



Photonics Forum

February 22, 2017

*11:45 a.m. -
1:15 p.m.*

9th Floor

Room 901

Photonics Center

8 Saint Mary's Street

Lunch will be served!

Professor Alex Sushkov, Boston University

Quantum Science in the Laboratory: From Magnetic Imaging of Single Atoms to Searching for Dark Matter

The field of Quantum Science and Engineering was originally stimulated by ideas from information theory showing that quantum mechanical machines can perform certain informational processing tasks much faster than any classical computer. While it is still unknown if and how truly large-scale quantum machines can be built, these concepts have already spurred new fields of science and inspired novel applications. Dr. Sushkov will talk about the development of new quantum tools for precision measurements and about how these tools can be used to address key problems in fundamental and applied science. He will focus on nanoscale magnetic sensing, and describe how we use nitrogen-vacancy (NV) centers in diamond to achieve magnetic sensing and imaging on the nanometer scale, with sensitivity of single nuclear spins, under ambient conditions. He will describe the search for axion dark matter using precision magnetic resonance, in which our goal is to probe a wide range of axion masses, where there are no existing experimental constraints on axion-like dark matter.

Alex Sushkov received his bachelor's degree from the University of New South Wales in Sydney, Australia, and his Ph.D. is in Physics from the University of California, Berkeley. At Yale University, he studied the Casimir Effect and searched for the permanent electric dipole moment of the electron. At Harvard University, he worked with nitrogen-vacancy (NV) centers in diamonds to perform magnetic resonance experiments with sensitivity of single nuclear spins. He is currently an Assistant Professor in the Boston University Physics department.



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