

Dear Triple Axis Spectroscopy (TAS) Users of the HFIR at ORNL:

As the deadline approaches for the next ORNL neutron scattering proposal call, here are some quick updates about the TAS Instrument Suite at the High Flux Isotope Reactor (HFIR):

1. Proposal deadline

IPTS is now open to accept proposals for the 2027-A call, with a **Sept. 23rd deadline at noon**. Please visit ipts.ornl.gov to submit a proposal.

2. TAS general user beamtime access

There are now three different ways to access TAS beamtime through the general user program to increase flexibility for our users.

- (a) Standard general user proposals requesting beamtime on a single TAS instrument
- (b) Structured multi-instrument proposals requesting beamtime on a TAS instrument and one of its sister instruments. Here are the options for each TAS instrument:
 - a. VERITAS => CORELLI or DEMAND
 - b. HB-1 => polarized HYSPEC
 - c. HB-3 => ARCS or SEQUOIA
 - d. CTAX => unpolarized HYSPEC or CNCS

These proposals will be reviewed for the scientific merit of running on both beamlines. If approved, the sister instrument experiment would run in the **2027-A** beam period and the TAS instrument experiment would run in the **2027-B** beam period. This is a great proposal mechanism for facilitating efficient follow-up experiments on the TAS instruments, which can benefit many scientific projects.

- (c) Back-up instrument option: Users can now be considered for time on a TAS instrument if they submit a general user proposal to one of its sister instruments that does not get approved. Make sure that this preference is specified in the IPTS system. Eligible proposals will be reviewed for feasibility on the TAS instruments and awarded beamtime based on scientific merit. These proposals will be considered for TAS beamtime along with the ones submitted directly to the TAS instruments.

3. TAS instrument descriptions

(i) **VERITAS (HB-1A)**: The high signal-to-noise ratio and large Q-coverage makes this instrument ideal for magnetic elastic scattering studies of small single crystals (mass > 2 mg), powders, and thin films with a variety of different sample environment options. A four-circle goniometer option is available (4 – 450 K) and particularly useful for magnetic structure studies of materials with small moments ($\leq 2 \mu_B$) and/or for cases where ultra-low $\lambda/2$ contamination is preferred. Traditional triple axis mode is also available

for a variety of different temperatures (0.04 – 1800 K), vertical magnetic fields (0 – 6 T), applied hydrostatic pressure (< 2 GPa), uniaxial pressure (compressive force < 300 lbs), and electric fields (≤ 10 kV with 1.5 – 300 K and 0 – 6 T). For more information, please contact Wei Tian (tianwn@ornl.gov) or Adam Aczel (aczela@ornl.gov).

(ii) **HB-1:** This instrument is specifically designed for polarized beam measurements with several experiment configurations. These measurements can be done at a variety of different temperatures (0.04 – 1800 K), magnetic fields (0 – 8 T), applied hydrostatic pressure (< 2 GPa), uniaxial pressure (compressive force < 300 lbs), and electric fields (≤ 10 kV with 1.5 – 300 K and 0 – 6 T). Experiment configurations available at HB-1 include half-polarization, longitudinal polarization analysis (single axis or XYZ), spherical neutron polarimetry (SNP), and Larmor diffraction ($\Delta d/d \approx 10^{-5}$). ***A recent upgrade of the Heusler analyzer has increased the instrument's intensity by a factor of 2-3.*** For general information about HB-1, please contact Masaaki Matsuda (matsudam@ornl.gov) or Avishek Maity (maitya@ornl.gov). For more information regarding SNP or Larmor diffraction, contact Peter Jiang (jiangc@ornl.gov) or Fankang Li (frankli@ornl.gov) respectively.

(iii) **HB-3:** This instrument is our most intense triple-axis spectrometer and is designed for inelastic measurements on single crystals over a wide range of momentum and energy transfers (up to ≈ 100 meV). These measurements can be done at a variety of different temperatures (0.04 – 1800 K), vertical magnetic fields (0 – 8 T), applied hydrostatic pressure (< 2 GPa), uniaxial pressure (compressive force < 300 lbs), and electric fields (≤ 10 kV with 1.5 – 300 K and 0 – 6 T). In addition to the standard PG monochromator, the instrument has a Si monochromator for experiments that want to avoid $\lambda/2$ contamination and a Be monochromator for achieving higher resolution at high energy transfers. For more information, please contact Songxue Chi (chis@ornl.gov) or Eleanor Clements (clementsem@ornl.gov).

(iv) **CTAX (CG-4C):** This instrument is designed for inelastic measurements on single crystals, where low energy transfers between -2 to 5 meV and good energy resolution are necessary. These measurements can be done at a variety of different temperatures (0.04 – 1800 K), vertical magnetic fields (0 – 8 T), horizontal magnetic fields (0 – 6 T), applied hydrostatic pressure (< 2 GPa), uniaxial pressure (compressive force < 300 lbs), and electric fields (≤ 10 kV with 1.5 – 300 K and 0 – 6 T). The Q-range of the horizontal field magnet is very limited, so please contact the instrument team in advance of submitting your proposal to properly assess feasibility. For more information, please contact Tao Hong (hongt@ornl.gov) or Hodaka Kikuchi (kikuchih@ornl.gov).

The adaptability of the TAS instruments ensures that a wide variety of user-supplied equipment can be accommodated when needed and potential users are encouraged to discuss possible options with the instrument teams. More details for these instruments can be found at the following link:

<http://neutrons.ornl.gov/instruments/>

4. HFIR and the ORNL guest house Note that it takes 10 – 15 minutes to drive between the HFIR site and the ORNL guest house. ORNL offers a taxi service between the two locations, but the taxis only run on weekdays between 8 AM – 4 PM. Therefore, it is highly desirable for at least one member of your experimental team to arrive at ORNL with a car. If this is not possible, please let the instrument team know in advance so other transportation arrangements can be made.

5. Single crystal sample alignments

If you need to align a single crystal for your TAS experiment, please email your local contact well in advance of the experiment, so alignment time can be reserved for you on the neutron alignment station CG-1B or one of our two Laue x-ray diffractometers. Note that we have a first-come, first-served scheduling system for these instruments. Also, let your local contact know if you are experienced with sample alignments or if you will require significant assistance.

6. Sample environment

(i) **High Temperature Experiments** (> 400K): A high temperature checklist is required to perform a high temperature experiment at HFIR. It is ideal to fill out the checklist and return it as soon as it is received so that any issues can be addressed and mitigated quickly. Please consider the sample holder material in reference to the sample material for any reactions that may occur at the required temperatures. The high temperature equipment dimensions and temperature range information are available on the public sample environment webpage: <https://neutrons.ornl.gov/sample/list/furnaces>. For more information, please contact Bekki Mills (millsra@ornl.gov).

(ii) **Ultra-low Temperature and/or Magnetic Field Experiments**: (< 1.5K): Please ensure that a properly aligned and mounted single crystal or a loaded powder sample can be provided to the sample environment team at least one working day (Monday – Friday) before the experiment is scheduled to begin to maximize data collection time on the instrument. The ultra-low temperature equipment dimensions and temperature range information are available on the public sample environment webpage: <https://neutrons.ornl.gov/sample/list/ultra-low-temperature-device>. For more information, please contact Josh Pierce (piercejj@ornl.gov).

(iii) **Applied pressure**: If you want to apply hydrostatic or uniaxial pressure during your experiment, it is critical to begin communication as early as possible to ensure success of your experiment. Due to our Be-containing sample and equipment handling policy, all CuBe pressure cells for neutron scattering experiments must be supplied by ORNL. Pressure users are strongly advised to arrive to ORNL at least one full day before their experiment begins to ensure successful sample loading. Our high-pressure capabilities are available on the public sample environment webpage: <https://neutrons.ornl.gov/high-pressure-and-gas-handling/home>. For questions regarding our high-pressure program, please contact Dilip Bhoi (bhoidk@ornl.gov).

(iv) **Block scheduling**: We schedule experiments requiring the same sample environment equipment on a particular instrument in blocks. For this reason, the impossible dates that you provide when submitting the proposal are **extremely important**. Please enter these dates into the IPTS system with as much accuracy as possible when you submit your proposal. We will accept changes to impossible dates up to **one week** after experimental approval notices are sent out to users. After this period, we will create the experiment schedule and therefore we may not be able to accommodate additional change requests.

Regards,

Adam Aczel, for the HFIR TAS Group