

# What to do before arriving

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By following the subsequent suggestions, experimental time at the SEQUOIA instrument will be more efficiently utilized.

## Arrival time

It is highly recommended that all users arrive at least one day before the scheduled start date of the experiment. This will accommodate for all requisite training, sample preparation, etc. which may be necessary. In the case that more involved sample or other preparation is necessary, please plan to arrive earlier.

## Sample Shipment

Non-radioactive samples must arrive at least one calendar week before your experiment to avoid any delays to your experiment. All samples must be entered and confirmed in [IPTS](#) before shipping. DO NOT ship any sample which has not been confirmed in IPTS. Sample confirmation requires specifying if the sample will be returned to the user or disposed of. If the sample is to be returned, then the Radiation Safety Officer, contact information, and proper shipping address must be provided.

### Addresses

For non-radioactive samples, please send the parcel to the following shipping address:

Attention: <Any special requirements, e.g. freezer>  
<Recipient Name>, SNS User Sample IPTS-####, BL17  
Oak Ridge National Laboratory / SNS Site  
Chestnut Ridge, Bldg 8920  
Oak Ridge, TN 37830

For radioactive samples (DOT Class 7) which are NOT fissile materials, special nuclear materials, or require something beyond a typical commercial carrier, please plan for the parcel to arrive at least two weeks in advance to the following shipping address with the proper DOT packaging, placarding, and labeling for the radionuclides and activity:

Attention: <Any special requirements, e.g. freezer>  
<Recipient Name>, SNS User Sample IPTS-####, BL17  
Oak Ridge National Laboratory  
Bethel Valley Road, Bldg 7001  
Oak Ridge, TN 37830

Please include your facility's report of radionuclide composition as this will aid us in handling the sample.

For samples that are fissile materials, special nuclear materials, or require something beyond a typical commercial carrier, please contact [neutronlabs@ornl.gov](mailto:neutronlabs@ornl.gov).

## Shipping Information

When shipping your samples to HFIR or SNS, you are responsible for adherence to relevant federal, state, and local laws and regulations, and applicable facility and ORNL policies and procedures. Please verify with your institution if you are unsure.

- Pack samples in a secure, DOT/ICAO approved container with correct regulatory marking and labeling.
- Each shipment must include a detailed packing list of all samples and materials shipped. All samples must be individually labeled. For small samples, mark the container or position in the sample holder with a number and include a numbered list. Labels or packing list must indicate sample constituents/formula.
- If shipping from outside the United States, you are responsible for all aspects of the U.S. Customs clearance process. This would include payment of any applicable duties or fees, which is accomplished by selecting "Deliver Duty Paid" (DDP) as the Incoterms rule on a proforma invoice. Often express carriers will provide brokerage services by filing necessary documents with U.S. Customs as the Importer of Record and then billing your account for any consequent duties or fees.

## Sample Preparation

A Laue x-ray station is available as a part of the SNS Scientific Laboratory suite. Use of the Laue machine is administered by Dr. Matt Stone who may be contacted at:

Matthew B. Stone  
Neutron Scattering Science Division  
Oak Ridge National Laboratory  
PO Box 2008 MS6475  
Oak Ridge, TN 37831-6475

Phone: (865)-202-6898  
Fax: (865)-574-6080  
[stonemb@ornl.gov](mailto:stonemb@ornl.gov).

Crystal alignment by means of neutrons may be performed at the HFIR. Use of the crystal alignment station is governed by Dr. Lee Robertson who may be contacted at:

Lee Robertson  
Neutron Facilities Development Division  
Oak Ridge National Laboratory  
PO Box 2008 MS6473  
Oak Ridge TN 37831-6473

Phone: (865)-574-5243  
Fax: (865)-576-3041  
[robertsonjl@ornl.gov](mailto:robertsonjl@ornl.gov)

Other laboratory equipment is available for sample preparation within the SNS and HFIR scientific laboratories suite. For more information, please contact Chrissi Schnell, the Neutron Scattering Science Division scientific laboratory coordinator:

Chrissi Schnell  
Neutron Scattering Science Division  
Oak Ridge National Laboratory  
PO Box 2008 MS6475  
Oak Ridge, TN 37831-6473

Phone: (865)-235-1741  
Fax: (865)-576-7577  
[schnellca@ornl.gov](mailto:schnellca@ornl.gov)

## Register for XCAMS account

Visit the IPTS site: <http://www.ornl.gov/sci/iuums/ipts/login.shtml> and click on the green button which says "Register in XCAMS." Note: This is not necessary if you already have a valid XCAMS or UCAMS account.

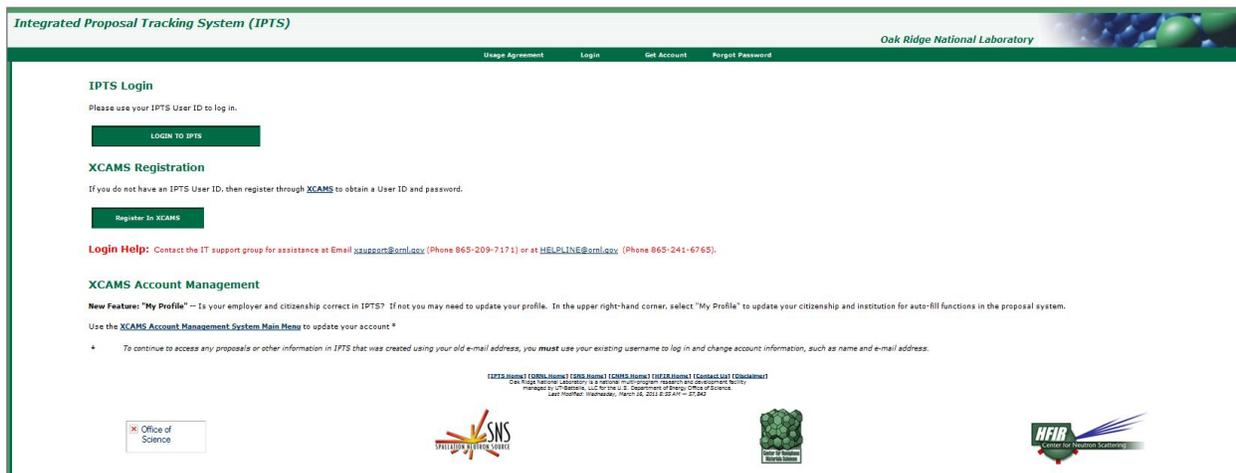


Figure 1: Screen shot of the IPTS login page.

## Request access to SEQUOIA computer

Once a valid UCAMS or XCAMS account is established, visit <https://neutrons.ornl.gov/accounts/request->

  
**Neutron Sciences Account Request Page**

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SNS Instrument Computer and Portal User

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2) Please select your instrument

- ARCS
- Backscattering Spectrometer
- CNCS
- Liquids Reflectometer
- Magnetic Reflectometer
- NOMAD
- POWGEN
- EQSANS
- SEQUOIA
- SNAP
- TOPAZ
- VULCAN

3) Please enter your Proposal ID (preferred) or a justification for access ( max 75 characters )

[sns.html](#) to request access to the SEQUOIA data analysis computer.

## Ensure Sample Mounting Scheme is consistent with SNS provided Sample Environment Equipment

### Using CCR13, SEQUOIA's workhorse

CCR13 is a closed cycle refrigerator with a base temperature of 6.3 K which is free to rotate 360° about the vertical axis. Sample containers readily available for use with CCR13 are shown below. Questions related to sample mounting or preparation for use in CCR13 should be directed to [Todd Sherline](#).

- 1) Powder Samples
  - a. Typical powder samples are loaded into a 50 x 50 mm<sup>2</sup> flat square indium-sealed cells. Sample thicknesses of 0.1 mm, 0.5 mm, 1 mm, 2 mm, 4 mm, and 6 mm are available. As a rule of thumb, sample thickness is chosen such that the total scattering probability is approximately 10% or less. Typically, the powder is wrapped in a thin Al foil before inserting into the sealed cell. For low-temperature experiments in which the sample temperature is an important consideration or the sample requires an inert environment, the cell will be sealed within a He filled glove box and subsequently leak checked.

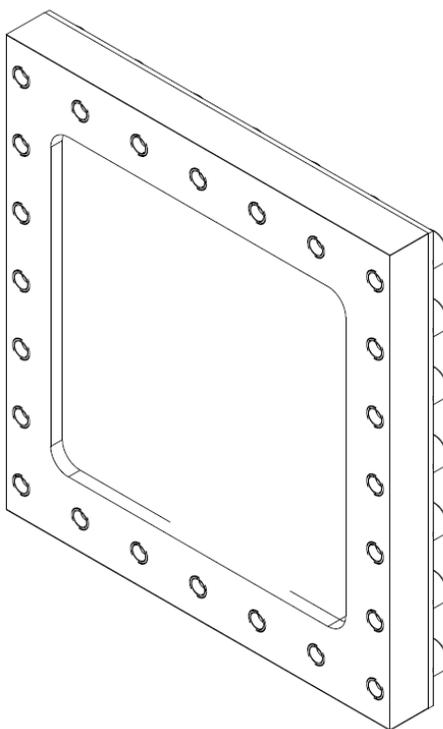


Figure 3: Schematic diagram of the flat Al powder cell body. Several versions are available with differing thicknesses.

## 2) Single Crystal Samples

- a. The sample orientation should be known and the orientation of the crystal with respect to the vertical axis decided. In this case, the sample exchange gas can, as shown below, will be used. Rotations of  $360^\circ$  about the vertical axis are possible in this configuration. Typically, the optional spacer above the Cu flange is omitted, i.e.  $x = 0$ . The sample should be mounted prior to arriving and should have either a stud or tapped hole with the thread pitch as indicated in the figure.

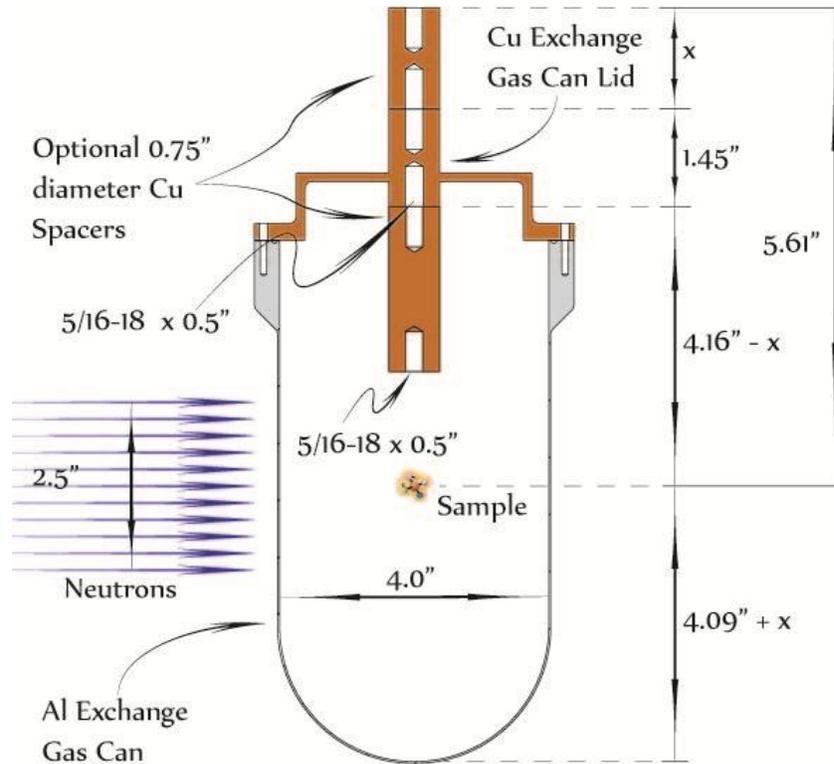


Figure 4: Schematic diagram of the exchange gas can used for single crystals.

- b. A second exchange gas can is available with the option to tilt the sample out-of-plane by approximately  $\pm 4^\circ / \pm 3.3^\circ$  about two orthogonal axes. In this case, the maximum load permitted is 60 g. The sample mount should have a cylindrical stud at the end with a diameter of 0.25". Optimally, the stud will penetrate the collar by 0.3", but can be shifted by  $\pm 0.1$ " if adjustment is needed.

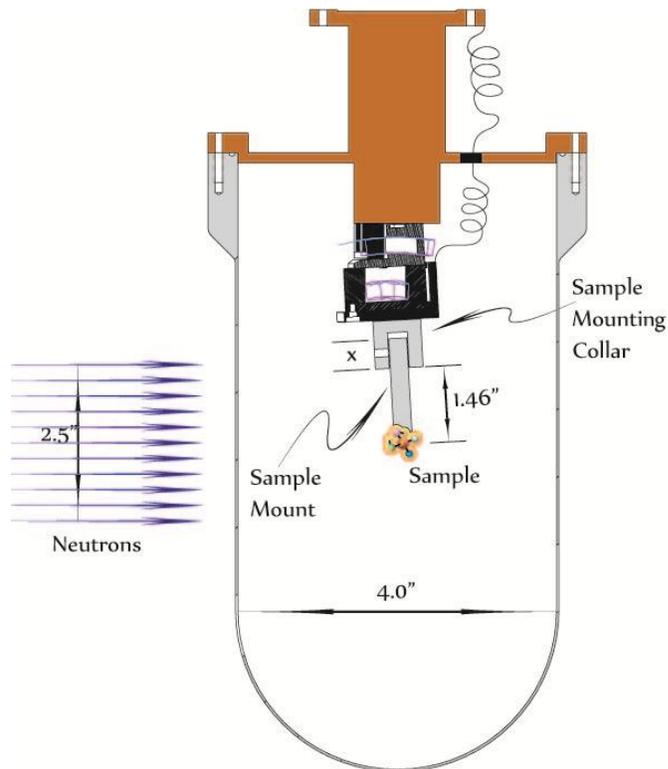


Figure 5: Exchange gas can which enables out-of-plane tilts in addition to rotations about the vertical axis.

- c. An alternative exchange gas can which produces a lower background is available. Similar to the can in Sec. a, rotations of 360° about the vertical axis are possible. Note that the sample must be attached via a 1/4" post when using this can.

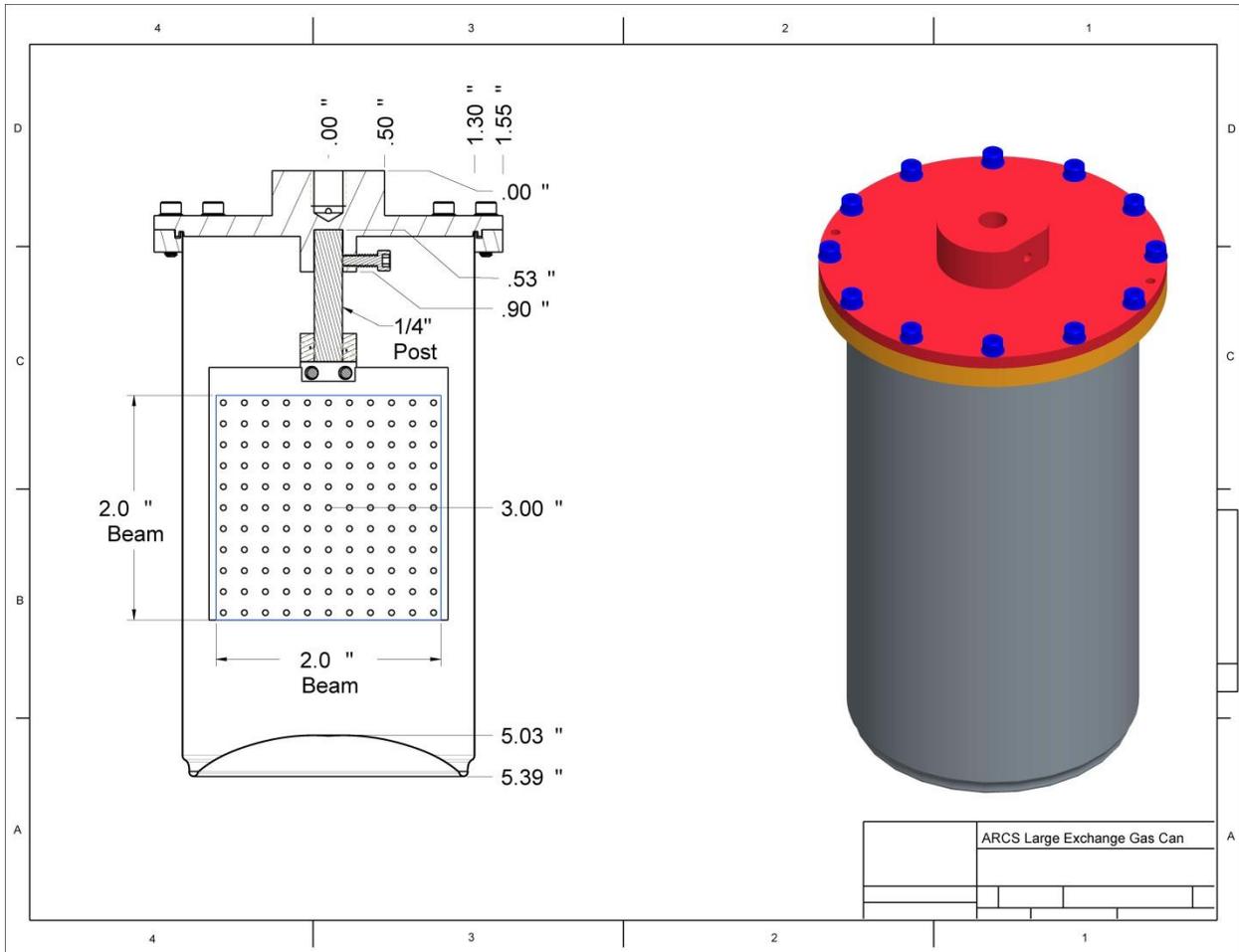


Figure 6: Thin walled exchange gas can used for single crystal experiments. Full rotation about the vertical axis is possible.

### Alternate sample environments

Experiments may be performed at SEQUOIA using a variety of sample environments aside from CCR13. Such environments include intermediate and high pressure gasses, static magnetic fields up to 16 T, among others. Please visit the SNS Sample Environment page (<http://neutrons.ornl.gov/instruments/SNS/sample/>) to see the full spectrum of available sample environments.