

# Nuclear Physics in Proton Therapy

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*University Endowed Professor*

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1:30 – 2:30 PM

Venue: GL100A, MMC



**Abstract:** Technological advances spurred by the demands of physics research find applications in many disciplines, including providing benefit to society through the treatment and diagnosis of diseases. As an example, the over 3,500 hospital-based nuclear medicine departments in the U.S. perform over 10 million procedures each year, positively impact countless lives, and generate over \$1 billion in revenue.

The medical technologies of tomorrow may be underway in physics research laboratories today. Various research project examples will be presented, with a specific focus on nuclear physics applications in proton radiotherapy. Proton therapy is a precise form of radiation treatment for cancer. Due to the characteristic Bragg peak associated with ion energy deposition, proton therapy provides the radiation oncologist with an improved method of treatment localization within a patient, as compared with conventional radiation therapy using X-rays or electrons. This can be accomplished only in concert with advances in tumor identification and localization, patient motion and positioning, treatment planning and evaluation, and a host of supporting technologies.

**Biography:** Dr. Cynthia Keppel is an experimental nuclear physicist with a joint position both as faculty at HU and as staff scientist at the Thomas Jefferson National Accelerator Facility (Jefferson Lab). She earned her PhD in 1995 from The American University for work at the Stanford Linear Accelerator Center. She garnered over \$35M in extramural research support during her tenure at HU, including a National Science Foundation CAREER award. She received the Virginia State Council on Higher Education 2000 Outstanding Faculty Award, a 2011 Virginia Outstanding Scientist Award, and the 2010 Innovate Hampton Roads High Tech Leadership Award. She has served on numerous national boards, including the American Physical Society Division of Nuclear Physics Executive Committee, the Jefferson Science Council, the National Institutes of Health National Advisory Research Resources Council, and the Pediatric Proton Foundation. She is an author of over 180 peer-reviewed scientific publications, 47 of which are ranked as top cited (50+) articles.

*The event is free and open to the public.*

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