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Invited Presentation

BIOMEDICAL ENGINEERING SEMINAR

11:00 a.m.-12:00 noon, Friday, April 3, 2009
Mann Hall, Medical Sciences Building

Title: **Biomedical Applications of Nonlinear Acoustics**

Presenter**: Mark Hamilton, Ph.D.**
Harry L. Kent, Jr. Professor in Mechanical Engineering,
The University of Texas at Austin

Abstract: Practical applications of nonlinear acoustics trace back to 1960 with the discovery of a novel way to form highly directional beams of low-frequency sound. This application was of particular interest to the sonar community and led to substantial funding of both basic and applied research in nonlinear acoustics over the next several decades. Medical ultrasound has now emerged as the area with arguably the largest concentration of activity in nonlinear acoustics. This seminar will begin with a brief review of physical principles of nonlinear acoustics that are relevant to medical ultrasound. Specific applications for which theoretical models are being developed by the speaker's group will then be described. These include dynamical interactions within cavitation bubble clusters produced during shock-wave lithotripsy, nonlinear bubble dynamics in channels, acoustic radiation force on a bubble in tissue, nonlinear shear waves in tissue, and tissue harmonic imaging.

Host: James F. Greenleaf, Ph.D.

♦ See BME web page for list of speakers:
http://mayoresearch.mayo.edu/mayo/research/physio_bme/2009_bme_seminars.cfm