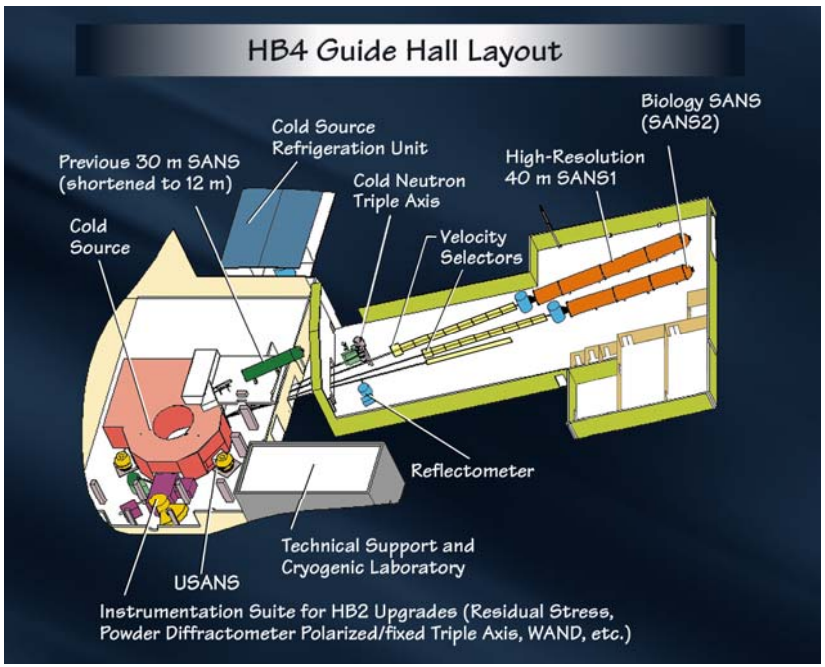
SUPPORT FACILITIES NEEDS FOR SOFT MATTER

Infrastructure: Needs & Requirements

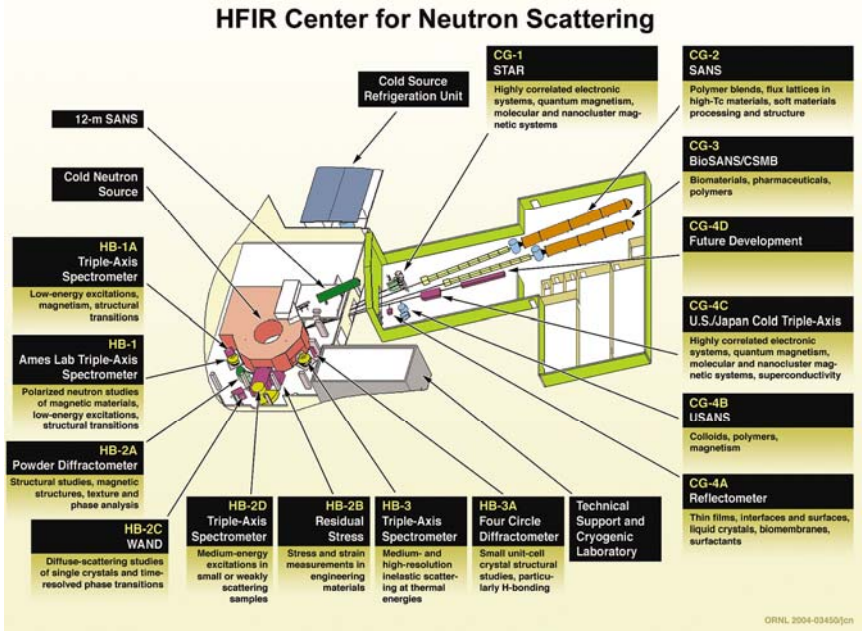
HFIR



SNS

CSMB - Biological SANS at HFIR

- Bio-SANS station designed specifically for biology
  - Designed with community
  - Low background/high flux
  - Additional Shielding
  - Resolution dλ/ λ ~20% (8-45%)
  - User friendly operation



- User Program, Infrastructure & Support
  - Laboratory for bio-sample preparation
  - DLAB - H/D-labeling, isolation & characterization
  - Computational tools for structural biology
  - New SAXS and Light Scattering

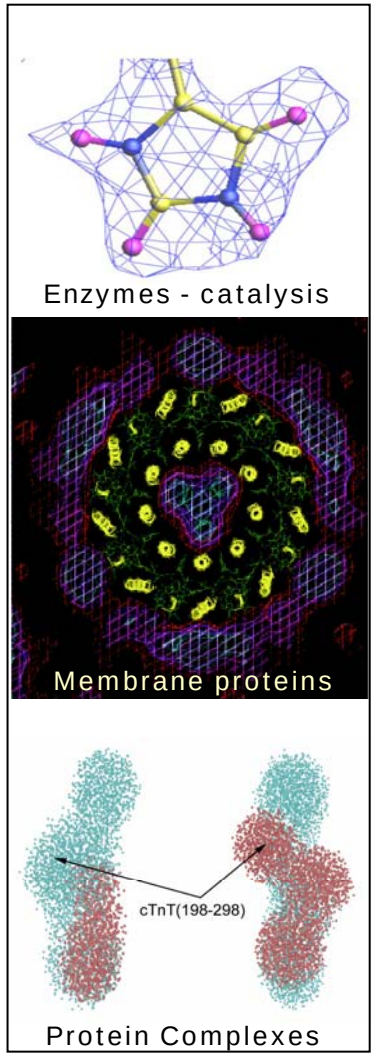
A world class facility for the US user community.

Deuteration Laboratory

Central facility and user program for *in vivo* H-D labeling of macromolecules

FY05 LDRD with Dale Pelletier (*Life Science Division)*

- Develop a Central Deuteration Laboratory dedicated to specific H/D labeling of cells, proteins, nucleic acids and other bio-molecules.
- Develop better and faster systems and methods to produce deuterium labeled biological macromolecules for the biology community
- Improving downstream technologies to exploit these reagents (including data collection and interpretation for neutron scattering)
- Train research students and staff in application of these powerful techniques

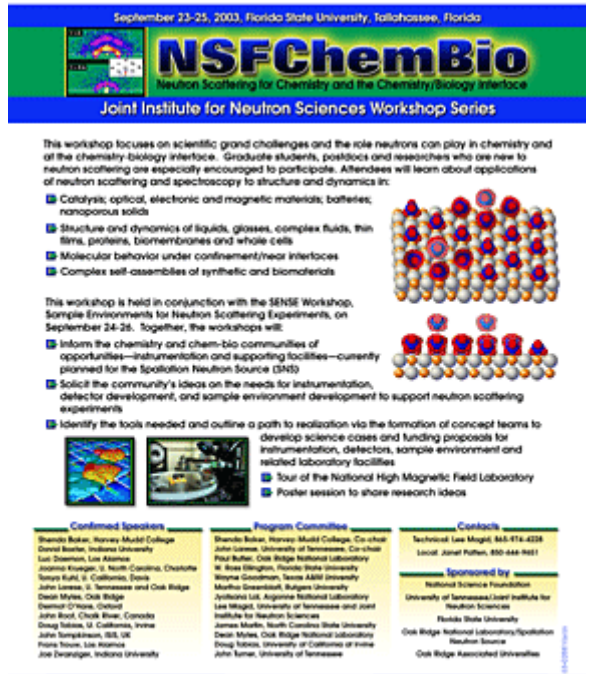


2005 - ORAU Visiting Scholar Program

Community Needs – Community Support

- Neutron Scattering for Chemistry and the Chemistry/Biology Interface
- Sample Environments for Neutron Scattering Experiments

http://www.sns.gov/jins/tallahassee_workshops_2003/workshops.htm



NSF CHEMBIO Sept. 25, 2003

Paul Butler & Joanna Krueger

- 1) X-ray scattering/reflectivity instrumentation on site at the neutron facility is essential

  A) Reflectometer geometry (theta-theta diffractometer, Goebel mirrors and a scintillation detector)

  B) Small-angle x-ray scattering

- 2) Significant laboratory space on the floor in close proximity to the instrument is critical

  - A) A full chemistry & soft matter laboratory in CLO
  - B) substantial amount of floor space be available around the sample area

Sense: Biological and Life Sciences

David Worcester, Jim Torbet

Outline of Needs and Recommendations

- Deuteration (Essential)
- Relative Humidity (accurate measure, homogeneous)
- Sample changer 10-20 positions, horizontal.
- Hydrostatic Pressure. ~5kbar. Al or Ti,Zr AND sapphire
- Magnetic Field for orientation. ~10T (cryogen free?)
- Hydrodynamic shear for orientations and Rheology
- Pulsed Electric Fields for Rotational Diffusion
- Software Control (as part of data acquisition)
- Ventilation for organics in Reflectometry
- Langmuir Trough

Community Needs – Community Support

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