

# Cyber-enabled Discovery and Innovation and DMR Programs

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# Outline

- CDI
- An example
- Facilities, networks, instrumentation

# CDI

Computer-Enabled Discovery and Innovation (CDI)  
is a bold five-year initiative to create  
**revolutionary** science and engineering research  
breakthroughs made possible by innovations and  
advances in computational thinking.

Computational thinking is defined  
broadly and comprehensively to encompass computational  
concepts, methods, models, algorithms, and  
tools.

# CDI Scope

- Five year initiative
- NSF-wide, all directorates and offices
- \$750M over 5 years (Requested!)
- Interdisciplinary and transformative

FY2008	FY2009	FY2010	FY2011	FY2012
\$52M	\$100M	\$150M	\$200M	\$250M

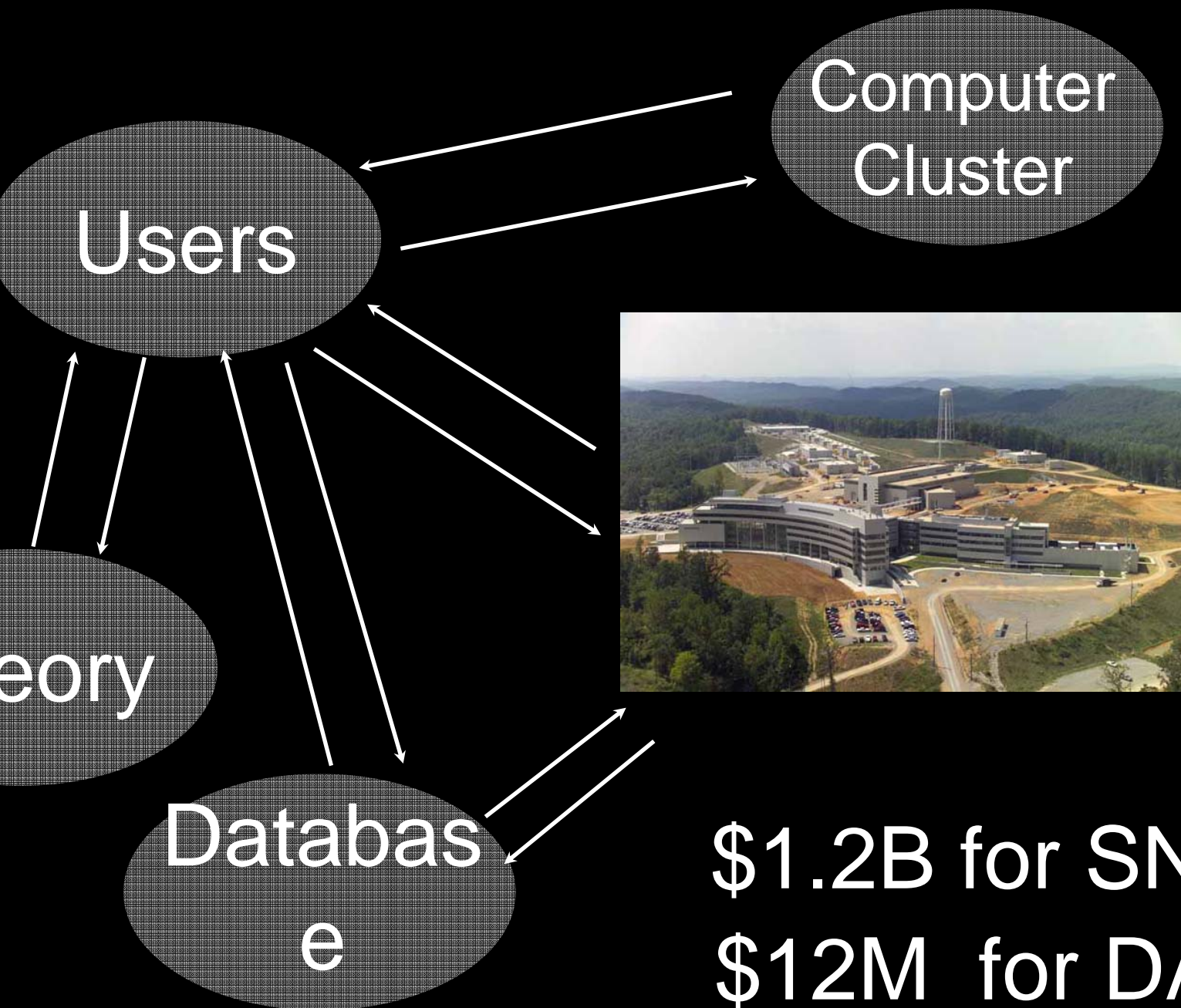
- Virtual Organizations
- Data to Knowledge
- Complexity

# Computed Analysis of Neutron Scattering Experiment



Spallation Neutron Source

# Distributed Analysis of Neutron Scattering Experiments



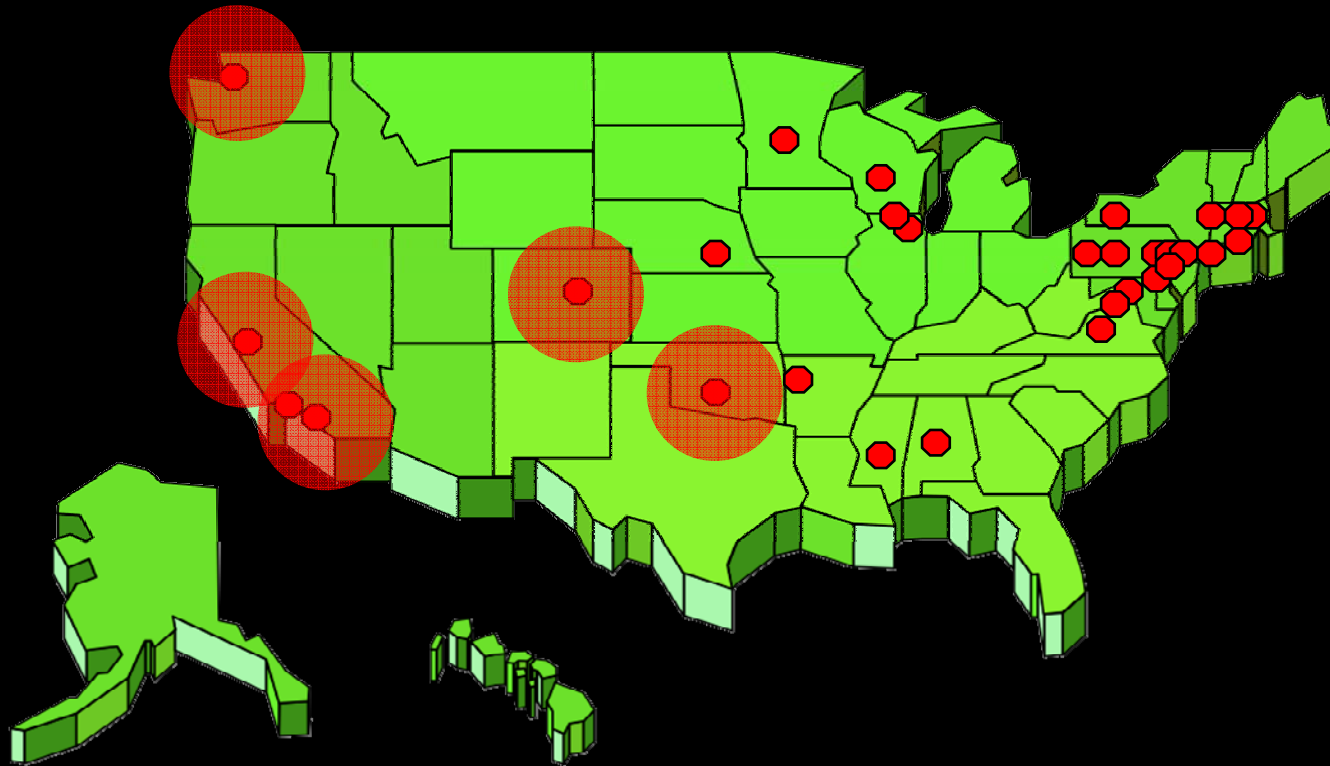
- Distributed resource
- Unites communities
- Encapsulates code
- Extensible
- Fosters collaboration

\$1.2B for SNS  
\$12M for DANSE

# Scaling

- Synchrotrons, Mag. Lab, NIST
  - Hub and spoke
- MRSEC--facilities network
- Instrumentation, remote access

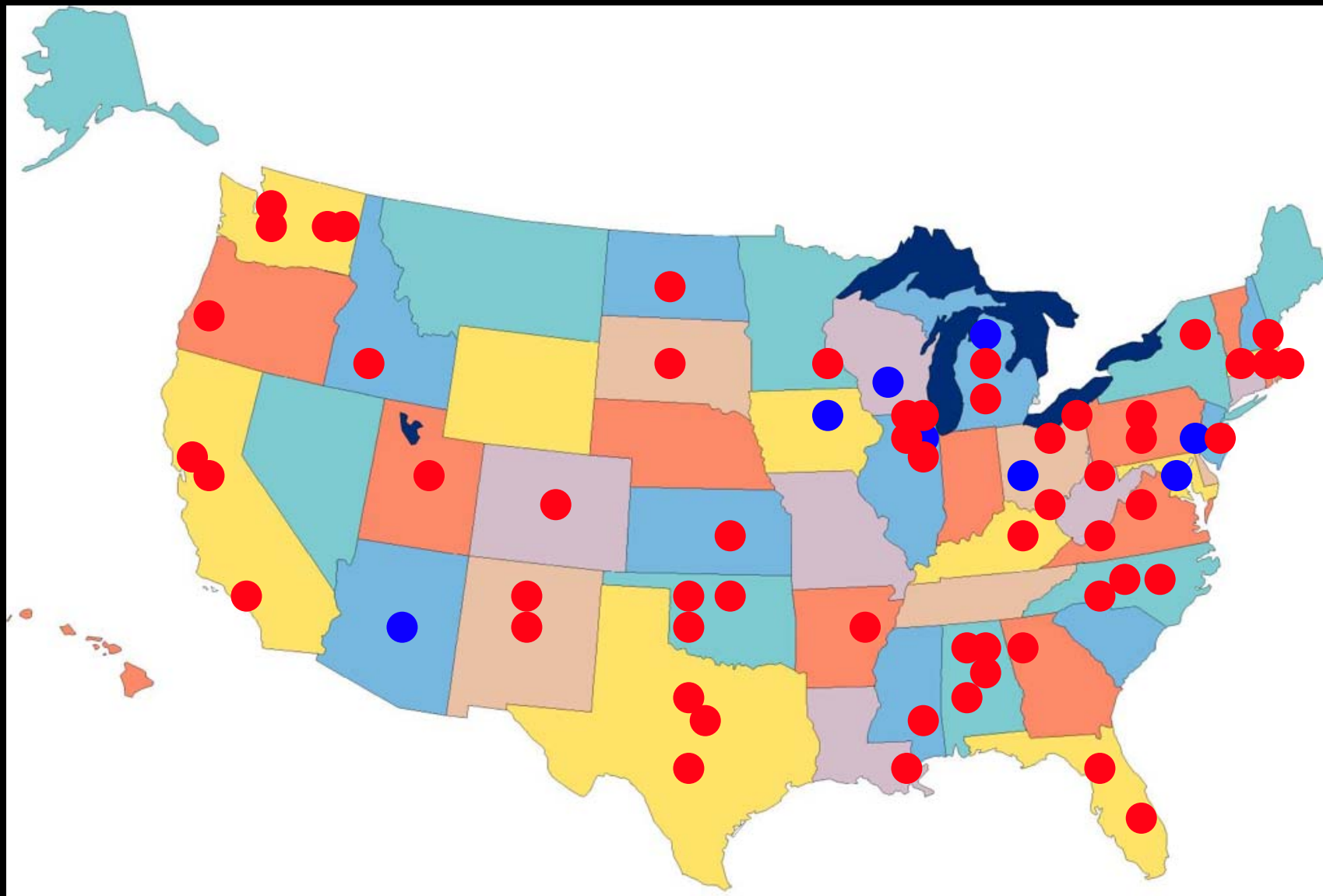
# MRSECS



- 26 MRSEC, 5 Coordinating sites for facilities network
- Identify partners within MRSECs
- NSF as portal. One contact. Other networks



# Electron Microscope Awards and Requests



Rem  
Acc

# CDI Challenges

- Engaging DMR communities
- Relating CDI to DMR programs

[www.nsf.gov/crssprgm/cdi](http://www.nsf.gov/crssprgm/cdi)

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