

1. List of persons wishing to join including position (e.g. faculty-with rank, post doc, graduate student, engineer etc.).

Dr. Larry Isenhower – assistant professor

3-5 undergraduate students each summer

1-3 undergraduate students during the academic year

It is possible that in the future other faculty will be able to join as current project commitments end.

2. Planned Institutional Board (IB) representative.

Dr. Larry Isenhower

3. Summary of the science and technical experience of the group, with specific reference to the expertise of the senior members (e.g. all faculty or equivalent).

Larry – specializes in electronics, optics, lasers, and atomic physics. I have built multiple laser systems for use in quantum information experiments. I have some previous experience with particle detectors through working on the PHENIX experiment at BNL and E906 at Fermilab and will be assisting with supervising students on E1039 at Fermilab this summer. I also have a strong interest in trying to bring atomic physics and laser optics techniques into other areas of research. For example, I am finishing work on a design for a novel particle beam monitor based on measurements of highly excited atomic states.

There are 4 other faculty with nuclear/high energy physics research experience at ACU: Dr. Donald Isenhower, Dr. Rusty Towell, Dr. Michael Daugherty, and Dr. James Drachenberg. They are currently collaborators on E1039 at Fermilab, STAR at BNL, and NIFFTE at LANL. So they do not have the time available to commit to DUNE at this time but are happy to provide advice and short term help as needed and may be able to make a larger commitment in the future as other projects end. Donald brings 40 years of particle detector and electronics design expertise and has won the APS Prize for a Faculty Member for Research in an Undergraduate Institution. Rusty brings 25 years of experience in nuclear physics detector design and construction. Michael has 20 years of experience in both detector construction and data analysis. Jim is a deputy spokesman for STAR and member of the spin physics working group. This research group has received continuous DOE funding since 1981.

4. Summary of the proposed science and technical contributions to DUNE of the group, with specific reference to the interests of the senior members.

We were asked to join the construction team for the dual phase far detector by Jaehoon Yu of the Univ. of Texas at Arlington, and this would serve as our initial focus for our contributions. We should be able to provide several (3-5 at least) undergraduate students and some facility space to help with the construction of this detector. We have a large assembly space available with machining equipment, welding equipment, and a 5 ton crane that should be able to support the simultaneous assembly of 2-4 far detector modules at a time.

Larry also attended the Near Detector workshop hosted by UTA on April 18-19 and saw there are multiple opportunities available for making significant contributions within that work. Based on our previous expertise the work on the TPC appears to be a good area to focus our contributions. Our group is specifically interested in the possible light detection system, the laser calibrations, and the new inner wire chambers that need to be designed and built. We would be interested in helping with any prototyping, construction, and testing needed for these systems.

5. Resources the group could contribute to DUNE (near term and potential for longer term, it is understood that the latter is often contingent on success with proposals).

Near term we would provide 1 faculty member and if funding is available 3-5 student workers each summer and 1-3 student workers during the academic year. We also have some large facility space with a 5 ton crane (a portion of a 40' by 60' assembly hall can be dedicated to this work with appropriate planning) to help with the construction, testing, and maintenance of DUNE detectors and equipment. We also would like to help with operations of any active experiments through running shifts, performing data analysis, or running simulations. Larry has internal funding for 1 or 2 undergraduate students in the Fall and Spring semesters that could work on some design, testing, or prototyping tasks.

In the long term, we would provide students to help with running shifts, construction of additional detectors or equipment, maintenance of operational detectors and equipment, and data analysis. It is also possible that additional faculty will be able to join as their current commitments end.

6. Short CVs of all senior members, as an attachment.