
NCNR
DUNE
THE MOTION PICTURE EVENT FOR 1984
THE SPICE MUST FLOW
NEUTRONS

2017 OUTAGE

PROJECTS

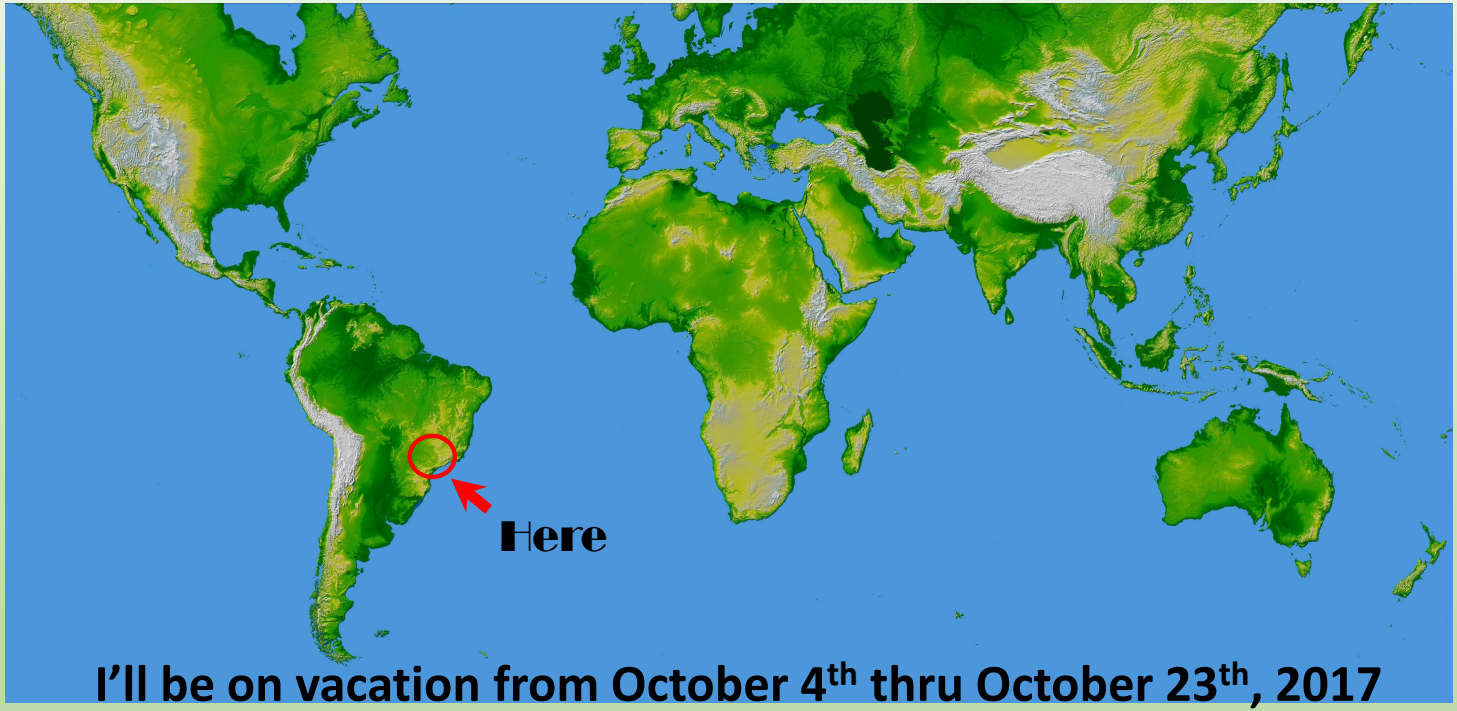
for S.E. R&D

Juscelino Leão

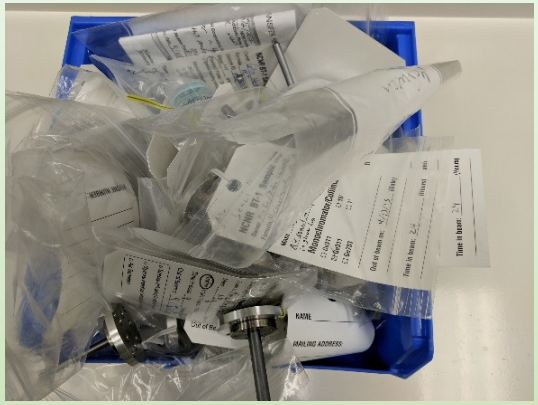
Projects:

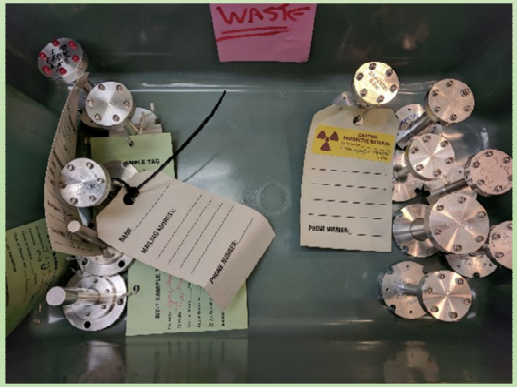
- Empty powder sample cans for BT7/BT1
- SANS LIPPS pressure and temperature control
- SANS high temperature furnace
- Oscillating pressure cell for SANS/USANS
- High pressure in ^{3}He Big Blue
- Maintenance:
  - High pressure system
  - High temperature furnaces
  - Gas loading equipment
- MANIACS
- Reflectometry Wet Cell
- Off line measurements:
  - AC susceptibility of MoTe2
  - Conductivity of modified closo-borate electrolytes
  - Solubility of Xenon gas

Juscelino's Outage

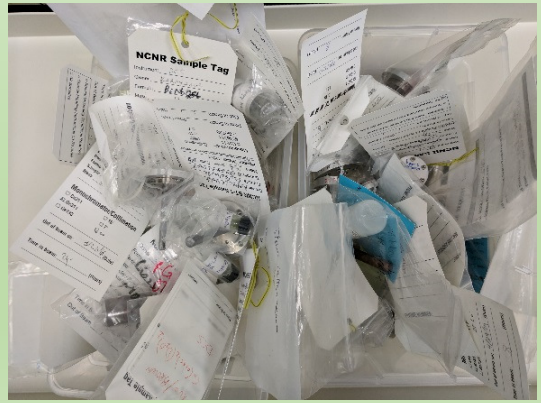


Powder Sample Cans for BT1/BT7





~ 50 powder sample cans as of now



SERVING THE

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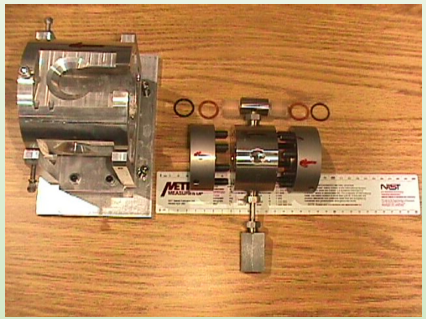
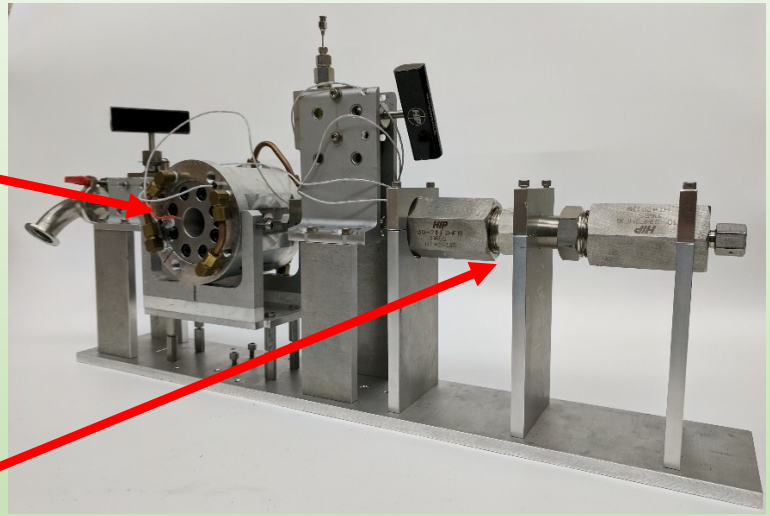
SANS LIPPS pressure and temperature control

4 kbar liquids cell

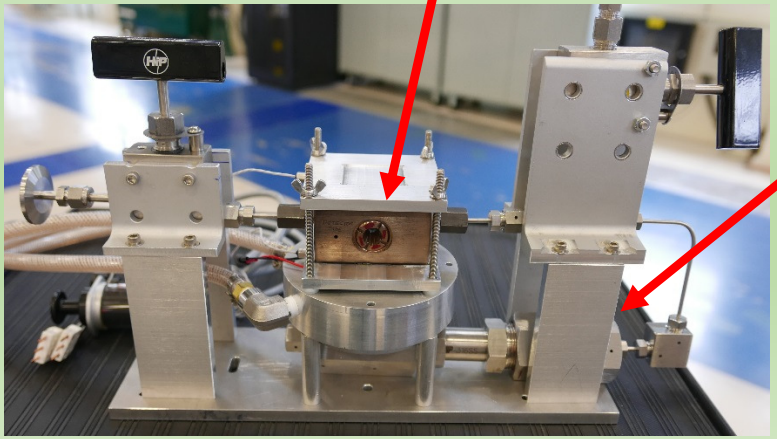




4 kbar powders cell

Sample is injected

Pressure media separator



Current:
Sample volume: < 10 cc
255 K ≤ T ≤ 353 K

Target:
Sample volume: < 3 cc
173 K ≤ T ≤ 400 K

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SANS LIPPS pressure and temperature control

SERVING THE

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SANS LIPPS pressure automation

New:

- Computer controlled software
- Automated valves rated to 4 kbar

Piston replacement (4kbar)

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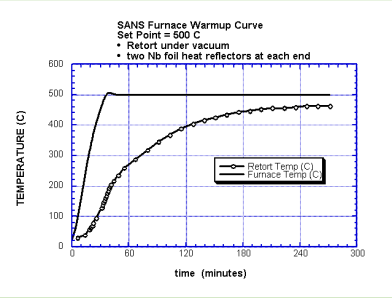
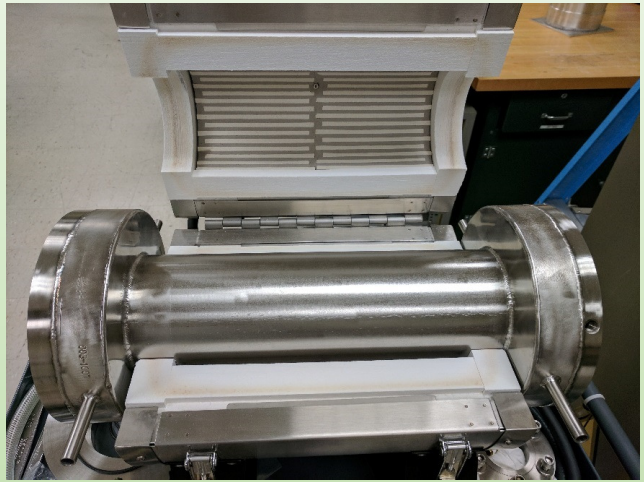
SANS High Temperature Furnace

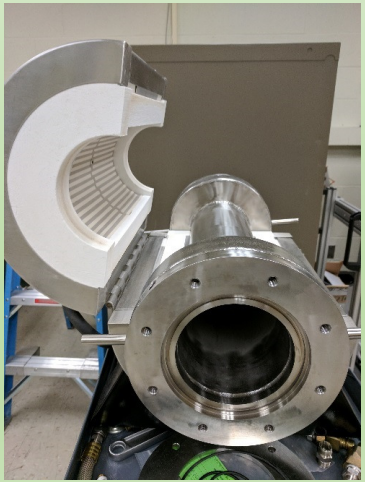


Current:
Tmax ≤ 500 °C

Target:
Tmax > 800 °C
Reduce time to Tmax



SERVING THE



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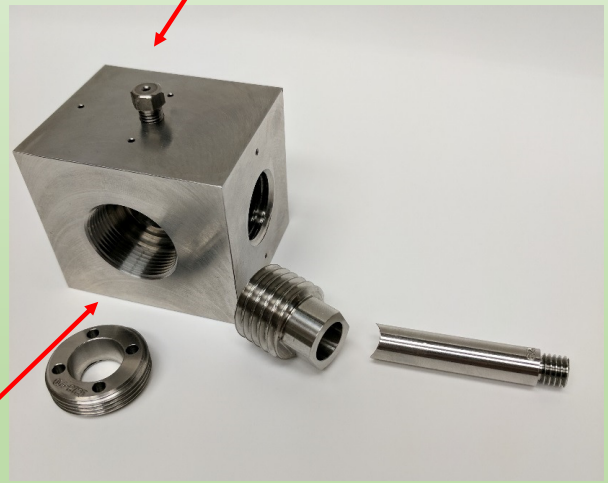
New temp control:
Phase angle control mode:
RMS load V^2 or I^2

Oscillating Pressure Cell for SANS/USANS

Piezo actuator with 30 µm travel

Three pressure fittings



Sapphire windows

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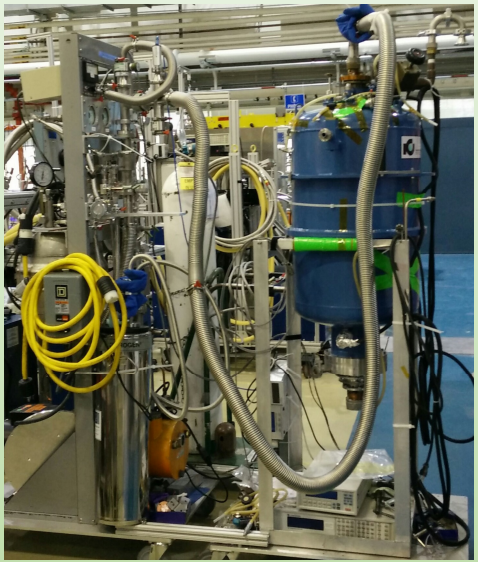
- High pressure in ^{3}He Big Blue



- 10 kbar Pressure cell
- High pressure line heat sunk to shields
- Pressure change at 70 K

- Preliminary test:
  - Tmin=300 mK
  - T gradient < 10 mK

Pressure line coiling rig

1600 C Furnace and stick

General Maintenance

High pressure system:

- Pressure rig casters
- Pressure line
- Pressure lines heaters

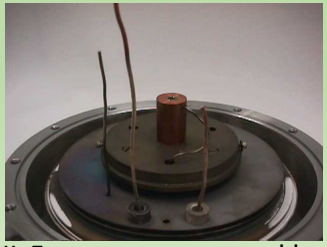
High temperature furnaces

- BNL:
  - Replace T sensors
  - Replace control SSR
  - Pressure control relay
- 1600C Furnace:
  - Rewire T sensors
  - Clean sample stick
  - Replace vacuum controller

Gas loading equipment

- Sample sticks line heaters
- CCR collars
- Replace pressure controllers

Pressure rig



BNL Furnace sensors and heater

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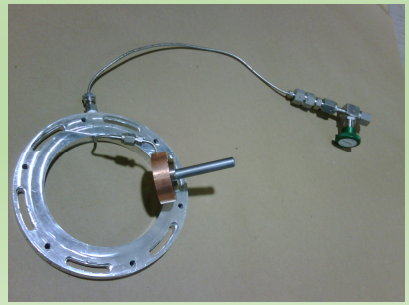
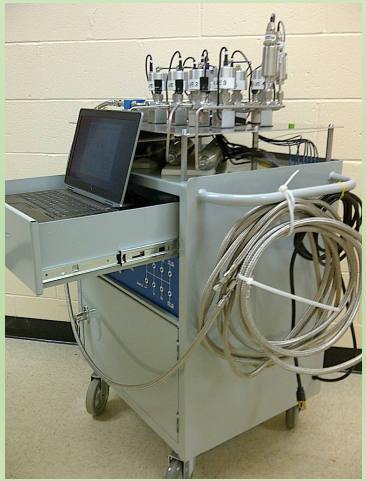
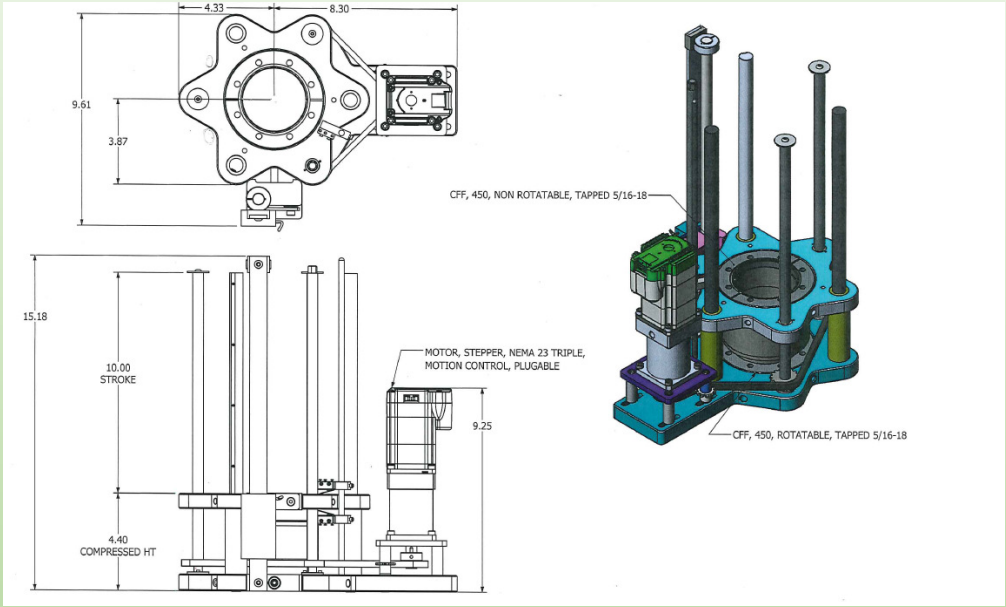
CCR Collar





Gas loading cart

Multi Application Neutron In-situ AC Susceptometer (MANIACS)



Vertical Linear Translator

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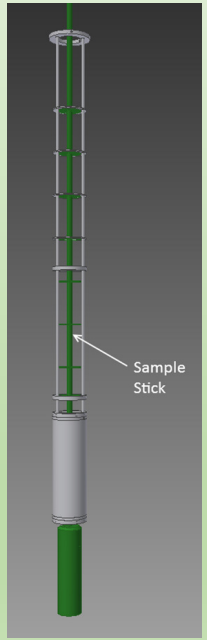
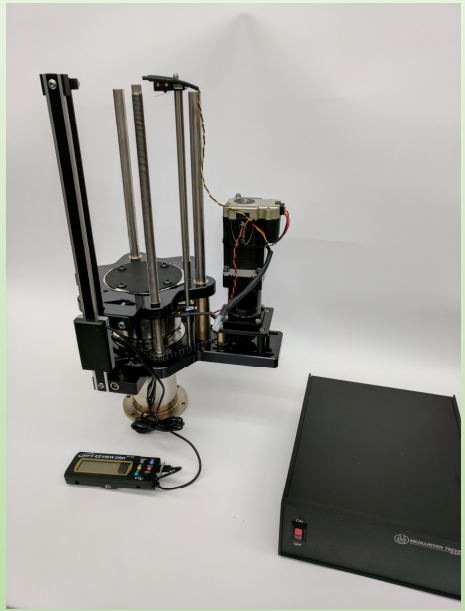
New Sample Stick



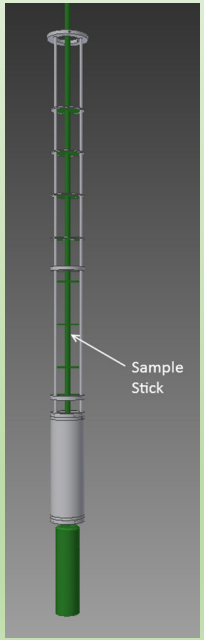
AC Coils Support

Multi Application Neutron In-situ AC Susceptometer (MANIACS)



Vertical Linear Translator

New Sample Stick



AC Coils Support

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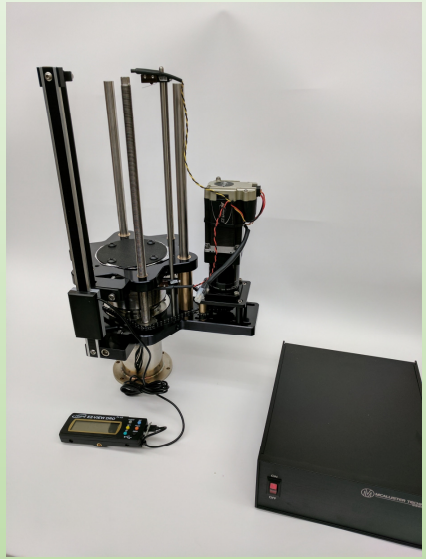

Vertical Linear Translator

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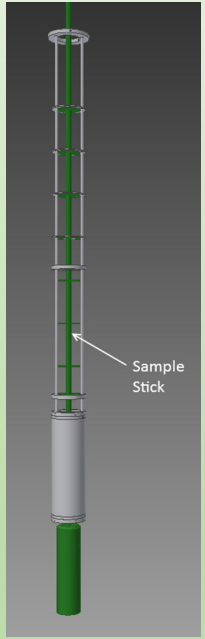

AC Coils Support

New Sample Stick

Instrumentation Tank

Instrumentation

Reflectometry Wet Cell

Old cell

New cell

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SERVING THE CHRNS COMMUNITY