The CREAIT Network’s Micro-Analysis Facility SEM/MLA Lab offers the following services:

**Scanning Electron Microscopy**: The SEM provides for digital imaging, and acquired image files are standard formats (ex. TIF, JPEG). Imaging services include:

- Traditional high resolution applications for clean/dry samples under high vacuum, which will demand the sample be conductive or conductively coated.
- Cathodo-luminescence (CL) imaging in real-time colour
- Variable-pressure SEM for imaging non-conducting and dry samples
- Backscattered electron imaging (BEI), or atomic number (Z) mapping, is available for both of the above modes of use
- Environmental SEM for imaging non-conducting and wet samples

**High speed energy dispersive x-ray (EDX) detection**: The SEM is equipped with Roentec SDD EDX X-ray detectors for acquiring elemental x-ray spectra with high efficiency. Services include:

- Qualitative and elemental identification and semi-quantitative analysis for specific spot on the sample
- Qualitative and semi-quantitative elemental line scans
- Qualitative and semi-quantitative elemental spatial distributions (maps)

**Mineral Liberation Analysis**: SEMs allow for image analysis (feature analysis) using FEI’s MLA acquisition and processing software. Examples of MLA analysis include:

- Particle analysis and mineral grain associations (ex. Mineral liberation)
- Traditional modal analysis
- Rare phase searches (ex. Au, Zircon)
- Discrimination of Hematite and Magnetite in modal analysis
- High resolution texture mapping of geologic sections

**Electron Backscatter Diffraction Analysis (EBSD)**: Our 650 FEG is equipped with an Oxford EBSD system and the Nordlys II camera. The EBSD system includes the Mineralogical Society of America minerals database for verifying mineral identification and determining crystalline lattice orientations.

**Sample preparation**: The SEM lab is equipped for accepting almost any type of small sample and preparing them for SEM/MLA analysis. Our support equipment includes:

- Conductive coating with evaporated carbon or sputtered gold
- Size fractioning (sieving) relatively small aliquots of particles (ex. 2kg of particles smaller than 2 mm)
- Creating representative small aliquots with the rotary micro-riffler
- Epoxy embedding and polishing 25 and 30 mm diameter mounts with Struers Tegra polishing system
- Fine polishing with the Buehler Vibromet polisher.

The above described capabilities of the SEM-MLA facility do not include the instruments or our facilities versatility. Potential clients are encouraged to contact the SEM-MLA coordinator.

Dr. David Grant, SEM-MLA Lab Coordinator
(709) 864-6799  dgrant@mun.ca
Dr. Derek Wilton, Principal Investigator
(709) 864-8389  dwilton@mun.ca

**Charges for instrument time**:  
A minimum SEM session is 3 hours.  
The following types of rates apply to clients:

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational (Memorial University)</td>
<td>$30/hr</td>
</tr>
<tr>
<td>Collaborative research (other univ.)</td>
<td>$30/hr</td>
</tr>
<tr>
<td>Non-collaborative research (other univ.)</td>
<td>$50/hr</td>
</tr>
<tr>
<td>Non profit-organizations (ex. GS Canada)</td>
<td>$50/hr</td>
</tr>
<tr>
<td>Industrial or commercial</td>
<td>$100/hr</td>
</tr>
</tbody>
</table>

Note that MLA applications required instrumental time for data acquisition and for preliminary processing. Clients and users should keep this in mind for estimating costs and reserving time. When deemed it is the facility’s responsibility for all data processing, the additional rate of $75/hr will apply.

**Charges of specimen preparation**:  
Specimen preparation is assumed sample dependant, and will be charged at an hourly rate. Examples include: sieving and/or riffling unknown amounts, including drying and cleaning.

- Sample handling and preparation $30/hr

For those clients who already have their samples, or who have made them ready for mounting/polishing, the following charges apply:

- Epoxy embedded polished grain mounts $40/ea
- Trans-vertical polished grain mounts $50/ea
- Sample coating no charge