

**Abstract Submitted for the 55th Annual Meeting
Division of Plasma Physics
November 11-15, 2013
Denver, Colorado**

Category Number and Subject: 6.20 DIII-D Tokamak

Theory Experiment

Developing a Roadmap for US Divertor and PMI Research in the ITER Era,* D.N. Hill, *LLNL*; B. Lipschultz, D.G. Whyte, *MIT*; A.M. Garofalo, A.W. Leonard, *GA*; R. Maingi, *PPPL* — The role of existing and candidate future facilities for developing driven core, boundary plasma and plasma-facing components (PFCs) solutions for burning plasma experiments will be discussed in light of scientific and technical challenges, testing capabilities, scheduling implications, and cost. Present experiments point to likely integrated core-edge solutions which may enable steady-state high-gain, high power density operation; focused research on existing tokamak facilities could strengthen confidence significantly. In parallel, both existing and new candidate materials suitable for testing under high neutron fluence can be developed and qualified. We will also discuss the potential role of new facilities in closing the knowledge gaps to a Fusion Nuclear Science Facility (FNSF), and what form the final step of integrating core and edge solutions will be (separate, or as part of an FNSF) in terms of size, goals and cost.

*Supported by the US DOE under DE-AC52-07NA27344, DE-FC02-99ER54512, DE-SC00-02060, DE-FG02-04ER54762, DE-FC-02-04ER54698, and DE-AC02-09CH11466.