Nanofabrication and Devices

Dafei Jin (Interim Group Leader) djin@anl.gov
ultralow temperature/strong magnetic field measurement, FIB/SEM dual beam imaging and patterning

David Czaplewski dczaplewski@anl.gov
MEMS/NEMS, electron beam lithography, CVD

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nanophotonics

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electron beam lithography, nanogels, MEMS/NEMS

C. Suzanne Miller cmiller@anl.gov
electron beam lithography, nanocrystals, MEMS/NEMS

ANALYSIS

Anirudha Sumant sumant@anl.gov
superlubricity, diamond-based NEMS, CNT, graphene wear/friction measurements

MAJOR TOOLS

- JEOL 8100FS, 100kV electron beam lithography
- Raith 150, 30kV electron beam lithography
- FEI Nova 600 NanoLab DualBeam FIB/SEM
- Karl Suss M6 Optical mass aligner
- ASML PAS 5000 wafer stepper
- Direct write optical lithography
- Interferometric lithography
- AJA oxide sputtering
- Xactix XeF2 etcher
- AMI 5-1-1 Tesla Vector Magnet

Quantum and Energy Materials

Nathan Guisinger nguisinger@anl.gov
UHV STM, AFM, 2-D materials, STS, cryo-STM with magnetic field

Brandon Fisher bfisher@anl.gov
XRD, magnetometry, electrical measurements

Jeffrey Guest jguest@anl.gov
STM, laser spectroscopy and nanomechanical dynamics, ambient AFM

Saw Wai Hla shla@anl.gov
LT-STM, SP-STM, AFM, SX-STM

Xiao-Min Lin xmlin@anl.gov
synthesis of nanocrystals, TGA/DSC, rheometry at Sector 8 of APS, glovebox

Volker Rose vrose@anl.gov
synchrotron X-ray scanning tunneling microscopy

Dan Rosenmann rosenmann@anl.gov
evaporation, deposition, sputtering

MAJOR TOOLS

- UHV SPM (AFM/STM) (Omicron)
- VT-STM (Omicron) with optical access
- CreaTC LT-STM
- Cryo-STM w/magnetic field
- Scanning probe microscope, AFM (Veeco)
- Kurt Lesker electron beam evaporator and sputtering, deposition

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Theory and Modeling
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Nanophotonics and Biofunctional Structures
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Elena Rozhkova ...........................................rozhkova@anl.gov bio(m)organic, biological chemistry, synthetic biology, GC/MS
Elena Shevchenko.................................eshevchenko@anl.gov 2-D and 3-D nanoparticle assembly, SEM
Xufeng Zhang............................................xufeng@anl.gov nanolog spectrofluorimeter

Electron and X-ray Microscopy
Martin Holt (Interim Group Leader)...............mvholt@anl.gov X-ray diffraction, ptychography and fluorescence

Electron Microscopy
Rachel Koritala...........................................koritala@anl.gov SEM/TEM trainer
Haihua Liu...............................................haihua.liu@anl.gov TEM, STEM, EELS, SAED
Yuzi Liu..................................................yuziliiu@anl.gov analytical TEM, in situ TEM
Jianguo Wen.............................................jwen@anl.gov ACAT, TEM, batteries, PV

Synchrotron X-ray Microscopy
Mathew Cherukara..................................mcherukara@anl.gov X-ray diffraction

MAJOR TOOLS
- Nanoscience Computational Facility 30 TFlop cluster:
  - Density-functional-based tight-binding
  - Time-domain nanophotonics simulation
  - MPI-based parallel versions of nanophotonics and tight-binding codes
- GPFWB: real space, grid-based DFT-PAW
- Access to Argonne computer facilities
- Support for experimental projects
- Support for theoretical projects
- (DFTB) electronic structure package
- BLAST
- FANTASTIX

MAJOR TOOLS
- Ultrafast transient absorption spectroscopy
- Confocal Raman microscope, Renishaw
- VIS/NIR microscopy
- Time-resolved emission spectroscopy
- Time-correlated single photon counting
- UV-to-THz ultrafast spectroscopy
- Single photon microscope for optics (SNSPD)
- Fluorescence spectroscopy
- Field-emission SEM (JEOL JSM7500F)
- Electron paramagnetic resonance (Bruker)

MAJOR TOOLS
- Circular dichroism spectrometry
- Functionalization, electro/photo-chemical
- HPLC, GCMS
- Laser Scanning Confocal Microscope (Zeiss)
- Post-self-assembly processing
- Peptide synthesizer
- ZetaSizer Nano, Malvern
- Solar simulator, QEMS (Oriel)
- FTIR (Thermo-Nicolet)
- Synthesis & surface modification of nanoparticles
- Microfluidic Droplet Generation and Imaging
- Magneto-Electrical-Optical Spectrometer (MEOS)

X-ray Microscopy
- Hard X-ray nanoprobe beamline, Sector 26 of APS
- Scanning nanodiffraction and ptychography
- Chemical and structural nanoimaging
- Heating/cooling specimen stage
- 20-30 nm resolution, 6-12 keV
- In situ/in operando experiments