National Nanotechnology Coordinated Infrastructure
nano@Stanford

http://nanolabs.stanford.edu

Introduction

The science and technology of the nanoscale is one of the most promising areas in science and engineering today. The ability to create materials and devices at the scale of one-billionth of a meter will have applications in every area of life, from more effective medicines to ultrafast communications and cleaner fuels. nano@Stanford provides access to world-leading facilities and expertise in nanoscale science and engineering for internal users and for external users from academic, industrial, and government labs. Over 1,100 annual users take advantage of a comprehensive array of advanced nanofabrication and nanocharacterization tools available at the nano@Stanford site.

The Labs

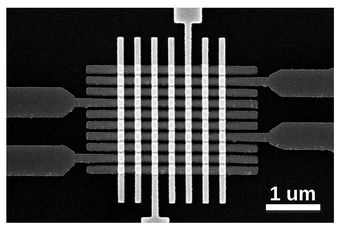
nano@Stanford provides researchers access to instrumentation and staff experts organized under Nano Shared Facilities (SNSF), the Stanford Nanofabrication Facility (SNF), the Mineral Analysis Facility (MAF), and the Environmental Measurement Facility (EMF). Together these facilities feature

- ~16,000 sqft fully equipped cleanroom facilities, including resources that are not routinely available, such as an MOCVD and advanced e-beam lithography
- ~15,000 sqft of characterization facilities, including SEM, TEM, FIB, XRD, SPM, XPS, X-ray microscope and unique tools such as a NanoSIMS, and a scanning SQUID microscope.

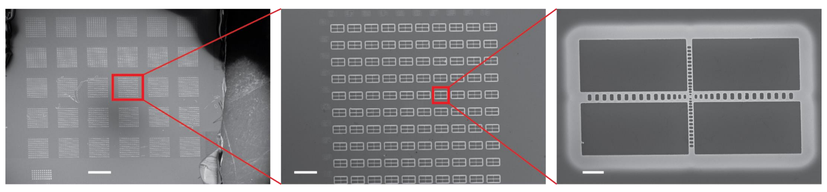
Research

nano@Stanford supports a broad research portfolio spanning traditional nano areas as well as life science, medicine, and earth and environmental science.

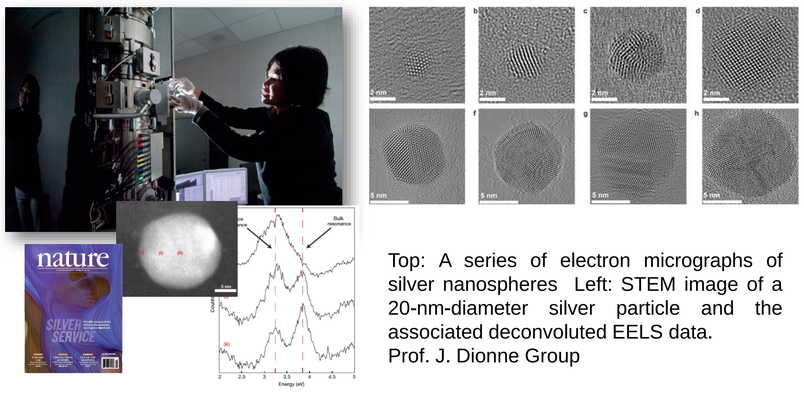
100 kV JEOL e-beam, 40 nm grating with ~ 8 nm lines. Image: low voltage SEM image of polymer resist. Image courtesy of Dr. Tiberio (Stanford).



Novel Memory and Storage Devices beyond the technology roadmap.
Prof. H.S. Wong Group

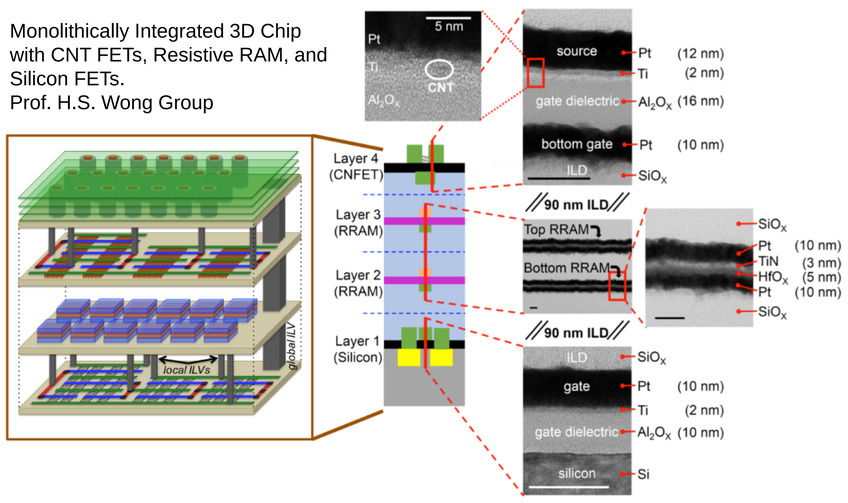


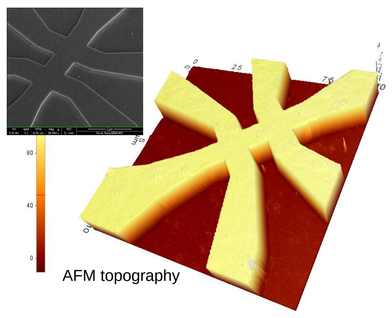
Photonic crystal crossbeam structures in GaAs. Scale bars 200, 10 and 2 microns. Image courtesy of Sonia Buckley. Prof. Vuckovic Group



Top: A series of electron micrographs of silver nanospheres Left: STEM image of a 20-nm-diameter silver particle and the associated deconvoluted EELS data.
Prof. J. Dionne Group

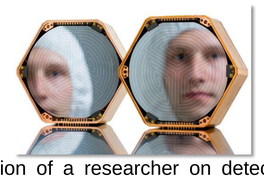
Monolithically Integrated 3D Chip with CNT FETs, Resistive RAM, and Silicon FETs.
Prof. H.S. Wong Group



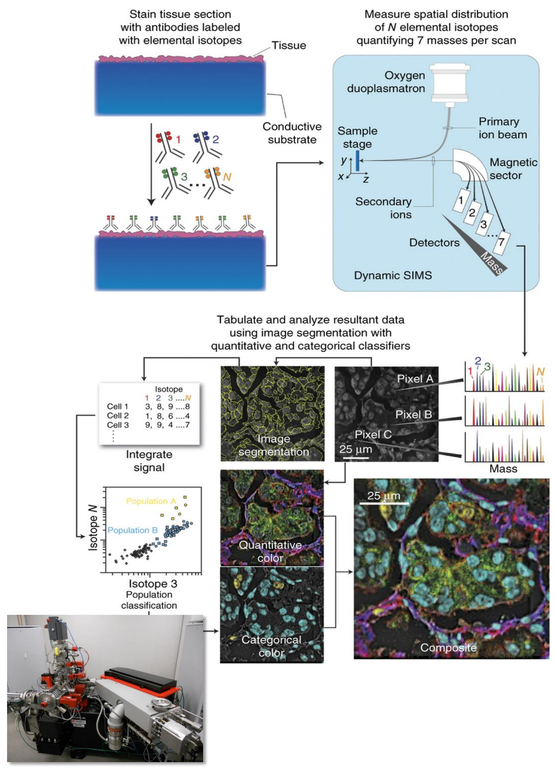


Fabrication of 1 um Hall bars of HgTe quantum wells to study Quantum Spin Hall Effect.
Prof. D. Goldhaber-Gordon Group

Intravenous Imaging of Arteries: The device consists of a ring of transducers with associated electronics, all mounted on the tip of a catheter with a hollow core.
Prof. P. Khuri-Yakub Group



Reflection of a researcher on detectors he fabricated for detection and study of dark matter.
Prof. Blas Cabrera Group



Immunohistochemistry (IHC) is a tool for visualizing protein expression - diagnostic for solid tissue malignancies. Existing IHC methods use antibodies tagged with fluorophores or enzyme reporters that generate colored pigments.
NanoSIMS can image antibodies tagged with isotopically pure elemental metal reporters, enabling multiplexed imaging.
Prof. G. Nolan Group

Education & Outreach

Education and outreach is an integral part of the Stanford Nano Center and includes

- Training, consultation and collaboration by our research staff in charge of instruments
- Hands-on experiences on tools
- Technical Seminars and Workshops
- Undergraduate- and graduate-level classes
- Field trips for K-12 students and educators

Middle School Teachers participating in a 1-week Summer School learn from staff members about TEM.

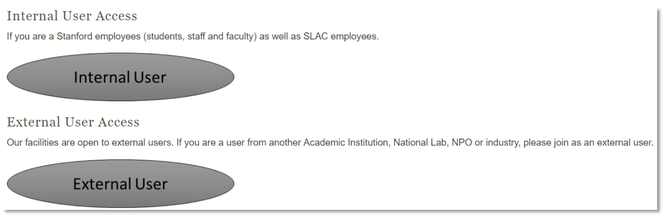
Remote interaction activity between staff at Stanford and Vizitec Club students in Hunedoara, Romania.

Museum Educators learn about nanotechnology during a field trip organized by the Exploratorium, San Francisco.

Visitors to the Bay Area Science Festival at AT&T Park in San Francisco participate in hands-on educational activities to introduce them to nanotechnology through exploration.

Become A Lab Member

nano@Stanford is open to internal users as well as users from other institutions, National Labs or industry for any type of research and development activity acceptable within Stanford University Academic Research Policies and Procedures.



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