

# NCNR

a national neutron user facility

Rob Dimeo

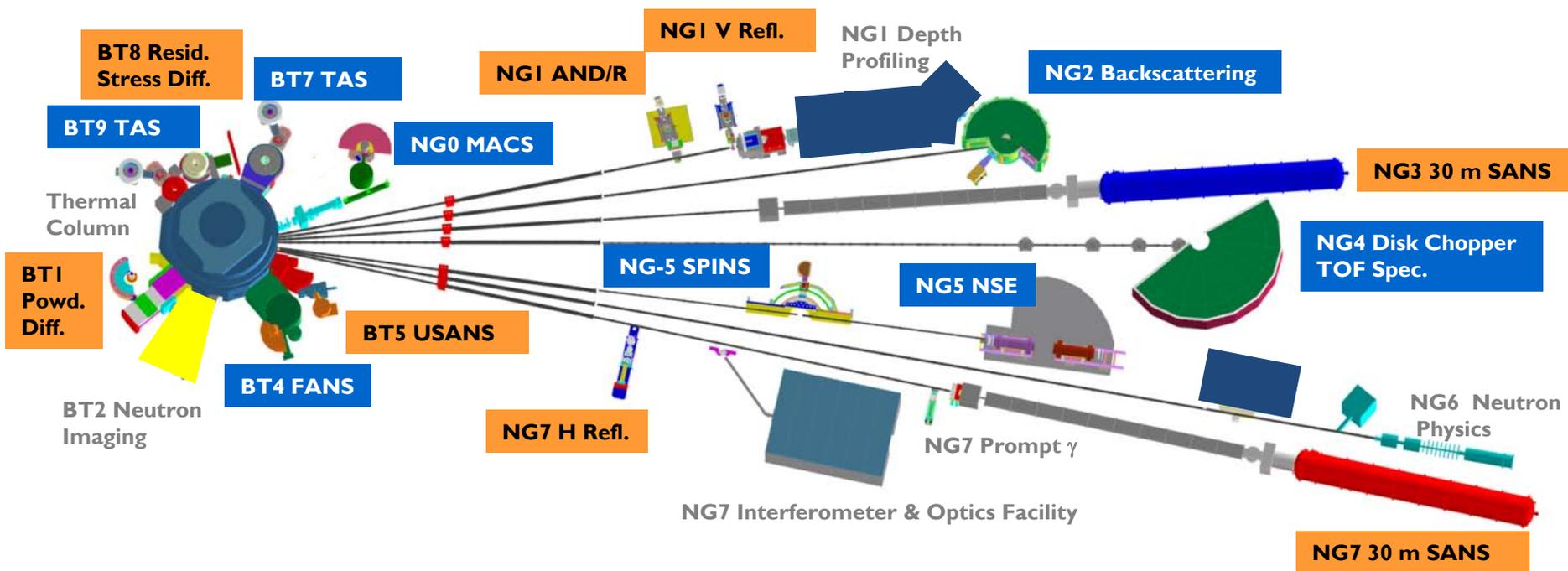


“Assure the availability of neutron measurement capabilities to meet the needs of US researchers”



# 25 beam facilities

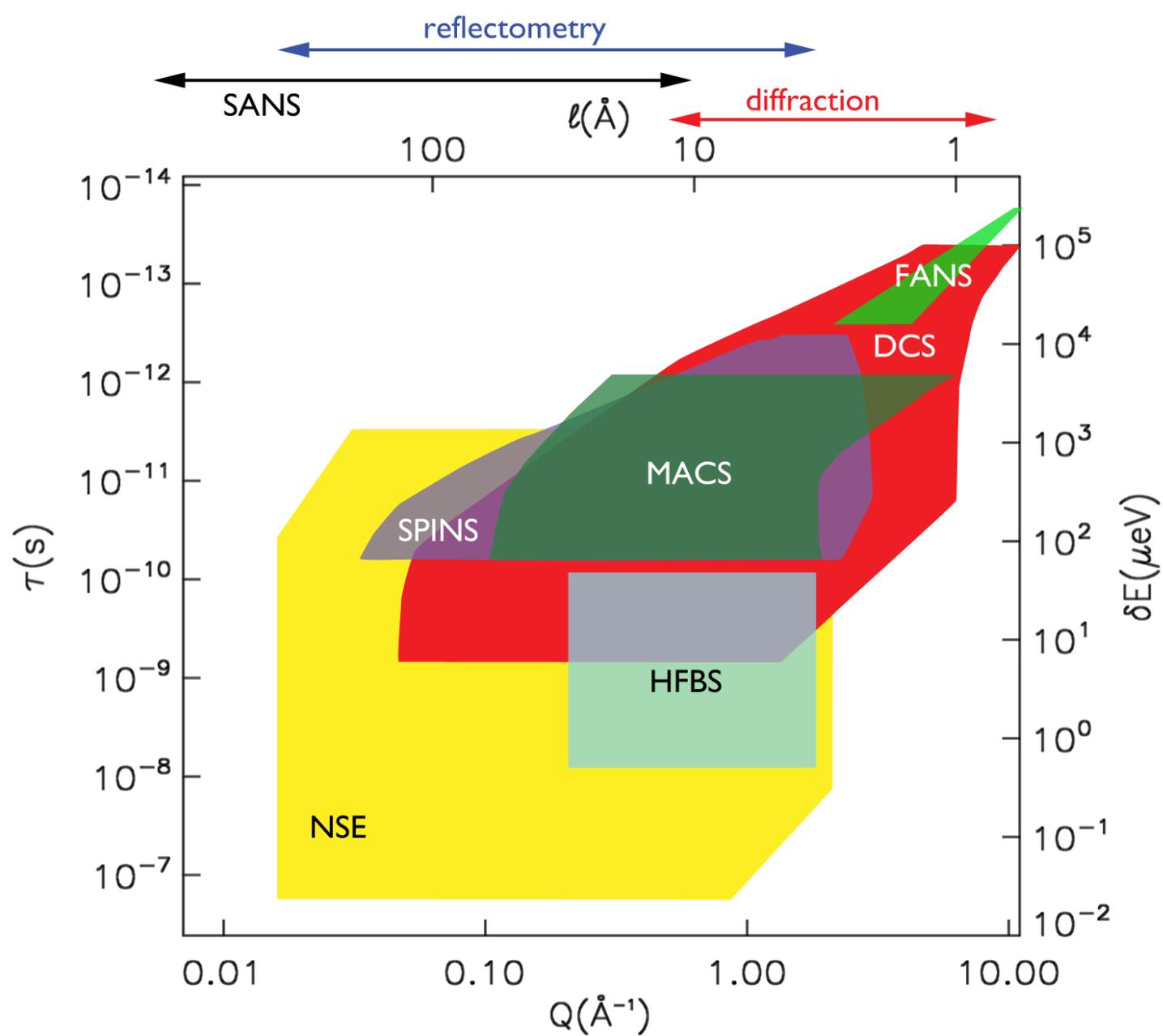
4 irradiation facilities



diffraction

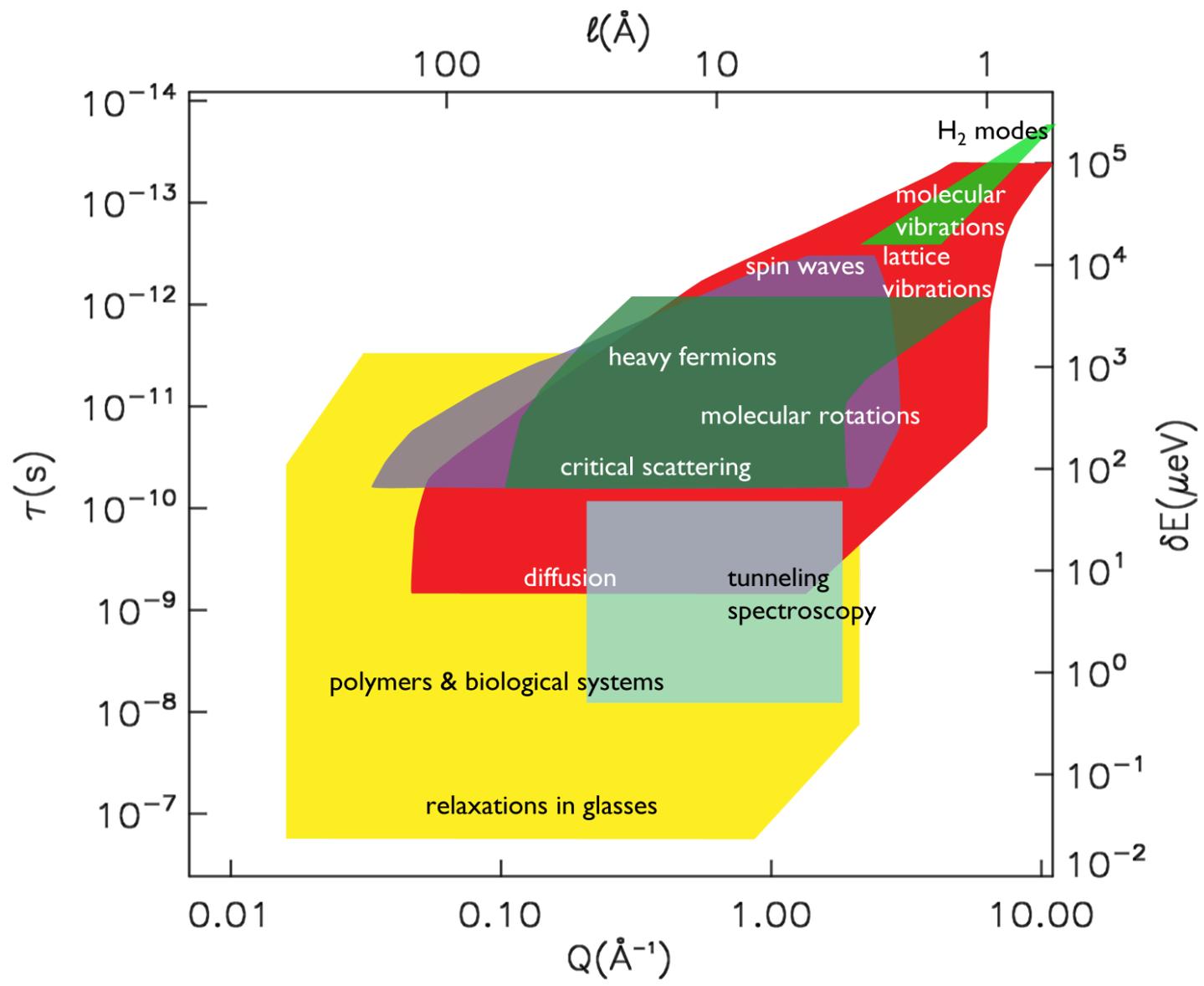
spectroscopy

other neutron methods



viruses    colloids    polymers and proteins    crystal and magnetic structure    liquid and amorphous structure

**elastic scattering**





**NEUTRON SPIN-ECHO**  
highest resolution spectrometer in US



# HFBS

highest count-rate of any  
neutron instrument with  
sub- $\mu\text{eV}$  resolution

# MACS

world's most *intense*, monochromatic, cold neutron beam





What things are important to our

**users**

?

## *2009 Operations Schedule*

This schedule is a best estimate of cycle dates through December 2009. It should be noted that startup and shutdown dates can be altered by elements not under the control of Operat schedule of a startup on Thursday, 38 days of operation, then a shutdown on Sunday. The shutdown will be followed by a 10 day maintenance period. Please note that the cycle in Septemb

**reliable  
operating  
schedule**

JANUARY 6 - JANUARY 28	OPERATING
JANUARY 29 - FEBRUARY 11	SHUTDOWN
FEBRUARY 12 - MARCH 22	OPERATING
MARCH 23 - APRIL 8	SHUTDOWN
APRIL 9 - MAY 17	OPERATING
MAY 18 - MAY 27	SHUTDOWN
MAY 28 - JULY 5	OPERATING
JULY 6 - JULY 22	SHUTDOWN
JULY 23 - AUGUST 30	OPERATING
AUGUST 31 - SEPTEMBER 9	SHUTDOWN
SEPTEMBER 10 - SEPTEMBER 24	OPERATING
SEPTEMBER 25 - OCTOBER 4	SHUTDOWN
OCTOBER 5 - OCTOBER 23	OPERATING
OCTOBER 24 - OCTOBER 25	SHUTDOWN
OCTOBER 26 - OCTOBER 31	OPERATING
NOVEMBER 1 - NOVEMBER 11	SHUTDOWN
NOVEMBER 12 - DECEMBER 20	OPERATING
DECEMBER 21 - JANUARY 4	SHUTDOWN

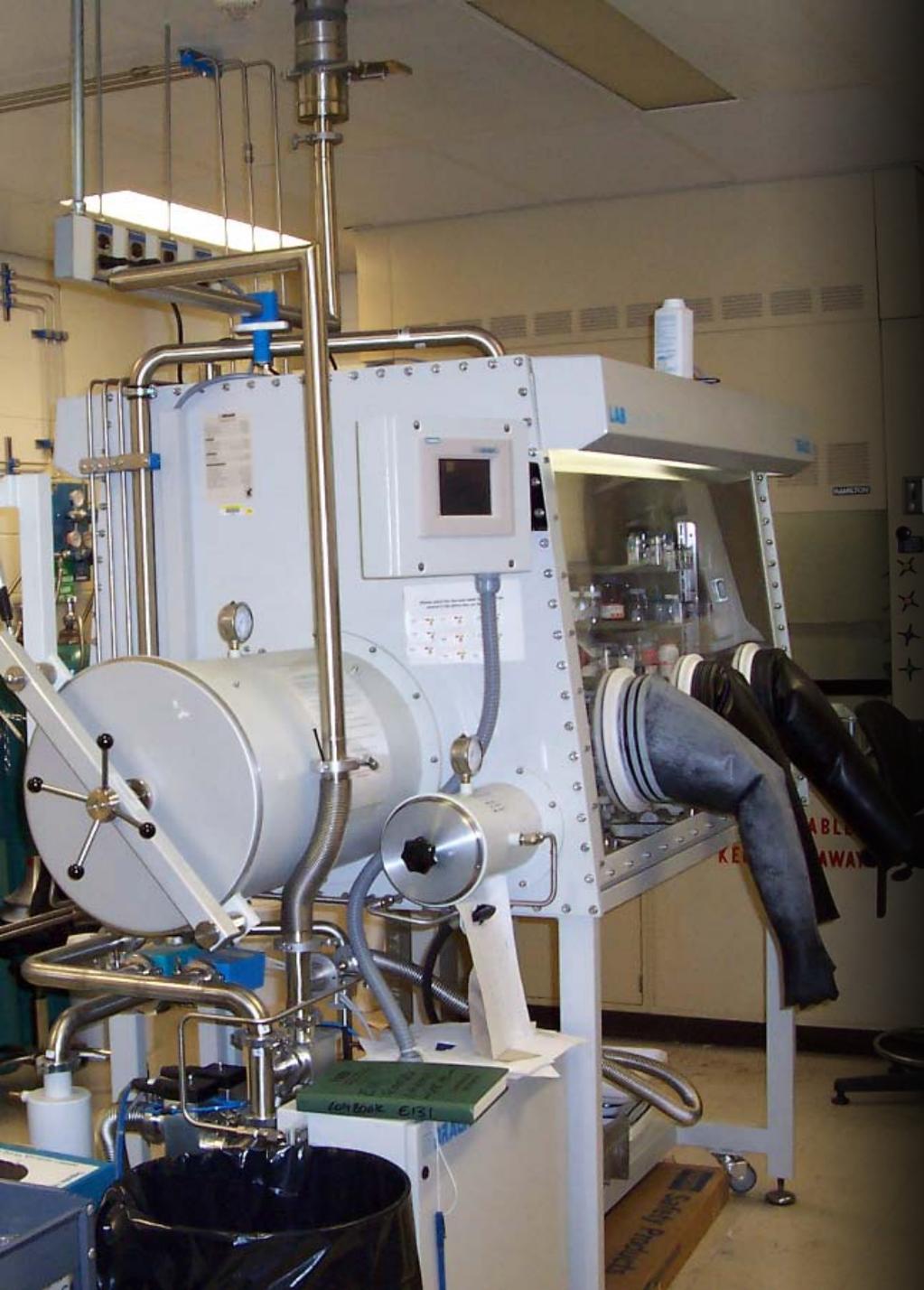
modern **beamlines** &  
**instruments**

**reliable** operation

excellent, unique,  
**sample environment**

ACCESS TO MAJOR INTERNATIONAL X-RAY AND NEUTRON FACILITIES  
Committee on International Scientific Affairs of the American Physical Society

April 2009



well-equipped  
**laboratories**

A woman with long blonde hair, wearing a dark sweater and sunglasses on her head, is seated at a desk and using a computer mouse. A man in a light blue shirt and glasses stands behind her, looking at the screen. The scene is dimly lit, with the primary light source being the computer monitor. The background shows a blurred office environment with other people and equipment.

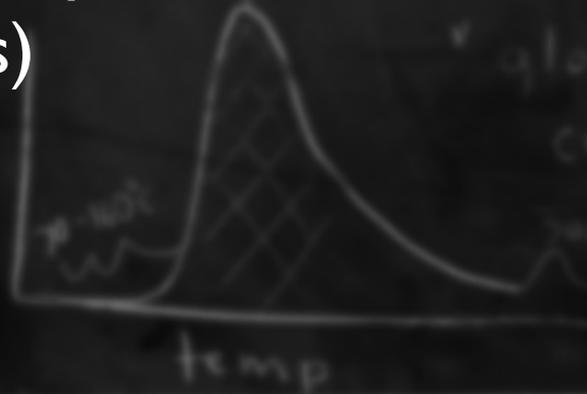
good  
software

# on-demand. training

Cryogenics/sample environment operations  
Radiation/beam experiment safety  
Neutron instrument operation  
Chemical lab (+acids)  
Local crane  
Evacuation  
Access

TLD

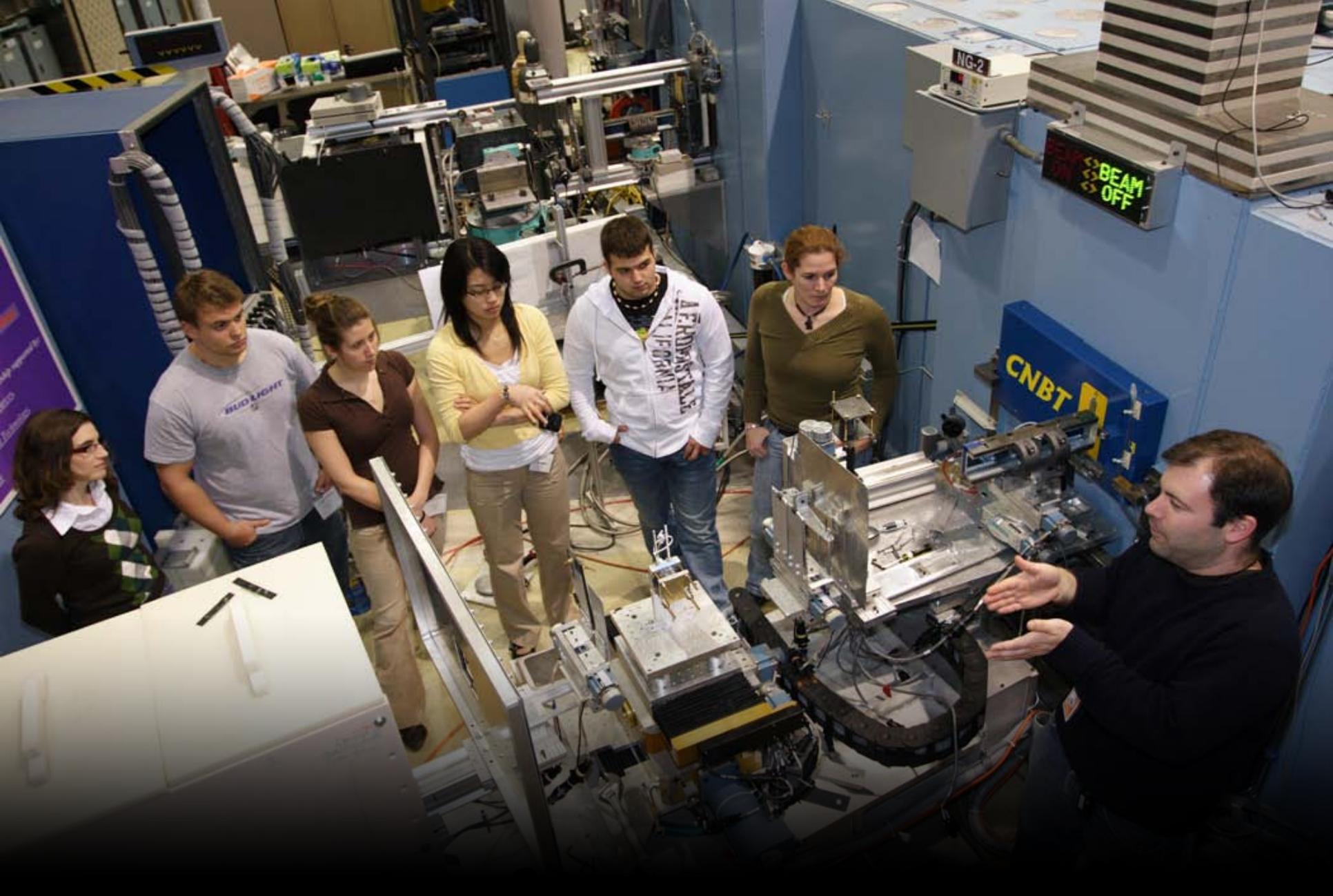
Thermoluminescent dosimeter  
(must be worn on trunk of body)



Pocket



Law



knowledgeableinstrumentstaff



**diverse** sample environment **capabilities**  
**strong** user-oriented **support**

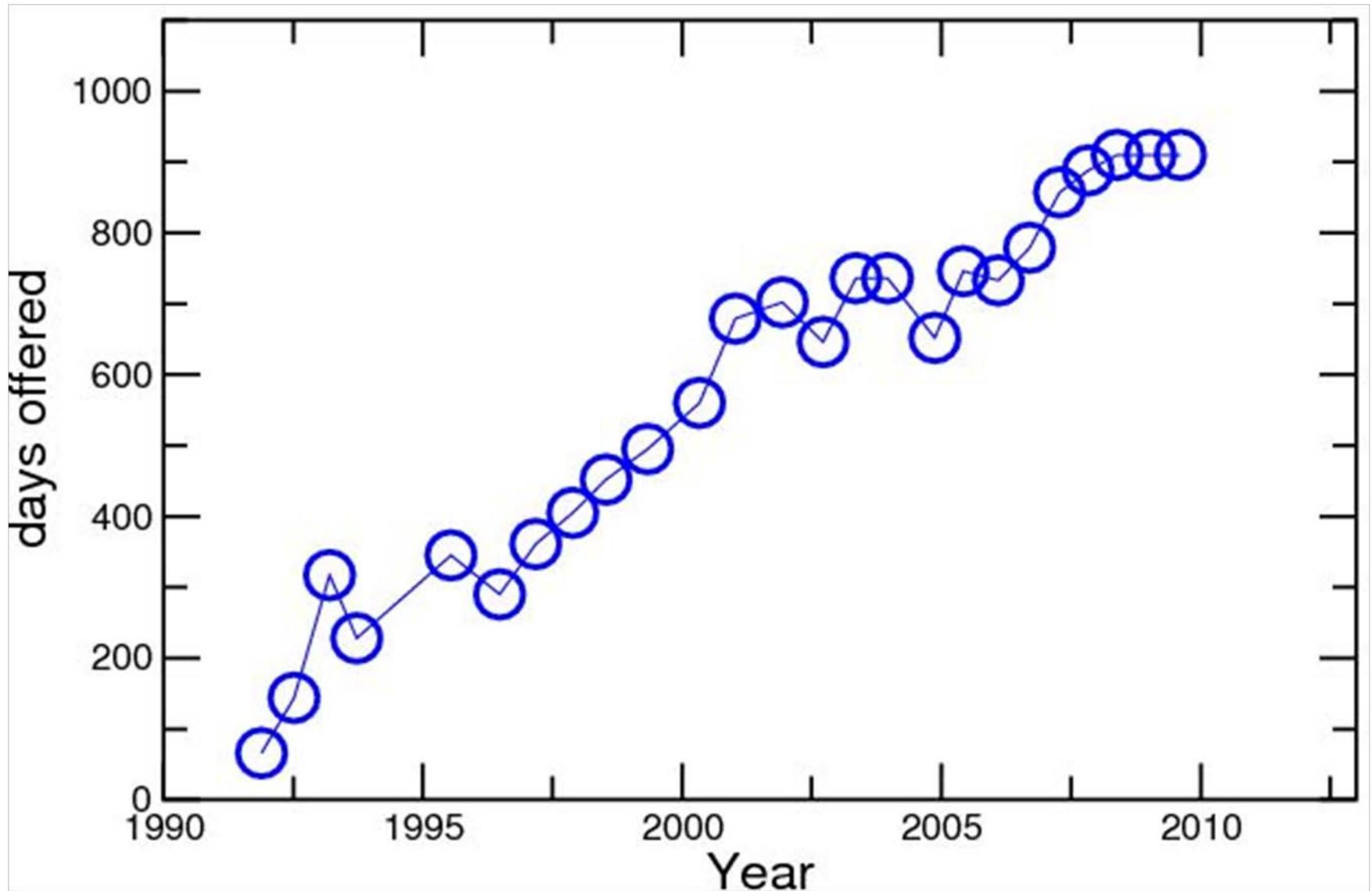
**technique  
instruction**



# Beam Time Allocation Committee

(one of the five teams in the BTAC shown)

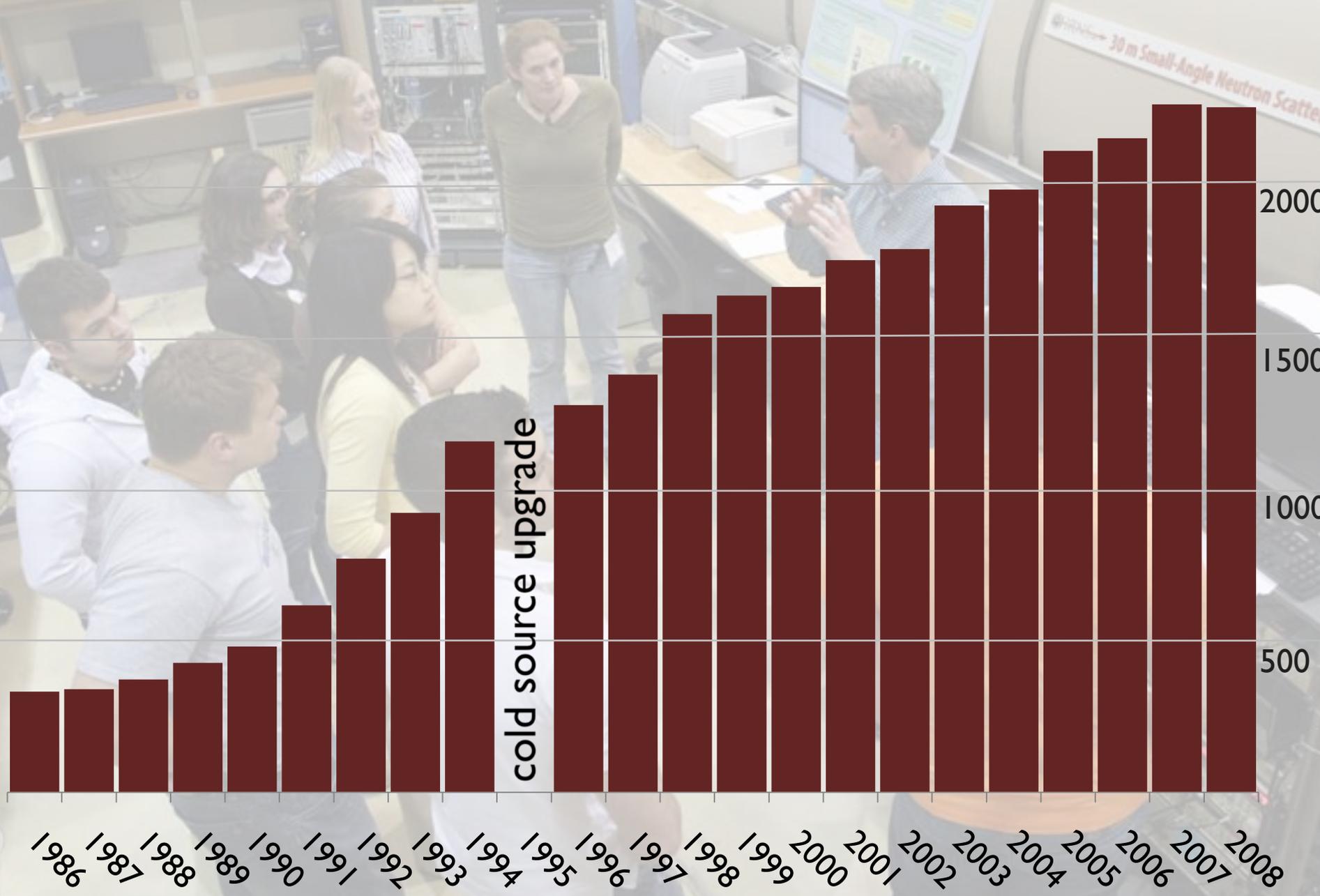




**2021** days requested for the most recent call

**2.2** average oversubscription

# RESEARCH PARTICIPANTS



# impact & publications

# 320

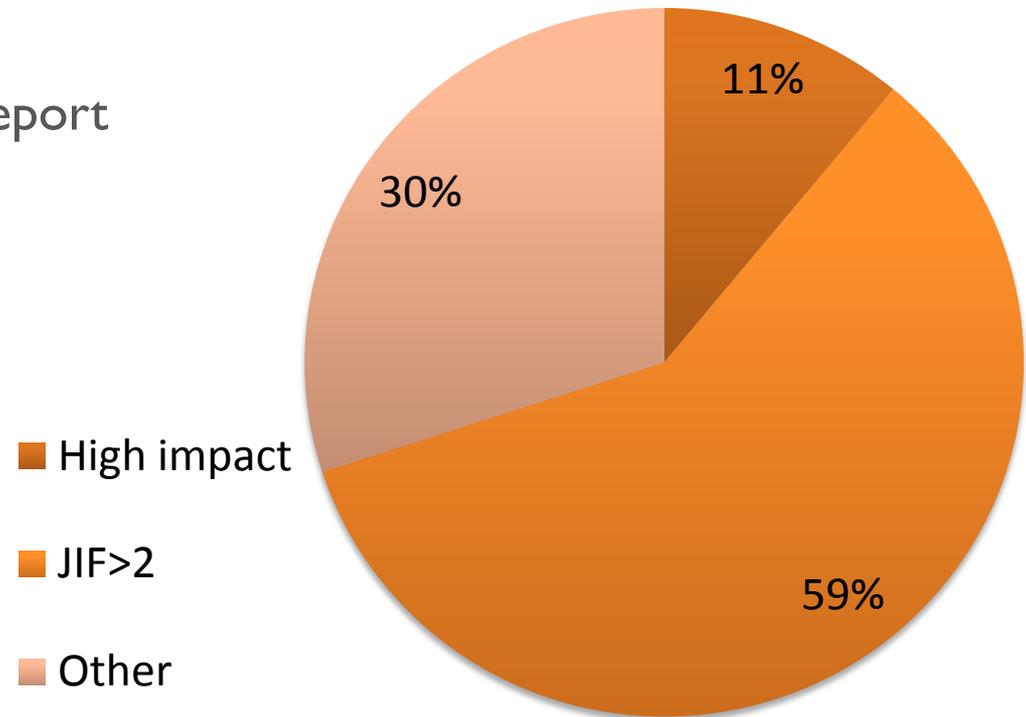
publications reported in 2008 annual report

# 70%

appeared in journals with JIF>2

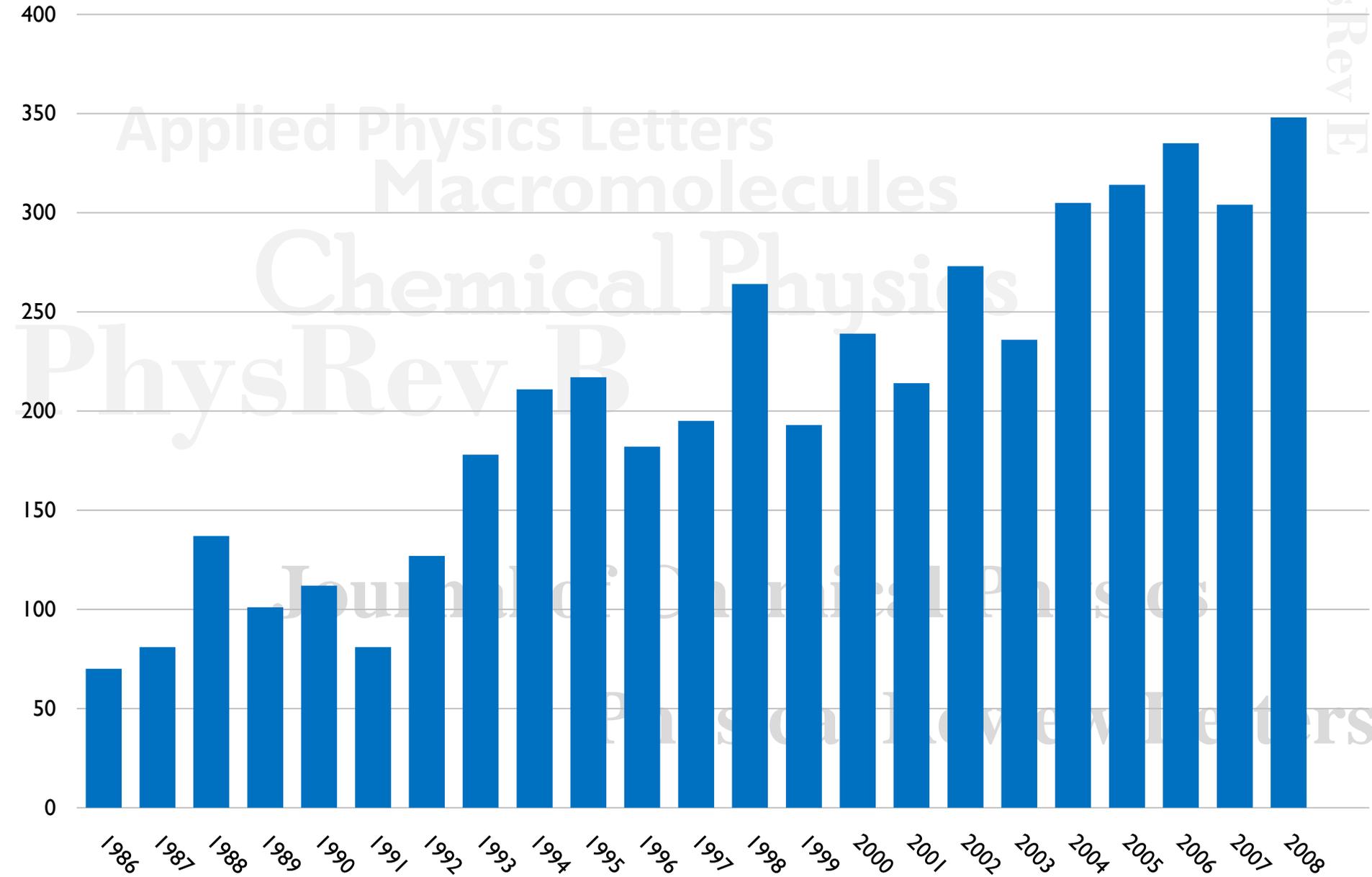
# 34

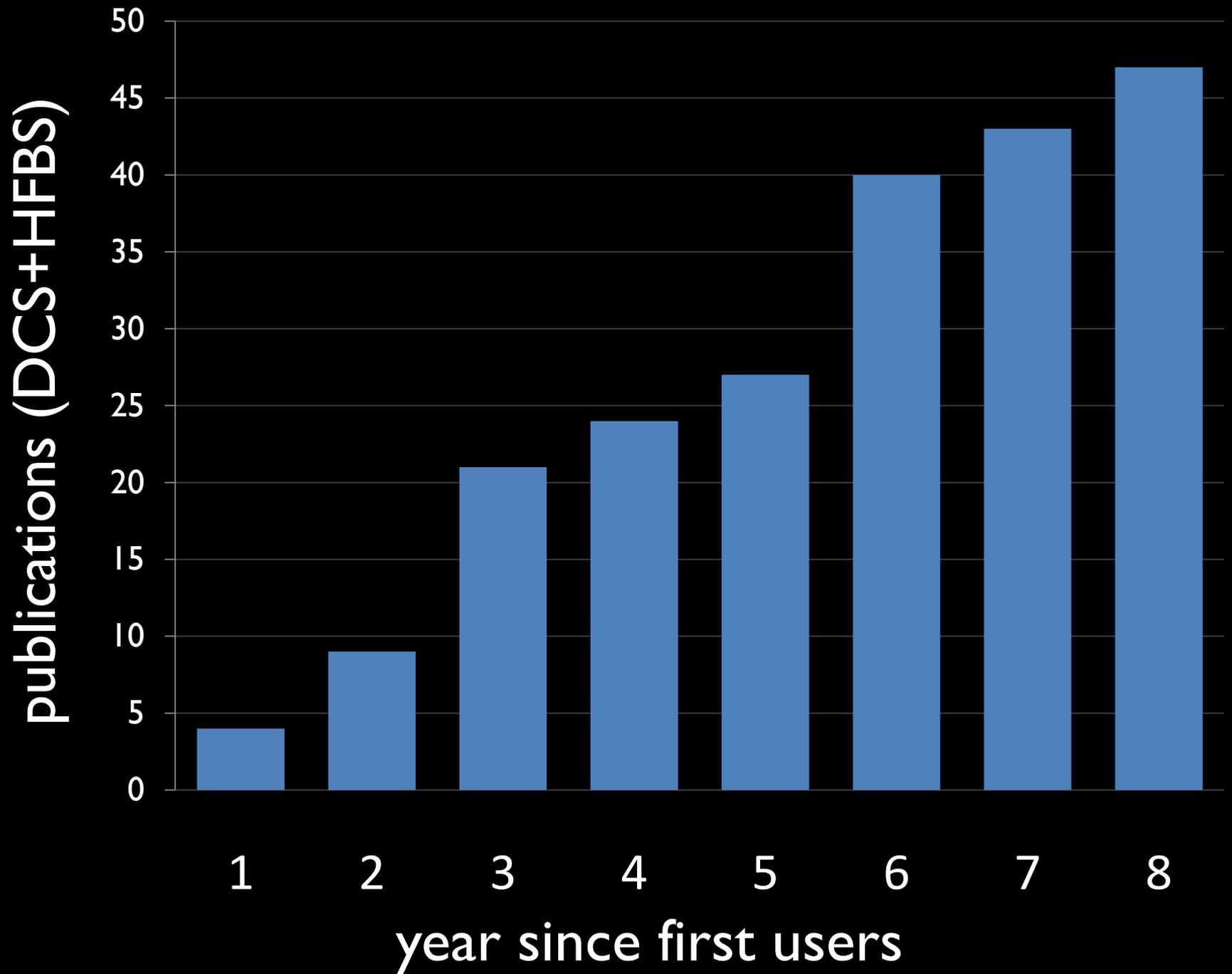
appeared in **high impact** journals\*



\* **high impact** journals include:  
Nature (all), Science, PNAS, PRL, JACS

# total publications





...the **NCNR at NIST** currently has the **largest user program** (i.e., the largest number of users per year) and **highest productivity** (i.e., most scientific papers published per year) **in the United States.**

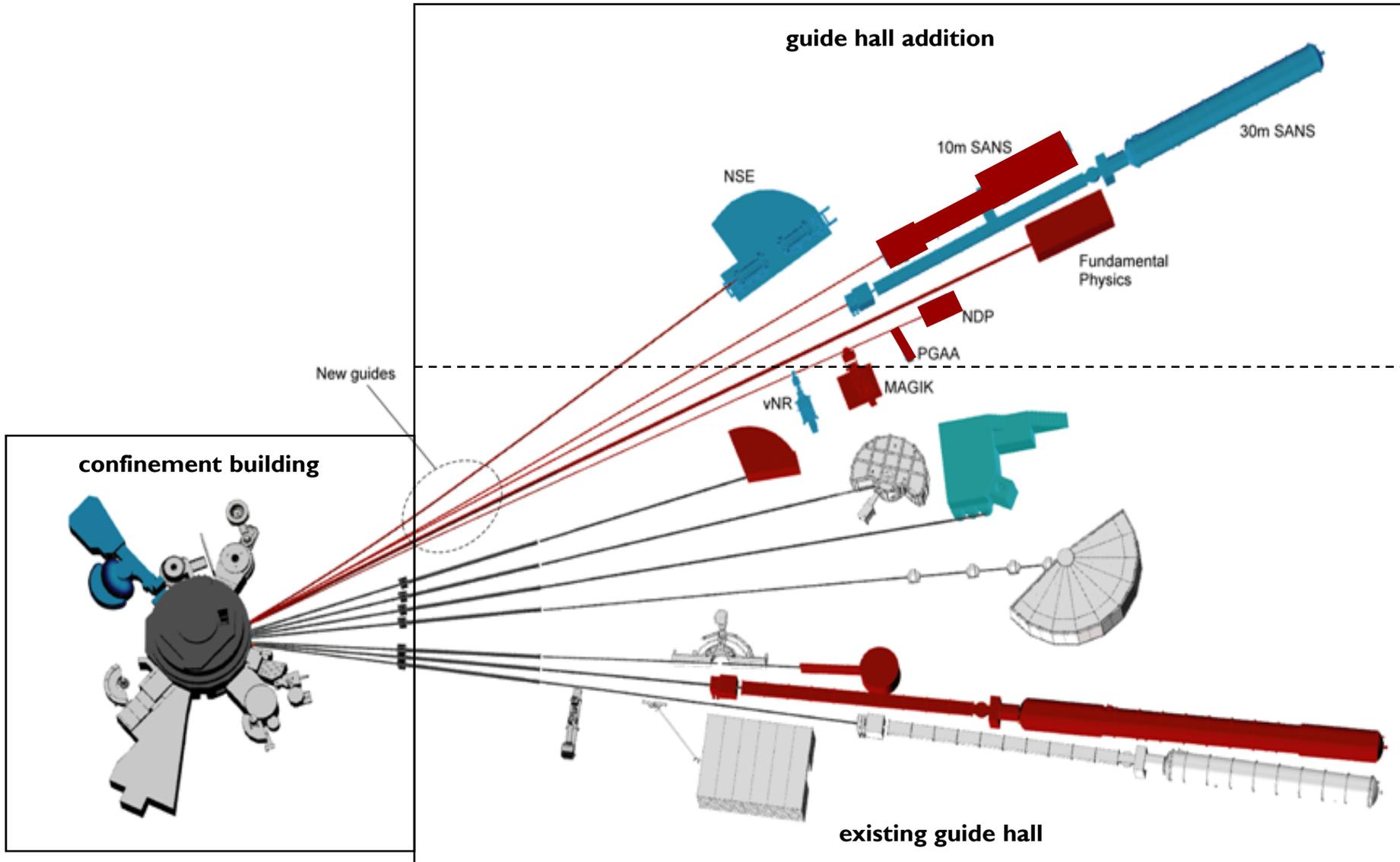
Yet the **NCNR reactor (20 MW power)** **produces a modest neutron beam flux** ( $4 \times 10^{14}$  neutrons/cm<sup>2</sup>.sec), approximately one-third the flux of **HFIR and ILL**. The productivity of **NCNR** as a user facility dramatically increased with the installation of the new neutron guide hall and a spectrum of new instruments.

# ncnr expansion & reliability enhancement project

Project under the American Competitiveness Initiative (ACI) and America Competes Act to **increase cold neutron measurement capacity** of NCNR by 30%:

- new cold source & guide system
- expanded guide hall
- new neutron instrumentation
- support and office space

# ncnr expansion



June, 2009



September, 2009



# LICENSE RENEWAL PROCESS

**April, 2004**

May, 2004

November, 2004

October, 2004

September, 2005

November, 2005

June, 2006

September, 2006

January 2006

January 2007

July 2007

August 2007

February 2009

April 2009

June 2009

**July 2, 2009**

**Submitted application**

Fed Register Notice of receipt & notice of availability

Deadline to file for public hearing/intervention

FRN on environmental scoping process

Public meeting on environmental scoping (CANCELLED)

Environmental scoping audit completed

Environmental scoping process ends

Issue RAIs on environmental program

Final responses to RAIs due

Issue draft Environmental Impact Statement (EIS)

FRN notice of availability & comment on EIS

Public meeting on EIS (CANCELLED)

End of EIS comment period

Issue Final EIS

FRN for availability of final EIS

Issue Safety Evaluation Report (SER) with open items

Advisory Committee on Reactor Safeguards (ACRS) Subcommittee meets on SER

Full ACRS meets on SER (Public)

ACRS letter issued

**License renewal and SER issued**





<http://www.whitehouse.gov/budget/2006/images/dhs-6.jpg>



supply  
**demand**

Credit: University of Pennsylvania  
School of Medicine





# neutron user facility

[www.ncnr.nist.gov](http://www.ncnr.nist.gov)

good sample prep & characterization laboratories  
on-demand training for safe facility use/operations  
capabilities that the scientific community needs  
merit-based, peer-reviewed proposal system  
reliable source & instrument operations  
unique sample environment equipment  
instruction in measurement technique  
strong sample environment support  
good software & software support  
knowledgeable instrument staff  
multiple access mechanisms