

Air Force Institute of Technology establishes groundbreaking research collaboration First international agreement will lead to program on nano-sensors and nano-materials.

By Amy Rollins, Skywrighter Staff

The Air Force Institute of Technology has entered into its first international research collaboration with international and state universities.

The collaboration, involving AFIT, the University of Toledo and Kwangwoon University in Seoul, South Korea, aims to build an international research and education program based on nano-sensors and nano-materials. The program focuses on a research and learning center called the Nano-STAR Center (Nano-Sensor Technology Advancement and Research Center), that will be established at Kwangwoon University.

AFIT was the final entity to sign the Cooperative Research and Development Agreement, also called a CRADA. Dr. Marlin Thomas, dean of AFIT's Graduate School of Engineering and Management, signed the document Aug. 16 in his office at Wright-Patterson Air Force Base. The president of Kwangwoon University will make a formal visit to AFIT later this year.

The initial key collaborators are:

- Dr. Mark Goltz, professor of engineering and environmental management at AFIT;
- **Dr. Dong-Shik Kim**, associate professor in the UT Department of Chemical and Environmental Engineering, who started the foundation for the collaboration when he was at AFIT as a summer faculty research fellow last summer;
- **Dr. Brent Cameron**, associate professor of bioengineering at UT; and
- Dr. Do-Young Yoon, professor of Chemical Engineering, Kwangwoon University.

The CRADA sets a nice precedent for AFIT and provides good collaboration in an area of importance, Dr. Thomas said.

"I think it's good for the Air Force, the Department of Defense and certainly for our surroundings here at Wright-Patterson Air Force Base," Dr. Thomas said. "All of us work in the area of sensors, across a number of dimensions at AFIT."

Dr. Goltz said that while his interest as an environmental engineer is in using the nano-sensors to detect contaminants in the environment, the sensors can be used for a lot of other things, such as detecting chemical warfare agents.

Dr. Kim said, "We are happy to be an agent that helps build this relationship between AFIT and Kwangwoon University and also the relationship between AFIT and the University of Toledo. To me, it's a wonderful combination of different expertise to make more effective nano-sensors and more effective nano-materials that go into sensors. The potential is great, and the application is great as well."

"It is my honor to sign this CRADA," Dr. Yoon said. "It's a very good chance to finesse our research and our program."

Dr. Heidi Ries, associate professor of physics and dean for Research, Research and Sponsored Programs at AFIT, noted that AFIT has been involved with collaborative research agreements within the U.S. for some time.

"This is an excellent expansion of our CRADA program. The three-way international collaboration extends our influence."

Dr. Ries noted that much of the behind-the-scenes work on this agreement was handled by Jessica Webb, a former intern majoring in international business at Wright State University who is now a budget analyst in AFIT's Office of Research and Sponsored Programs.

Participating in the signing ceremony along with Drs. Thomas, Ries, Goltz, Kim and Yoon was Dr. Adedeji Badiru, AFIT professor and head of the Department of Systems and Engineering Management.

The CRADA has a two-year lifespan initially, but AFIT officials hope it will continue indefinitely, they said.

The Air Force Office of Scientific Research (AFOSR) was partly responsible for the agreement being forged, Dr. Thomas and Dr. Ries noted, for supporting post-doctoral associates and summer faculty at AFIT.

"AFOSR supported the summer faculty fellowship program, allowing the University of Toledo to send a faculty member here to Wright-Patterson Air Force Base, and supported a post-doctoral research associate at AFIT through the National Research Council. These programs brought some new nano fabrication techniques to AFIT and facilitated the collaboration," Dr. Ries said.

"The AFOSR investments in those exchange programs were key to allowing this nanoscience collaboration that hopefully will result in some interesting advances in lightweight, fast, accurate, and inexpensive chemical sensors for our troops to use in the field," Dr. Ries said.

Dr. Goltz and Dr. Kim, along with Dr. L. Racz, have already collaborated on an article, "Using Nanotechnology to Detect Nerve Agents," Air and Space Power Journal, Summer 2011.

The Air Force Institute of Technology, or AFIT, is the Air Force's graduate school of engineering and management as well as its institution for technical professional continuing education. A component of Air University and Air Education and Training Command, AFIT is committed to providing defense-focused graduate and professional continuing education and research to sustain the technological supremacy of America's air and space forces.

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