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**Advancements toward matter-antimatter pair plasmas in the laboratory** E.V. STENSON[1], U. HERGENHAHN, H. NIEMANN, N. PASCHKOWSKI, T. SUNN PEDERSEN[2], H. SAITOH[3], J. STANJA, Max Planck Institute for Plasma Physics, M.R. STONEKING, Lawrence University, C. HUGENSCHMIDT, C. PIOCHACZ, S. VOHBURGER, Technische Universität München, L. SCHWEIKHARD, Ernst Moritz Arndt University of Greifswald, J.R. DANIELSON, C.M. SURKO, University of California, San Diego — APEX/PAX (A Positron Electron Experiment/Positron Accumulation Experiment) has as its overarching goal the creation and magnetic confinement of a laboratory electron-positron pair plasma, thereby enabling experimental investigations of a topic that has already been the subject of hundreds of analytical and computational studies. This goal involves several interdependent challenges: design and construction of a suitable magnetic confinement device, access to a sufficient number of sufficiently cool positrons, and refinement of methods for the transfer of the positrons (and an equal number of electrons) into the device. The latest results of the subprojects addressing these challenges will be summarized here. Highlights include efficient (40 percent) injection of the NEPOMUC (Neutron-Inducted Positron Source Munich) positron beam into the confinement region of a dipole magnetic field, characterization of the beam at energies from 5 eV to 1 keV, and hour-long electron plasma confinement in a high-field (2.3 Telsa) Penning-Malmberg trap.

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