

UMBC NanoImaging Center (NIC)

User Policies

Mission of NIC

NIC is a user facility funded by UMBC and NSF. It supports research at the University of Maryland, Baltimore County, other campuses of the University System of Maryland, other academic and non-profit entities, and commercial organizations. NIC also supports the teaching mission of UMBC by making its instruments accessible for coursework and student projects on both the undergraduate and graduate levels.

User fees are collected depending on the instrument, the type of user, and the length of use, as listed in the posted "User fees" file. The fees are needed for service contracts, maintenance and repair costs, supply, etc. The fees are comparable to the fees at similar facilities in the area.

Decisions about policies, priorities, and other general issues are made by the Director of NIC, in close consultation with the NIC Steering Committee. The members of the Steering Committee represent several science and engineering departments.

Access to NIC Instruments

The instruments of NIC are available on a first come – first served basis. If large demand results in unacceptably long waiting periods, the time of use will be limited (e.g. for 3 hours per day but not more than 10 hours per week per user.) If a measurement requires longer running time, access by an expert user can be arranged for the weekend or overnight. In case of conflict, priority will be given to courses and to research at UMBC and other UM campuses. If serious overload develops, priority decisions will be made by the NIC Steering Committee.

Before access to any instrument, potential users shall fill out the NIC Users' Registration Form (posted,) that records appropriate data on the user, the name of the person financially responsible for the project, and the appropriate billing information.

Potential users of the Nova NanoSEM 450 will be interviewed by the Director of NIC in order to determine their background, the level of necessary training, and the need for supervision when working on the instrument. Three basic categories of users will be distinguished and recorded on the User Registration Form:

- Class A: Expert users, who are able to operate the instruments without assistance in most situations and are able to do basic troubleshooting when needed. They can arrange for instrument time outside usual working hours.
- Class B: Experienced users, who are able to perform routine operation, but may need assistance occasionally. They should arrange instrument time during regular working hours.
- Class C: Beginners, who need the help from a more experienced user, either a coworker or a person associated with NIC. They should work during regular working hours and make sure that help is available.

Unsupervised work or training by another user has to be authorized by the Director of NIC. In addition, the user or his/her supervisor must have the financial resources to pay the appropriate user fee.

Instrument time can be reserved online or by emailing the Director of NIC. The person who made the reservation must begin work not later than 15 min after the beginning of the scheduled time; otherwise a stand-by user may take over the reserved time slot.

Bookkeeping

Each instrument has a log-book. Users must record the time of starting at the beginning of their work. They must also provide basic information on the type of application and detectors/tips used. At the end of a session, the end time has to be

recorded, together with any unusual occurrence during work. Potentially useful observations and successful ways of handling problems can also be recorded. A separate form has to be completed for billing purposes at the end of each session.

Laboratory Safety

No food or drink is allowed in the laboratory. Open beverage containers are particularly dangerous.

Maintaining the general cleanliness of the lab is essential to the operation of the instruments on top level of performance. Avoid causing a mess e.g. by carrying in mud on your shoes. Clean up or ask for clean up if necessary, before any dirt gets scattered around.

Follow safe general laboratory practices. Do not disconnect cables or hoses. Avoid clutter; store away tools and supplies when not needed.

Never touch anything that will be placed inside an SEM without clean gloves on. Touching anything inside the sample chamber without gloves is strictly forbidden. Minute amounts of grease condense in the column, decompose under the electron beam and form carbon deposit near the path of the electrons. The carbon deposit leads to deteriorating performance and it is very difficult to remove.

Alcohol is provided for cleaning sample holders and other items that are placed in the sample chamber of the microscopes. Notice that the washing alcohol sold as "ethanol" is a poison, it contains 10% highly toxic methanol and 10% isopropyl alcohol. It is not suitable for drinks. Take this very seriously.

Using the Instruments at NIC

Specific directions are posted next to each instrument. Follow them carefully. If the procedure is not clear, discuss the problem with the NIC Director or his Representative. Trial and error is not always a good way to proceed, especially if causing an accident, e.g. hitting the magnetic lens or a detector with a sample, is possible.

Standard imaging can be performed by a certified experienced user without supervision. But approval of the NIC Director is required before any more advanced measurement or installation of an SEM detector or new AFM tip is attempted.

If an instrument behaves in an unexpected way or malfunction is suspected, stop working, turn off the high voltage on SEMs, record the problem in the instrument log-book and ask for advice from the NIC Director or his Representative. Do not attempt to repair the instrument.

Publications and Acknowledgements

The productivity of the NanoImaging Center is measured by the productivity of its users. Therefore, it is essential that users provide explicit acknowledgement of its use in their publications and presentations. A possible wording is: "SEM/AFM images were obtained at the UMBC NanoImaging Center."

The NanoImaging Center maintains a list of all the publications that benefited from its use for reporting purposes. Therefore, the publication of any image obtained at the NanoImaging center must be reported to the NIC Director. The author(s), title, and the coordinates of the publication must be submitted together with an electronic copy of the publication itself.

The copyright of any image belongs to the researcher bringing the sample to the NanoImaging Center. Nevertheless, user images are often useful to demonstrate the capabilities of the instrument to potential other users or students and they will be used for that purpose unless the user specifically requests otherwise, e.g. in case of classified work. No image will be placed on the NIC web page or made public in any other way without explicit permission of the user.