# Future Drivers

# Future Needs

*workshop*



Rob Dimeo

Potomac, MD
August 21-22, 2014

# Your Charge

5-10

What new research opportunities can be addressed by new capabilities in the NCNR Expansion?

What are the neutron measurement capabilities that would open new research opportunities?

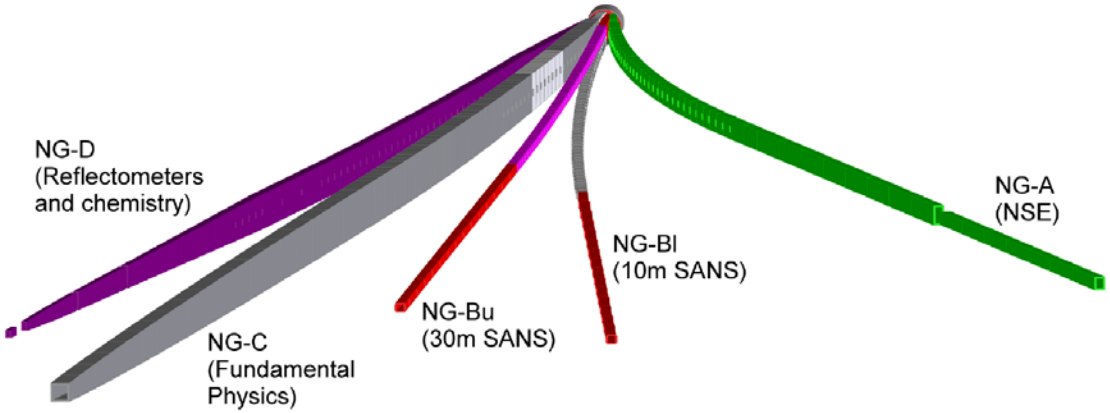
# NCNR Expansion Workshop

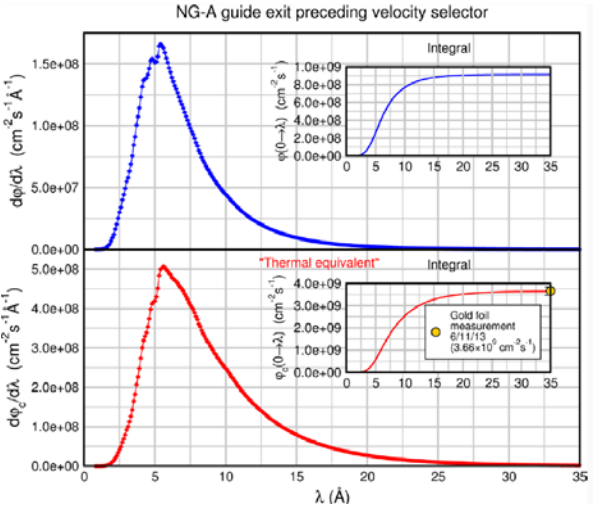
Bethesda: July 17-19, 2006

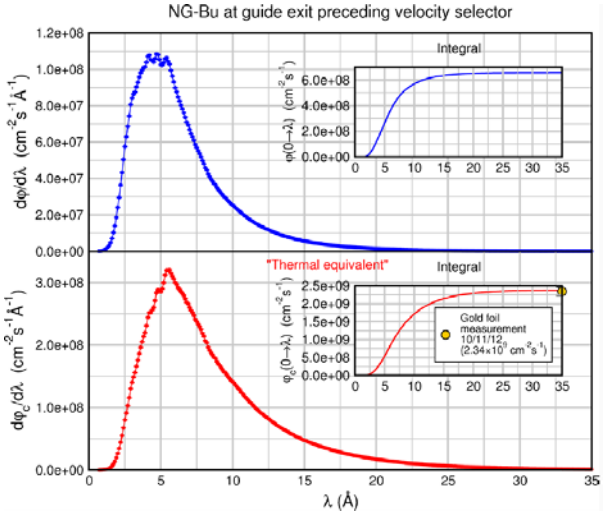
What new research opportunities could be addressed by new capabilities in the NCNR Expansion?

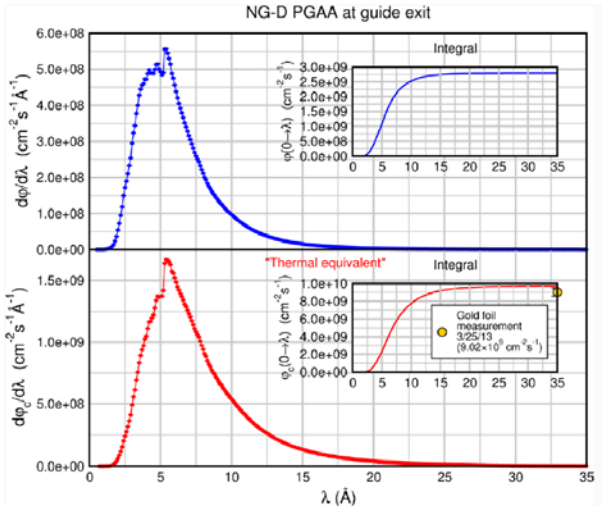
What are the new measurement capabilities that would open new research opportunities for the US?

Advances in neutron optics, detectors, and polarization devices to substantially advance performance of existing instruments and open up new types of instrumentation.



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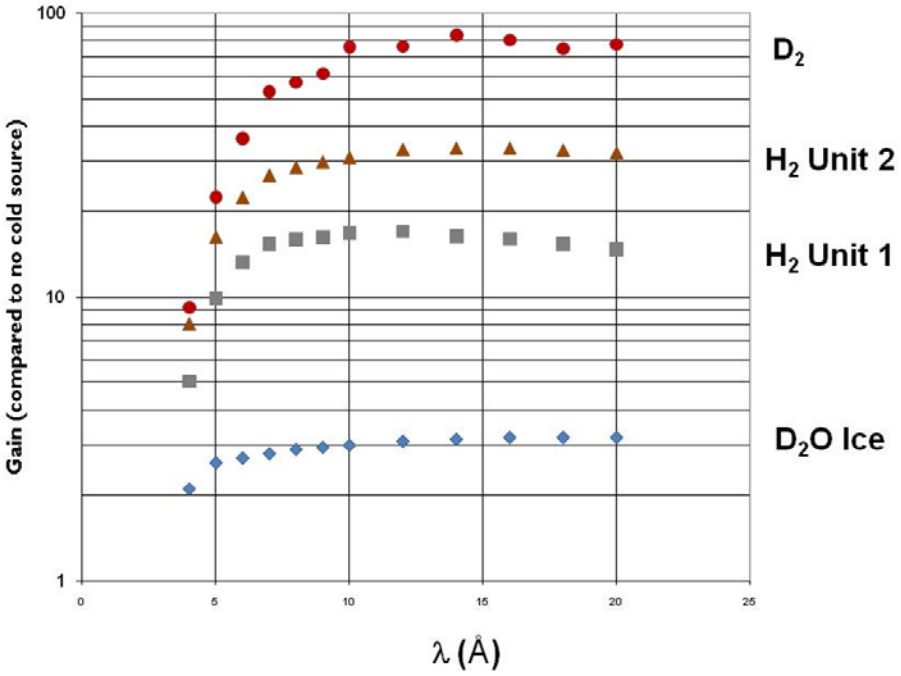
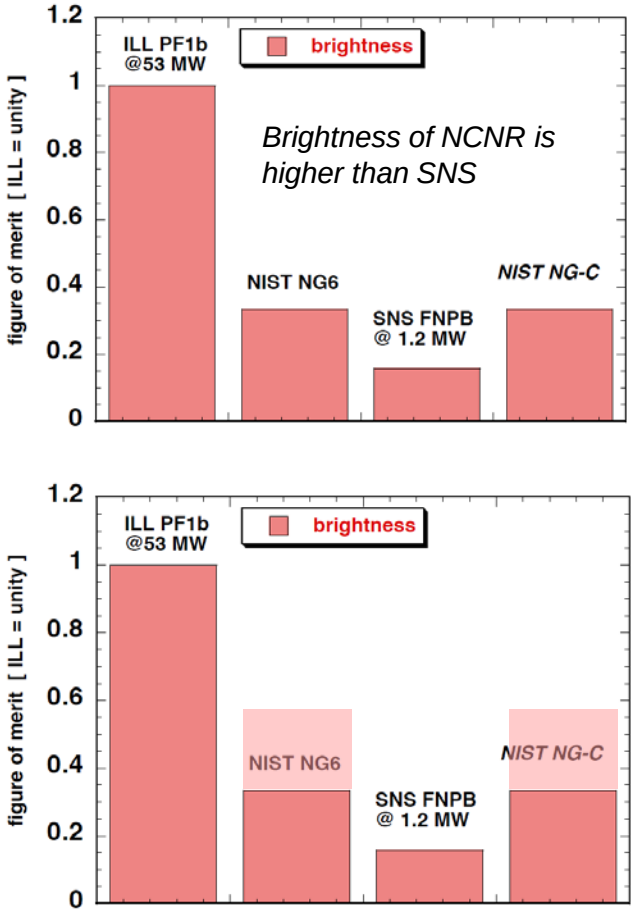
50% gain in cold flux with $D_2$ cold source to be installed in 2018



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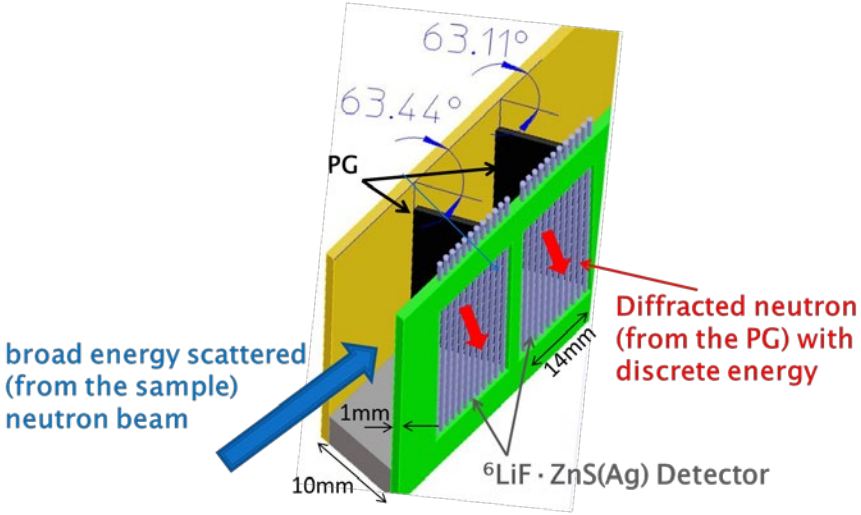
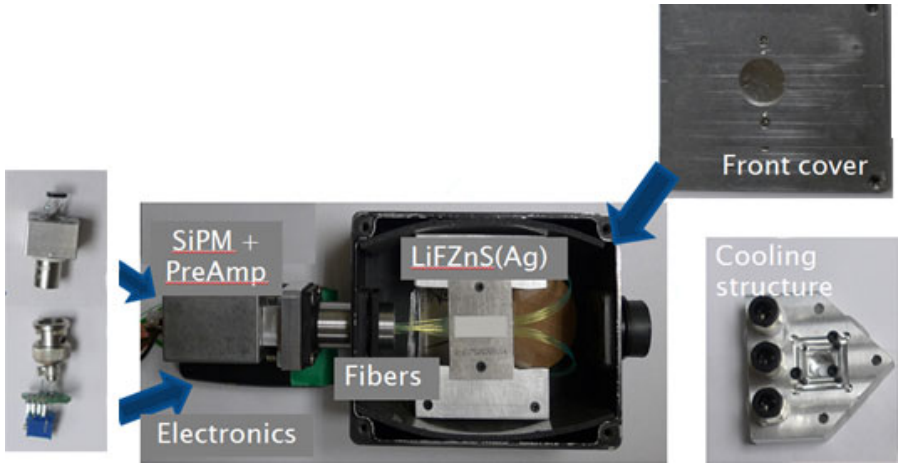



CANDoR
30 detection blocks
54 detectors/array
1620 detectors total




Prototype functional

Optimization in progress

Thinnest detector: 1 mm
Efficiency: 45% at 4.7 Å
$\gamma$-discrimination: $10^{-7}$

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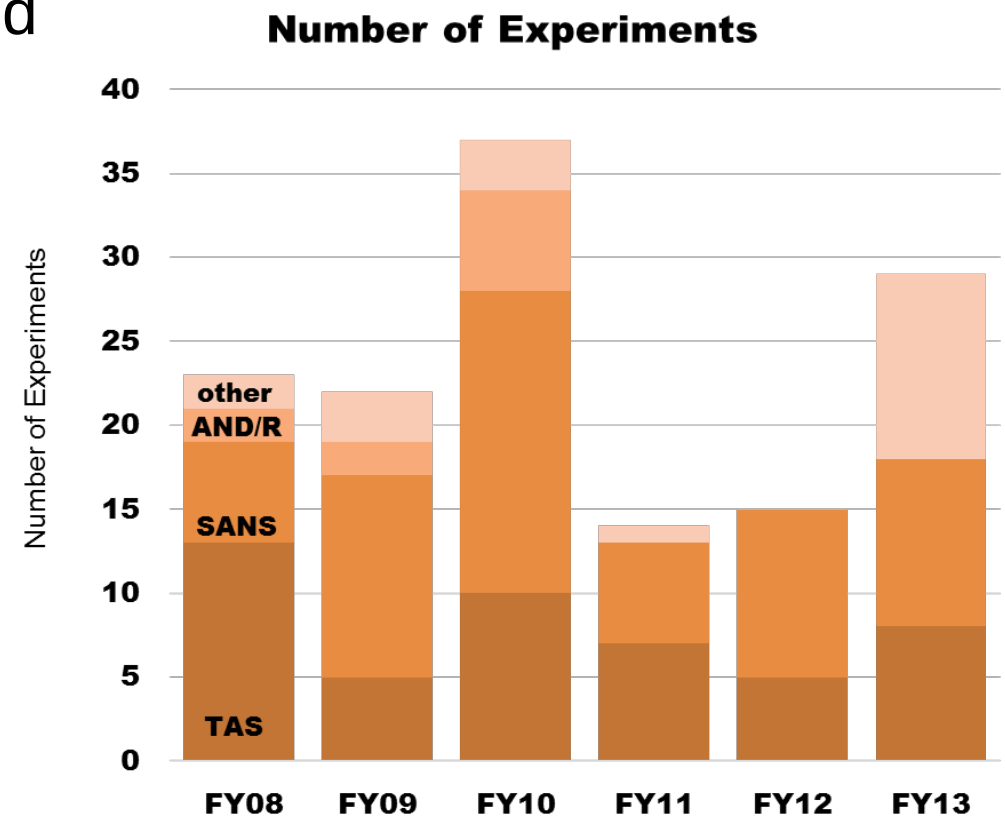
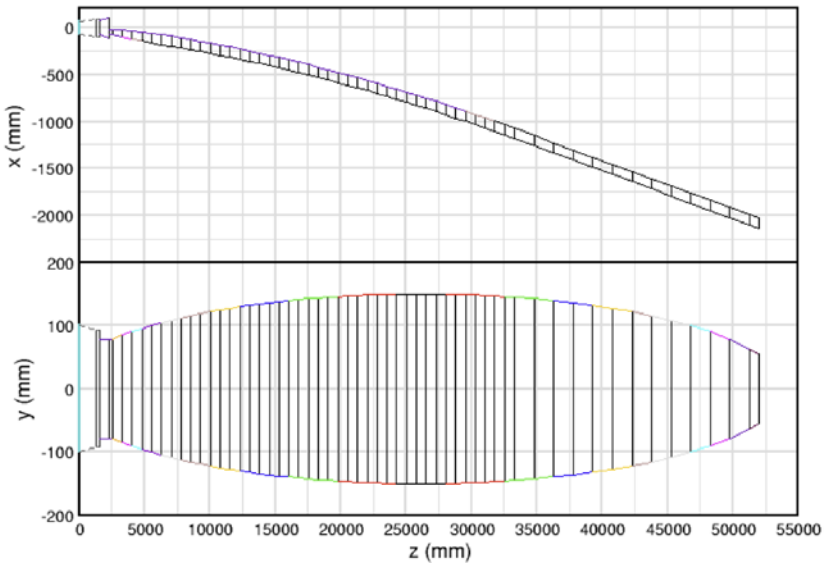
## 85% polarization achieved

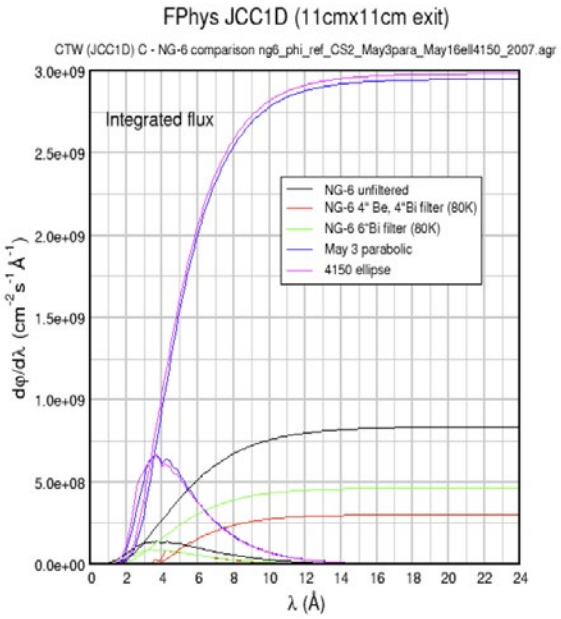
Standard capability available for use on SANS, MACS, TAS, & the Reflectometers



Significant research opportunities in:

Fundamental neutron physics (high current & high brightness beams)
Cold neutron imaging (high resolution, enhanced phase sensitivity/penetration)
High flux/low angle diffraction and high resolution spectroscopy for advances in soft matter systems
Polarized neutron scattering and high flux diffraction & spectroscopy for advanced hard matter systems



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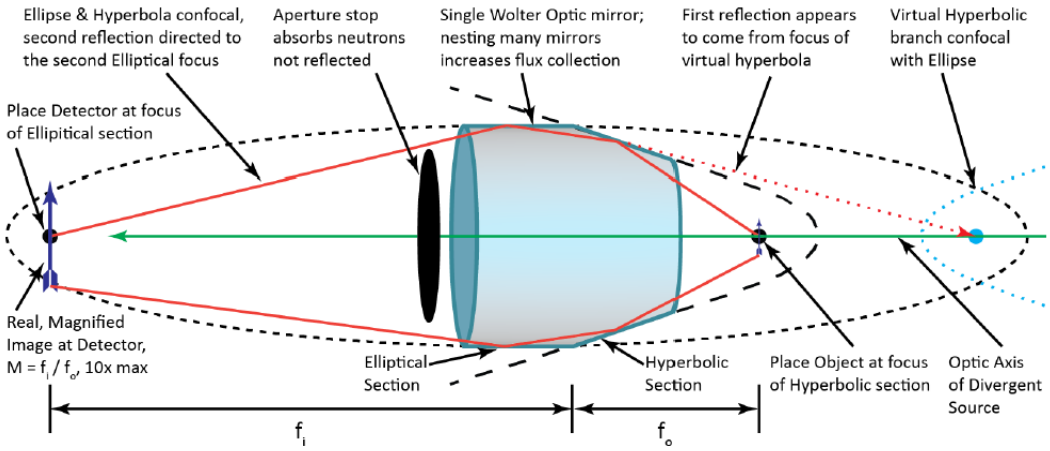


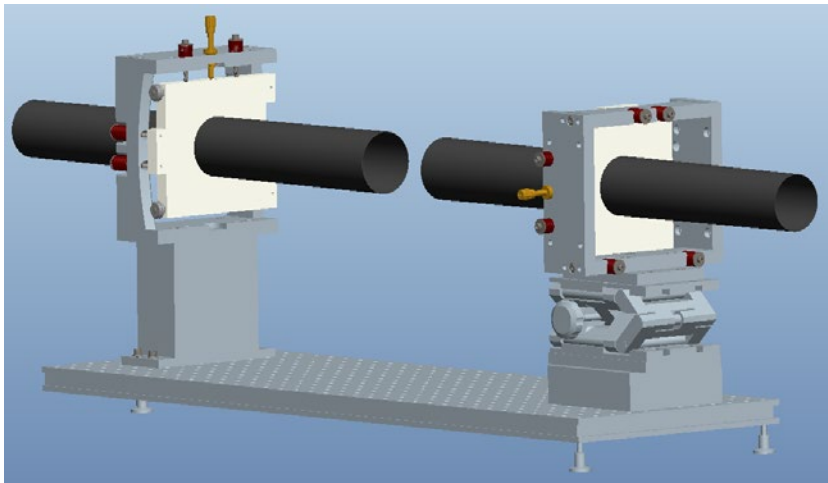

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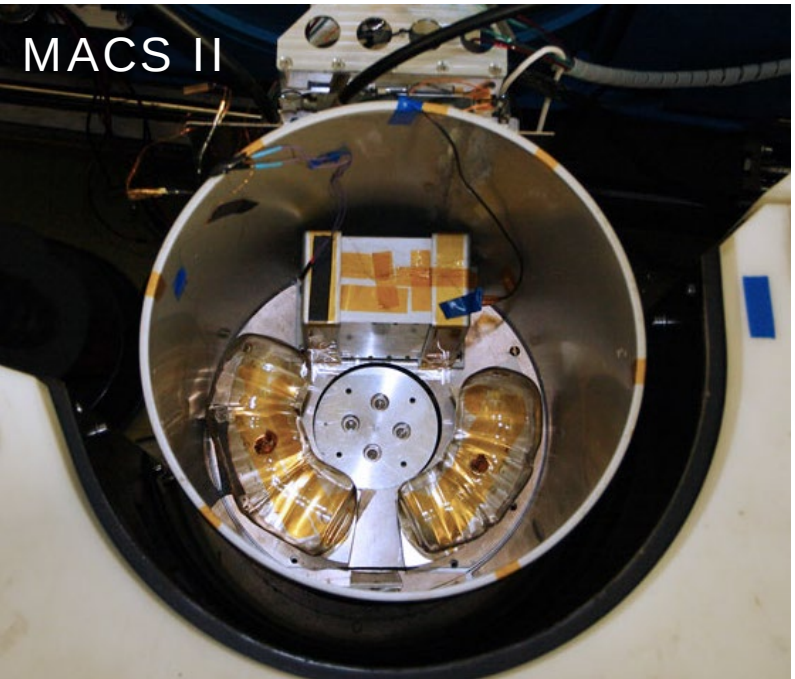


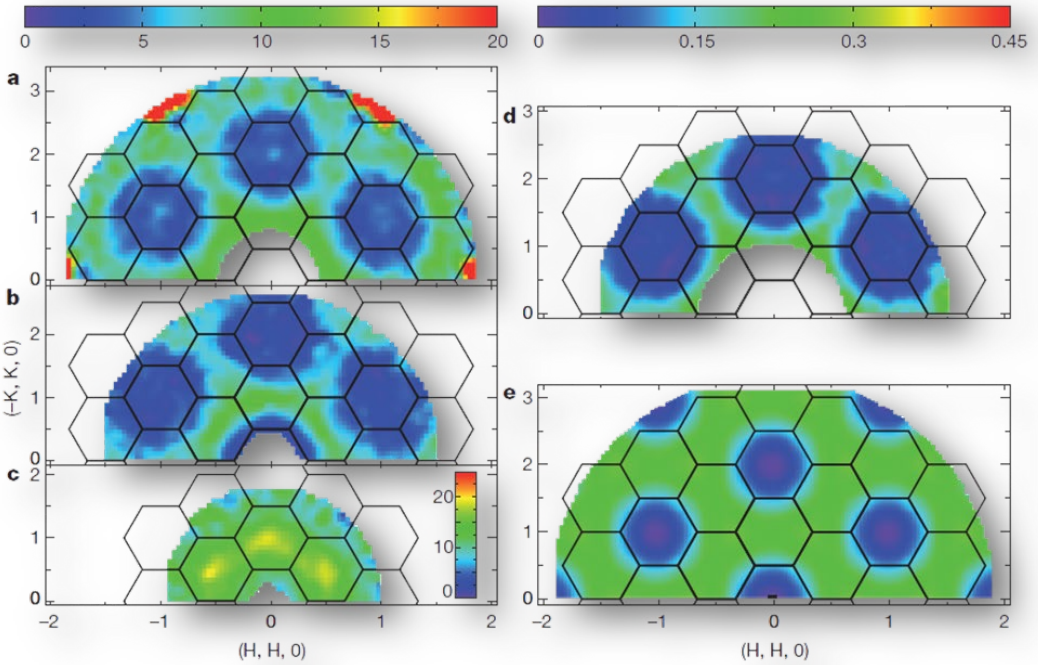

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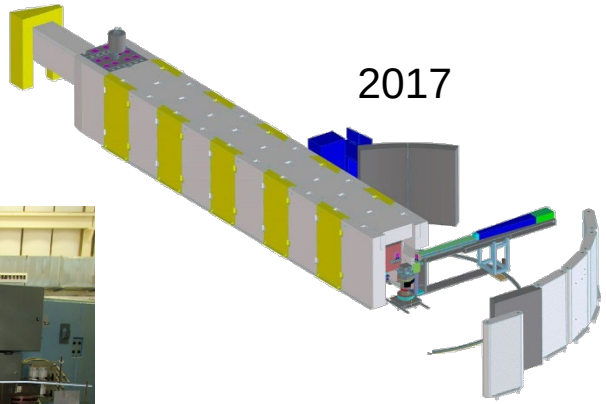
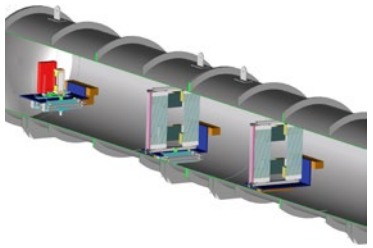


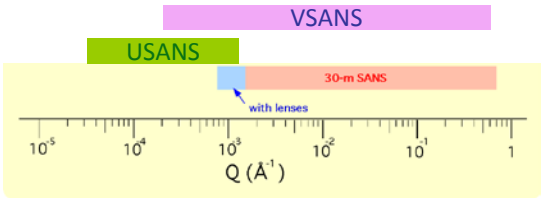
2017

MAGIk


VSANS

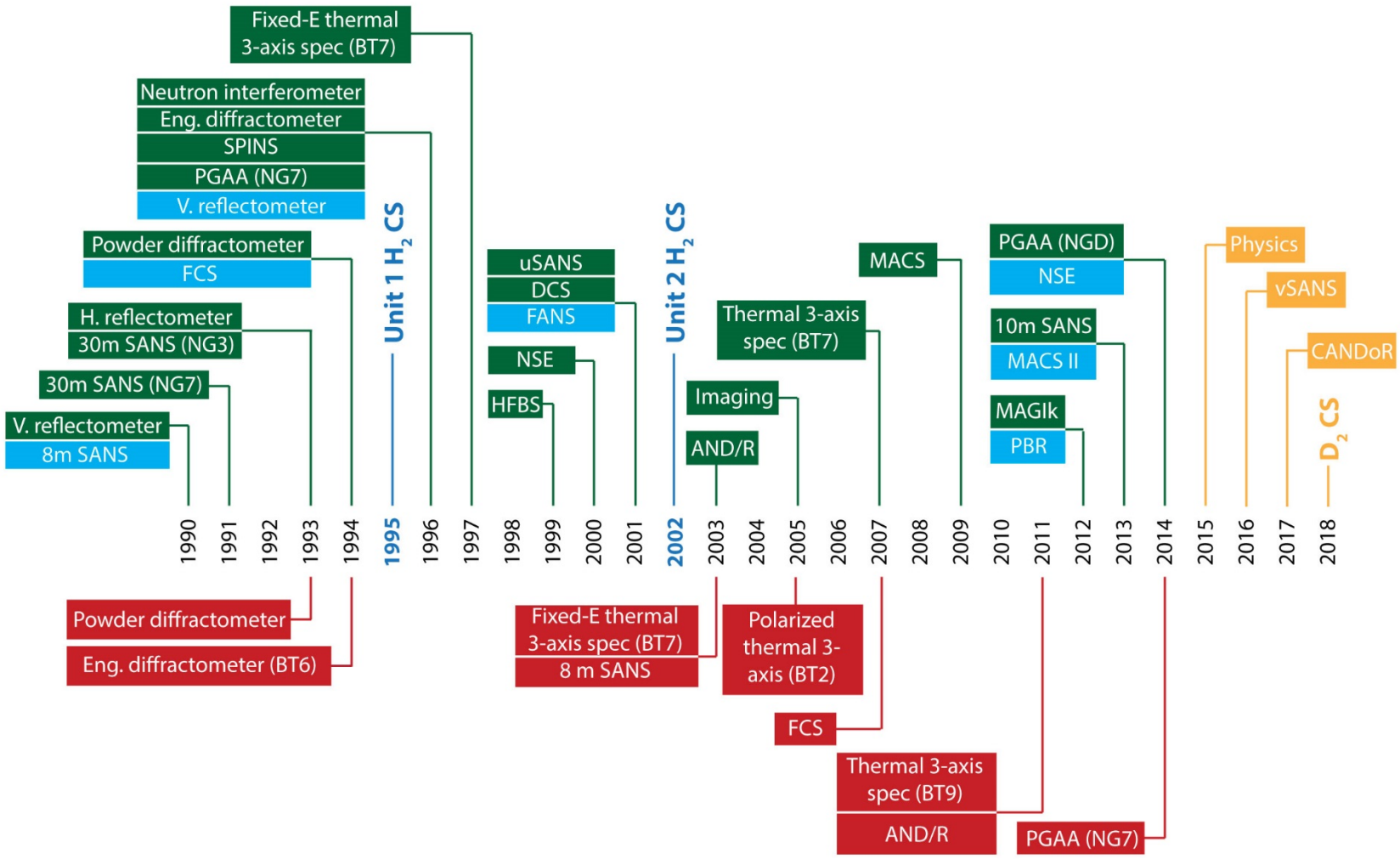


2016

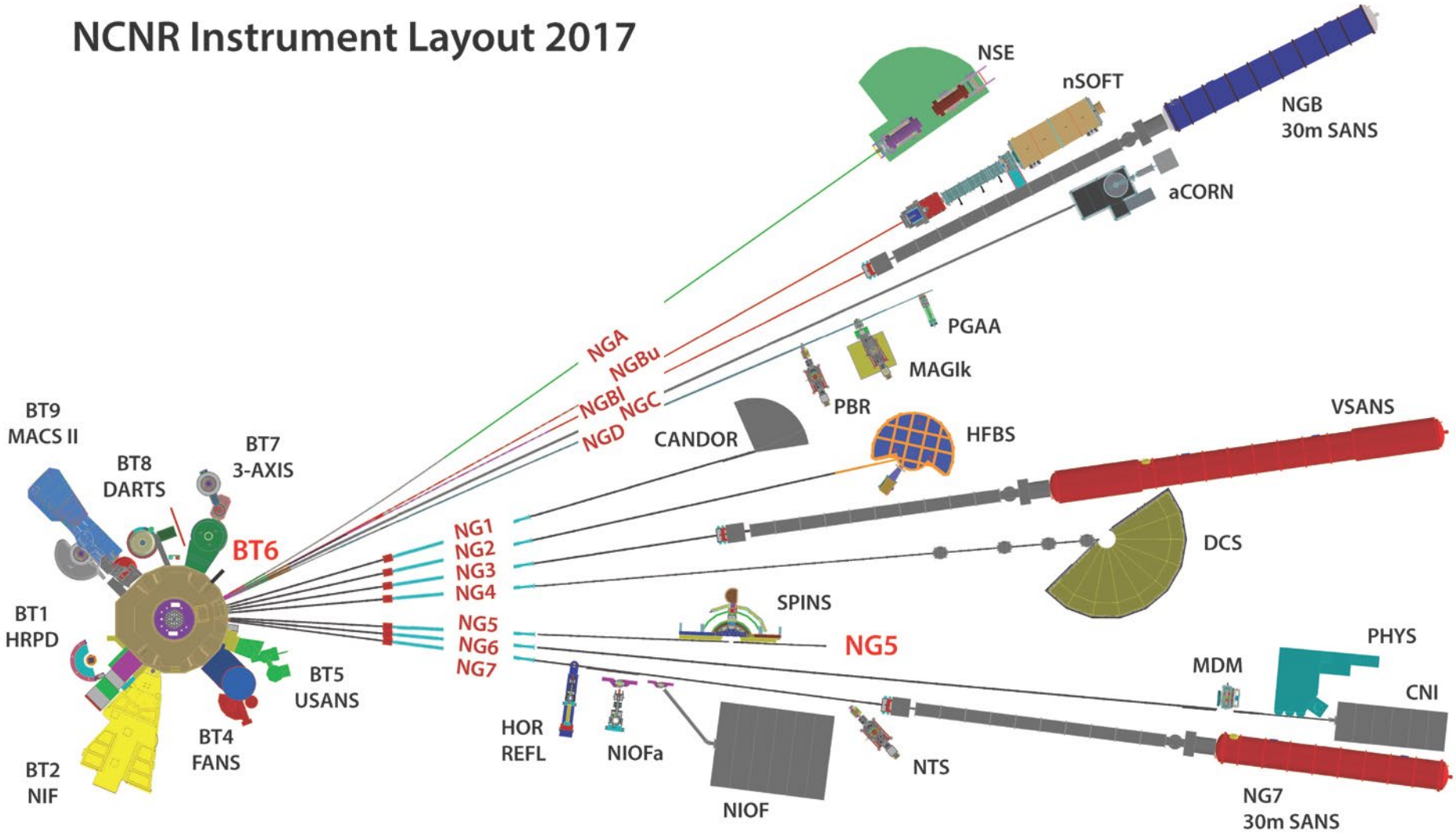


# NCNR INSTRUMENT TIMELINE

Instrument became available for users
Major instrument upgrade
Projected availability for users
Instrument decommissioned



# NCNR Instrument Layout 2017



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