Alexandra Boltasseva named 2013 MRS Outstanding Young Investigator for photonics

Alexandra Boltasseva, assistant professor at Purdue University, has been named the 2013 Materials Research Society Outstanding Young Investigator. Boltasseva was cited for "pioneering research to develop novel materials for advanced plasmonic, metamaterial and transformation optics devices with potential applications in future nanoscale photonic technologies." She will be presented with the award at the Materials Research Society Spring Meeting in San Francisco.

A prolific researcher, Boltasseva has quickly made many contributions to the plasmonics and metamaterials field, including plasmon waveguides and circuits, and semiconductor metamaterials components. Her research includes transformative work on waveguides offering subwavelength-confinement and novel fabrication approaches for nanoplasmonic devices.

Most recently, she has tackled a key problem in plasmonics. The majority of work in this field utilizes noble metals, such as silver and gold, which exhibit absorption losses related in part to their relatively high electron densities. Boltasseva has now pointed the photonics and materials research community toward a counterintuitive direction, which is to explore plasmonic excitations in less metallic materials, which confers the opportunity to significantly reduce the absorption losses. Her work has demonstrated potential for reduced loss in novel plasmonic materials, including conducting oxide and nitride compounds, implying a bright future for plasmonic materials at near- and mid-infrared as well as visible wavelengths.

In addition to her position in the School of Electrical and Computer Engineering and Birck Nanotechnology Center at Purdue, Boltasseva is adjunct associate professor at the Technical University of Denmark (DTU) and guest professor at Universität Erlangen-Nürnberg, Germany. She received her BS and MS degrees in applied physics and mathematics from the Moscow Institute of Physics and Technology, and her PhD degree in electrical engineering from DTU. Boltasseva has over 70 publications.

An advocate for educational outreach, Boltasseva organized "Nano for Energy" day for the inaugural Purdue Energy Camp held in 2012; participated in scientific demonstrations for Open House, NanoDays at the Birck Center and for the Gifted Education Resource Institute Summer Residential Camp at Purdue. She also co-authored a chapter in a book on nanophotonics for high-school teachers. Boltasseva is a member of the Women in Engineering Program at Purdue and the Network for Women in Physics in Denmark.

Boltasseva's honors include the Young Elite-Researcher Award from the Danish Council for Independent Research (2008); the Chicago Alumni New Faculty Award, Purdue University (2009); the Young Researcher Award in Advanced Optical Technologies from Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany (2009); and the TR35 Award by the MIT *Technology Review* magazine that "honors 35 innovators under 35."

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