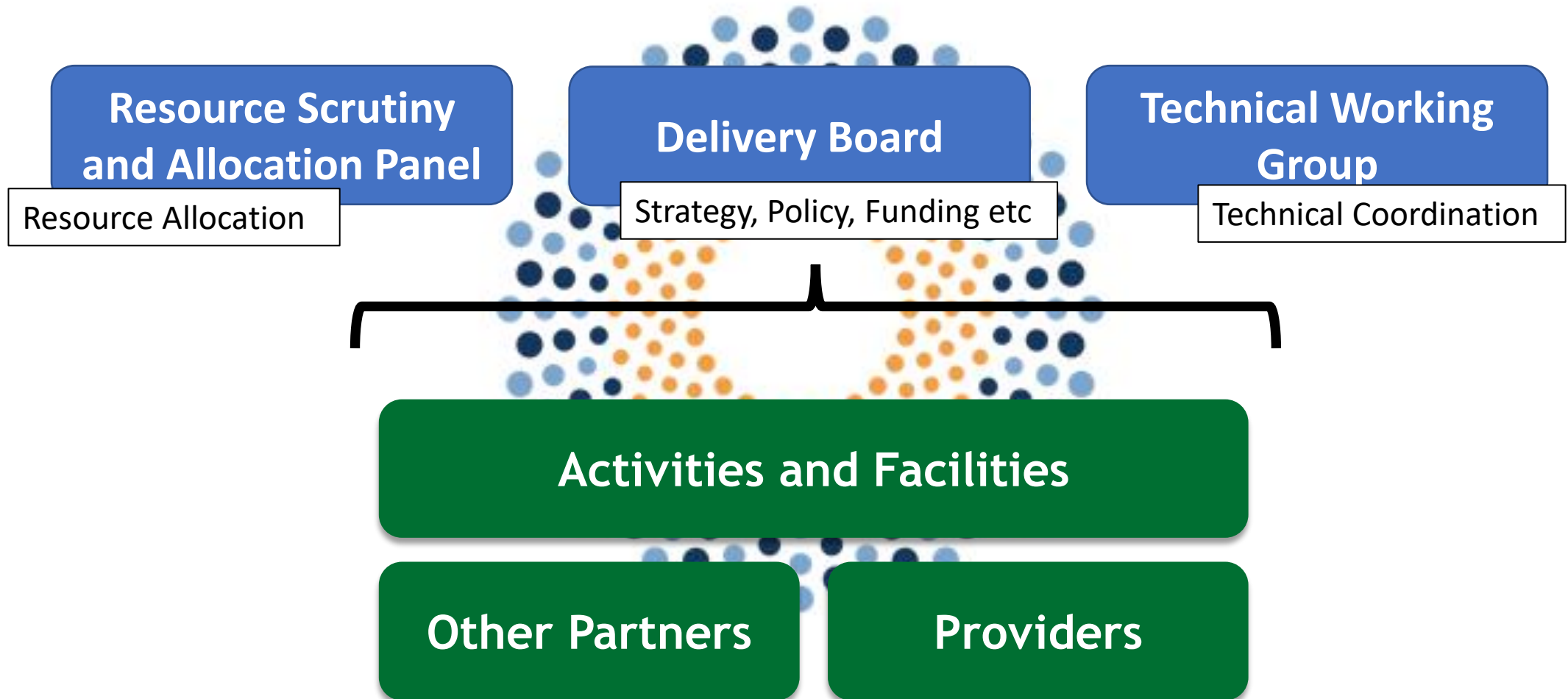
Build community

Support training

Making the case for investment



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Funding

- 2017:
 - £1.5m Capital : £1m hardware, 0.5m digital assets
- 2018:
 - £16m (4M / year over 4 years)
 - 11M Hardware
 - 5M Digital Assets for National Facilities
- 2020:
 - Capital injections ~ £6m
 - 3M capital for IRIS, 2M for LSST (Rubin Observatory), 1M for SKA
- 2021:
 - Digital Research Infrastructure funding ~ £2m
- 2022:
 - STFC Capital funding £2.4m – anticipated recurrent over 3 years
 - UKRI DRI funding – £3.5m additional funding in 22/23 + 23/24
 - Additional capital supporting Astronomy programme £2.3m
 - UKRI/NERC £110k **IRISCAST** project – as part of UKRI NetZero Scoping Project (See talk on Friday)





IRIS and its Community



Technical Working Group

Weekly meetings

- Technical discussions – presentations, showcases etc

- Operations reports

Regular ad-hoc workshops as and when needed

- Wide range of topics from identity management, cloud computing, GPU usage, machine learning etc

Targeted at the IRIS community but open to all



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IRIS and its Community



Security Forum

Meeting roughly quarterly but also with ad-hoc meetings as and when required

Broad remit

Policy

Operations

Training

Communications

Strong collaboration across providers
– building on excellent work they have done

Security Workshop took place yesterday
– update later in this session



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Digital Asset Creation

Digital Assets

Essentially software (or similar) products (capitalizable) – with a defined end point or delivery of the asset

(Funded through ALC for national facilities)

Additional track of funding “Other DA” programme available to full IRIS Community

Often infrastructure related but can also be closer to science

UKRI DRI funding also allows some non-capital projects
- can be used for R&D as well as asset production





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Digital Asset Creation

Digital Assets

Essentially software (or similar) products (capitalizable) – with a defined end point or delivery of the asset



Focused on:

On-boarding

Joining-up

Core infrastructure

Software “reuse and repurposing”

Security

Training (from FY22/23)



Digital Asset Creation



Digital Assets

Identity management - IRIS-IAM

- Working towards single-sign on
- Closely aligned with LSST and SKA work
- Integrated with the DiRAC Federation Project

Radio astronomy on-boarding

- eMERLIN, ALMA, and others
- Documentation, tutorials, community engagement
- Evaluation for IRIS integration

Algorithm Development

- Efficient random numbers on FPGAs
- Support for FAST-HEP toolkit

Data management

- RUCIO (LHC) from development for non LHC usage – multi-VO support, token based authentication support, etc (LSST, DUNE, SKA)
- High performance data transfers for SKA – using FTS and RUCIO (leveraging hardware investment by ExCALIBUR)

Core infrastructure

- Security policy
- Information Security Management – supporting STFC SOC
- Accounting development – building on work at Tier 1
- VMDIRAC – workflow management building on DIRAC (LHCb) for non-LHC
- Tools and services portfolio



Digital Asset Creation



Digital Assets

Identity management - IRIS-IAM

Working towards single-sign on
Closely aligned with LSST and SKA work
Integrated with the DiRAC Federation Project

Radio astronomy on-boarding

eMERLIN, ALMA, and others
Documentation, tutorials, community
engagement

Evaluation for IRIS integration Current around going for approval today.

£415k – FY22-23 and FY23-24.

Algorithm Development

Efficient random numbers on FPGAs
Support for FAST-HEP toolkit

Data management

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Core infrastructure

Security policy
Information Security Management –
supporting STFC SOC
Accounting development – building on work at

Workflow management building on

DIRAC (LHCb) for non-LHC
Tools and services portfolio



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What IRIS is not...



IRIS is not a turn-key computing solution

IRIS currently has no direct resource funding for user support – some community support as “best effort”

IRIS can provide physical resources for groups who can make use of it –

Activities may need their own:

- Software frameworks

- Support staff

IRIS might not have the kind of hardware needed for every activity



Future outlook

Established funding line over three years 2022/23 through 24/25

Building stronger links through STFC Programmes to collaborate on DRI delivery for large projects

Though more policy development needed to understand how to establish more solid footing for all our partnerships – science activities, facilities, and providers

Some additional work needed on governance and reporting

Ensure we maintain the autonomy that we have by demonstrating we have good processes, controls, and internal review

Also important for recording and demonstrating benefits realisation to those who make decisions about our funding

Strong participation in UKRI DRI

Expect further funding from this direction

Important to recognise the potential for IRIS to be a demonstrator of how to join up disparate projects and facilities into a more coherent whole

Complete our strategy work!



Future outlook

Complete our strategy work!

IRIS Strategy		Domains				
		Community & Communications	Skills & Training	Services & Operations	Policy & Governance	Resources / Hardware
Themes	Accessibility	How to engage with IRIS, onboarding, RACI Engaging with new communities	Reducing barriers to entry and onboarding	Reducing barriers to entry. UI & Platform provision. E.g. IDAAS, Jupyter User support	RSAP Define user scope of IRIS How to get access and what they can get access to? Engaging with new communities	RSAP Prototyping + seedcorn - hard making systems available for this
	Sustainability	Awareness around environment, community longevity, succession planning	Adding value to people and therefore community. Maintaining critical mass of skills and people.	FTE for operations Accounting - driver for efficiency. Understanding efficiency of use and improving	Reporting, modelling future needs, advocacy. Ensure mutually beneficial relationships Be a credible and reliable programme - operation, procurement, financial, project management	Environmental, procurement / vendor management, provider relationship management. Ensure mutually beneficial relationships
	Security	Awareness, sharing and security comms plans. Who you gonna call?	Training	Operational security monitoring and incident management	Security Policies - AUP, site policy etc	Ensuring we provide funding for security on top of just boxes. Firewalls, operational monitoring, Being an active partner for site security.
	Innovation	Sharing community intelligence. Talks, funding calls, awareness of opportunities Our funding clear on this	Upskilling each other, sounding boards, TWG Knowledge sharing. Sharing community intelligence. Sharing training, and opportunities	Identify needs and develop new services and products to meet those needs.	Process for seedcorn and novel resources. Support innovation through funding decisions.	Prototyping + seedcorn. Onboarding people who are getting there.
	Flexibility	Multi-platform - communications routes, JIRA, SLACK Information sharing - website	Training to prepare people for things we *may* want to use. Variety of skills knowing what we MIGHT need to use. Skills to adapt to changing ecosystem and take advantage of other peoples innovation.	Interoperability Joining up Resilience	Get out clauses Policy must support the science Annual review to ensure policy fit for purpose RCI	Having the right mix of hardware to meet needs. Ensure diverse ecosystem to be adaptable to changing needs



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Summary

IRIS is a cooperative community bringing together STFC (and beyond) computing interests

Bringing groups together
Building Infrastructure
Supporting Science
Lobbying for the future



<https://www.iris.ac.uk/>