

Research assistantships for MS and PhD students are available in

**Imaging Radioimmunotherapy Radionuclides using a  
Compton Camera with a New Novel Design.**

A large number of radionuclides are presently being considered for use in radioimmunotherapy. The energies of the gammas emitted by most of these radionuclides are so high (400 —2000 keV) it is not possible to image them with a SPECT camera. Fortunately, Compton cameras have the potential of imaging gammas in this energy range. Although they have not been successfully used in medicine to date, it is hoped that when a recently developed novel Compton camera design is used, they will be able to image these radionuclides.

To evaluate the novel design, the emissions that are expected in use along with the interaction of the gammas with the detectors will be simulated using Geant4. In addition, reconstruction algorithms capable of producing images in an acceptable amount of time using the huge amount of data produced by a Compton camera will be developed. Some algorithms will be based upon novel reconstruction methods that have recently been developed for Compton cameras, while others will be straightforward adaptation of established reconstruction methods. Simulations will be performed on a 3900-node cluster—the largest computing system in the world for open science research.

This research will lead to a MS or a PhD degree from the Electrical and Computer Engineering Department at the University of Texas at San Antonio, USA. In 2003, the Department initiated a new PhD program and is striving toward research. With over 28,000 students, the University is in the city of San Antonio, which is a clean, safe, inexpensive, culturally diverse, and expanding city.

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