Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Right-Side-Up Bubble Chambers: The Future of PICO Dark Matter Searches MATTHEW BRESSLER, Drexel Univ, PICO COLLABORATION — The PICO Collaboration, and its predecessor COUPP, have been operating superheated dark matter searches in the form of bubble chambers for more than a decade and presently provide world-leading limits for spin-dependent dark matter. However, an unexpected class of background events observed during that time have led to the redesign of the detectors, which will now be implemented in the Right-Side-Up orientation, eliminating the need for an inactive buffer fluid and thus any liquid-liquid interface in the apparatus, believed to be the cause of the anomalous background. PICO-40L, which will be the collaboration's first dark matter search using the right-side-up design, is set to start data collection at SNOLAB later in 2018 and is expected to show a factor of 6 improvement over the 2017 PICO-60 result. Drexel Universitys PICO group has built and operated a right-side-up bubble chamber, demonstrating the efficacy of the design. The progress made testing the Drexel bubble chamber and designing the PICO-40L detector give the collaboration confidence in the chosen design and instrumentation. Work has also started on the design of PICO-500, a ton-scale detector to follow PICO-40L.

Matthew Bressler
Drexel Univ

Date submitted: 12 Jan 2018 Electronic form version 1.4