

Abstract Submitted  
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**Stellarators for nonneutral and pair plasmas** E. V. STENSON, T. SUNN PEDERSEN, Max Planck Institute for Plasma Physics — Electron-positron plasmas are the quintessential "pair plasmas", comprising positively and negatively charged particles of equal mass. Theoretical and computational treatments of such systems go back more than 40 years and include a number of intriguing predictions that have yet to be tested. The EPOS (Electrons and Positrons in an Optimized Stellartor) project — the latest branch of the APEX (A Positron Electron eXperiment) Collaboration — aims to create and study electron-positron plasmas in the laboratory, magnetically confined on toroidal flux surfaces specifically designed for that purpose. In this talk, we will review the relevant physics at this unique combination of regime (low temperatures and densities, which are common to non-neutral plasmas but unusual for quasineutral plasmas), geometry (toroidal flux surfaces, which are common for quasineutral plasmas but unusual for nonneutral plasmas), and mass ratio (i.e., unity), as well as discuss the implications for the upcoming design of the device.

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