

Contribution ID: **2519** Type: **Poster Competition (Graduate Student)** / **Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

50 - A First Realization of a Quantum Pressure Standard

Tuesday 4 June 2019 17:15 (2 minutes)

Since the first demonstration of the vacuum by Torricelli (circa 1643), vacuum measurement and technology have been applied to scientific research and industrial technologies including the processing of semiconductors and the study of the upper atmosphere. However, until now, there has never been a primary pressure standard for the high-vacuum and ultra-high vacuum (UHV), P<10–9 Torr, and lower. Our study of cold atom - hot background particle collisions has solved this problem. In this section, I will present the first quantum pressure standard, which is based on our discovery of a new class of universality (describing the loss rate of atoms from shallow traps of depth). A direct application of this quantum pressure standard is to calibrate and characterize ion gauge performance with different gas species (He, Ar, Xe, N2, H2, and CO2). Further, a MOT can be used as a transfer standard, enabling the quantum pressure standard to be connected to other pressure regimes. Finally, some future directions for this quantum pressure standard will be displayed.

Authors: Mr SHEN, Pinrui (Department of Physics and Astronomy, University of British Columbia); Dr BOOTH, James (Department of Physics, British Columbia Institute of Technology); Prof. MADISON, Kirk (Department of Physics and Astronomy, University of British Columbia); Prof. KREMS, Roman (Department of Chemistry, University of British Columbia)

Presenter: Mr SHEN, Pinrui (Department of Physics and Astronomy, University of British Columbia)

Session Classification: DAMOPC Poster Session & Student Poster Competition Finals (26) | Session d'affiches DPAMPC et finales du concours d'affiches étudiantes (26)

Track Classification: Division of Atomic, Molecular and Optical Physics, Canada / Division de la physique atomique, moléculaire et photonique, Canada (DAMOPC-DPAMPC)