

Engineering professor wins award for pioneering work expected to improve electronic devices

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A professor at the University of California, Riverside's Bourns College of Engineering will receive an international award for his pioneering work in nanotechnology that could have far-reaching impacts on electronic devices.

Alexander Balandin, a professor of [electrical engineering](#) and founding chair of a campus-wide Materials Science and Engineering Program, was selected to receive the Pioneer of Nanotechnology Award for 2011, the Nanotechnology Council of IEEE, formerly known as The Institute for Electrical and Electronics Engineers, announced Friday.

He will receive the award and give a keynote talk at the organization's conference in Portland, Oregon in mid-August. Only one university professor is selected for this award each year.

Balandin, a native of Russia who has been at UC Riverside since 1999, is the first professor in the University of California system to receive the award. Previous recipients of the award include distinguished professors from the University of Toronto, Yale University and the University of Michigan. Last year's award recipient was internationally renowned scientist Phaedon Avouris from the IBM T.J. Watson Research Center in Yorktown Heights, NY.

"It's really an honor, especially considering the people who have received this award before me," Balandin said.

Reza Abbaschian, dean of the Bourns College of Engineering at UC Riverside, said the recognition is well-deserved.

"I predict it is one of many awards Alexander Balandin will earn in the years ahead," Abbaschian said. "His ground-breaking research, contributions

to his field and his leadership in developing our Materials Science and Engineering Program have been invaluable to our college, our students and the science and engineering community at-large."

The award recognizes individuals who by virtue of initiating new areas of research, development or engineering have had a significant and transformative impact on the field of [nanotechnology](#). Balandin is receiving the award for his "pioneering contributions to nanoscale phonon transport with applications in nanodevices, graphene devices, thermoelectric and thermal management of advanced electronics."

"He is one of the leaders in the field and has done pioneering research that clearly can have major impacts on [electronic devices](#)," said James Morris, a professor of electrical and computer engineering at Portland State University who chaired the committee that recommended Balandin receive the award.

Balandin is an internationally renowned expert in the area of advanced materials, nanostructures and nanodevices. He is a fellow of the Optical Society of America, the International Society for Optical Engineering and the American Association for Advancement of Science.

Since 1997, he has been developing the concept of nanoscale phonon engineering and its applications to heat removal from advanced electronic chips and renewable energy conversion. Phonons are quanta of crystal lattices vibrations in materials. They affect electrical resistance and determine thermal conductivity of semiconductor materials used in electronics.

In 2008, his research group made the important discovery of the extremely high intrinsic thermal

conductivity of graphene and explained it theoretically. To perform the first measurements of heat conduction in graphene, Balandin invented an experimental optothermal technique based on Raman spectroscopy.

Balandin's group has also demonstrated the first low-noise top-gate single-layer graphene transistor, graphene triple mode amplifier and phase detector, and carried out the first "graphene-like" mechanical exfoliation of thin films of a new class of materials - topological insulators.

Provided by University of California - Riverside

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