

STFC AI Strategy

“AI for Scientific Innovation”

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Why an STFC AI Strategy?

- Mission-led obligation to advance cutting-edge AI to support delivery of world-leading science and innovation
- AI has the potential to transform how we perform science and deliver discovery
- To make AI pervasive across STFC, need to take a strategic, organisation-wide approach to advancing AI
- Position STFC as key contributor to sovereign AI capability
- Produce a well-informed bid into the multi-year spending review

Key aims of strategy

- Galvanise STFC's communities to embrace potential of AI as integral to our mission and create mechanisms to achieve this.
- Act as a tool to help shift perceptions across UKRI and HMG about the nature of the relationship between STFC and AI
 - STFC wants to realise the transformative benefits of AI across its investments: in doing so, we will advance the state of the art of AI.
- Enable potential funders to clearly see the value of advancing AI across STFC
- Position STFC as a credible delivery partner for HMG across the AI ecosystem.

Transforming the “nature and methods of scientific inquiry”

- **AI-enabled pipelines** to ingest existing and future large datasets to accelerate analysis, prediction, create deeper insight and boost rates of discovery
- **Digital twinning** to enhance the design, assembly and optimisation of experiments, complex engineering systems and facilities
- **Innovative tools for facility control and operation** including instrument automation, anomaly detection and preventative maintenance
- **Domain-aware AI surrogates and pre-selection models** to augment and accelerate simulation workflows
- **Near real-time coupling** of experiment, facility, industrial or biological processes with large-scale simulation
- **Augmented working** via automation of daily tasks

Strategic vision

An STFC that is advancing science-led AI, at scale and pace, to maximise the value of data across the research and innovation system, thereby unlocking the potential of AI to accelerate scientific discovery and productivity, develop sovereign AI capability and create economic growth and impact across society.

Key findings (External)

- Foundations of a healthy AI ecosystem have been laid at national level
 - current focus on safety rather than opportunities and AI solutions
- Comparator nations are investing heavily in AI, particularly in people and software
- A healthy AI ecosystem requires data, compute, people and software
- Sovereign, strategic advantage in AI will be derived from the development and application of cutting-edge tools and technologies

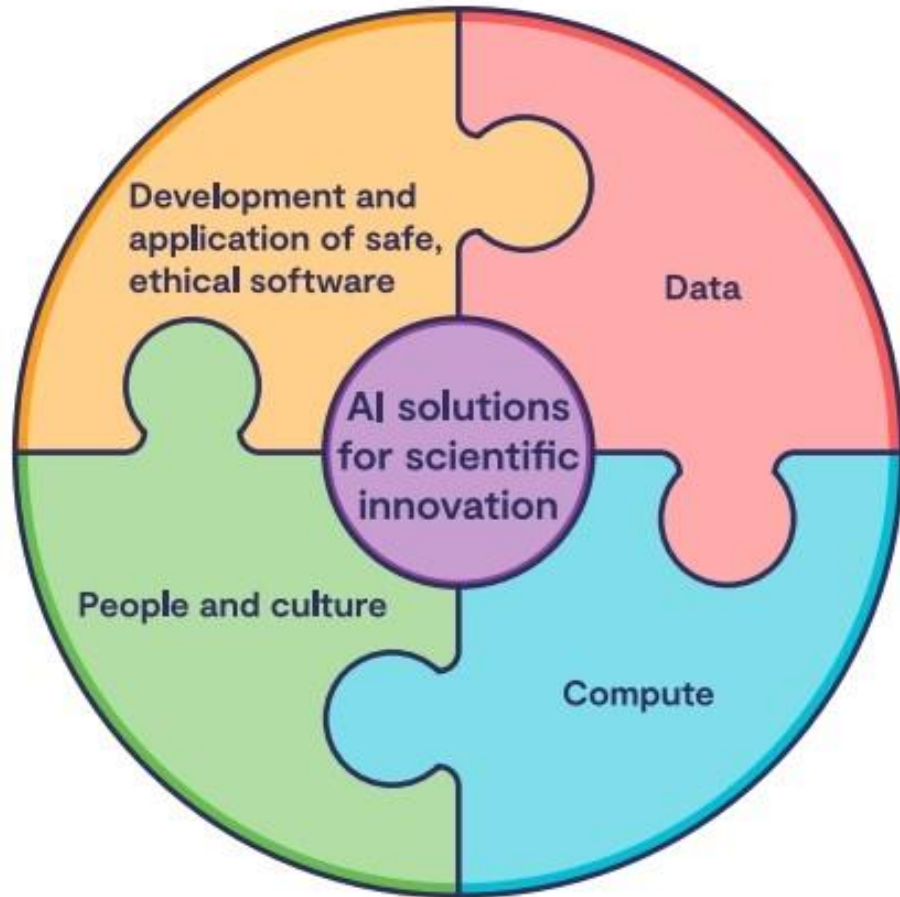
Key findings (Internal)

- Complex interplay between STFC mission led-obligations and the development and application of AI solutions.
- Mission-led AI means we are transforming the science of AI and a key contributor to the development of sovereign AI capability
- AI strategy reflects our role as an enabler and deliverer of science at scale across UKRI
- We also deliver AI solutions that are transforming core national missions
 - healthcare, materials, space, energy, catalysis, business supply chains & logistics
- National labs and campuses drive innovation-led growth in businesses and support the creation of jobs in high-tech sectors, including AI.

Key findings (Internal)

- Need to integrate our depth and breadth of AI expertise across STFC
- Need to leverage our experience in designing and exploiting large scale infrastructure to deliver the national AI capabilities needed by UK scientists
- Success depends on the whole system pulling together to deliver the required people, data and compute investments
- Delivery at scale and pace essential for UK's competitive advantage
 - integral to our reputation as a world-leading science and innovation organisation

AI for Scientific Innovation



Network of Co-creators

"Our AI vision and capabilities are supported by an informal network of AI specialists and domain experts. "

Network spans academia, industry and public sector:

- PPAN Community
- National Laboratories
- Scientific Computing Department
- Hartree

Strategic Themes

Core themes:

- **Embedding AI at the heart of STFC:** create conditions for AI to thrive as a foundational technology across STFC
- **Advancing STFC science and driving sovereign AI capability:** engaging in challenge-led AI R&D
- **Delivering mission-led AI solutions:** reflect our unique enabling role within UKRI and the wider UK R&I ecosystem
- **Sustainable Innovation:** embed environmental sustainability in all activities

Cross-cutting theme: Partnerships

Interdependencies: National compute and data capabilities

Next steps

Develop delivery plan over next 6 months with proposed workstreams:

1. AI ecosystem leadership and governance within STFC
2. Data (logistics, interoperability, FAIRness, AI readiness)
3. AI R&D for sustainable scientific innovation
4. Skills
5. Partnerships

Please engage.....

- Comment on what you've seen in this talk
- Highlight concerns/risks; provide additional examples or case studies
- Provide feedback on strategy when circulated
- Don't assume that someone else in your field is responding to consultations