SACRAMENTO STATE

Department of Physics and Astronomy

FALL 2022 Colloquium Series

"Making a Difference in First Generation and Underrepresented Students' Education Through Research: Quantum Coherence in a Bose Thermal Gas"

Dr. Hyewon K. Pechkis

California State University, Chico

Since the experimental realization of Bose-Einstein condensation (BEC), ultracold atoms (T < 1 mK) have been the preferred platform in atomic, molecular, and optical (AMO) physics to study quantum phenomena. A BEC is formed when a sample of atoms is cooled to the nanokelvin temperature regime, whereby the individual wave functions of the atoms overlap resulting in a macroscopic matter wave. Just as laser-cooled atomic samples have improved the accuracy of atomic clocks, which enable GPS, BECs could enable future revolutionary technologies in precision measurements and quantum computing.

Although ultracold AMO research, particularly that involving BEC, is performed primarily at R1 institutions and national laboratories, experimental AMO physics can be a powerful educational tool in undergraduate settings. At California State University, Chico, an undergraduate-only, we are working towards creating laser-cooled ultracold atoms. Our work provides educational opportunities through research and shows a great impact on student success, who are mostly first-generation and minority students. I will present the progress towards completing our apparatus to create ultracold atomic spinor gases and, ultimately, spinor BECs for studies of spinor physics.

Thursday, November 10, 2022

4:00 – 5:20PM

MND1015

Open & Free to all students, faculty and public