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Searching for Neutrinoless Double Beta Decay with the MAJORANA DEMONSTRATOR

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The MAJORANA DEMONSTRATOR is a neutrinoless double-beta decay experiment currently operating two modules of p-type point contact germanium detectors at the 4850' level of the Sanford Underground Research Facility. Our latest results from 26 kg-yr of exposure set a half-life lower limit of 2.7 x 10^{25} yr (90% C.L) owing to an unprecedented energy resolution of 2.5 keV FWHM and a background rate of 12 cts/(FWHM t yr) at the ^{76}Ge double-beta decay Q value of 2039 keV. Due to its low background rate, the DEMONSTRATOR's physics data set has also been used to search for other physics beyond the Standard Model, including bosonic dark matter and tri-nucleon decay. Optimization of background-reducing analysis techniques and the development of a complete background model are expected to yield improved background rejection and to inform the design and background expectations of the next-generation LEGEND experiment. In this talk, I will review the key physics and technical results from the MAJORANA DEMONSTRATOR and report on progress in background reduction and modeling.

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