

Two leading researchers in Discovery Park's Birck Nanotechnology Center have been selected as University Faculty Scholars for Purdue University.

Michael Manfra, the William F. and Patty J. Miller Professor of Physics, and Alexandra Boltasseva, an associate professor of electrical and computer engineering, were recognized April 24 during the Faculty Awards Convocation.

The faculty scholars program, created at Purdue in 1998, provides resources and recognition for associate and full professors who are judged to be on an accelerated path for academic distinction. Faculty scholars are select associate and full professors who have been in that rank for no more than five years and are on an accelerated path toward academic distinction.

In the Department of Physics and Astronomy, nominations are made by the Physics Advisory Committee and forwarded to the dean of the College of Science. In the College of Engineering, they are nominated by committees from their academic areas, and reviewed and recommended by a subcommittee of the college's named and distinguished professors.

The deans make the selections and request approval by the provost.

Boltasseva specializes in nanophotonics and nanotechnology focusing on optical metamaterials, nanoscale optics, plasmonics and plasmonic materials, nanofabrication and material growth. Her work on metallic optical waveguides and novel plasmonic materials are highly visible and open new prospects for miniaturization of integrated optical devices and for the next generation of nanoscale optical technologies.

She recently initiated a new research direction in which novel materials (other than materials used so far) will form the basis for future low-loss, CMOS-compatible devices that could unleash the power and full-scale development of hybrid nanophotonic technology and optical metamaterials. The central theme of her work is to build the fundamental knowledge base and material platforms to enable next-generation photonic technologies by applying the knowledge, expertise and methods from materials engineering to solve the critical problems of existing nanophotonic devices.

The research group led by Manfra, who also serves as a professor of materials engineering and electrical and computer engineering, studies the physics and technology of ultra-high purity III-V semiconductors. To build the heterostructures and nanostructures needed for experiments, the research team employs a

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high purity growth technique known as molecular beam epitaxy (MBE), which enables the team to build semiconductor structures one atomic layer at a time for engineering the electronic energy levels.

Ongoing projects include fundamental studies of correlated electrons in reduced dimensions in GaAs for future applications in quantum computing and the development of novel light sources in III-Nitride materials. In addition to growth and structural characterization, the Manfra group utilizes low temperature and high magnetic field transport techniques.

— *By Phillip Fiorini, senior writer for Purdue Marketing and Media*