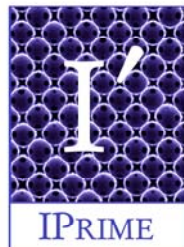


IPRIME

Industrial Partnership for Research in Interfacial and Materials Engineering

IPRIME is an entry portal to research activities at the University of Minnesota. It supports industrial interactions with selected programs within the Institute of Technology and currently includes about 35 faculty from 6 departments working in 6 program areas. One page program descriptions are included. For the second consecutive year, the University of Minnesota-Twin Cities ranked among the top three public research universities in the United States, according to a study from the University of Florida. Measures included the strength of faculty, the research program and private support.

Company memberships in IPRIME are available at three levels. Membership information and some of the key features of participation with IPRIME are outlined in the attached "IPRIME Backgrounder". Additional information is also available by contacting Bob Lewis, the Director for Technology Transfer.



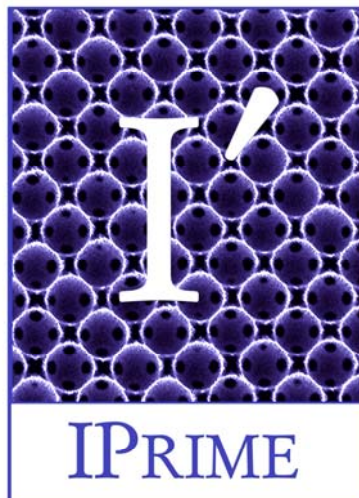
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IPRIME History

The Industrial Partnership for Research in Interfacial and Materials Engineering (IPRIME) grew out of the legacy of the University of Minnesota's Center for Interfacial Engineering (CIE). CIE, a National Science Foundation (NSF) Engineering and Research Center (ERC), was founded in 1998 with support from the University of Minnesota, NSF, and member companies. After receiving the maximum 11 years of support from the NSF's ERC program, it was vital to find another way to continue the collaboration. IPRIME was created, in response to strong industrial interest, not only to maintain the collaborative research already underway but also to extend the partnership to other programs, including those supported by the Materials Research Science and Engineering Center (MRSEC) established in 1998 under a NSF grant.

IPRIME fosters an exchange which provides an ideal environment for training the next generation of scientists and engineers while strengthening research in both the academic and the industrial sectors.



Membership benefits fall into four categories:

Technology Advances

Future Employees

Facilities

Technology Transfer

Technology Advances

As a member you have the opportunity to influence and participate in formulating research directions and proposals through the Technical Advisory Committees (TAC) of the six programs – Coating Process Fundamentals, Nanostructured Materials and Processes, Tissue Science and Engineering, Microstructured Polymers, Crystalline Organic Semiconductors, or Magnetic Heterostructures. Further descriptions are contained in the attached one page documents. Several of the current programs also receive government (NSF) funding which provides about a 3:1 leverage for your investments. In addition, the University matches this government funding at a 20% rate. Benefits also include early access to research results, attendance at our Annual Meeting held at the end of May, early access to students, access to faculty and their expertise, assistance as a portal to other University research and resources, Special Projects for proprietary work (separately funded), and certain Intellectual Property benefits. Participation in programs depends on the membership level and is described more fully below.

Future Employees

Early access to students can be beneficial when looking for new employees with skills in areas important to your company. You can track their research and get to know them better and their capabilities to help you identify and hire the best. For example, the Chemical Engineering program at the University of Minnesota is the number one rated program in the United States as determined by the most recent National Research Council rankings. It's also been our experience that most students working on IPRIME related projects are employed by IPRIME companies after graduation.

Facilities

You also have access to several University resources with state-of-the-art equipment and instrumentation, including:

- The Institute of Technology Characterization Facility (CharFac)
- The Polymer Characterization Area
- Polymer Synthesis Facility
- The Microtechnology Lab
- The Tissue Science Mechanics Lab

These facilities, except the Microtechnology Lab, have discounted rates for member companies that range from one third to one half of the regular rates charged to non-member companies.

Characterization Facility

The Characterization Facility supports the characterization of organic and inorganic solids, polymers, and interfaces. Specialists assist users and help them interpret results. Training is available to allow users direct access to instruments. This facility has over \$6 million of ion beam analysis, scattering, spectroscopy, microscopy, and nanoprobe equipment including SEM, TEM, nanoindentation/scratch systems, a stylus profilometer, an FT-IR spectrometer with scanning microscope accessory, an ellipsometer, scanning probe microscopes, X-ray diffractometers, and SAXS. Ion Beam Analysis for elemental depth profiling is a particularly unique capability in the CharFac and one of the only such systems at a midwestern university. Several staff professionals maintain, upgrade and develop instrumentation, train users, and assist with analysis and data interpretation. You can submit samples or operate the equipment yourself after appropriate training. The website for this major University facility is <http://resolution.umn.edu/> Greg Haugstad is the Director and can be reached at (612) 625-1352 and at haugs001@umn.edu.

Coating Process Fundamentals Lab

Specialized facilities and expertise support visualization of coating processes.

Tissue Mechanics Lab

Provides instruments and expertise to measure the mechanical properties of soft tissues and other biological materials.

Polymer Characterization Lab

State-of-the-art rheometry equipment and expertise support characterization of polymeric and other complex materials.

Polymer Synthesis Lab

Design and synthesis of custom polymer materials in lab- and pilot-scale batches.

National Institute of Standards and Technology

(NIST; Gaithersburg, MD)

Small-angle neutron-scattering (SANS) characterization of polymer materials

Technology Transfer

The University of Minnesota and IPRIME are dedicated to transferring research results to industry and accomplish this through several mechanisms. The first is the Annual Meeting held the end of May with program reviews, poster sessions, workshops, and Technical Advisory Committee (TAC) meetings. These TAC meetings provide a forum for member companies to give direct input to the faculty and program leaders on topics of interest to them. In addition, we encourage companies to maintain contacts with faculty and students throughout the year to stay up-to-date on research developments and to continue to provide industrially relevant problems to faculty and grad students.

Membership Benefits

Annual Meetings

At the Annual Meetings each research program gives formal oral presentations and posters on its work during the past year. The three-day schedule of intensive technology transfer includes a reception, master classes, special topic workshops, and Technical Advisory Committee meetings.

Special Project Research

Industrial Partners may fund directed (possibly proprietary) research and obtain sole ownership of resulting Intellectual Property.

Materials Research Science and Engineering Center (MRSEC) Educational Programs

Offers a range of programs including an opportunity for college students to do research in their sophomore summer and an internship at an IPRIME company during their junior summer. MRSEC also conducts a vigorous outreach to under-represented groups and minorities

Industrial Fellows Program

The Industrial Fellows program is available to Sponsors and is an effective way to develop and transfer technology from the University to industry. Through this program a company employee is resident on campus for a period of time (one to three months or longer with faculty agreement). While on campus the employee works on a research project of mutual interest with the faculty member and has the opportunity to work closely with the grad students. This close interaction provides an excellent environment to both absorb and develop technical knowledge in the area of interest which the employee takes back to their company.

Membership Details

Corporate memberships are available depending on the size of the company and the program areas of interest. At the Sponsor level the fee is \$50,000 per year with participation in one or up to all of the program areas. At this level you would have representation on the selected program TACs, the Planning and Policy Board (provides overall guidance to IPRIME 's operation and sets policy), the Facility Advisory Committee for the Characterization Facility listed above, and the opportunity to send a person to carry out research in-residence as an Industrial Fellow at the University with a Faculty member (requires the Professor's agreement on the research topic), and the option to sponsor a separately funded Special Project (may include proprietary activities). At the Affiliate level the fee is \$40,000 per year with participation in one program or \$40,000 for two program areas. You would have representation on the TACs of these programs but not the other representations as for the Sponsor level. You would also have the option to sponsor a Special Project.

At the Small Company Affiliate level the fee is 0.03% of sales with a \$7,500 minimum per year. You can participate in one program with representation on its TAC.

All three levels give you the right to attend the Annual meeting in May and to access the Members Only portion of the IPRIME website.

Companies joining the Partnership:

- Influence research directions
- Participate in collaborative research
- Identify potential future employees through early contact with students
- Receive reduced rates at selected supporting facilities
- Have access to information on related research
- Benefit from the exchange of ideas and insights with faculty and students
- Have preference in licensing of IPRIME patents
- Receive members-only privileges at the IPRIME website

IPRIME Programs

Microstructured Polymers

Design and synthesis of novel polymers, characterization of their structural and mechanical properties, and investigation of their rheological and processing behavior for both commodity and high value-added polymer products.

Nanostructural Materials and Processes

Identifying key molecular parameters and principles governing the assembly and properties of molecular thin films, surfactants, and ordered molecular phases of molecular systems for synthesis of specialty materials in agricultural, cosmetics, pharmaceuticals, and other businesses.

Coating Process Fundamentals

Process and prototype visualizations, microscopies, nanotesting, NMR and other spectroscopies, and microstructure probes combined with theory, computational methods, and computers to support the electronics, photonics, magnetics, specialty-films, and many other industries.

Crystalline Organic Semiconductors

Synthesis of new organic semiconductors and elucidation of structure-mobility relationships in order to maximize electron and hole mobilities for electronic device applications, e.g., thin film transistors (TFTs).

Nanoparticle Technology

Synthesis of free-standing nanoparticles and nanostructured materials for superhard coatings and novel semiconductor materials.

Tissue Science and Engineering

Elucidation of composition-structure-functional property relationships of native tissues and their design in cell-based fabrication of artificial tissues, with emphasis on novel tissue mechanical testing and analysis methods.

Magnetic Heterostructures

Experiments and theory for advancing the understanding of magnetism and spin transport at interfaces—phenomena critical to new sensor and digital technologies.

