

February 8, 2012

UNIQUE THERMAL PROPERTIES OF GRAPHENE: APPLICATIONS IN THERMAL MANAGEMENT OF OPTOELECTRONICS AND ELECTRONICS

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Abstract: In 2004, graphene – a single atomic layer of carbon atoms – was mechanically exfoliated, for the first time, by a team of researchers from Manchester, UK and Chernogolovka, Russia. This event started the “graphene revolution”, which spread quickly around the world, bringing scientists and engineers with different backgrounds to the field. Initially driven by exotic physics, the interest in this new material system has grown with the proposal of practical applications. The special nature of graphene research was confirmed again when the Nobel Prize in Physics was awarded to A. Geim and K. Novoselov for their graphene work in 2010, just six years after their first paper. In this talk, I will overview graphene’s basic properties and discuss possible practical applications. Specifically, I will talk about several research breakthroughs in graphene field achieved at UC-Riverside: including the discovery of the extremely high thermal conductivity of graphene and demonstration of the first graphene triple-mode amplifier and phase detector. Graphene’s prospects for applications in thermal management of electronics and communication systems will also be discussed.



About our speaker: **Dr. Alexander Balandin** received B.S. and M.S. degrees (summa cum laude) in applied physics from the Moscow Institute of Physics and Technology (MFTI), Russia, in 1991 and a Ph.D. degree in electrical engineering from the University of Notre Dame in 1997. He was a research engineer at UCLA, from 1997 to 1999. In 1999, he joined UCR, where he is currently a professor of electrical engineering and a founding chair of materials science and engineering. His research interests are in electronic and optoelectronic materials, nanostructures, and devices. He does both experimental and theoretical research. He has authored more than 180 journal publications, 12 invited book chapters and edited four books. His current research topics include graphene electronic devices, thermal conduction in nanostructures, photovoltaic solar cells, sensors, thermoelectric devices and battery technology. Prof. Balandin is a recipient of the IEEE Pioneer Award in Nanotechnology for 2011. His work was also recognized by his elections as a fellow of OSA, SPIE, APS, IOP and AAAS, and other honors. His laboratory at UCR is sponsored by NSF, SRC, DARPA, AFOSR and ONR.



Wednesday, February 8, 2012

Reception: 6:00; Dinner: 7:00; Talk: 8:00
Meal: Buffet Style

Cost: \$30 (OSSC Student Members are Free!)
Winston Chung Hall (Bldg. 94), Rm. 205/206
Aberdeen Drive and North Campus Drive
UC Riverside, Riverside, CA 92521

Park in Lot 24 (Canyon Crest and Linden)
Enter campus at University Drive, go right on West Campus drive to buy permit from kiosk

On-line Registration: www.ossoc.org or
Contact: [Brent Bergner](mailto:Brent.Bergner@ossoc.org), OSSC Arrangements Chair,
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Please Register by February 7, 2012