**پژوهشکده علوم و فناوری نانو برگزار می کند:**

# کارگاه یک روزه

# Body Heat Harvesting to Power Wearable Electronics

## ارائه دهنده: آقای دکتر داریوش وشایی

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**مکان: دانشکده فیزیک طبقه ۴ – سالن پرتوی**

This workshop will provide an overview of body heat harvesting based on thermoelectric generators for low power computation and communication wearable devices. Efficient body heat harvesters can empower such devices and enable self-powered systems, which can be used to monitor critical health and environmental parameters continuously. Continuous monitoring can give chances to clients and medical service providers to acquire longterm trends in well-being parameters and enable actions to advance health. For this technology to be enabled, it is necessary that the heat from the human body be harnessed with best in class approaches. It is additionally essential that the harvested power be used efficiently using low power circuits and radios that consume substantially less energy than ones accessible today.

This workshop will cover different aspects of nanotechnology-enabled thermoelectric generators (TEGs) for efficient human heat harvesting. A TEG is a device in which electrons are driven by thermal energy and create electrical power. Over the last several years, ASSIST research center at North Carolina State University, sponsored by National Science Foundation, has made significant progress to the development of battery-less wearable electronics for health and environmental monitoring. After a brief introduction of the ongoing efforts in ASSIST, the prospect of TEGs for powering wearable technologies will be discussed. Recent advances in nanostructured thermoelectric materials for body heat harvesting and device optimization strategies for wearable applications will be presented. Such devices can be implemented in the healthcare systems and become available for public use.

****لطفا در صورت تمایل به شرکت در کارگاه حداکثر تا تاریخ ۷ مهر از طریق ایمیل ثبت نام کنید.**

**(شرکت در کارگاه بدون هزینه است.)** INST.workshops@gmail.com

Daryoosh Vashaee is the Professor of Electrical and Computer Engineering and Materials Science and Engineering at North Carolina State University (NCSU). He is the director of the Nanoscience and Quantum Engineering Research Group (NQERG) at NCSU. He is also a member of ASSIST Engineering Research Center. In ASSIST, he leads the thermoelectric materials research for the development of self-powered wearable health and environmental monitoring and advising systems. He is an expert in the quantum and nanostructured materials for energy conversion and information technologies. In the past, he has contributed to the development of several critical thermoelectric structures including heterostructure thermionic devices and bulk nanocomposite thermoelectric materials. He received his Ph.D. working under the supervision of Dr. Ali Shakouri at University of California at Santa Cruz in 2004, worked at MIT as a postdoctoral scholar under the supervision of Drs. Mildred Dresselhaus and Gang Chen, and worked at Oklahoma State University as Assistant Professor in 2008-2013.