

Memorandum of Understanding

Dustin Keller

April 25, 2018

Purpose of Contract

The general objective of this Memorandum of Understanding (MOU) is to initiate a contract of employment for Dustin Keller from the University of Virginia (UVA) at the University of New Hampshire Physics Department. The common goal is to establish an independent research program in Nuclear Spin Physics capable of attracting additional Department of Energy funding.

Request for Position

The expectation is to be hired at the Associate Research Professor level at a salary of \$90 K per year which includes a 3 month summer salary paid by the Department of Energy. Joining UNH at this ranking gives a greater precedence for attracting the future funds needed to build-up a major research program and would be a promotion rather than a lateral move from UVA. The 9 month salary will be paid by UNH for the 3 year contract providing the stability and time required to transition the polarized target lab from UVA to UNH as well as the time to establish a new grant under the DOE.

Space Request

Under my present research program there exists a need to build up both an evaporation high cooling power solid polarization lab as well as dilution low-temperature lab, both sets of infrastructure could fit into a single lab space at

the University of New Hampshire. The lab should ultimately have additional space for setting up and testing large scale superconducting magnets and low temperature cryogenic systems used for target polarization. There is a considerable amount of hardware expected to come from the University of Virginia, Jefferson Labs and Los Alamos National Labs. A space is needs to house this equipment.

Start-up Funding

Though much of the infrastructure for the initial setup of these systems can come from long term loans from the University of Virginia the over all greatest benefit to both parties can best be achieve by additional start-up funds that can support the construction of a UNH owned low temperature dilution refrigerator system for dynamically polarized targets to be used in nuclear physics scattering experiments. The construction of this type of dilution refrigerator can be build in house (campus based machine shop) for \$100K. Such a target polarized system would make UNH immediately attractive in experimental collaborations which use high intensity photon beams. This system would also provide the necessary framework to do high polarization and low temperature target research on-site, as well as provide student and collaborator training equipment. The ^3He , pipe assembly and pump system, and superconducting magnet system is expected to come from the University of Virginia. The University of Virginia will also loan the microwave generator and waveguide components needed for dynamic polarization. Los Alamos National Labs has agreed to donate a NMR system for the polarization measurements.