

Abstract Submitted
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Developing DIII-D To Prepare For ITER And The Path To Fusion Energy¹ RICHARD BUTTERY, DAVID HILL, WAYNE SOLOMON, HOUYANG GUO, General Atomics, DIII-D TEAM — DIII-D pursues the advancement of fusion energy through scientific understanding and discovery of solutions. Research targets two key goals. First, to prepare for ITER we must resolve how to use its flexible control tools to rapidly reach $Q=10$, and develop the scientific basis to interpret results from ITER for fusion projection. Second, we must determine how to sustain a high performance fusion core in steady state conditions, with minimal actuators and a plasma exhaust solution. DIII-D will target these missions with: (i) increased electron heating and balanced torque neutral beams to simulate burning plasma conditions (ii) new 3D coil arrays to resolve control of transients (iii) off axis current drive to study physics in steady state regimes (iv) divertors configurations to promote detachment with low upstream density (v) a reactor relevant wall to qualify materials and resolve physics in reactor-like conditions. With new diagnostics and leading edge simulation, this will position the US for success in ITER and a unique knowledge to accelerate the approach to fusion energy.

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