Applications are invited for PhD positions in the fields of experimental search for WIMP Dark Matter and experimental High Energy Astrophysics at Rice University.

1) Some 25% of the content of the universe consist of cold Dark Matter (DM), the origin of which is unknown. A prime DM candidate is the least massive stable particle predicted by SUSY extensions of the Standard Model of particle physics. The direct search for DM in underground recoil experiments has the potential to uncover these elusive particles. Our group has been actively involved in the XENON DM Experiment since its beginning in 2001. The XENON project aims at implementing a DM detector on the 1 ton scale of fiducial mass, based on dual-phase liquid/gas xenon time projection chambers (TPC). Its current stage of implementation “XENON10" is located at the Gran Sasso underground national laboratory (LNGS) in Italy. We have just announced the world's lowest limits on SUSY WIMP Dark Matter, surpassing the best limits so far by a factor of six. The program is aggressively moving ahead towards the next step detector, which will probe deeply into SUSY parameter space. A Ph.D. student is sought for hardware and electronics development and testing, data analysis, and/or simulations for this next step.

2) The scientific potential of gamma-ray astronomy in the energy regime of nuclear transitions has long been recognized. Testing the explosion mechanisms of thermonuclear and gravitational supernovae and measurement of star formation and supernova rates throughout the galaxy with imaging gamma-ray line spectroscopy are only two out of a wide array of exciting astrophysics topics. Barely the tip of the iceberg has been probed by gamma-ray telescopes to-date, due to a lack of sensitivity. A future "Advanced Compton Telescope" (ACT) could boost this field by improving sensitivity by up to 2 orders of magnitude over current instruments. Our group works on the implementation of the liquid xenon TPC concept as an imaging Compton telescope with time-of-flight and sufficient energy resolution to study the physics processes involved. A Ph.D. student is sought for R&D on energy resolution and time-of-flight in a compact Compton telescope, with the goal of building and testing a prototype detector module with later implementation on a balloon platform. Additional research in high-energy astrophysics with GLAST may be possible.

Candidates must have concluded at least the equivalent of a 4-year university education in physics or astrophysics, corresponding to a degree of Bachelor of Science. Additional course work at the graduate level may be counted towards the Rice Ph.D. course requirements. Some undergraduate research experience and computer knowledge in a high programming language such as C or C++ are desirable. Prior knowledge of IDL, root, or GEANT4 are advantageous but not required. Candidates should be fluent in written and spoken English.

Applicants should submit a résumé with a brief statement of research interests, and names and contact information for references via email. Please provide GRE and TOEFL scores as applicable. Positions remain open until filled.

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