May 02, 2006

UMBC, Johns Hopkins, Join Princeton in Multi-Million NSF Engineering Research Center

Advanced Research in Mid-Infrared Spectrum Could Yield Sensor Breakthroughs for Medicine, Environment, Military, Homeland Security

CONTACTS: Mike Lurie
410-455-6380 office
443-695-0262 cellphone
Email: mlurie@umbc.edu

Chip Rose
410-455-5793 office
443-690-0307 cellphone
Email: crose@umbc.edu

BALTIMORE– The University of Maryland, Baltimore County (UMBC) and The Johns Hopkins University are part of a newly announced multimillion-dollar National Science Foundation (NSF) Engineering Research Center based at Princeton University that is expected to revolutionize sensor technology, yielding supersensitive devices that can detect minute amounts of chemicals found in the atmosphere, emitted from factories or exhaled in human breath.

The goal of the Center's research is to produce devices that are so low in cost and easy to use that they transform the way physicians monitor patients, states track air quality, governments guard against terror attacks and scientists understand the evolution of greenhouse gases in the atmosphere.

Other partner institutions with Princeton, Johns Hopkins and UMBC are Rice University, Texas A&M University and City College of New York. NSF and industrial funding for the Center could exceed $40 million over 10 years. NSF funding started May 1 with $2.97 million for the first year.

The center – named MIRTHE, for Mid-Infrared Technologies for Health and the Environment – will combine the work of about 40 faculty members, 30 graduate students and 30 undergraduates from the six universities. The center also is collaborating with dozens of industrial partners on technology commercialization and is partnering with several educational outreach partners to apply MIRTHE research in improving science and engineering education.

"The sensors we are creating will be portable and easy to use," said Claire Gmachl, associate professor of electrical engineering at Princeton and MIRTHE's director. "Today's state-of-the-art sensors are very sensitive, but require an

expert to operate and are bulky and expensive. Our vision is to make sensors with the same or better level of sensitivity at a fraction of the size and cost."

Sensor technologies developed by MIRTHE team members are expected to have a variety of commercial, military and educational applications. UMBC is home to several NASA-Goddard related atmospheric, environmental and earth science research centers and the Baltimore Ecosystem Study, where MIRTHE technologies should improve monitoring of pollution in the soil, water and air. Another potential application is an "invisible fence" sensor system that can vastly improve detection of chemical and biological hazards for military troops in the battlefield and homeland security first responders.

MIRTHE is a National Science Foundation Engineering Research Center, one of several interdisciplinary centers located at universities across the United States. The centers are among the foundation's largest and most prestigious grants.

MIRTHE team members' expertise ranges from fundamental science to applied technology. Work on MIRTHE at UMBC will be led by MIRTHE deputy director Anthony Johnson, a past president of the Optical Society of America and director of UMBC's Center for Advanced Studies in Photonics Research (CASPR).

"This is an exciting day for engineering research in the Baltimore-Washington region" Johnson said. "With seven faculty researchers each from The Johns Hopkins University and UMBC, this is incredible news for science in the state of Maryland."

As deputy director of MIRTHE, Johnson brings a wealth of knowledge on the design, workings and manufacture of next-generation sensors based on novel optoelectronic materials. These sensors will be capable of detecting chemical and biological molecular markers in the mid-infrared portion of the spectrum.

Other UMBC researchers on the MIRTHE team include: L. Michael Hayden, chair of physics; Yanhua Shih, professor of physics; Joel Morris, Curtis Menyuk and Fow-Sen Choa, professors of computer science and electrical engineering; and Claire Welty, director of the Center for Urban Environmental Research and Education.

Johns Hopkins researchers involved in MIRTHE include: Terence H. Risby of the Bloomberg School of Public Health; Katalin Szlavecz, a geologist and lecturer at the Krieger School of Arts and Sciences; Robert Brown of the Department of Anesthesiology and Critical Care Medicine in the School of Medicine; Jacob Khurgin of the Department of Electrical and Computer Engineering in the Whiting School of Engineering; Charles Lowenstein and Steven Solga of the Department of Medicine in the School of Medicine; and Michael Trush of the Department of Environmental Health Sciences in the Bloomberg School of Public Health.

MIRTHE's other key mission is in education – working to train a new and diverse generation of engineering students in the U.S. The center will incorporate extensive efforts to engage college and K-12 students in hands-on science and engineering projects, with major outreach programs taking place at UMBC, City College of New York and Princeton.

At UMBC, MIRTHE will link with the Meyerhoff Scholars Program, which is recognized nationally as a model for preparing high-achieving undergraduate students, particularly African-Americans, for research careers in science and

engineering. Johnson also has extensive experience with K-12 optical science education outreach to under-represented minority students through his work with the Optical Society of America's Hands-On Optics (HOO) program.

"PROMISE: Maryland's Alliance for Graduate Education and the Professoriate (AGEP), which is also sponsored by the NSF, will focus on the cultivation, retention and successful graduation of graduate students from populations that are underrepresented in MIRTHE's core disciplines," said UMBC's PROMISE Director Renetta Tull.

The work of creating the successful proposal to the NSF already has established a sense of community among the participants. "We are delighted to be partnering with Princeton and the other fine institutions in the Engineering Research Center's critical work," said Freeman Hrabowski, president of UMBC.

Posted by crose

Email this entry to:

Your email address:

Message (optional):

Send