**Research Development Fund – Fall FY16 Cover Page Template**

**SUBMISSION DEADLINE: September 15, 2015 at 12 noon CDT to** **rdf@tamu.edu**

(All cover pages will be posted for the campus community to view at <http://rdf.tamu.edu/abstracts>)

**Proposal Title:** Cyclotron Experimental Hall

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**Key Participating units:** Cyclotron Institute,College of Science

**Anticipated Request Amount ($):** $1.5M (Estimate total cost of $3M, but we would seekco-fundingfrom facilities construction funds or other sources.)

**Executive summary of the intended proposal.**

The Cyclotron Institute (CI), which is a DOE Center of Excellence, provides the primary infrastructure for Texas A&M’s research and education programs in nuclear chemistry and nuclear physics. The CI is a cornerstone to the IUMRI Nuclear Solutions for the 21st Century. Four outstanding young faculty members have recently been added to the CI and the Nuclear Solutions Institute. The CI’s international stature also allowed us to recruit Yuri Oganessian, discoverer of six new elements, as a TIAS fellow. The CI is in the process of an accelerator upgrade, funded by the DOE and the Welch Foundation. The upgrade will make Texas A&M one of only two facilities in the world with fast, stopped and reaccelerated radioactive beams. The breadth of the Institute research program has grown substantially, and there is a need for a new experimental hall to fully realize the capabilities of the upgraded facility. An internal planning report “strongly endorses the need to expand the facility.” If approved, this project would help propel the already internationally recognized research program at the Cyclotron Institute to a new level.

The Ci has reached a space limitation in accommodating the fast growing needs of the new and existing experimental programs. The demand for new experimental areas from the local groups and also from external users is bound to increase even further with the completion of the upgrade. Preliminary plans for the new experimental hall call for moving at least two major experiments into it. IUMRI Professor Grigory Rogachev is building a new active target detector, TexAT and there is a $1M proposal to the DOE to convert TexAT to SuperTexAT which will make it the most sensitive detector in the world for specific astrophysical measurements. The footprint of SuperTexAT is large and the optimum location for it will be in the new experimental hall. The new hall will also be the perfect location for AGGIE – a reconfiguration of the SASSYER spectrometer, which we recently acquired from Yale University, and a cornerstone of Professor Charles Folden’s research in the chemistry and physics of the heaviest elements. The are numerous other possibilities that the new experimental hall will open up for basic nuclear and interdisciplinary science research and also for applications (national security, radiation effects, etc.) at the CI. Without the new experimental hall we will have to carefully consider space allocation within the existing experimental area and may not be able to renew an existing agreement with Lawrence Livermore National Laboratory, which uses one of our existing beamlines to study surrogate reactions that are important for nuclear stockpile stewardship and national security applications.