

NDIIF ELECTRON MICROSCOPY CORE USER GUIDE

Active Infrastructure, (S)TEM Platforms, SEM/FIB, and Specimen Preparation Protocols

Notre Dame Integrated Imaging Facility (NDIIF) • Core Reference Guide

UPDATED ELECTRON MICROSCOPY CORE (EMC) RESOURCES

This reference document reflects the active high-resolution electron microscopy infrastructure within the **NDIIF Electron Microscopy Core**, including our premier Thermo Scientific (S)TEM platforms, FE-SEM systems, and specimen preparation facilities located across Stinson-Remick Hall and McCourtney Hall.

1. Active Electron & Focused Ion Beam Microscopes

Instrument	System Modality & Location	Key Capabilities & Primary Applications
Spectra 300 (S)TEM (Thermo Scientific)	Probe-Corrected (S)TEM Stinson-Remick B03	Ultra-high resolution 30–300 keV S/TEM with probe aberration correction (50 pm resolution). Equipped with EMPAD, Panther detector system, and Super-X EDX for atomic-scale imaging and chemical mapping.
Talos F200i (S)TEM (Thermo Scientific)	20–200 kV Field Emission (S)TEM Stinson-Remick B09	Versatile (S)TEM designed for materials science, 2D/3D microstructure characterization, in situ dynamic observation, and dual Bruker X-Flash EDS mapping.
Magellan 400 L (FEI / Thermo Scientific)	High-Resolution FE-SEM McCourtney Hall	Extreme high-resolution scanning electron microscope enabling sub-nanometer surface imaging at low accelerating voltages without coating delicate or beam-sensitive samples.
Helios G4 FEG SEM/FIB (FEI / Thermo Scientific)	DualBeam FIB/SEM System McCourtney Hall	Combines ultra-high resolution FE-SEM surface imaging with focused ion beam (FIB) nanomachining, 3D cross-sectional tomography, and site-specific TEM lamella preparation.

2. Specimen Preparation & Microanalysis Facilities

Sample Preparation & Analytical Capabilities:

- **Energy Dispersive X-ray Spectroscopy (EDS/EDX):** High-speed elemental mapping and quantitative microanalysis integrated across (S)TEM and SEM platforms.
- **Cryo-Specimen Preparation:** Vitrobot automated plunge freezer for rapid cryo-fixation and vitrification of aqueous macromolecular suspensions.
- **Ultramicrotomy:** Leica EM UC7 ultramicrotomes for room-temperature and cryo-thin sectioning of plastic-embedded biological tissue and soft polymers.
- **Sputter Coating & Deposition:** High-vacuum sputter coaters (Gold/Platinum) and carbon evaporators for artifact-free conductive sample coating.

3. Facility Location & Access Guidelines

- **Laboratory Locations:** Electron Microscopy Core facilities are housed across **Stinson-Remick Hall** (Spectra 300, Talos F200i) and **McCourtney Hall** (Magellan 400L, Helios G4).
- **Consultation & Training:** Core staff provide assisted operation, complete sample preparation services, and hands-on training for certified independent access.
- **Scheduling:** All instrument booking and service requests are managed via the NDIIF iLab portal.