P RISM is an interdisciplinary research and education organization at Princeton University. Our mission includes graduate and undergraduate education, research, and to build close interactions with industry, government laboratories and other academic institutions to advance material science research and applications in the areas of health, energy, security and information.

PRISM brings together university researchers and industry through their interdisciplinary approach to fundamental science to advance innovations into products that can benefit people’s lives and stimulate the economy.

The Institute engages in joint development agreements and long-term partnerships with external organizations that foster the exchange of ideas, personnel and scientific methods. The PRISM industrial affiliates program enables outside organizations to access the PRISM shared facilities, courses and staff expertise.

SHARED-USE FACILITIES
An essential component of PRISM is the operation, maintenance and training of on- and off-campus users of its open access, shared-use facilities; the Imaging and Analysis Center (IAC) and the Micro/Nano Fabrication Lab (MNFL).

Imaging and Analysis Center (IAC)*
The IAC provides for the micro chemical and micro/nano structural analysis of hard and soft materials. The center implements, operates, and trains its users on high-end, state-of-the-art instrumentation, including transmission and scanning electron microscopes, focused ion beam system, scanning probe microscopes, x-ray and optical based characterization tools.

Micro/Nano Fabrication Lab (MNFL)
The MNFL provides cleanroom space and equipment for working with a variety of materials to fabricate devices and structures for electronics, photonics, micro-electro mechanical systems (MEMS) and biological applications.

Our 5,000-square-foot clean room consists of class 1000 bays for deposition and etch, a class 100 bay for lithography, a separate electron beam lithography cleanroom, and lapping/polishing and packaging labs.

A special strength of the MNFL is the ability to handle a wide variety of substrates in our tools, ranging from the usual III-V and silicon semiconductor substrates to the more unusual glass, metal, and plastic foils used in novel flexible electronics applications.

PRISM Contacts:
Prof. James C. Sturm, Director
Prof. Craig B. Arnold, Associate Academic Director
Dr. Anthony Novembre, Associate Director and Manager of the Industrial Affiliates Program

For more information, please go to the PRISM website:
www.princeton.edu/prism
INDUSTRIAL AFFILIATES PROGRAM

The most effective way to work with PRISM is through its industrial affiliates program. Program benefits focus on direct access to PRISM faculty and their leading edge research programs. The benefits encompass:

• Appointment as Princeton visiting research collaborators.
• Access to PRISM shared-use facilities (MNFL and IAC).
• PRISM seminars, workshops, short courses.
• PRISM staff expertise in prototyping and technology transfer.
• Expert assistance with joint proposals to funding agencies.
• Establish long term research collaboration programs.

The industrial members span a broad range of regional business sectors, including pharmaceuticals, medical device and delivery manufacturers, chemical and ceramic materials suppliers, U.S. defense contractors, and small to mid-sized entrepreneurial ventures building a workforce and developing products for the health, energy, information and security markets.

Our diverse group of industry users finds many benefits and great value in working with PRISM. This is summarized in the above quote by one of our users and the benefits further include:

• Having access to state of the art materials fabrication and characterization instrumentation not available at their companies.
• Interactions with world-leading faculty, students and staff.
• The streamlined process for establishing formal membership, simplicity in opening up an account and ease of reserving time on the equipment of interest.
• The ability to use the instruments and work closely with the professional technical staff of the shared-use facilities. Training involves direct experimental demonstrations, hands-on instruction and eventual approval to independently operate the available equipment.
• The ability to perform rapid prototyping of materials under development and to accelerate bringing them to the market place.

PRISM RESEARCH CENTERS

PRISM administers a number of centers which compliment the core mission of the Institute. They are:

Princeton Center for Complex Materials (PCCM): NSF funded center is dedicated to pushing the frontiers of complexity in materials science.
www.princeton.edu/pccm

Princeton Physical Sciences-Oncology Center (PPS-OC): NIH funded center which seeks to undertake innovative new approaches to understanding the physical laws that govern the emergence and behavior of cancer.
www.princeton.edu/psoc

Combustion Energy Frontier Research Center (CEFRC): DOE funded center which focuses on the science underlying the development of non-petroleum-based fuels, including carbon-neutral biofuels and their optimal use in transportation.
www.princeton.edu/cefrc

Center for Networks, Science, and Applications (CNSA): Mission is to become a world leader in network science which is emerging as an important source of scientific discoveries and commercial opportunities.
www.princeton.edu/cnsa

Princeton Center for Mid-InfraRed Technologies for Health and the Environment (MIRTHE): NSF funded center is to develop Mid-Infrared (λ: 3-30 μm) technologies.
www.mirthecenter.org

A more detailed description of MIRTHE is provided in the following pages.

IAC SEM micrographs of (A) surface of a catalytic material and (B) nanoscale grating structure fabricated in the MNFL. Photo credit: PRISM.