DANSE: “Facility Update”

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- Goals and Issues
  - Schedule, Cost, and Quality
  - What will be delivered?
- Project Management
  - Management Practices

Why DANSE ?

New Science

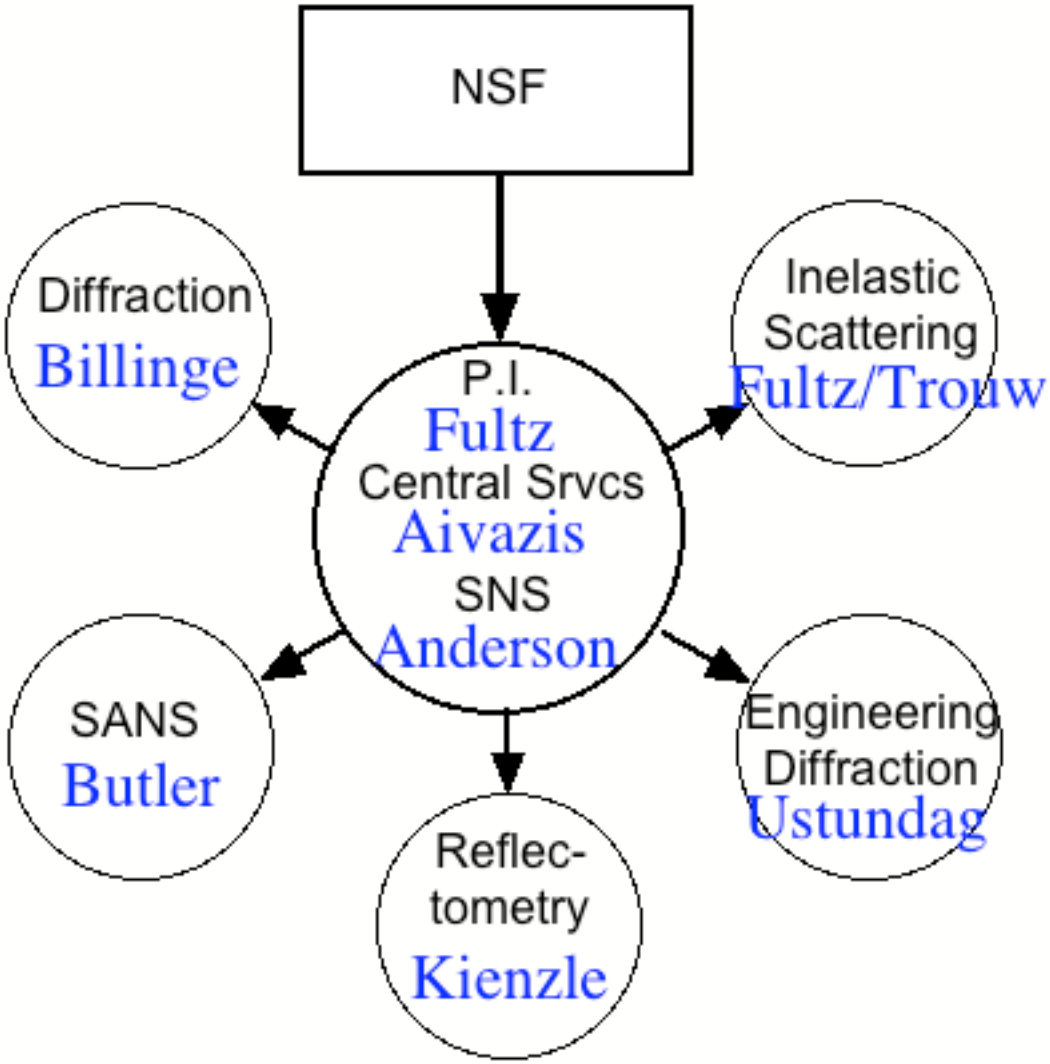
Better Science

Ease of Use

Software Stability and Reuse

Support Early Operations of the SNS

The DANSE Project



Develop computing methods for new types of discovery in neutron scattering science.

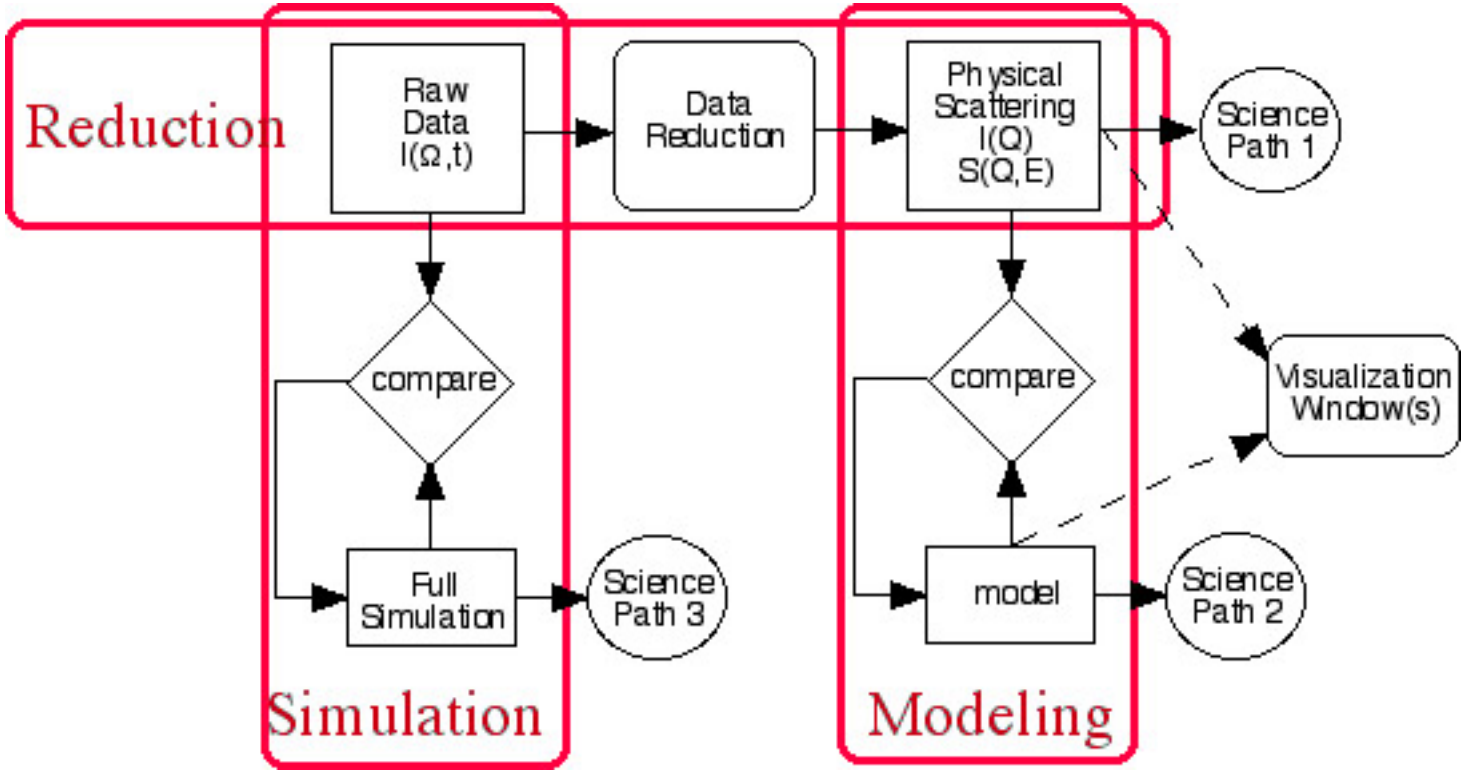
Ensure a career path for scientists who add value at this higher level.

DANSE focus is higher-level analysis tools

Approximately, the responsibilities of DANSE and SNS meet at S(Q,E) or I(Q)

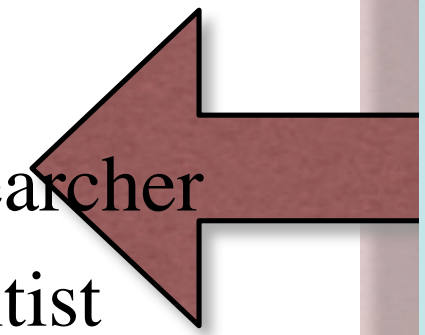
SNS Data and Reduction } S(Q,E) { DANSE Analysis Modeling

Three Paths to Discovery



Users Differ in Expertise

1. Beginning Student
2. Senior Student or Postdoc
3. Young Scientist
4. Established Researcher
5. Instrument Scientist
6. Software Developer
7. System Maintainer



REQUIREMENT
One application must serve everybody. Support for different user interfaces

Project Metrics: Schedule, Cost, Quality

- All are critical
- Reality: pick 2 of 3
- NASA Management emphasis on
  "Faster, Cheaper, Better" proved a disaster
- DANSE is doing well on Cost and Quality
  Schedule is a personnel issue

What Will DANSE Produce?

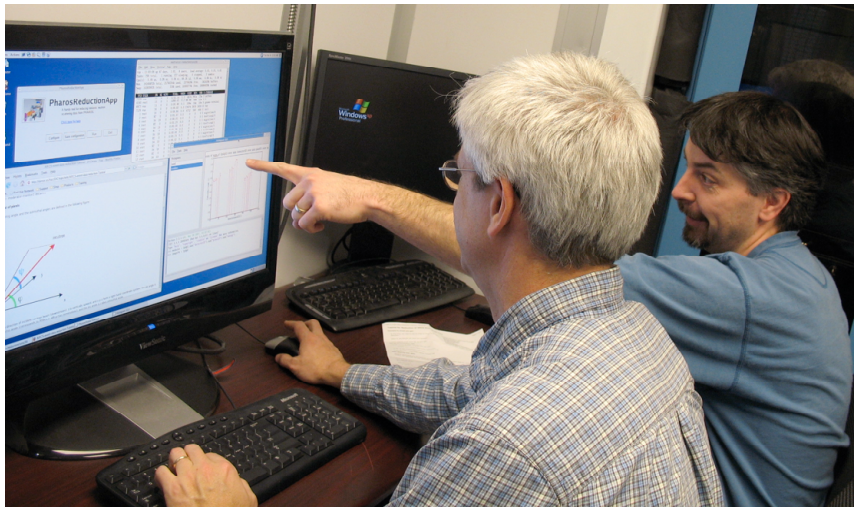
- Science-specific packages in

Diffraction, Engineering Diffraction, SANS, Reflectometry, Inelastic

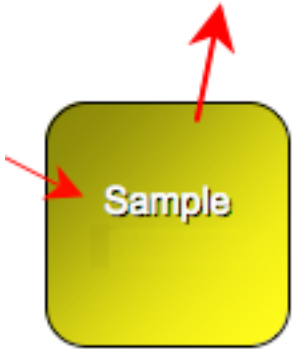
- Deliverables are at the discretion of project leaders, and vary by community needs
- SANS, reflectometry, diffractometry, have large numbers of users who need fast data visualization and manipulation
- Inelastic, engineering diffraction have focus on developments in materials theory (DFT, FEA) -- deployment as a web service.

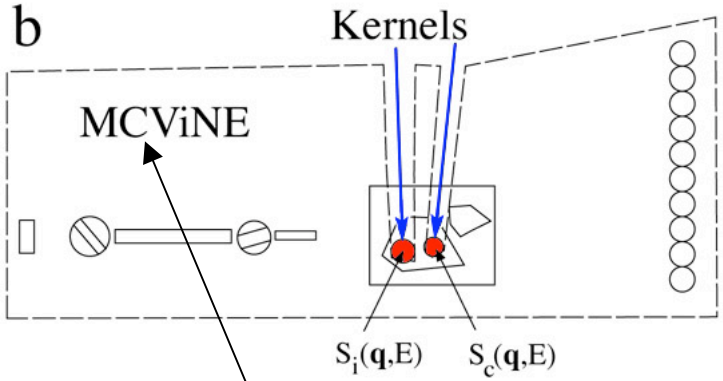
Data Reduction for Chopper Spectrometers (DRCS, or "DrChops")

- Installed on the ARCS cluster, to be adapted to SEQUOIA, CNCS
- Modular structure allows quick production of diagnostic tools
- Performance scales almost linearly with the number of processors.
- In use now.

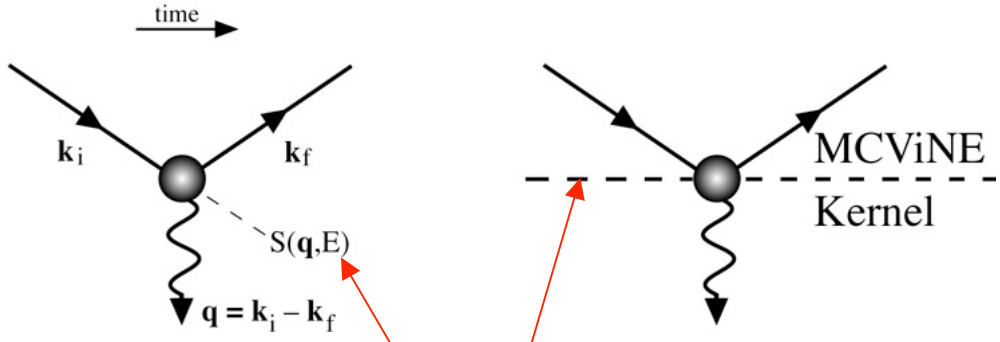


Virtual Neutron Facility: vnf
Monte Carlo Instruments + Scattering Kernels





McStas pieces,
but replaced
McStas compiler

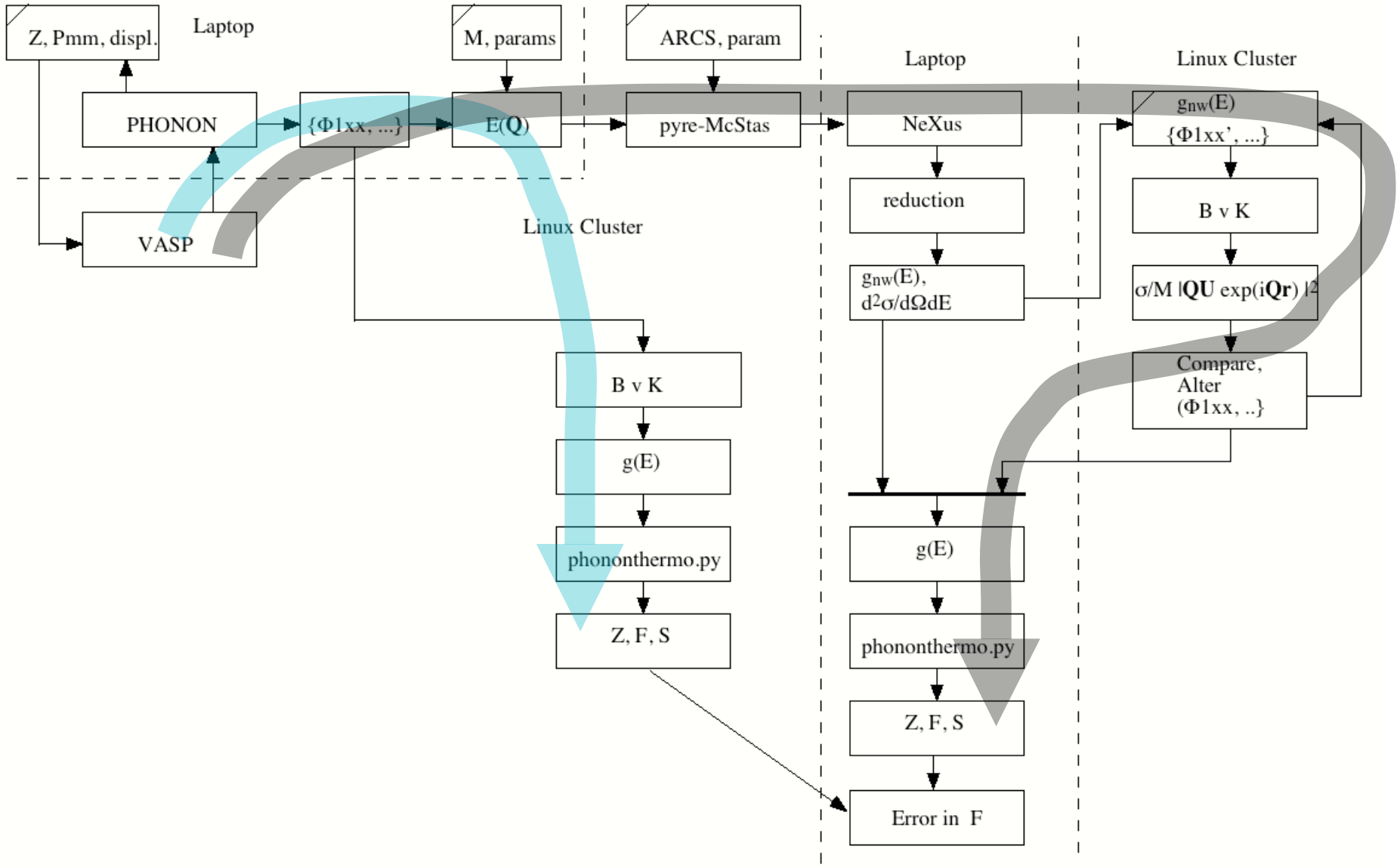


Interface is at S(Q,E)

Demo of vnf web service

http://vnf.caltech.edu

Error Bars in Phonon Thermodynamic Quantities



Summary

- Lots of low-lying fruit for computation and neutron science.
  - Laptop-friendly focus for SANS, reflectometry
  - Computational science focus for inelastic, engineering diffraction
- Misperceptions of specifications are the biggest risk in software projects, but DANSE developers are users.
- Subproject leaders know what science they want. Roles of DANSE and SNS have evolved naturally.
- The DANSE Project is initiated, and path forward is clear.