

Advanced Test Reactor National Scientific User Facility

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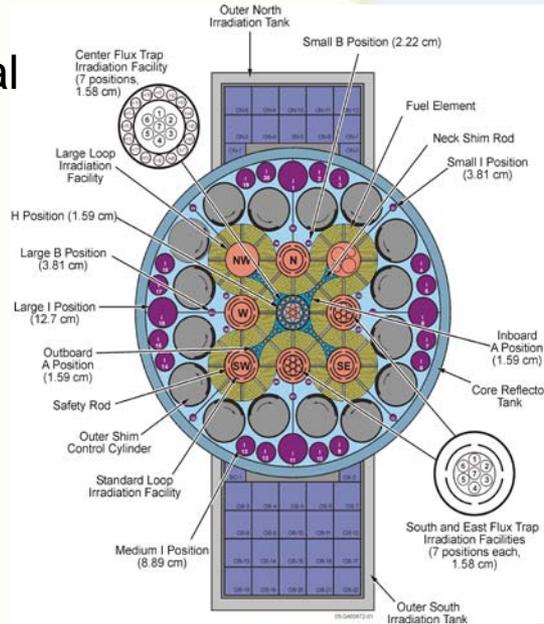
30 March 2010



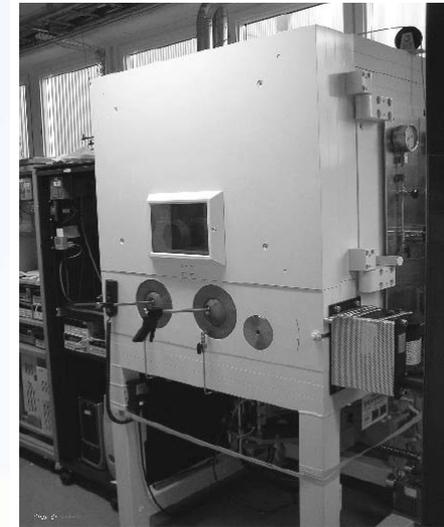
What is the ATR NSUF?

A means to provide the research community access to national capability to conduct cutting edge nuclear technology research and development

Test Reactors and Critical Facilities (ATR, ATRC, NRAD, MITR, Pulstar)



Examination Facilities (INL, MFC, UNLV, NCSU, Michigan, Wisconsin)



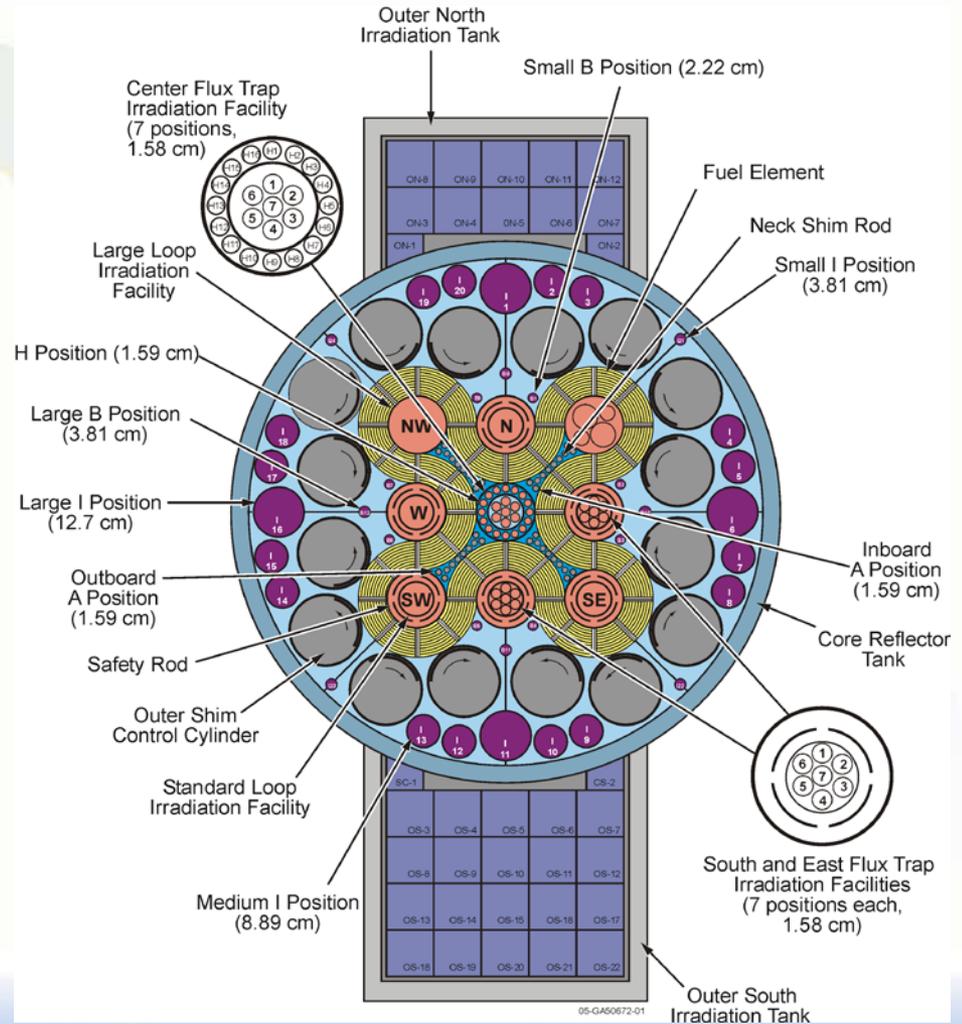
Other National User Facilities (APS, SHaRE)



Smart People



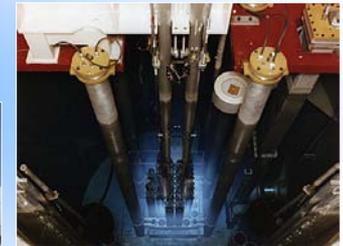
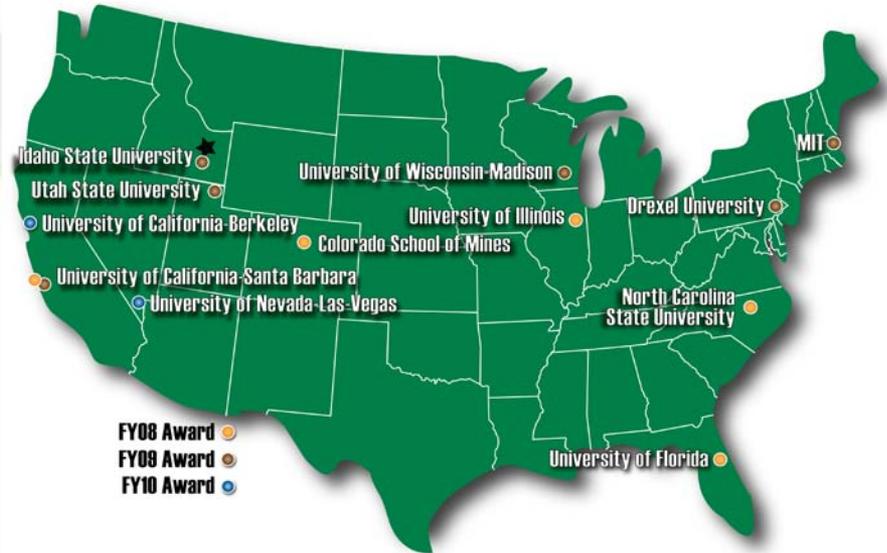
- Test size – up to 5.0” diameter
- 77 Irradiation Positions
 - 4 Flux Traps
 - 5 In-pile tubes
 - 68 in Reflector
- Approximate Peak Flux
 - 1×10^{15} n/cm²-sec thermal
 - 5×10^{14} n/cm²-sec fast
- Rotating Hafnium Control Cylinders – symmetrical axial flux
- Power/Flux Adjustments (Tilt) across the Core



Providing Access to World-class Facilities

- **ATR**

- Wisconsin pilot project inserted in 2008
- Peer reviewed projects
 - 2008 Florida, North Carolina State, Illinois, California Santa Barbara
 - 2009 Utah State, California Santa Barbara, Drexel
 - 2010 Idaho State, Boise State, Central Florida
- Peer Reviewed Projects
 - 2009 Idaho State
 - 2010 UNLV
- **Post-irradiation Examination**
 - Peer Reviewed Projects
 - 2009 Wisconsin
 - 2010 Michigan, Drexel

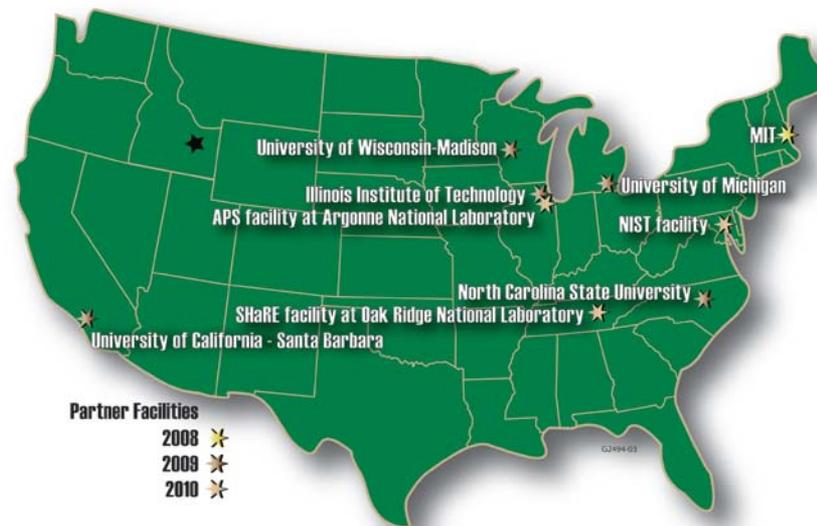


Seventy-five project proposals submitted as part of the first five solicitations, twenty-three ongoing projects

Partnering to Expand NSUF Capability

• University Partner Facilities

- MIT Reactor (4 projects)
 - 2008 Colorado School of Mines
 - 2009 MIT, California
 - 2010 Texas A&M
- Illinois Institute of Technology/
Advanced Photon Source (4 projects)-ANL, LANL, IIT,INL
- University of Wisconsin
Characterization Lab for Irradiated
Materials (1 project)
- University of Michigan Irradiated
Materials Lab
- NCSU Pulsar Reactor
- UNLV Electron Microscopy Lab
- Collaboration with Oxford
University



In discussion

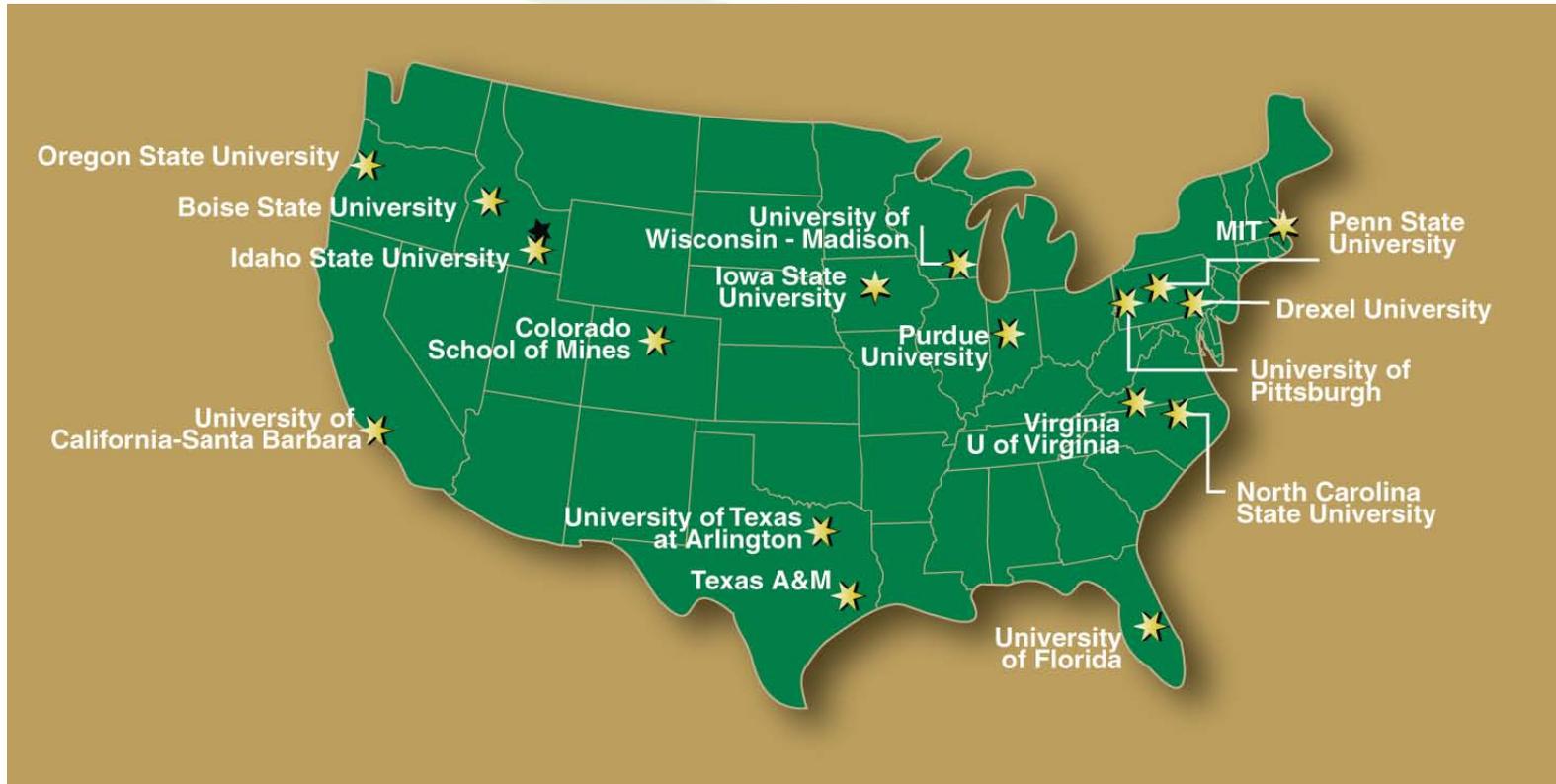
- LANSCE, MAI, HFIR/ORNL

University Education Programs Build a Cadre of Experimenters

- Users Week June 7-11, 2010
 - Fuels and materials performance course
 - Experimenter course
 - New user workshop
 - NSUF Research Forum (first NSUF results)
 - Facility tours
 - Instrumentation Course
 - LWR Forum with Chinese participants (10 engineers from 5 organizations)
 - Scientific Review Board
- Faculty-student teams
- ANS Student conference Apr 2010
- Colloquium Series
- Reactor Testing Textbook



University Visit Program



Spring 2010

- Texas A&M
- Missouri
- RPI
- NCSU
- Ohio State
- Georgia Tech

Requests

- WPI
- Montana State
- Portland State

Breadth of Interaction



Irradiation of Potential Inert Matrix Materials

University: University of Florida

University Investigator: Prof. Juan Claudio Nino, Materials Science & Engineering

INL Investigator: Pavel G. Medvedev

Project Goal: Evaluation of the irradiation stability of potential IM materials and the investigation of irradiation-structure-property relationships.

Sample Types: Ceramic discs of the following compositions for were loaded: $\text{MgO}\cdot 1.5\text{Al}_2\text{O}_3$, MgAl_2O_4 , MgO , $\text{Nd}_2\text{Zr}_2\text{O}_7$, $0.7\text{MgO}\cdot 0.3\text{Nd}_2\text{Zr}_2\text{O}_7$, and Mg_2SnO_4 .

Two specimen geometries were loaded, one for thermal diffusivity measurements and another for TEM characterization .

The specimens have now been irradiated at ~ 350 and 700 °C to a damage level of ~ 1 and 2 dpa in three capsules. The PIE plan documentation for first capsule has been completed.



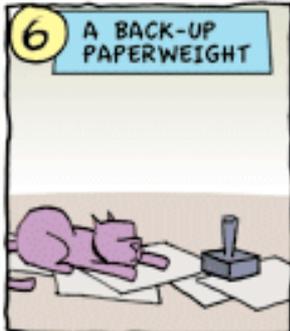
Projects

POOCH CAFÉ

Poncho's
TOP TEN
USES FOR
A CAT



BY PAUL GILLIGAN



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Combining Tools to Get a Better Answer

