

## 4D LABS Nanoimaging Equipment Summary

Tool	Manufacturer	Model	Imaging	Elemental Analysis	Stage	Navigation camera	Chamber view camera	Focused Ion Beam	Resolution	Low Vacuum	Training Time *	Advanced features
STEM 1	FEI	Tecnai G2	y	y	5-axis eucentric	n	n	n	0.14 nm	n	12.0 hr	EELS, EFTEM
STEM 2	Hitachi	8100	y	n		n	n	n	0.14 nm	n	4.0 hr	TEM training, Sample screening
STEM 3	FEI	Tecnai Osiris	y	y	5-axis eucentric	n	n	n	0.14 nm	n	8.0 hr	Dynamic BF/DF TEM, HAADF/DF4/DF2/BF STEM, EELS, STEM/PEELS, TEM/STEM tomography, 3D reconstruction programs
SEM 1	FEI	DB235	y	y	5-axis eucentric	n	y	y	3.0 nm	n	8.0 hr	Electronic measurement with microprobe contact
SEM 2	FEI	Helios	y	y	5-axis eucentric	y	y	y	0.7 nm	n	8.0 hr	Stereo image preparation, FIB cross section preparation and patterning, Retractable STEM and CBS (backscattered electrons) detectors, SmartScan and beam deceleration, Cryo SEM/FIB, sputter Pt deposition, E-beam/I-beam Pt deposition, TEM sample liftout, AutoSlice and View, 3D reconstruction programs
SEM 3	FEI	Explorer	y	y	3-axis, no rotation, no tilt	y	y	n	20 nm	y	3.0 hr	Variable pressure (low vacuum) imaging with air for non-conducting samples
SEM 4	FEI	Nova NanoSEM	y	y	5-axis non-eucentric	n	y	n	1.3 nm	y	5.0 hr	Stereo image preparation, Beam deceleration, navigation montage, low vacuum imaging using pole-piece mounting LVD/Helix, GAD, or cVD detectors with water vapor or air

\* Training time estimate is on basic imaging only and will vary significantly depending on the user. Do not rely on this number when budgeting expenditure