Department of Physics and Astronomy Colloquium

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Date: April 19, 2017
Time: 3:40 p.m. (**Refreshments** in ***Rm. 103*** @ **3:30 p.m.**)
Place: Rm. 103, Thirkield Hall, Howard University
Host: Prof. Tristan Hubsch

Beyond NV-Centers in Diamond: Alternative Solid-State Qubit Candidates

Abstract: In recent years, the search for room-temperature solid-state qubit (quantum bit) candidates has revived interest in the study of defect properties in semiconductors. In particular, defects called deep-center defects in semiconductors are known to have non-zero high-spin states and are of interest to quantum technologies such as quantum computing, quantum sensing and quantum metrology. One of these defects - charged NV-center in diamond - has demonstrated the use of such systems in quantum applications. Increasingly, however, there is an interest in exploring deep defects in alternative semiconductors due to the challenges posed by diamond as the host material. In order to streamline the search for alternative qubit-candidates, we need to understand the mechanism behind the formation of defect-induced high-spin states in semiconductors. In this talk, I will briefly discuss this mechanism. I will also present our Density Functional Theory (DFT) and group theory work on very promising alternatives to the NV-centers in diamond: (1) defects in silicon carbide (SiC), and (2) defects in hexagonal boron nitride (hBN).