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 2024-A call, with a **Sept. 20th 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 (0.03 K – 1800 K), vertical magnetic fields (0 - 8 T), and applied pressures (< 2 GPa). A new single analyzer-detector assembly was successfully commissioned in April 2023. This upgrade, combined with the previously completed double-bounce monochromator optimization, produces a 4 -5x stronger signal. A commissioning experiment with a new uniaxial pressure stick was also just completed and this capability is now available for the user program. To discuss the feasibility of a uniaxial pressure experiment on VERITAS or for general instrument inquiries, 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 (0.03 K – 1800 K), magnetic fields (0 – 8 T), and applied pressures (< 2 GPa). 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 Jaime Fernandez-Baca (fernandezbja@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 (0.03 K – 1800 K), vertical magnetic fields (0 – 8 T), and applied pressures (< 2 GPa). In addition to the standard PG monochromator, the instrument has a Si monochromator for experiments that want to avoid $\lambda/2$ contamination and a Ge monochromator for achieving higher

resolution at high energy transfers. The adaptability of the instrument also allows for the potential use of user-supplied equipment when needed, and users are encouraged to discuss options with the instrument team. For more information, please contact Songxue Chi (chis@ornl.gov) or Travis Williams (williamstj@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 (0.03 K – 1800 K), vertical magnetic fields (0 – 8 T), horizontal magnetic fields (0 – 6 T), and applied pressures (< 2 GPa). 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 Travis Williams (williamstj@ornl.gov).

More details for these instruments can be found at the following link:
http://neutrons.ornl.gov/instruments/

3. Neutron alignment station

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 CG-1B. Note that we have a first come, first served scheduling system for this instrument. 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-devices. For more information, please contact Josh Pierce (piercejj@ornl.gov).

(iii) **Applied pressure:** If you want to apply pressure during your experiment, it is critical to begin communication as early as possible to ensure success of your experiment. Please contact the instrument team and/or the Sample Environment's High-Pressure Group (Mark Loguillo, loguillomj@ornl.gov) to

help with the experiment planning. If possible, this communication should commence from the proposal writing stage and continue until the experiment begins. 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,

Your Triple Axis Spectroscopy Instrument Team at the HFIR