



Computational Science Centre  
for Research Communities



# The Computational Science Centre for Research Communities

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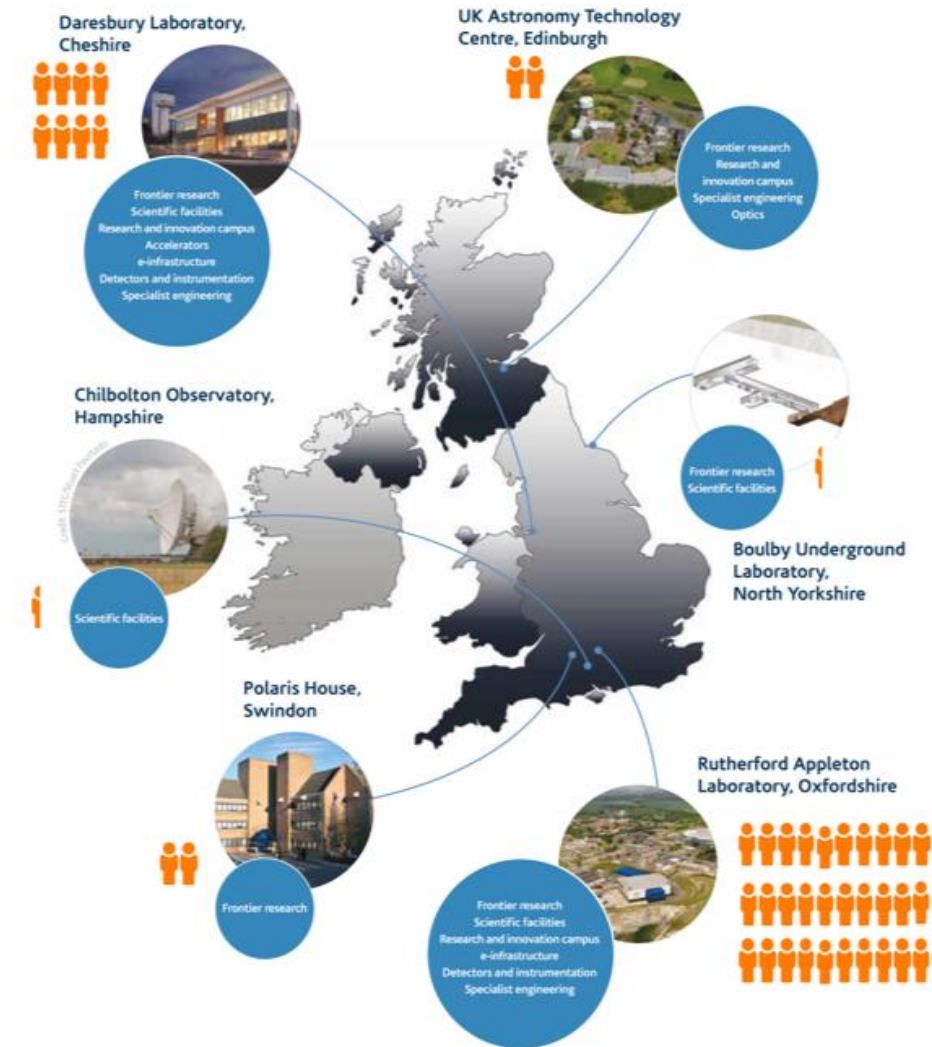
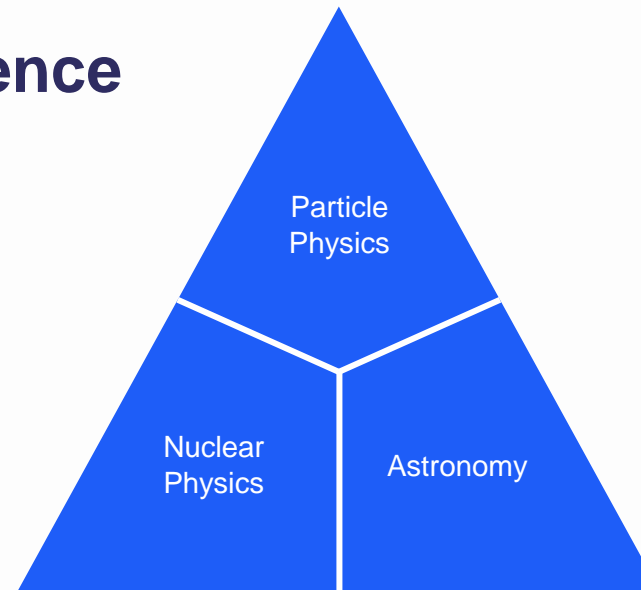
Enables computational research by developing software **as an infrastructure** to address complex problems requiring advanced computing

## ***A UKRI funded Centre to deliver, enable and support collaborative computational research***

Achieved through **stable long-term holistic partnerships** with researchers organised as UKRI-funded communities

**Mission:** “Deliver world-leading national and international research and innovation capabilities and, through these, solve real world challenges and discover the secrets of the Universe”

- Funding for Frontier Science
- World Class Facilities
- Science and Innovation Campuses
- Sector Focused Clusters



# STFC Scientific Computing

- A department within STFC's National Laboratories
- Provides direct computational infrastructure, science and engineering support to STFC's national facilities and users
- Also working externally with researchers across UKRI and internationally
- 300+ Research Technical Professionals (RTPs) based at both STFC's Daresbury and Rutherford Appleton Laboratories



Daresbury Laboratory  
Warrington, Cheshire



Rutherford Appleton Laboratory  
Chilton, Oxfordshire

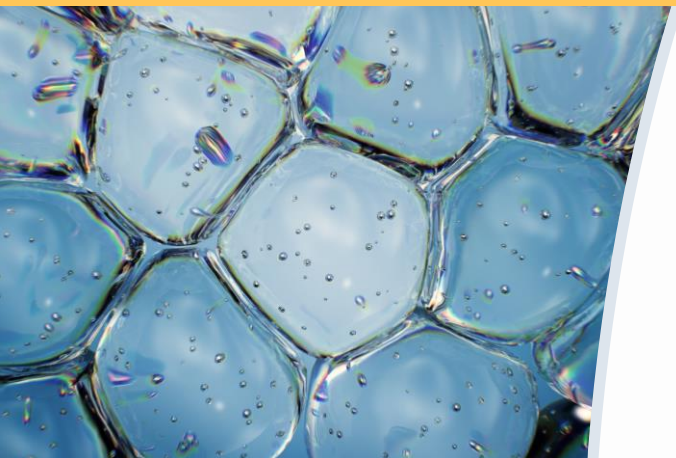
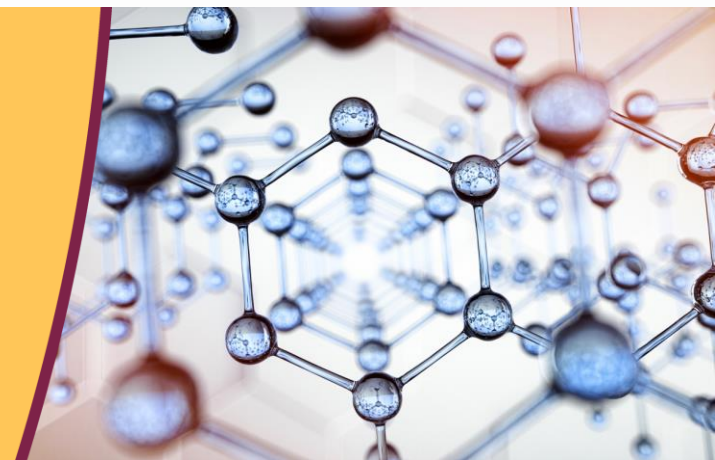
# CoSeC and Computational Research

*Computing is a key tool for modern researchers. For some, it supports and underpins, for others it is a primary mechanism of exploration. Without research software and data, research computing hardware has no purpose. Software is an enabler of research and a pivotal element of a national digital research infrastructure.*

- **The Computational Science Centre for Research Communities (CoSeC):**
  - Run by STFC Scientific Computing within its National Laboratories
  - Provides a team of Research Technical Professionals (RTPs) who collaborate with funded computational communities
  - These span thousands of domain-specific researchers around **research software development, its delivery and maintenance, FAIR data, technical training and community building**
  - A hub for the application of important computational research topics like **AI, quantum computing, sustainable green computing**



# Collaborative Computational Communities



# The Collaborative Computational Community Model

- UKRI (currently EPSRC, MRC, BBSRC, NERC, and STFC) fund collaborative communities to bring together researchers to:
  - Exchange knowledge and information on theory, algorithms, and computer codes
  - Collect, maintain and develop key research software
  - Encourage fundamental research by providing facilities for quick implementation of new computational methods and techniques
  - Assess and advise on associated computational needs, such as data handling
  - Disseminate information among researchers and enable technical training
- A concept dating back to the 1970s that has evolved but still serves UK research and innovation well.
- An effective model for research software sustainability.
- Communities currently follow one of two funded models:
  - Collaborative Computational Projects (CCPs – EPSRC, MRC, BBSRC, STFC)
  - High-end Computing Consortia (HECs – EPSRC, NERC)

# Community Landscape

- Through UKRI DRI STFC funds and CoSeC supports 13 CCPs as well as 6 EPSRC funded HECs
- From 2025 STFC funds and CoSeC supports 6 scoping projects to develop new communities

## Materials

- [CCP9](#): Electronic Structure of Condensed Matter
- [CCP-NC](#): NMR Crystallography
- [CCP5](#): Simulation of Condensed Phases
- [UKCP](#): Car-Parrinello Quantum Mechanics
- [MCC](#): Material Chemistry



## Biology

- [CCP4](#): Protein Crystallography
- [CCP-EM](#): Electron Cryo-microscopy
- [CCP-N](#): NMR Spectroscopy
- [CCPBioSim](#): Biomolecular Simulation
- [HECBioSim](#): HPC within Biomolecular Simulation



## Imaging

- [CCPi](#): Tomographic Imaging
- [CCPSyneRBI](#): Synergistic Reconstruction for Biomedical Imaging




## Engineering

- [CCP-WSI](#): Wave Structure Interaction
- [CCP-NTH](#): Nuclear Thermal Hydraulics
- [CCP-Turbulence](#): Complex Turbulence modelling
- [UKTC](#): HPC for Turbulence modelling
- [UKCOMES](#): Mesoscale Engineering
- [HEC-WSI](#): HPC for Wave Structure Interaction



## New Communities

- Particulate Solids (Edinburgh)
- Arts, Humanities, and Culture (Durham)
- Data-driven Computational Mechanics (Imperial)
- Volume Electron Microscopy (Francis Crick)
- Numerical Relativity (King's College London)
- Theoretical and Experimental Particle Physics (Swansea)

[CCP-QC](#): Quantum Computing 



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**Scientific Computing**

[www.cosec.ac.uk](http://www.cosec.ac.uk)