Abstract Submitted
for the TSF10 Meeting of
The American Physical Society

**Scientific analysis of materials and designs to increase reliability and performance of RF Superconductivity Cavities**[1] NATHANIEL POGUE, PETER MCINTYRE, AKHDIYOR SATTAROV, Texas A&M University, CHARLES REECE, Thomas Jefferson National Lab — Texas A&M in collaboration with Jefferson Lab has put together an investigative plan for analyzing material performance and design of Niobium superconducting cavities. A sample test cavity is being designed to analyze the materials used during construction to identify the main inhibiting factors of performance, or accelerating gradient achievable. Once these phenomena are known, enhancements can be made to the surface to push to even higher limits thus reducing the cost and with higher gradients. These enhancements are new layered surface treatments that can be put down using a sophisticated cluster tool obtained by A&M. Once these layers are tested and certified as being extremely useful, the only means of applying them is through an open assembly cavity design, or polyhedral cavity. This cavity has many advantages: ease of machining, visible analysis, open cleaning, iris size reduction, and elimination of instabilities caused by other fields. This plan could dramatically change the landscape of common practices in high performance niobium cavities.

[1]Supported by DOE grant DEFG0210ER41650.

Nathaniel Pogue
Texas A&M University

Date submitted: 24 Sep 2010 Electronic form version 1.4