

# Quantum Phenomena for Information era

**Manijeh Razeghi, PhD**  
Walter P. Murphy Professor  
of Electrical Engineering and  
Computer Science  
Northwestern University

**Location: TBA**  
**Date: May 3, 2019**  
**Time: 10:30a - 11:30a**

**FOOD WILL  
BE SERVED!**



**Abstract:** We are living in an unprecedented era of hyper-connectivity that is redefining our societies and cultures. And this has only just begun. From data collection and search engines to e-commerce, the internet has become the ubiquitous cloud that is connecting every aspect of our daily lives. And powering this cloud is an intricate web of globally connected data centers, each filled with thousands of computer servers networked together and linking us to a seemingly unlimited breadth of information and content. Nowadays, our mobile devices provide various forms of connectivity that allows instant access to thousands of applications and all data on internet. The resulting explosion in data is staggering and the amount of data created globally will roughly double every two years. Meanwhile, healthcare as our parents knew it is being transformed. New wearable devices can track heart rate, glucose levels, and food intake, helping doctors and caregivers monitor the biometrics of their chronically ill patients—regardless of their location—to identify patterns that may lead to more successful treatments. Even more leading-edge: Wi-Fi chips meant to be swallowed to deliver a raft of information instantly to doctors. All of these advances offer unparalleled possibilities to enrich the lives of people around the world while generating growth and opportunity across the global economy. But none of this would be possible without understanding of ATOMS thanks to Quantum mechanics, the most fundamental building block of our modern age: The semiconductor is one of the most pervasive and powerful inventions in human history from the beginning up to now. It has been ranked fourth, in the list of top innovations since the wheel invention, behind the printing press, electricity, and penicillin, but ahead of eyeglasses, paper, and the steam engine. It is not hard to imagine what modern life would be like without semiconductors. In fact, it would probably more closely resemble the Industrial Age than anything else, when electronics and optoelectronics were very primitive and light bulbs were among the most amazing technology in the world. The material cover in this talk will be a unique blend of the most important topics related to semiconductor materials largely as a result of the focused background of prof. M. Razeghi that has been molded by her career-long efforts on understanding the structure of atom and semiconductor material systems that make a practical impact. This talk will allow students to quickly come up to speed on the main aspects of the new science and technology related to nanostructures and Quantum Devices, from deep UV (0.2 Microns)) to THZ( 300 microns).

**Speaker Bio:** Manijeh Razeghi received the Doctorate d'état ES Sciences Physiques from the Université de Paris, France, in 1980. After heading the Exploratory Materials Lab at Thomson-CSF (France), she joined Northwestern University, Evanston, IL, as a Walter P. Murphy Professor and Director of the Center for Quantum Devices in Fall 1991, where she created the undergraduate and graduate program in solid-state engineering. She is one of the leading scientists in the field of semiconductor science and technology, pioneering in the development and implementation of major modern epitaxial techniques such as MOCVD, VPE, gas MBE, and MOMBE for the growth of entire compositional ranges of III-V compound semiconductors. She is on the editorial board of many journals such as Nature Scientific report, Nature Light, Journal of Nanotechnology, and Journal of Nanoscience and Nanotechnology, an senior Editorial board of IOP, Opto-Electronics Review., the International Advisory Board for the Polish Committee of Science, and many more. She has authored or co-authored more than 1000 papers, more than 32 book chapters, and 19 books.

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