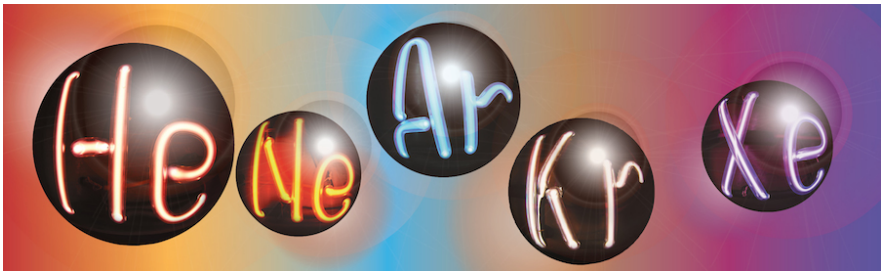

Contribution ID: **6** Type: **Oral Presentation**

Updates on the DEAP-3600 experiment and steps towards the ARGO experiment

Tuesday, 21 October 2025 14:00 (20 minutes)

Over the past decade, liquid argon (LAr) has been established as a promising target for detecting Weakly Interacting Massive Particles (WIMPs), a leading dark matter candidate, due to its high particle discrimination efficiency, scalability, and intrinsic radiopurity. The Global Argon Dark Matter Collaboration (GADMC) was formed to lead a long-term research program utilizing LAr-based detectors for dark matter searches. Among its initiatives, DEAP-3600 has been operating at SNOLAB, Canada, since 2016. It is a single-phase LAr scintillation detector that utilizes a 3.3-tonne atmospheric LAr target viewed by 255 inward-facing photomultiplier tubes. DEAP-3600 has set the most stringent limits on WIMP-nucleon interactions in argon, particularly for WIMPs with masses greater than 30 GeV/c^2. Recent hardware upgrades were implemented to achieve a zero-background environment by mitigating degraded-energy alpha backgrounds. Key results from DEAP-3600 will be presented.

ARGO is being developed with a 400-tonne LAr target, fully instrumented with digital silicon photomultipliers surrounding an acrylic vessel. SNOLAB ' s Cube Hall has been selected as the preferred site for this experiment. Studies of radiogenic neutron backgrounds and background mitigation strategies will be discussed.

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Session Classification: Applications

Track Classification: Applications (dark matter, neutrino, precision frontier, medicine, etc.)