Department of
Physics and Astronomy
WASHINGTON STATE UNIVERSITY

2018-2019

Distinguished Colloquium Series

Dr. Ronald Walsworth

Senior Lecturer, Physics,
Harvard University and Smithsonian Institution

Thursday, October 25, 4:10 pm
Webster Hall, Room 17

Ron Walsworth is on the Physics faculty at Harvard University and is also a Senior Physicist at the Smithsonian Institution. He leads an interdisciplinary research group that develops precision measurement tools and applies them to problems in both the physical and life sciences. Current areas of research include: new approaches to the search for dark matter; astronomical detection of Earth-like planets around other stars; and the development of quantum sensors and novel NMR tools, with applications ranging from condensed matter physics to neuroscience to Earth & planetary science.

"Magnetic sensing using quantum defects in diamond"

Nitrogen vacancy (NV) quantum defects in diamond provide an unparalleled combination of magnetic field sensitivity and spatial resolution in a room-temperature solid, with wide-ranging applications in both the physical and life sciences. NVs can be brought into few nanometer proximity of magnetic field sources of interest — such as single protons and electrons — while maintaining long NV spin coherence times, a large (~Bohr magneton) Zeeman shift of the NV spin states, and optical preparation and readout of the NV spin. Recent applications include mapping magnetic signatures in >4 billion-year-old meteorites and early-Earth rocks that inform theories of solar system and Earth formation, noninvasive magnetic sensing of single neuron action potentials, measuring the spin chemical potential in magnetic devices, and NMR chemical fingerprinting at the scale of a single biological cell. I will provide an overview of this technology and its diverse applications.

Please meet our guest speaker at a reception to follow, 5:00 – 6:30 p.m.
in the foyer on floor G above the lecture hall
Host: Dr. Brian Saam