Department of Physics
Arizona State University

COLLOQUIUM

Thursday, October 6th, 2022

Refreshments at 3:45pm in PSF 186
Colloquium from 4:00 PM – 5:00 PM in PSF 101

Ultracoherent nanomechanical resonators for quantum experiments and precision measurement

Professor Dalziel Wilson

University of Arizona

Abstract:

Nanomechanical resonators have recently achieved quality factors of 1 billion using strain and mode-shape engineering. Attractive features of these devices include attonewton force sensitivities, thermal coherence times of milliseconds, and zero-point displacement amplitudes in excess of picometers, spurring proposals from room temperature quantum experiments to ultra-fast force microscopy. I'll review these developments in the context of a new class of ultra-high-Q nanomechanical resonators based on torsion modes of strained nanoribbons, highlighting their potential use in a new generation of applications including imaging-based quantum optomechanics, precision optomechanical inertial sensing, and optomechanical dark matter searches.

Biography:

Dalziel Wilson is an assistant professor of optical sciences and physics at the University of Arizona. His work in cavity optomechanics includes seminal demonstrations of radiation pressure feedback cooling, quantum-limited position measurement, optomechanical light squeezing, and quantum coherent nanomechanics. Previously, he was a scientist at IBM Research–Zurich and a Marie Curie Postdoctoral Fellow at EPFL. He received his Ph.D. from Caltech in 2012 and his B.S. from UC Berkeley in 2006.

Host: Prof. Will Terrano

View our Fall 2022 Physics Colloquium schedule at https://physics.asu.edu/colloquia