

Speaker: Dr. Yong Chen, Purdue University

Developing new ways to make and measure quantum materials

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Abstract: This colloquium will discuss our efforts in developing new ways to make and measure novel quantum materials, particularly in the space of two-dimensional (2D) and topological materials. Some recent examples include the realizations of a metastable “pentagonal” 2D material (made from pentagons as building blocks), a “Moire magnet” made from twisted 2D antiferromagnets, and hybrid structures involving topological materials. We apply multi-modal/operando measurements (combining electrical transport/devices with optical spectroscopies and scanning probe microscopies) on various 2D/topological materials to reveal their rich properties and functionalities. We further develop new types of spin-sensitive and quantum sensing probes, particularly on exotic “quantum magnets” or “topological superconductors” that may host exotic quasiparticles for quantum applications.



BIO: Yong P. Chen received his BSc and MSc degrees in mathematics from Xi'an Jiaotong University and MIT respectively, and his PhD in Electrical Engineering from Princeton University. After a postdoc in physics and nanotechnology at Rice University, he joined the faculty of Purdue University in 2007 and is currently the Karl Lark-Horovitz Professor of Physics and Astronomy and Professor of Electrical & Computer Engineering, and Director of NSF Industry-University-Cooperative-Research-Center (IUCRC) on Quantum Technologies. He has also been a Villum Investigator and part-time Professor at Aarhus University, Denmark, and a principal investigator at Advanced Institute for Materials Research in Tohoku University, Japan. His group works on a wide range of quantum matters in both solid state and AMO physics, involving graphene, topological insulators, 2D materials, and cold atoms & molecules, and their potential applications. He has received NSF CAREER Award, Young Investigator Awards from ACS and DOD, IBM Faculty Award, Masao Horiba Award, Herbert McCoy Award, and is a Fellow of American Physical Society (APS).