

Columbia Nano Initiative (CNI) Shared Facility Equipment List



Credit: James C. Hone



Thin Film Deposition and Thermal Processing:

- UHV E-beam Evaporation Angstrom
- Evaporator Thermal, Edwards BOC/Auto 306
- Evaporator (Thermal/E-beam) and Sputter, Angstrom EvoVac Multi-Deposition System
- AJA, Orion-8 Dielectrics Sputtering System
- AJA, Orion-3 Metal Sputtering System
- ALD, Cambridge Nano Tech Inc. Savannah 200
- PECVD, Oxford Instruments, PlasmaPro NPG80
- Cressington, 108 Manual Sputter Coater
- Furnace, Expertech LPCVD CTR-125

Dry Etch:

- ICP-RIE—Cl, Oxford Instruments, Plasma Pro System100 Cobra III-V
- ICP—F-based, Oxford Instruments, PlasmaLab 80+
- ICP/DRIE—F-based, Oxford Instruments, Plasma Pro System 100/1 Cobra300
- Plasma Asher/Etch, Anatech SCE-110 RF
- Plasma Asher/Etch, Diener Plasma Etch System

Metrology and Characterization:

- Optical Microscopes, Nikon Eclipse
- Optical profiler, Wyko NT9100
- Surface Profilometer, Alpha-Step D-600, KLA-Tencor
- Ellipsometer, J. A. Woollam, Alpha-SE
- Atomic Force Microscope, Bruker, Dimension FastScan
- Spectrophotometer, Agilent 8453 UV/Vis
- SCXRD, Agilent SuperNova
- Powder XRD, PANalytical XPert3
- Cryogenic SQUID Magnetometer, R-700X
- Zetasizer, Malvern Nano-ZS
- TGA, TA Instruments Q500
- X-ray Photoelectron Spectroscopy, Phi Electronics, Phi 5500
- Micro-Raman spectroscopy, Renishaw inVia
- Gel Permeation Chromatography (Agilent & ECOSEC)
- Micromeritics ASAP 2020 HV BET Analyser

Photo and E-beam Lithography:

- Mask fabrication, Heidelberg DWL 66+ Laser Writer
- Mask fabrication, Heidelberg μ PG 101 Laser Writer—3 micron
- Electron Beam Lithography, Nanobeam nB4
- Electron Beam Lithography, Nanometer Pattern Generation System on a NovaNano SEM
- Mask Aligner, Süss MicroTec MA6
- Mask Aligner, Süss MicroTec MA6 with DUV source and BS alignment
- Spinners, Laurell, Lite series

2D Materials Processing:

- Glove box N_2 inert environment 2D materials processing, including NanoMagnetics ezAFM, Horiba XploRA Micro-Raman, and Signatone CM300 transfer station

Backend and Packaging:

- Dicing Saw, Disco, DAD3220
- Wire Bonder, West Bond, 7476D, Al
- Wire Bonder, West Bond, 7477E, Au
- Critical Point Dryer, Bal-Tec 030
- G&P Chemical Mechanical Polishing, Poli-400L
- Parylene Coater, SCS PDS 2010

Electron Microscopy and Sample Preparation:

- Scanning Electron Microscope, Carl Zeiss, Zigma VP
- Scanning Electron Microscope, FEI, Nova Nano450
- Transmission/Scanning Transmission Electron Microscope (S/TEM), FEI, Talos F200X
- Optical Microscope, Zeiss, Axioscope A1
- Optical Microscope, Zeiss, stemi DV4
- Diamond Saw, Buehler 11-1280-160
- Dimple Grinder, Gatan 656
- Polisher, South Bay Technology, 910
- Precise Ion Polishing System, Gatan, PIPS II 695
- Plasma Cleaner, Gatan Solarus 950
- Sovall Dupont Ultra Microtome MT-2B

CNI Shared Facility Mission and Objectives

- Provide the Columbia University research community with access to cutting-edge micro- and nanofabrication and characterization equipment
- Support preeminent leadership in nanoscience and engineering
- Provide technical support for equipment use, process development, and training for users from Columbia University, other academic institutions, and industry