**Information for New Users of the Michigan State University**

**RTSF Cryo-Electron Microscopy Core**

**INSTRUMENT RESERVATIONS**

During initial User training, the User will be granted access to the Google Calendar for the instrument that they have been trained to use (*e.g.* glow discharger, carbon coater, Vitrobot, or grid clipping station). This allows the User to make unassisted reservations at any time. The MSU Google Calendar is located online.

Booking availability of the Talos Arctica will be allocated according to the Director and/or Staff Manager discretion to ensure fair use.

To ensure efficient instrument use, all users “A, B, and C” type Users are encouraged to schedule imaging sessions to start early in the day (i.e., before or at 9 AM). Only experienced “B” type Users will be allowed to begin an imaging session in the afternoon. Compliance with these practices will help to ensure that more people can run samples on any given day, which will help to alleviate scheduling congestion.

“A and C” Users will need to schedule “Vitrobot” and/or negative staining preparation time in advance of imaging. Users may cancel their Vitrobot and/or negative staining reservations >24 hours prior to the scheduled time without risk of penalty. Cancellations made <24 hours from a scheduled reservation will result in a fee. Unused reservation time will be billed at the regular training rate of $80 per hour.

Note that billing hours are based on the time reserved, not the portion of the reserved time during which samples were analyzed.

**BILLING**

RTSF Cryo-EM Users are billed according to reserved hours. Billing rates are available at: <https://cryo-em.natsci.msu.edu/services/>

**GRID RETENTION AND ACCESS**

Each Cryo-EM Core dedicated faculty member (*e.g.* Parent and Kim labs) will have a reserved cane filled with pucks that is compatible with the SubAngstrom system. Grid storage for “A and C” type Users will be managed by the Director and/or the Staff Manager.

Grid storage length for Users will be based on the discretion of the Director and/or the Staff manager. If Users wish to purchase their own dewars, they can keep grids either in the facility or off site. However, management of these outside use dewars will NOT be the responsibility of the CryoEM Core.

**DATA RETENTION AND ACCESS**

Ultimate responsibility for data storage is on the part of the User. It is recommended that Users back up their data as soon as possible after acquisition (e.g., the day after acquisition). The RTSF Cryo-EM facility will attempt to retain all raw User data for 21 days on the Talos Arctica Buffer server.

Data on the Talos Arctica Buffer is backed up to the DDN Storage Server once per week using automated backup software. Data will be maintained on the DDN Storage Server for up to 1 year.

Data on the Talos Arctica Buffer will be deleted after 21 days to make space for new data.

**DATA RETRIEVAL BY USER**

Data is backed up each night/early morning. If a User wants to retrieve data collected prior to the nightly backup, the User must transfer the data manually with his or her own hard drive.

EPU sessions will be named according to the lab name (last name of the PI, e.g. “Parent lab”). The Director and Staff Manager will then set permissions to access lab folders to individual Users.

**WORKSTATIONS**

The RTSF CryoEM Core has four GPU Workstations (cryoEM1, cryoEM, cryoEM3 and cryoEM4). It is expected that “B” Users purchase their own workstations for routine use and preprocessing.

Two Workstations are located in the BMB Core Computational Facility (room 502 located in the Biochemistry building at 603 Wilson Rd), and two are in the cryo-EM facility computer room (e.g. room D127 located in the ERC East at 1449 Engineering Research Court).

CryoEM1 is located in the ERC East in room D127. The primary purpose of cryoEM1 is to do initial MotionCorr processing and initial quality assessment of data as we setup EPU sessions. This is accessible by all Users.

CryoEM2 is located in the ERC East in room D127 and is dedicated for use by the Staff Manager.

CryoEM3 and CryoEM4 are both located in Biochemistry 502 and are available to all Users although access to CryoEM4 (largest GPU machine) will be discretionary based on need (*i.e.* priority will be given for the most computationally intensive projects) and this will be determined by the Staff Manager.

CryoEM3 and CryoEm4 are equipped with open source software for data processing including:

* Relion
* EMAN2
* CisTEM
* Chimera
* Phenix
* IMOD
* CryoSPARC

CryoEM will also have a license for Amira

Computers will be updated with new software and all preventative maintenance will be performed by Pappan. Contact Pappan for help or questions with software installation (padmanab@msu.edu)

It is required that you copy your data onto a hard drive **immediately** following processing. Data files on these four CryoEM Workstations will be deleted after user by the Director or the Staff Manager to free up storage space.

There is no charge for using a Workstation.

Long term storage of reconstructed data is the sole responsibility of the Users. If labs wish to purchase a NAS unit they may store it securely in room 502 in the Biochemistry building.

**SECURITY & FACILITY ACCESS**

RTSF Cryo-EM facility Staff-supervised hours are Friday from 9AM to 5 PM, excepting University Holidays or instances when the Core is otherwise closed (notification would be posted). Additional time may be requested and will be given at the discretion of the Director and/or Staff Manager.

RTSF Cryo-EM facility independent users will have access to the core Monday 9AM through Thursday 5PM. All data collection must be finished by Friday 8AM unless otherwise noted on the calendar. All Users must unload his/her grids before 8AM on the day that the next User is scheduled to operate the Talos. Failure to do so will result in disposal of grids by the Staff Manager as well as incur a fee of $100 to the User.

“B” Users who are trained may be granted 24/7 access privileges. Ask the RTSF Cryo-EM facility Director for the required documentation if you are interested in this privilege. It is expected that all “B” Users who are here after-hours will conduct themselves in a safe and professional manner.

“A and C” users must contact the Staff Manager for access to the space and this will be by appointment only. All access will be supervised for “A and C” Users. At no time may a “A or C” User be alone in the facility.

An important component of RTSF Cryo-EM facility security is ensuring that after-hours access is only available to authorized “B” Users. Anyone here after-hours must have signed the Liability Release Form. Furthermore, anyone here after-hours should enter via the locked keycard access door with the use of their own keycard. Do not open the door for anyone or leave any door open after hours.

Also, as there is valuable as well as harmful equipment/materials stored in the RTSF Cryo-EM facility, it is imperative that the User community is aware of who is in the RTSF Cryo-EM facility. If there is suspicion that someone is in the facility who should not be there, please inform the RTSF Cryo-EM facility Director.

Access to the CryoEM Computational Suite located in room 502 of the Biochemistry building is restricted by keycard access. Contact Mary Thompson diedri13@msu.edu for access. You must get the approval of the Director prior to this. This space will be available 24 hours a day, 7 days a week.

**ASSISTANCE FROM RTSF CRYO-EM DIRECTOR OR CORE STAFF**

RTSF Cryo-EM facility Staff are available during open hours (MWF, 8-5) to advise Users. Users are encouraged to work closely with Core Staff, who can provide expertise in matters including experimental design, preparative method development, analytical method development, data processing, and data interpretation. Depending on the urgency of the advice sought, Users are asked to schedule appointments with the Staff member(s) that they have worked with previously. Contact information for Core Staff may be found at

<https://cryo-em.natsci.msu.edu/people/core-faculty/>

**PUBLICATIONS**

All Users are required to acknowledge the “MSU RTSF Cryo-EM Facility” in their publications. The Director and/or Staff should be included as co-authors for instances where they have provided substantial intellectual input to the project, such as substantial involvement in experimental design, preparative method development, analytical method development, statistical analysis, data processing and/or data interpretation. This should be agreed upon prior to imaging and is most appropriate for “A” or “C” type users.

Users are welcome to ask the RTSF Cryo-EM facility Director and/or Staff to review relevant sections of manuscripts prior to manuscript submission. Also, please inform the Core when you publish; such information may help the Core acquire resources such as instrumentation.