

Press release XXVIII / 2015

Diamond technologies and coating materials research to expand as Michigan State University and Fraunhofer IWS establish new \$5 million technology center

Diamonds are rapidly emerging as one of the most exciting materials on earth, with technical applications that can take electrical, mechanical, thermal, and other properties to industry extremes. Likewise, new coatings technologies can deposit thin film materials that improve wear and corrosion resistance, and create new functionalities. Research advances in both fields are about to shine with the establishment of the Michigan State University-Fraunhofer Center for Coatings and Diamond Technologies.

The new \$5 million facility expands the current MSU-Fraunhofer laboratories in MSU's Engineering Research Complex (ERC) on the south side of campus. It will add approximately 15,000 square feet of space and new diamond synthesis equipment to accommodate an increase in personnel and research projects at the center. When completed, the new center is expected to generate \$7 million in research revenues annually.

The main partner in the new investment is The Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS in Dresden, Germany. The institute performs applied research and development in the field of laser and surface technologies, with services that range from basic materials research to developing systems. Total research expenditures for IWS in 2014 were 27 million Euros. IWS closely cooperates with the Technical University Dresden. IWS' U.S. activities are concentrated at two Fraunhofer USA Centers: the Center for Coatings and Diamond Technologies (CCD) in East Lansing, Mich., and the Center for Laser Applications (CLA) in Plymouth, Mich.

"Michigan State University and our long-term research partner Fraunhofer USA will triple the existing laboratory space and increase personnel and research resources to integrate and advance this mutually beneficial collaboration," said Leo Kempel, dean of the MSU College of Engineering. "This expansion also increases undergraduate and graduate research opportunities in an emerging industry," Kempel added.

Executive Director Thomas Schuelke and Research and Development Director Timothy Grotjohn will lead the new MSU-Fraunhofer Center. Both are professors in the Department of Electrical and Computer Engineering in MSU's College of Engineering. Schuelke said interdisciplinary teams of MSU faculty and students, Fraunhofer staff members, and industry and government partners will collaborate on market-driven research and development projects.

The MSU-Fraunhofer collaboration began 12 years ago when the partners first established a joint laboratory on campus under the leadership of Jes Asmussen, a University Distinguished Professor of Electrical and Computer Engineering. Today, the MSU-Fraunhofer

Center is considered a world leader of wide bandgap diamond power electronics and electrochemical sensor research, Schuelke added.

About Michigan State University

Michigan State University, a member of the Association of American Universities and one of the top 100 research universities in the world, was founded in 1855. MSU is an inclusive, academic community known for traditionally strong academic disciplines and professional programs, and its liberal arts foundation. The cross- and interdisciplinary enterprises connect the sciences, humanities, and professions in practical, sustainable, and innovative ways to address society's rapidly changing needs. As a public, research-intensive, land-grant university funded in part by the state of Michigan, its mission is to advance knowledge and transform lives.

About Fraunhofer

With 24,000 employees and an annual research budget exceeding 2 billion euros, the German Fraunhofer Society is Europe's largest applied research organization performing projects of direct utility to private and public enterprise and of a wide benefit to society. The Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS is one of the Fraunhofer's 66 institutes and known for its innovations in the business areas joining and cutting as well as in the surface and coating technology. IWS' special feature is the expertise of our scientists in combining the profound know-how in materials engineering with the extensive experience in developing system technologies. Every year, numerous solution systems have been developed and have found their way into industrial applications.

For information, visit <http://www.egr.msu.edu/fraunhofer-ccd>.

Contact:

Fraunhofer Center for Coating and Diamond Technologies
1449 Engineering Research Ct. B112
East Lansing, MI 48824-1226
USA

Executive Director
Dr. Thomas Schuelke
Phone: +1 517 432 8709
Fax: +1 517 432 8167
E-Mail: tschuelke@fraunhofer.org
Internet: <http://www.ccd.fraunhofer.org>

Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS Dresden
01277 Dresden, Winterbergstr. 28
Germany

Public Relations
Dr. Ralf Jäckel
Phone: +49 351 83391-3444
Fax: +49 351 83391-3300
E-Mail: ralf.jaeckel@iws.fraunhofer.de
Internet: <http://www.iws.fraunhofer.de/en.html>



Timothy Grotjohn (professor of electrical and computer engineering, and research and development director of an MSU-based center) and Thomas Schuelke (center executive director and professor of electrical and computer engineering)
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The new facility will expand the current MSU-Fraunhofer laboratory to about 15,000 square feet – more than triple its current size.
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