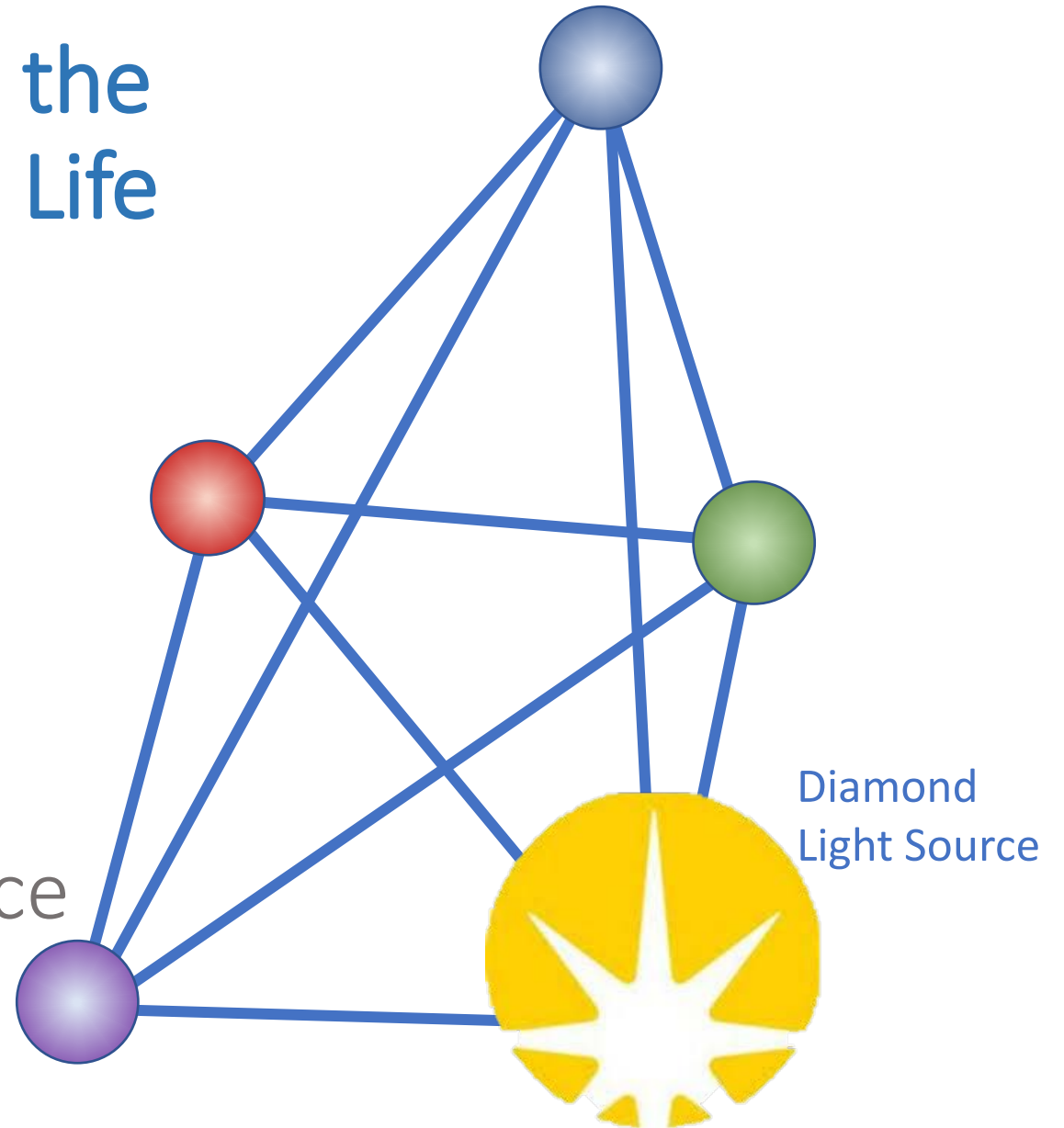


UK Community workshop on the Compact Light Source - Grid: Life Science & Cultural Heritage Opportunities

Introduction:

Phil Withers Royce Institute and Univ. of Manchester.

Hywel Owen: Accelerator Science and Technology Centre, Daresbury

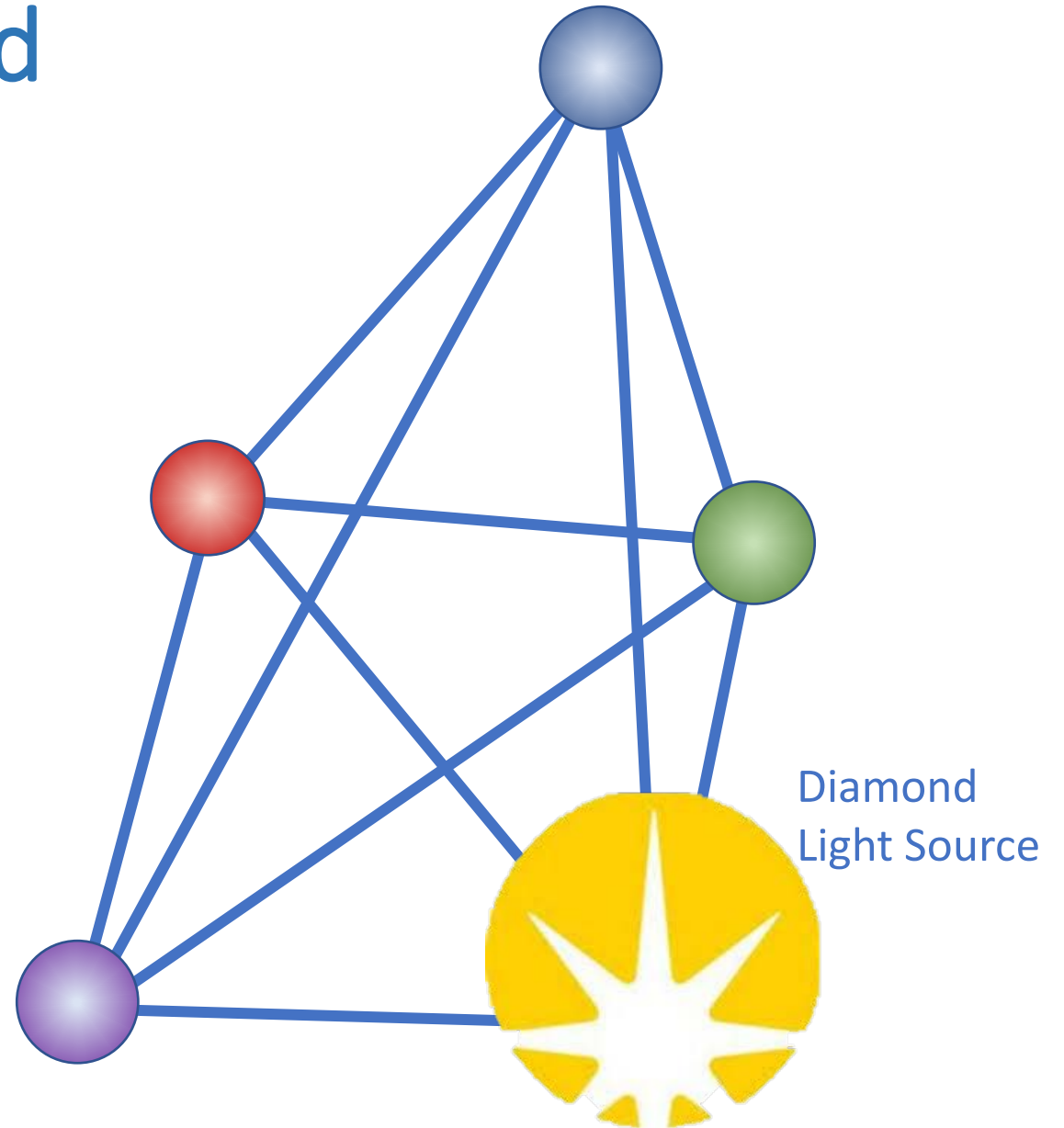


Compact Light Source Grid

Concept: to establish the first nationally connected grid of (X-ray) light sources in the world to undertake world leading science and to deliver regional and national economic and societal benefits

Aim: This workshop we will explore potential research applications at a Life Science Node and a Cultural Heritage Node.

'A national facility distributed regionally'



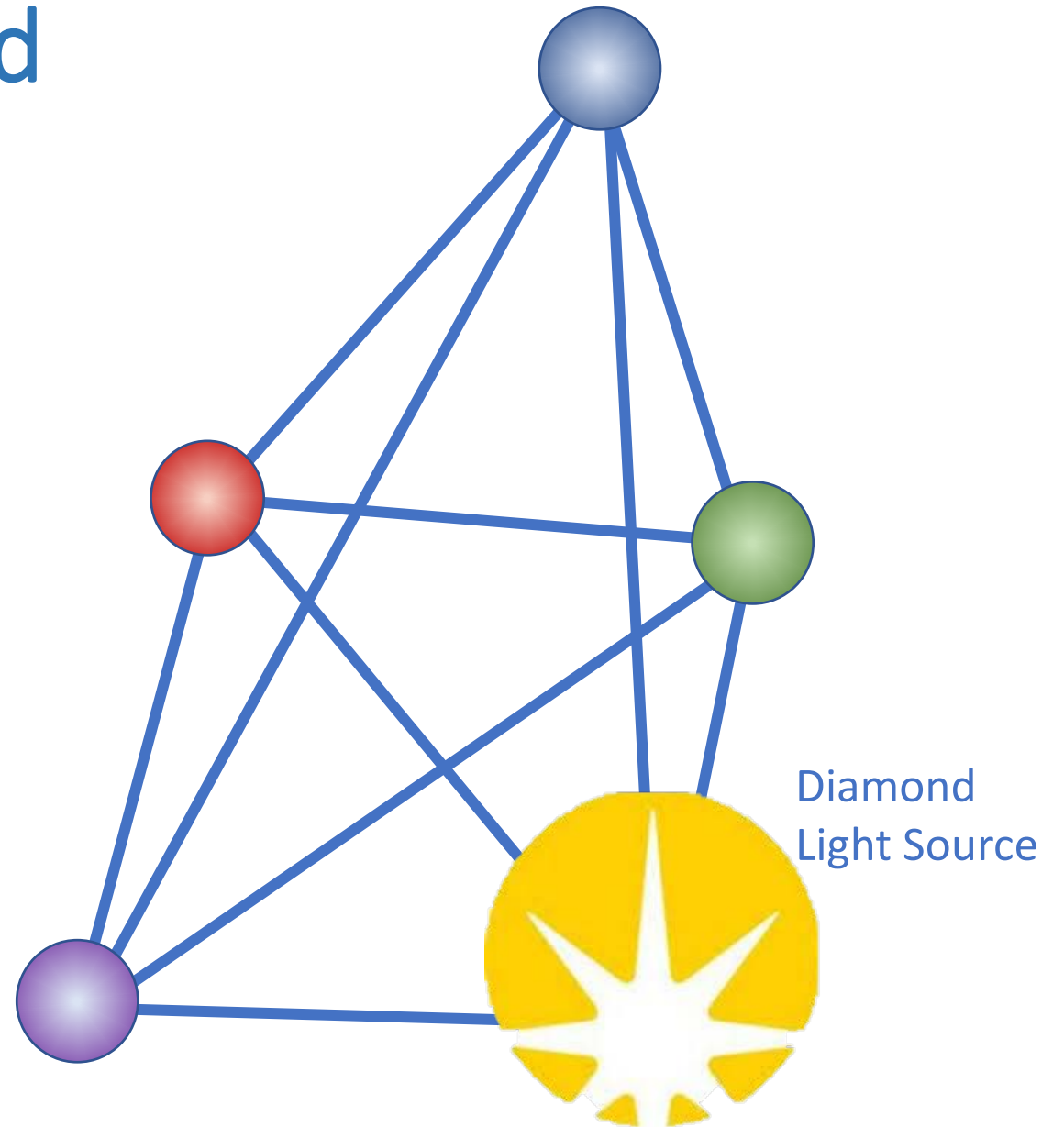
Compact Light Source Grid

This is your workshop:

- *most of us know relatively little about compact light sources and so there are no silly ideas or stupid questions!*
- *please contribute Qns using the chat or in the open sessions*
- *there is no expert panel so please contribute to the discussion sessions*

This workshop is not aimed at

- *identifying potential locations for a potential CL Sources*
- *identifying organisations to host CLSs*
- *identifying who could build CLSs*

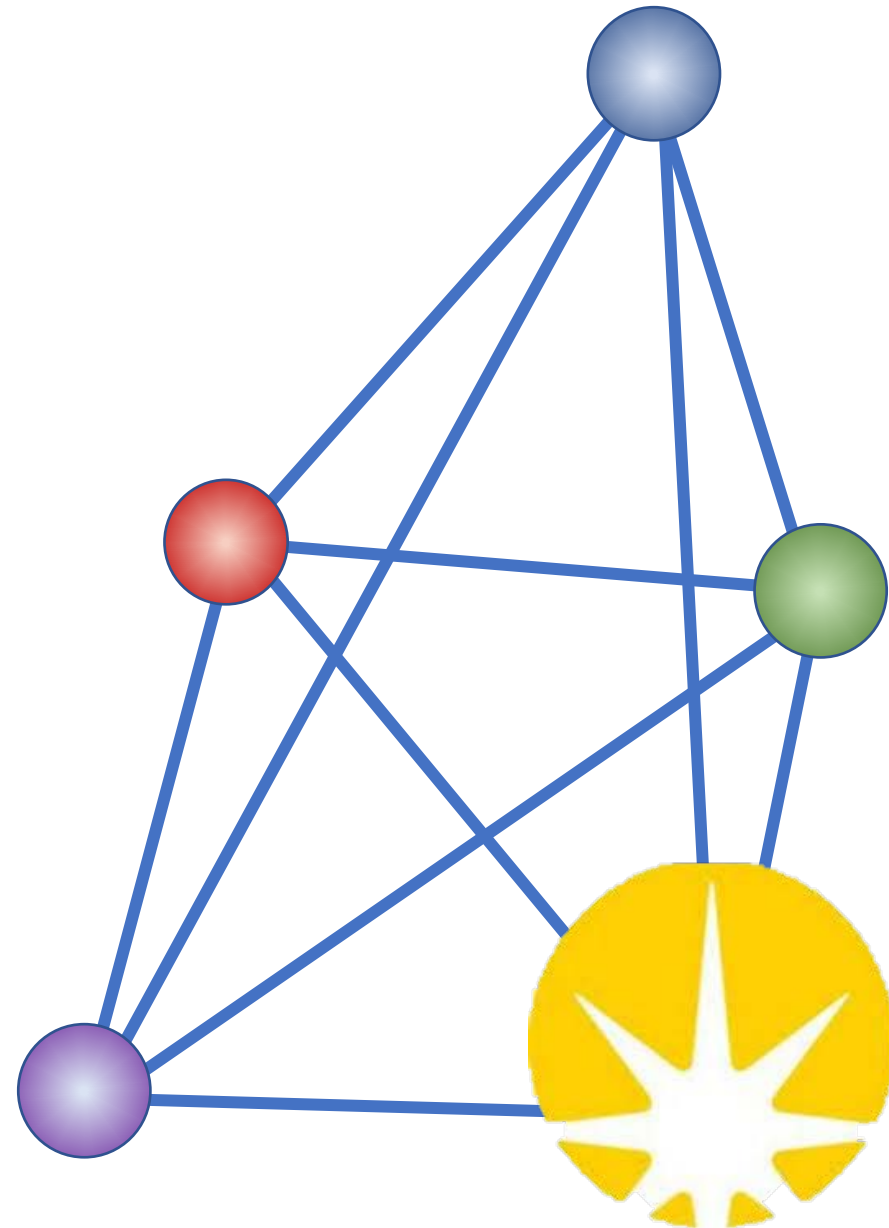


'Taking the source to the experiment'

Compact Light Source Grid

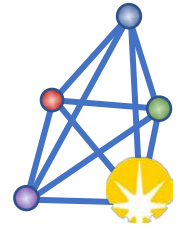
The vision is for a world-leading grid of mid-scale X-ray sources:

- Each with different scientific and technological drivers and capabilities
- Each representing a local/regional centre of excellence linked to industry/academic needs and clusters of expertise
- Each administered locally complementing the other nodes and the capabilities of DLS
- Each answering to a single national governance board with national stakeholders
- Each benefiting from technical developments coordinated by DLS
- Single data management structure harmonised with DLS/STFC



DLS to be at the heart of the Grid

A multi-disciplinary, local X-ray facility

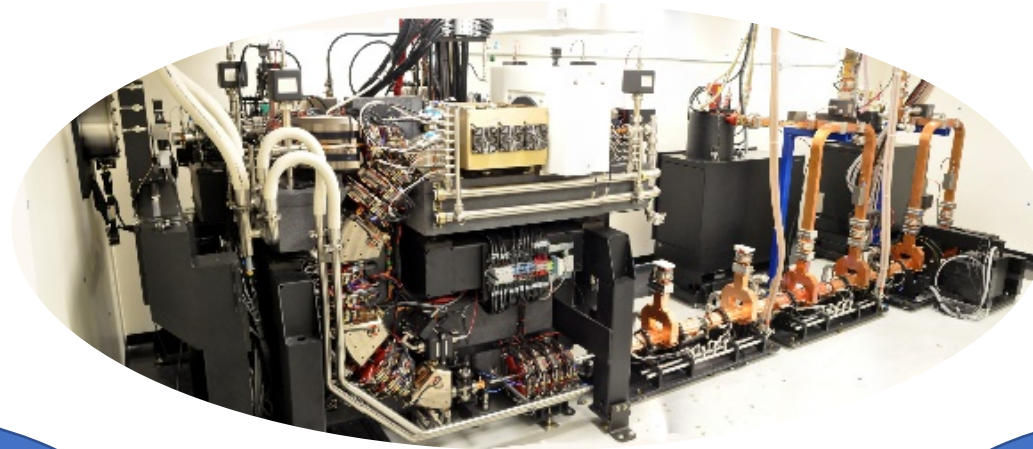


Taking the source to the experiment

Scaleable
Nodes can be added as required

Flexible operational schedules

Sample screening for time-limited synchrotron runs



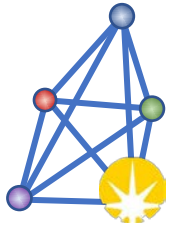
Local control of experimental time and access

Difficult-to-transport samples: *in vivo*, precious, hazardous, etc.

Tailored to iterative and longitudinal experiments

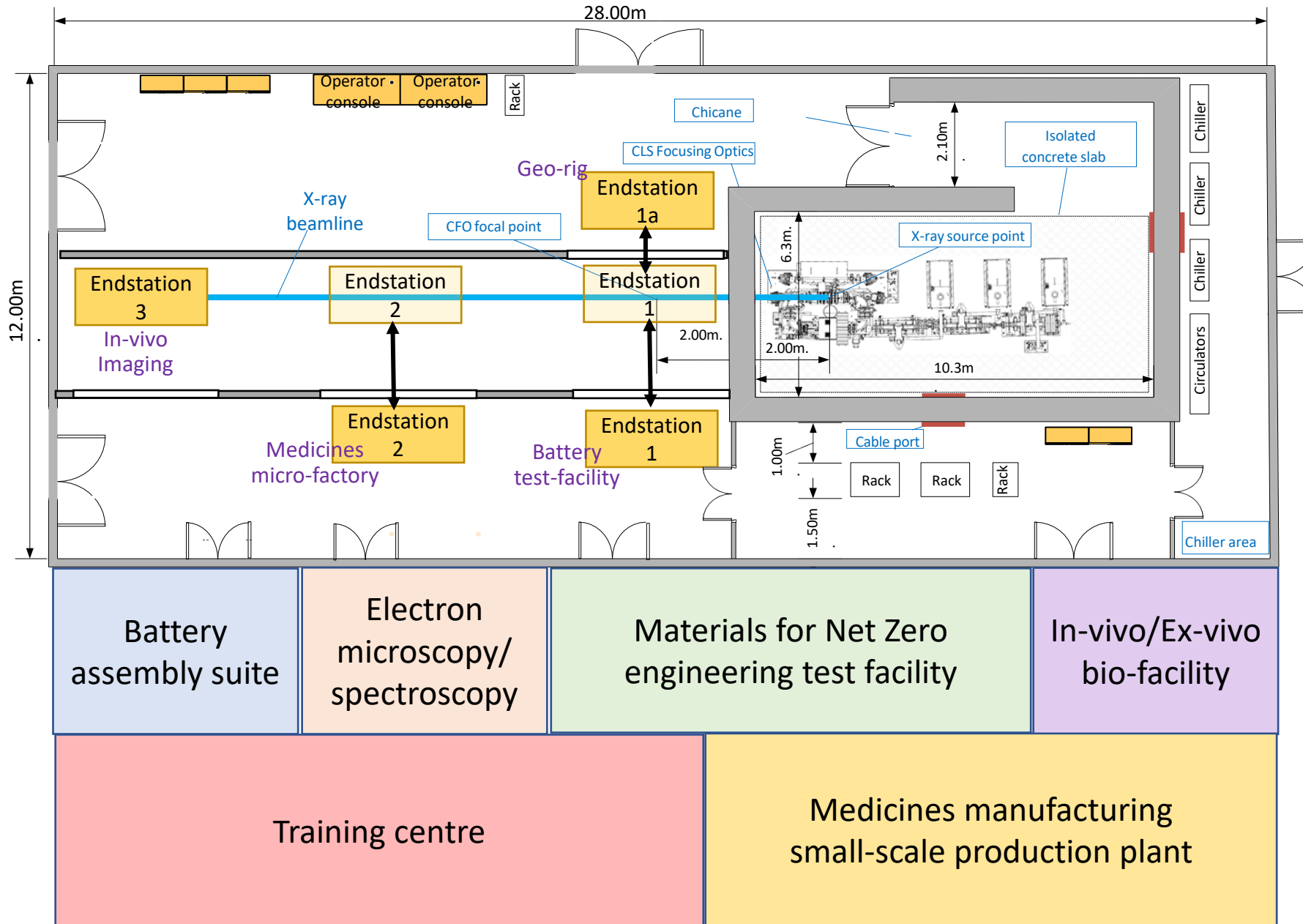
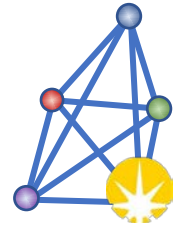
Enabling a wide range of applications and techniques

How would it complement Diamond Light Source?



- *This is not about providing access to beam time for projects that cant get time on DLS. It should be about enabling different types of science*
- UK is good at flagship science but we need tools that can be employed over longer term **campaigns** enabling the **systematic parametric studies** needed to turn flagship science into reliable manufacturing processes and products
- We need to build up **dedicated ancillary support facilities** alongside each node to support specific national priorities (e.g. small animal facility, dry atmosphere battery prep facility, in situ chemical process simulators)
- **Specialised dedicated endstations** for difficult or secure samples (biological, active, energetic, etc).
- We need facilities that are **always on** that can carry out longitudinal studies and can respond quickly to industry (e.g. engineering challenges)
- We need facilities that can be employed **routinely** to support key activities with the necessary standards and processes (e.g. forensics, clinical science, cultural heritage).
- Supporting the **regionalisation of expertise** and providing a doorway to advanced characterisation for local industry/enterprise

Compact light sources: what might a node look like?

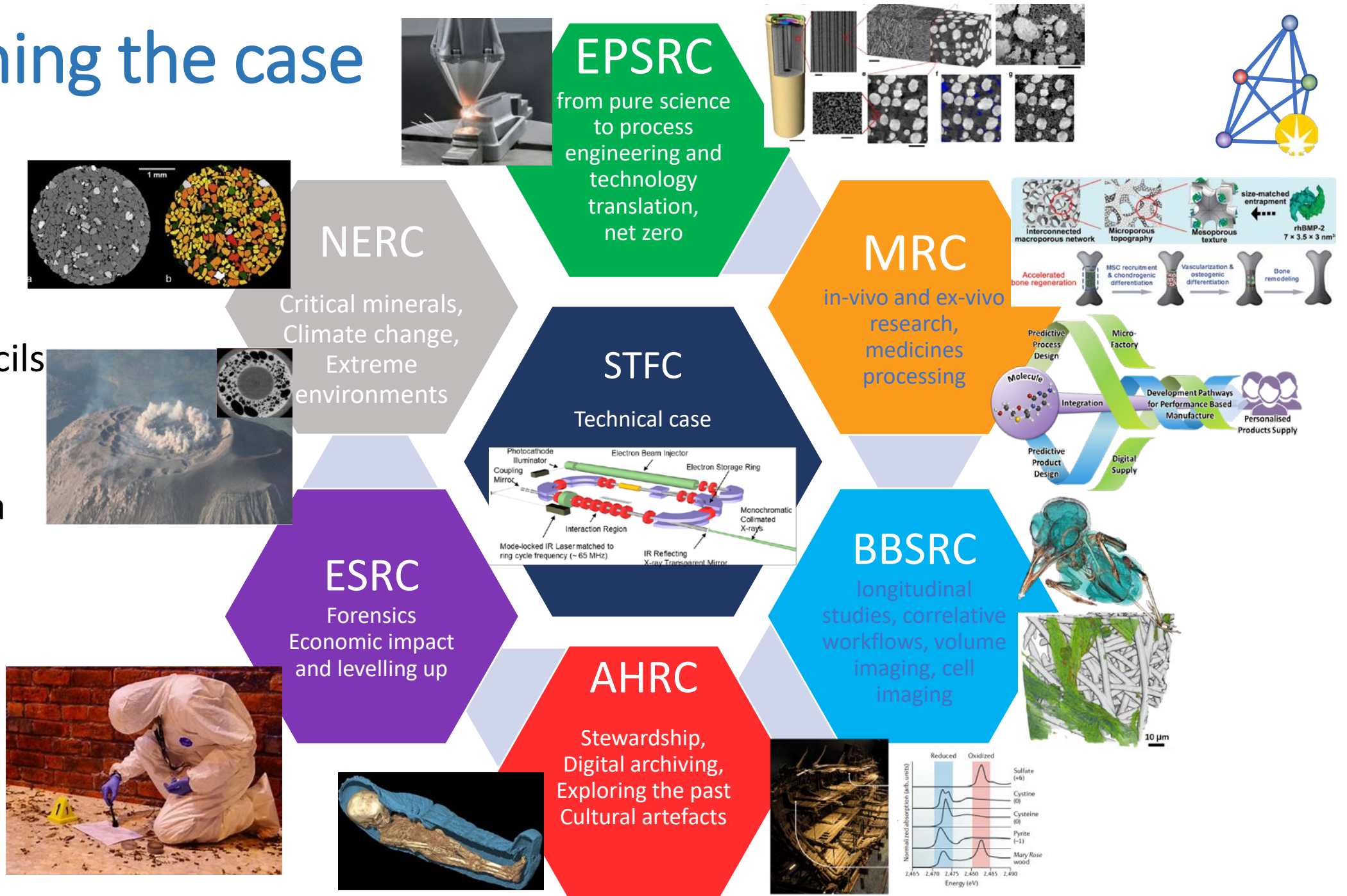


Construction will use STFC's life cycle analysis of sustainable construction, operation and decommissioning

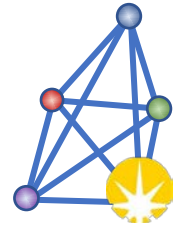
(Design based on existing facilities)

Establishing the case

A series of workshops in collaboration with the research councils to look at the opportunities presented by a CLS-Grid



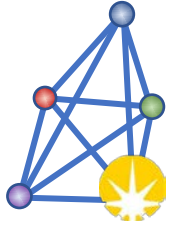
CLS-grid: how might it operate?



The ~300 people who took part in our original discussions identified a number of aspects that would make CLS-Grid unique

- Fast application and agile scheduling process – **no 6 month rounds**
- Grid is **always on** – short shutdowns coordinated between facilities
- Grid managed to direct users to the **best node or DLS** for their work
- The nodes would have **different beam characteristics** and have different ancillary support facilities.
- Each node would support specific **national activity/priority areas**, as well as take general applications from academia and industry
- Each node would have a **mixed funding model**
- Each node might have a **mixed staffing model** (baseline staff, university staff, research funded staff, catapult staff, etc)
- Truly **pan-Research council** initiative
- Distributed professional and technical development and training

Establishing the grid



- Node locations to be added step-wise
 - Benefitting from scale for shared technical design, build and equip resources
 - Working with UK provider companies (e.g. via [UKRI](#) to develop UK competence and export opportunities)
- Potentially a mixed model for identifying host locations might deliver the best outcomes
 - Nodes distributed nationally across the regions
 - Within a region these could be bid for with local co-investment/staffing and alignment with regional/national priorities and activities
 - Each node would be distinctive and have different stakeholders (LEPs, specific research councils, Universities, DSTL, Catapults, Institutes, etc) but would adhere to national coordination