Northeastern University

SPECIAL SEMINAR
Quantum Materials and Sensing Institute (QMSI)

"Spintronics Meets Quantum Materials"

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Friday, Dec 05, 2025, 11:00am – 12:00pm
Venue:Building 5 Conf. Room B
147 South Bedford St, Burlington, MA

The seminar is both in person and online

Many quantum materials, ranging from magnetic, superconducting to topological materials, are interesting due to their characteristic and unique spin degrees of freedom. In this talk I will discuss how various experimental techniques developed in spintronics and magnetics, can be applied to study such quantum materials. Examples include: spin-sensitive transport in topological insulators (with characteristic helical spin momentum locking that may have application to enable a spin injection and spin battery sources for electronic and even nuclear spintronics); magneto-optical-Kerr-effect (MOKE) and spin-sensitive transport measurements such as magnetic-tunneling-junctions and spin-hall-magnetoresistance measurements on 2D/van der waals (vdW) magnets --- ranging from twisted magnets (exhibiting non-collinear Moire magnetism, a magnetic analog of metamaterials with alternating ferro and antiferromagnetism) to "quantum" magnets (spin liquids). Time permits, applications of quantum sensing using spin qubits (NV centers or other spin defect centers) may also be discussed.

Prof. Yong P. Chen received a BSc and a MS in mathematics from Xi'an Jiaotong University and MIT respectively and received his PhD in Electrical Engineering from Princeton University. He did a postdoc in physics and nanotechnology at Rice University before joining the faculty at Purdue University, where he became the Karl Lark-Horovitz Professor of Physics and Astronomy and Professor of Electrical & Computer Engineering and served as the Inaugural Director of Purdue Quantum Science and Engineering Institute and also co-founded and directed NSF's first industry-university-cooperative research center (IUCRC) on quantum technologies. Currently he is a Villum Investigator and Professor of Physics at Aarhus University, Denmark and also a principal investigator at Advanced Institute for Materials Research at Tohoku University, Japan, where he has been appointed recently a Distinguished Professor in the Institute for Materials Research (IMR). His research contributions have spanned both condensed matter and atomic systems, such as graphene, topological insulators, 2D materials, and cold atoms & molecules, and their potential applications. He is a Fellow of American Physical Society (APS) and American Association for the Advancement of Science (AAAS).