



January 23, 2026

5th International Sample Environment School

Experiences at a Starting Facility

Bekki Mills

High Temperature Group Leader

Spallation Neutron Source

High Flux Isotope Reactor



U.S. DEPARTMENT
of **ENERGY**

ORNL IS MANAGED BY UT-BATTELLE LLC
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Early SNS Sample Environment: Learning by Doing



*Installing 5 Tesla magnet onto BASIS
(backscattering spectrometer) May 2008*

What is a “starting facility”?



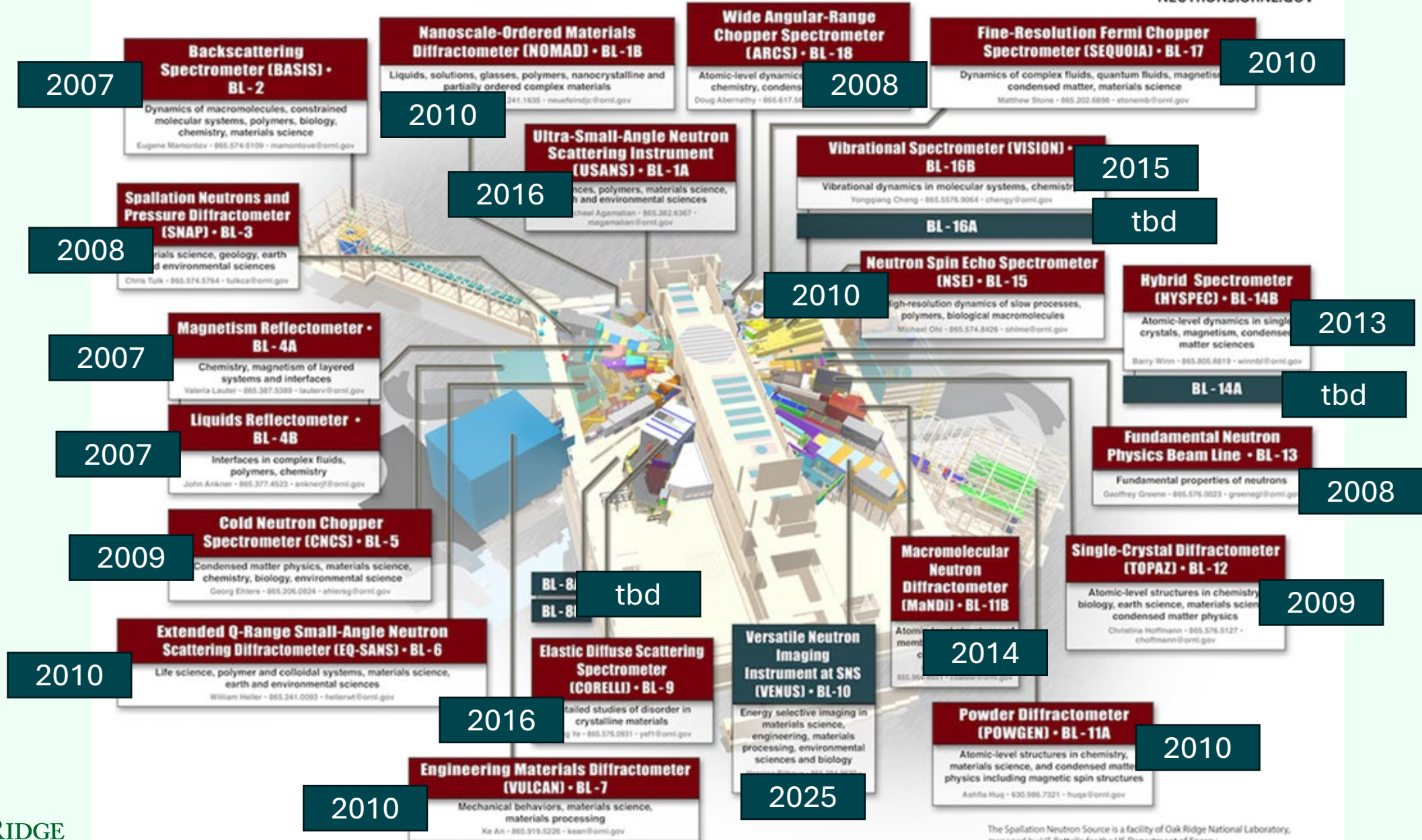
SNS Timeline

Spallation Neutron Source – Oak Ridge National Laboratory



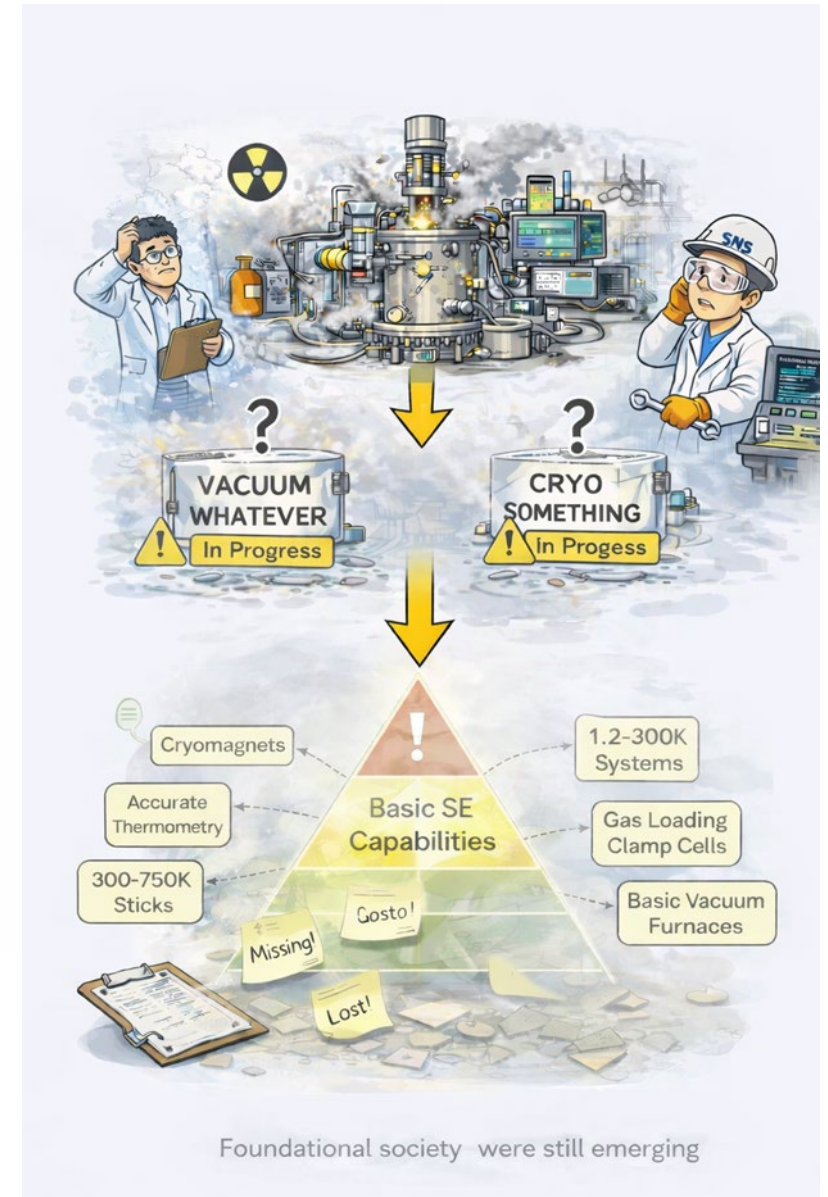
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Credit: ORNL, U.S. Dept. of Energy

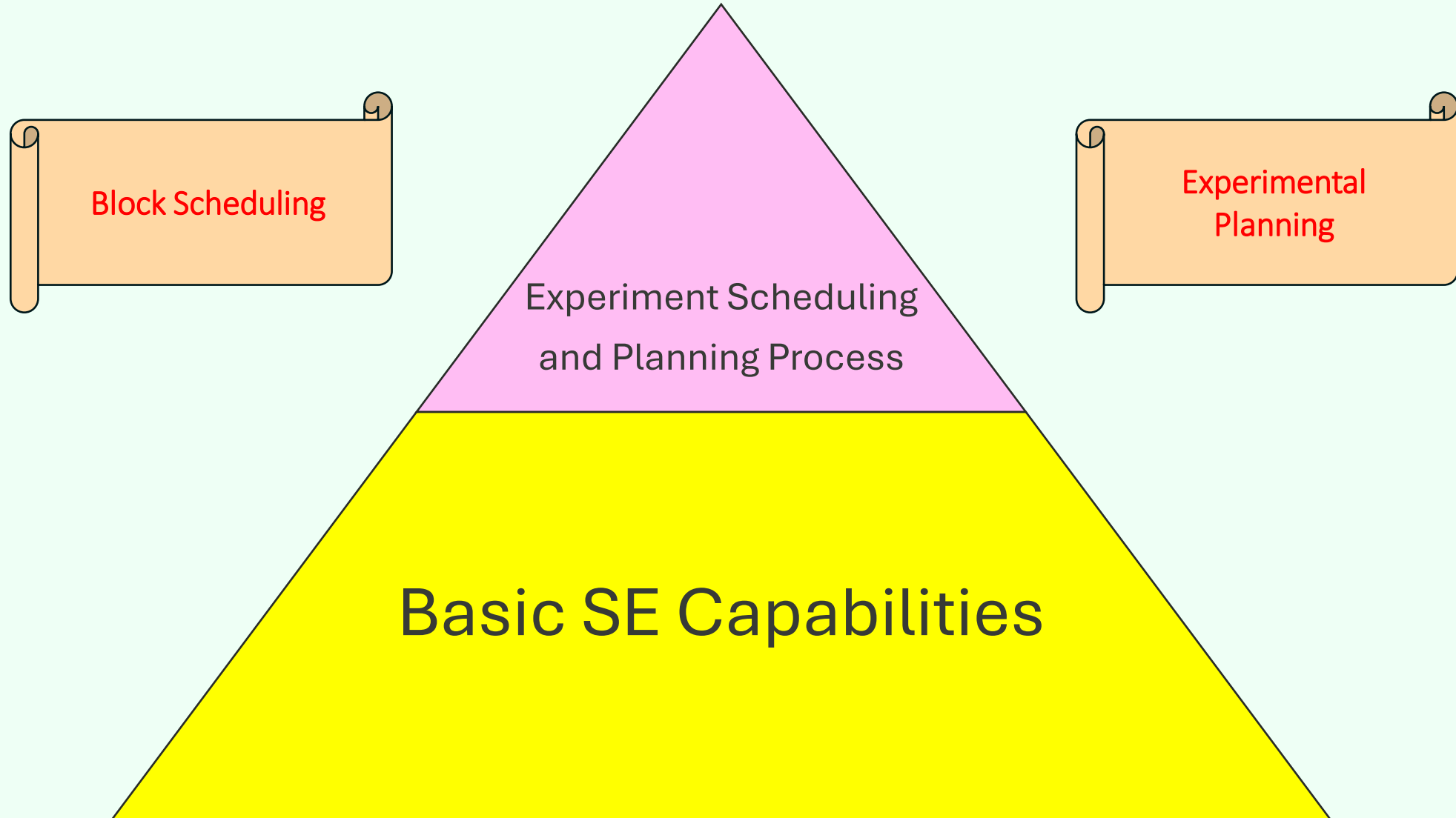


Starting with the Basics

- 4-300K systems
- Wet or Dry Cryostats 2K-300K
- He3 systems
- “Hot Sample Sticks”
- Software Control of SE
- Cryo-Magnets
- Accurate Thermocouples
- Gas Loading and Clamp Cells
- Standard Neutron Scattering Furnaces

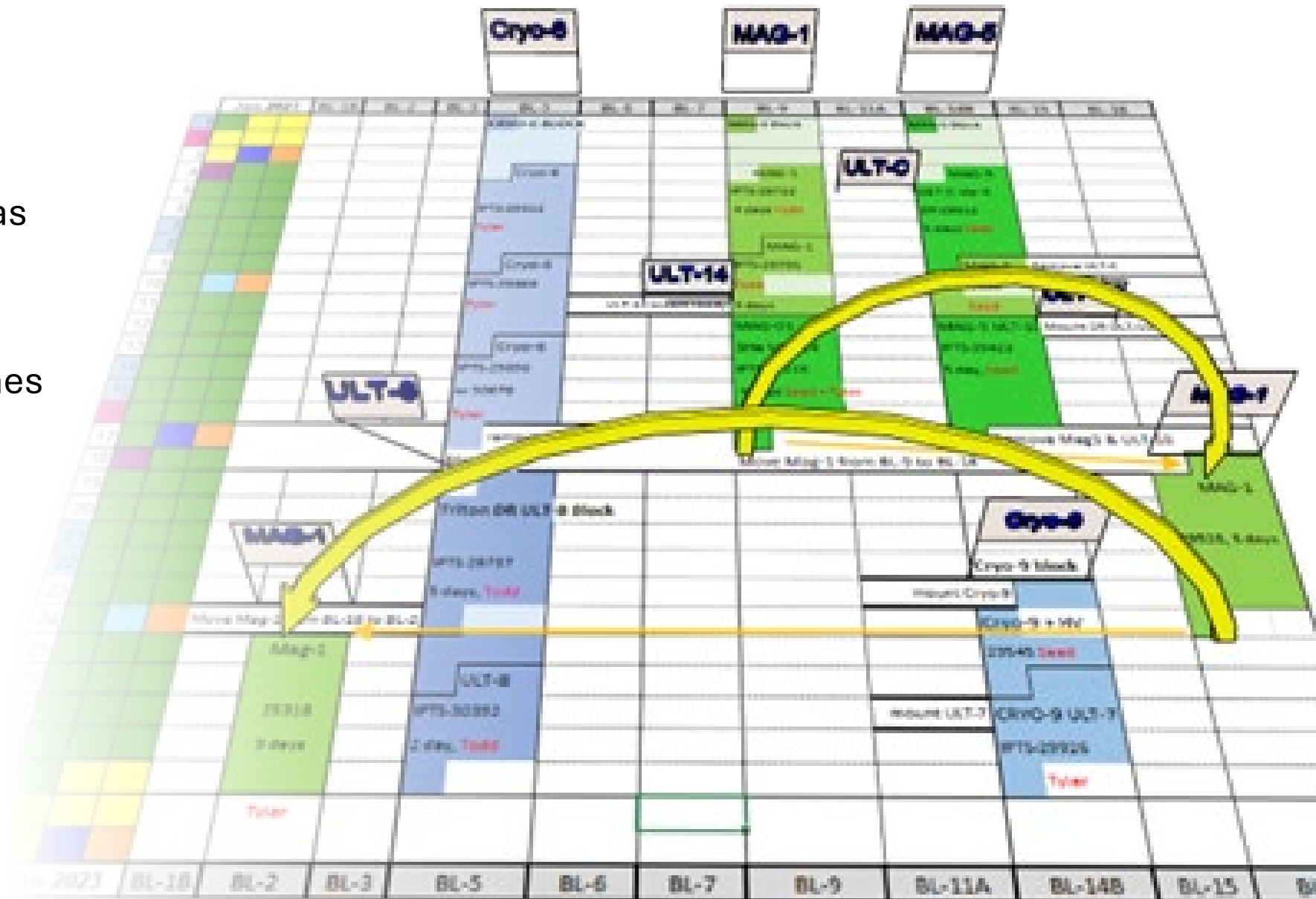


Going Beyond the Basics



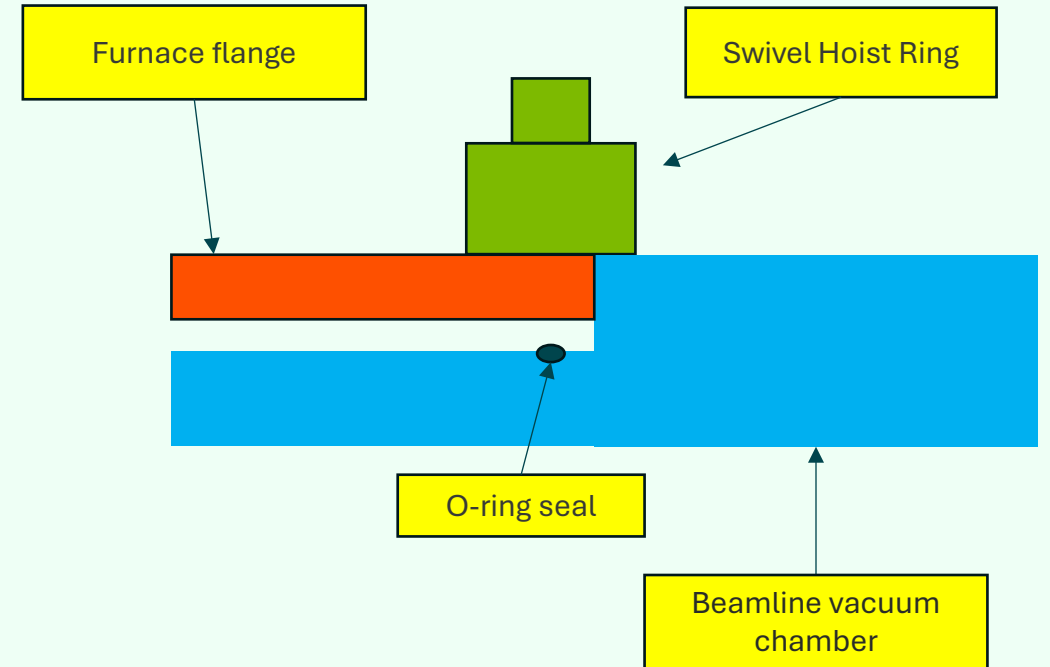
Scheduling Sample Environments

- Experiment planning evolves as capabilities stabilize
- Equipment scheduling becomes essential at scale
- Block scheduling improves reliability and sustainability

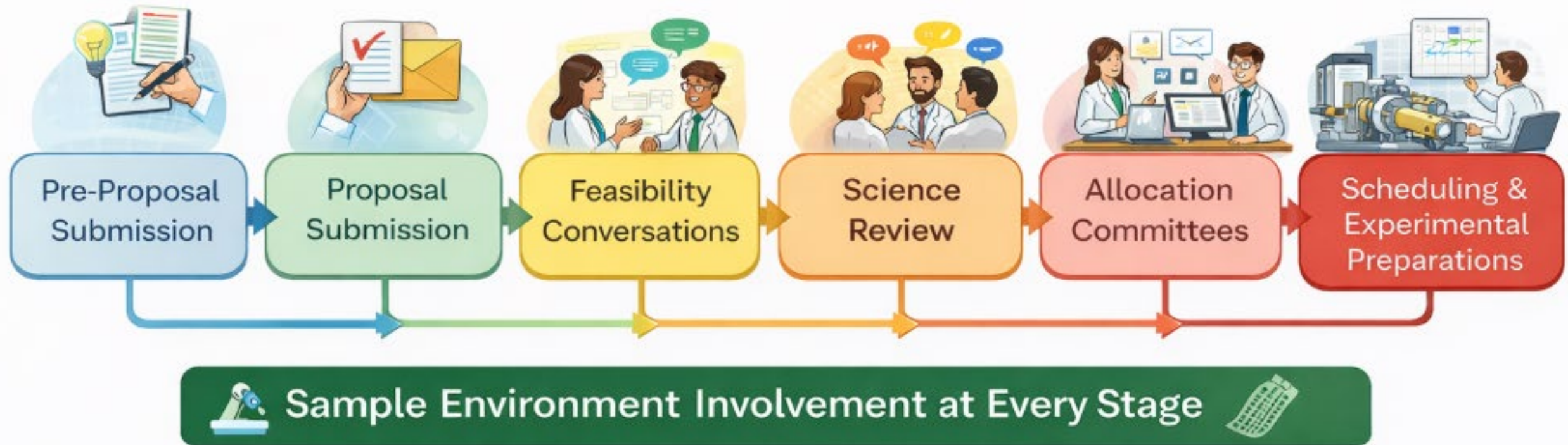


Quick Lessons:

Fit Test Equipment Before the Start of the Experiment



Experimental Planning: From Proposal to Beamtime



Example of Planning and Testing to our Advantage



Test 1: Sealed Vanadium sample can heated to 800C for 3 hours



Test 2: Sample sealed in quartz capsule, inside of sealed vanadium sample can, heated to 750C for 2 hours

“Friendly” Users and Early Expectations

“Friendly”

What They Sound Like:

Sounds fun!

Just happy to help!

What They Are **Actually** Like:



Very senior and experienced specialists



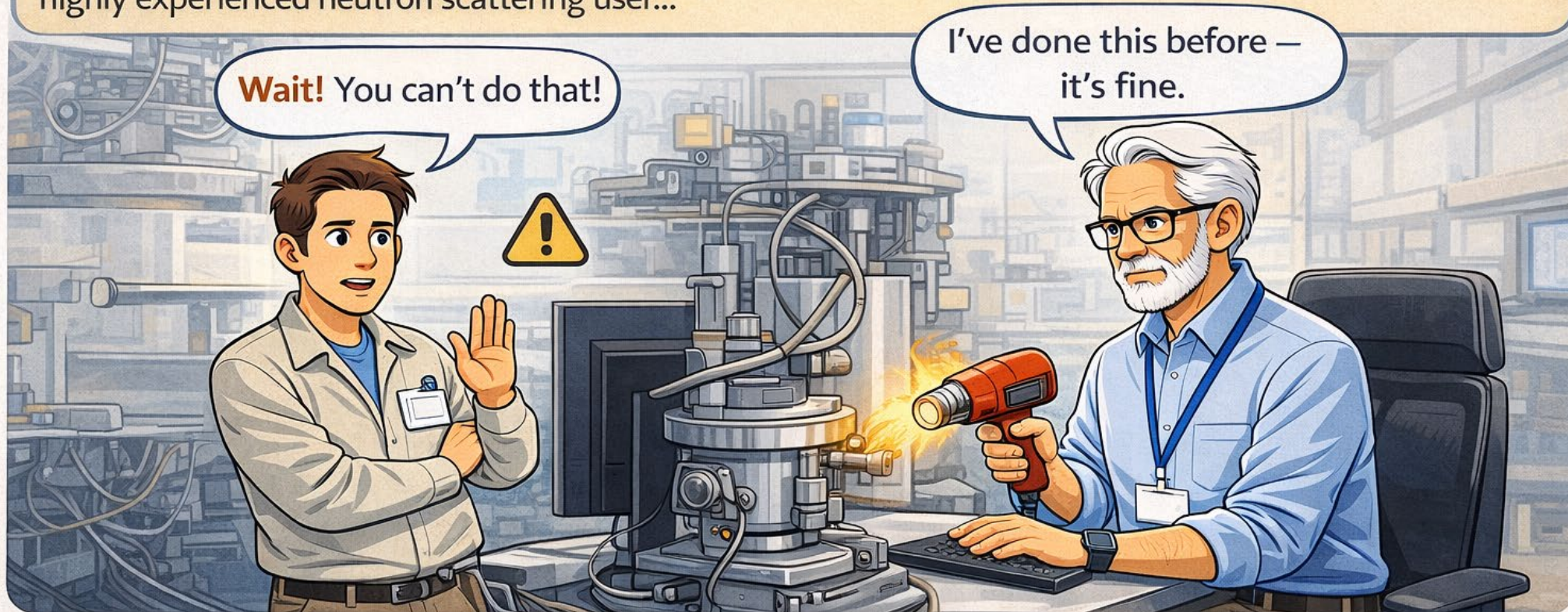
High standards and expectations



Image generated by ChatGPT, 2026

Having Grace and Building Trust with Early Users

Example from our **early days**: A sample environment technician was supporting an experiment with a highly experienced neutron scattering user...



Key Takeaway: Learn Early from Experienced Users

● Experienced users can bring deep expertise



● Build trust through shared problem-solving



Image generated by ChatGPT, 2026

In Conclusion: Working at a Starting Facility Is an Adventure



- **A starting facility** is a **journey**, not a single moment.



- **Strong basic sample environments** are the **foundation** for everything that follows.



- **Capability** grows through **planning**, **partnerships**, and learning along the way



- **Thoughtful scheduling** makes the adventure sustainable for people and equipment.



- **Early sample environment** involvement helps good science succeed.



Thank you for your attention!