

Development of a Gamma-Ray Detector for the study of Terrestrial Gamma-Ray Flashes from a Cubesat

Position Title: Engineering Research Assistant

Faculty Name and Title: Mallory Roberts, Assistant Professor of Physics; Francesco Arneodo, Associate Professor of Physics

Research Project Description: Terrestrial gamma-ray flashes (TGFs) are very brief (~ 0.1 milliseconds) bursts of gamma-rays directed upward from thunderstorms and so are best studied from low Earth orbit. We are developing a fast gamma-ray detector that could be deployed within 1U of space on a Cubesat. We need someone to aid in the development of the mechanical structure, thermal and power management systems, space qualification, and system integration as well as preparing for mission operations. We are looking for someone with experience in mechanical, civil, systems, electrical, and/or aerospace engineering. In addition to working on detector subsystems, they would also aid in the expansion of Prof. Arneodo's astroparticle laboratory. There may also be opportunities for collaboration with people at the Masdar Institute, as well as colleagues in Italy, Paris, and Washington DC. This project is supported by the UAE space agency, with the goal of having a detector fully ready for integration with a 3U cubesat by the Summer of 2019.

Responsibilities of the Position:

- Design, building and testing of a mechanical structure with thermal management system.
- Study of space qualification requirements, and aiding in the planning and performance of thermal vacuum and shake tests. Also study of ground station and communication requirements.
- Creation of and assistance in the management of documentation for all parts of project.
- Aid in the preparation of presentations for the UAE Space Agency and giving presentations at local and international meetings. This includes participation in public outreach events.

Essential Qualifications:

Bachelors degree or higher in Physics, Mechanical Engineering, Civil engineering, Systems engineering, Aerospace engineering, or Electrical engineering.

Preferred experience:

Facility in computer design software (eg. solidworks, autocad), programming skills in Python and/or C++, good knowledge of thermal and mechanical properties of materials. Knowledge of GEANT or previous work on space missions is a plus.

Applicants to provide:

1. Statement of interest

2. CV

3. Names and contact information for at least two people willing to provide letters of recommendation.