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

Ralu Divan..................................................divan@anl.gov
electron beam lithography, nanogels, MEMS/NEMS

C. Suzanne Miller..........................csmiller@anl.gov
XeF2, evaporation, RTP, dicing saw

Liliana Stan ............................................lstan@anl.gov
ALD, PVD, sputtering, evaporation

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 MA6 Optical mass aligner
- ASML PAS 5000 wafer stepper
- Direct write optical lithography
- Interferometric lithography
- AJA oxide sputtering
- Xactix XeF2 etcher
- AMI 5-1-1Tesla Vector Magnet

Quantum and Energy Materials

Nathan Guisinger (Group Leader)............nguisinger@anl.gov
UHV STM, AFM, 2-D materials, STS, cryo-STM w/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 XA) with optical access
- Createc LT-STM
- Cryo-STM w/magnetic field
- Scanning probe microscope, AFM (Veeco)
- Kurt Lesker electron beam evaporator and sputtering, deposition

- Magnetometry (QD PPMS & MPMS)
- TGADSC
- Luminescence/UV-vis-NIR
- X-ray diffractometer (Bruker D2 & D8)
- Integrated glovebox system
- Synchrotron X-ray STM (SX-STM) at sector 4 of APS

CONTACT
Supratik Guha
Director
Phone: 630-252-7740
Email: sguha@anl.gov
www.anl.gov/cnm

Tijana Rajh
Deputy Director
Phone: 630-252-5334
Email: rajh@anl.gov
www.anl.gov/cnm

Kathleen Carrado Gregar
Associate Director for User Programs
Phone: 630-252-7968
Email: kcarrado@anl.gov
www.anl.gov/cnm
Theory and Modeling
Subramanian Sankaranarayanan (Group Leader) ssankaranarayanan@anl.gov nanoscale oxide energy materials, machine learning
Maria Chan mchan@anl.gov photovoltaics, photocatalysts, thermoelectrics, batteries, informatics, atomistic modeling integration w/expt
Pierre Daranect pdaranect@anl.gov charge and energy transport, optoelectronics; exciton dynamics
Stephen Gray gray@anl.gov installation, quantum materials, catalysts
Michael Sternberg sternberg@anl.gov software development

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

Nanophotonics and Biofunctional Structures
Gary Wiederrecht (Group Leader) wiederrecht@anl.gov optical microscopy, transient absorption/emission spectroscopy
Anindita (Oni) Basu abasu@anl.gov microfluidics, nanobio materials
Benjamin Diroll bdiroll@anl.gov Synthesis, time-resolved spectroscopy
Chris Fry hfry@anl.gov synthesis, peptide synthesis, HPLC, CD
David Gosztola gosztola@anl.gov lasers, Raman microscopy
Xuedan Ma xuedan.ma@anl.gov single molecule/particle spectroscopy
Elena Rozhkova rozhkova@anl.gov bio(in)organic, biological chemistry, synthetic biology, GC/MS
Richard Schaller schaller@anl.gov transient absorption/emission spectroscopy, solar energy
Elena Shevchenko eshevchenko@anl.gov 2-D and 3-D nanoparticle assembly, SEM
Xufeng Zhang xufeng@anl.gov nanolog spectrofluorimeter

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

Electron and X-ray Microscopy
Ilke Arslan (Group Leader) arslan@anl.gov STEM, 3-D imaging, quantum materials, catalysts

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

MAJOR TOOLS
- ACAT: Argonne Chromatic Aberration-corrected TEM
- FEI Talos F200X TEM/STEM
- FEI Tecnai F20ST TEM/STEM
- Field-emission TEM (JEOL 2100F)
- Zeiss 1540XB FIB-SEM
- Zeiss NVision FIB-SEM
- Hitachi S-4700-II high-vacuum SEM
- FEI Quanta 400F environmental and variable-pressure SEM

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