

# User Fees for the 4D LABS Characterization Facility

## 1. Imaging Fees

Service	Industry Rate
SEM 1 - Helios:	
• SEM/EDS mode	\$125/hr
• SEM/EDS mode with FIB functions	\$175/hr
• Cryo mode setup	\$120/session
SEM 2 – Nova NanoSEM	
• SEM/EDS mode	\$115/hr
• SEM/EDS mode with mountable detectors or low vacuum mode	\$130/hr
SEM 3 – Explorer	\$60/hr
STEM 1 – Tecnai Osiris:	
• Normal mode	\$125/hr
• Cryo sample loading	\$30/sample
Helium Ion Microscope	\$120/hr
Sputter Coater – Ir/C	\$50/hr
Microtome	
• Room temperature mode	\$50/hr
• Cryo mode	\$40/session
• Additional cost when using diamond knife	\$5/hr
Polisher	\$50/hr
Vitrobot	\$30/hr
Wetbench 9 (Epoxy casting and sample prep)	\$40/hr
Training	\$60/hr
Technical Labor Rate	\$120/hr

## 2. Characterization Fees

Service	Industry Rate
Atomic Force Microscope (AFM, TASC2 7030)	\$80/hr
Ellipsometer 2 (UVISEL, TASC2 6140)	\$60/hr
Fuel Cell Test Station (TASC2 6140)	\$15/hr
ICPMS	
• Solution Phase	\$150/hr
• Laser Ablation	\$200/hr
Porosimeter (TASC2 6140)	\$100/hr
X-Ray Diffraction (TASC2 6140.3):	
• XRD 1 (Rigaku)	\$60/hr
• XRD 2 (Bruker)	
• Small Angle X-ray Scattering (SAXS)	
X-Ray Photoelectron Spectroscopy (TASC2 6140):	
• Tool time	\$120/hr
• Routine sample loading	\$60/sample holder
• XPS Ion gun setup (only for ion beam etching in XPS chamber)	\$30/session
• Liquid Nitrogen Setup (only for outgassing samples or low temperature XPS)	\$85/session
Leak detector (minimum 1 hr)	\$60/hr
Training	\$60/hr
Technical Labor Rate	\$120/hr

### 3. Materials and Supplies

Product	Cost
SEM Stub	\$1/ea
FIB Lift-Out Copper Grid	\$2/ea
Lift-Out Grid Storage Box	\$15/ea
TEM Grids:	
<ul style="list-style-type: none"> <li>5-10 nm Formvar/Carbon on 300 mesh Cu</li> </ul>	\$5/ea
<ul style="list-style-type: none"> <li>Non-supported grid</li> </ul>	\$3/ea
<ul style="list-style-type: none"> <li>Ultrathin Carbon Film on Lacey Carbon Support Film, 400 mesh, Copper</li> </ul>	\$10/ea
<ul style="list-style-type: none"> <li>Ultrathin Carbon Film on Lacey Carbon Support Film, 300 mesh, Gold</li> </ul>	\$15/ea
<ul style="list-style-type: none"> <li>Ultrathin Carbon Type-A, 400 mesh, Copper</li> </ul>	\$10/ea
<ul style="list-style-type: none"> <li>Lacey Formvar/Carbon, 200 mesh, Copper</li> </ul>	\$10/ea
TEM Grid Storage Box	\$20/ea
Carbon and iridium deposition	\$0.40/nm
Sample embedding in epoxy	\$5/sample puck
Microtome:	
<ul style="list-style-type: none"> <li>glass knife</li> </ul>	\$5/ea
<ul style="list-style-type: none"> <li>glass bar (to make own knives)</li> </ul>	\$20/ea
Liquid Nitrogen	\$2/L
X-ray Capillary Tubes:	
<ul style="list-style-type: none"> <li>Boron-Rich Tubes</li> </ul>	\$7
<ul style="list-style-type: none"> <li>Quartz Tubes</li> </ul>	\$10
SAXS Supplies:	
<ul style="list-style-type: none"> <li>Mica window</li> </ul>	\$7
<ul style="list-style-type: none"> <li>Viton o-ring (-150 °C – 220 °C)</li> </ul>	\$3
<ul style="list-style-type: none"> <li>Kalrez o-ring (-150 °C – 315 °C)</li> </ul>	\$45
<ul style="list-style-type: none"> <li>Disposable capillary</li> </ul>	\$9
<ul style="list-style-type: none"> <li>Reusable capillary</li> </ul>	\$700
AFM Supplies:	
<ul style="list-style-type: none"> <li>ScanAsyst-Air probe tip</li> </ul>	\$50
<ul style="list-style-type: none"> <li>Tapping Mode probe tip</li> </ul>	\$63
<ul style="list-style-type: none"> <li>Gelpack tip holder (stores 10 tips)</li> </ul>	\$44

### ***Rules and Regulations:***

1. Users of the Materials and Device Characterization Facility must be qualified on each tool used. This must be done through technician training at rates listed above. Training times will vary based on the complexity of the tool and the experience of the user.
2. Minimum usage is one half hour for all equipment.
3. External academic users who wish to have a 4D LABS technician run a sample for them (e.g., sample preparation, data acquisition, and data processing) will have to make these arrangements through 4D LABS ([nanoimaging@4dlabs.ca](mailto:nanoimaging@4dlabs.ca)). Cost estimates can be compiled based on a 10, 5, or 1 day turn-around time.
4. Invoices are normally sent on a monthly basis and payments can be made by cheque or account transfer (internal users only).
5. Payments are due Net (30) days from invoice date. Past due invoices are subject to a service charge of 1.5% per month (18% annual) on the unpaid balance or the maximum legal rate permitted by provincial law, whichever is lower.

### ***Special Notes:***

1. The XPS usage fee includes access to data analysis software.
2. The XRD usage fee includes access to a sample preparation station, data analysis software, and crystal structure databases.