Dear Triple Axis Spectroscopy 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 Triple Axis Spectroscopy Instrument Suite at the High Flux Isotope Reactor (HFIR):

1. Proposal deadline

IPTS is now open to accept proposals for the 2025-A call, with an **Aug. 28th deadline at noon**. Please visit **ipts.ornl.gov** to submit a proposal.

2. Triple axis spectroscopy instrument descriptions

(i) **VERITAS (HB-1A)**: fixed incident energy thermal triple-axis spectrometer. An excellent signal-to-noise ratio and large Q-coverage makes this instrument ideal for magnetic diffraction studies of small single crystals (mass > 2 mg), powders, and thin films at a variety of different temperatures (0.04 K – 1800 K), vertical magnetic fields (0 - 8 T), and applied hydrostatic (< 2 GPa) and uniaxial pressures (compressive force < 300 lbs). Experiments requiring vertical magnetic fields above 6 T are limited to a base temperature of 1.5 K. For more information, please contact Wei Tian (tianwn@ornl.gov) or Adam Aczel (aczelaa@ornl.gov).

(ii) **HB-1**: polarized thermal triple-axis spectrometer. 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 K – 1800 K), magnetic fields (0 – 8 T), and applied hydrostatic (< 2 GPa) and uniaxial pressures (compressive force < 300 lbs). A high-resolution neutron Larmor diffraction capability utilizing Wollaston prisms is available to users at HB-1. This technique provides a $\Delta d/d$ resolution on the order of 10^{-5}, which is ideal to measure small lattices distortions or Bragg peak shifts [see Journal of Applied Crystallography **51**, 584 (2018)]. There is limited availability of a neutron spin echo capability for inelastic measurements with ~10 μeV resolution [see Journal of Applied Crystallography **52**, 755 (2019)]. A spherical neutron polarimetry (SNP) capability is available also. SNP is a powerful technique to investigate magnetic structures, including chiral magnets. For more information regarding the Larmor diffraction and neutron spin echo capabilities contact Fankang Li (frankli@ornl.gov). For more information regarding SNP contact Peter Jiang (jiangc@ornl.gov). For all other information regarding HB-1 please contact Masaaki Matsuda (matsudam@ornl.gov) or Avishek Maity (maitya@ornl.gov).

(iii) **HB-3:** general purpose thermal triple-axis spectrometer. 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 K – 1800 K), vertical magnetic fields (0 – 8 T), and applied hydrostatic (< 2 GPa) and uniaxial pressures (compressive force < 300 lbs) 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):** cold triple-axis spectrometer. 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 K – 1800 K), vertical magnetic fields (0 – 11 T), horizontal magnetic fields (0 – 6 T), and applied hydrostatic (< 2 GPa) and (compressive force < 300 lbs). Experiments requiring vertical magnetic fields above 8 T are limited to a base temperature of 1.5 K. 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 Adam Aczel (aczelaa@ornl.gov).

The adaptability of the triple axis spectrometers 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/

3. Single crystal sample alignments

If you need to align a single crystal for your triple-axis spectroscopy 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.

4. 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 experimental 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 is 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. Please contact a member of the relevant instrument team before submitting an applied pressure proposal to assess feasibility and again after an applied pressure proposal has been approved to help with the experiment planning. Furthermore, high pressure users are strongly advised to arrive to ORNL at least one full day before their experiment begins to ensure successful sample loading.

(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,

The Triple Axis Spectroscopy Group at HFIR