

Abstract Submitted
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Prospects for US Stellarator Research¹ JEFFREY HARRIS, Oak Ridge National Laboratory, US STELLARATOR COMMUNITY COLLABORATION — Stellarators ensure plasma confinement using flux surfaces generated by external coils. The confinement properties of a stellarator are entirely determined by its complex 3D magnetic configuration. A suitably designed stellarator reactor thus offers the prospect of steady-state, ignited, disruption-free operation with minimal active control. The challenge for stellarator research is to develop techniques that allow optimization and confident extrapolation of configuration designs to reactor-scale devices. US researchers have made significant contributions to stellarator analysis and optimization which are in use around the world, but the US domestic stellarator program is small, and operates only two university-scale stellarator facilities: HSX (University of Wisconsin) and CTH (Auburn University). To increase its role in stellarator development in the next ten years, the US stellarator community is leveraging its expertise in national collaborative efforts on the large, superconducting stellarator devices W7-X (Germany) and LHD (Japan), with a particular focus on 3D divertor physics. Progress on these large experiments will set the stage for a new US stellarator experiment to explore the physics of quasi-symmetric stellarator confinement.

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