

# ***Physics Colloquium Series***

## ***~ Physics Seminar Student Talks ~***

### ***“Healing Cancer With Physics: Detection of Cancerous Cells Using Q-Dots”***

*An estimated 1,372,910 people will be newly diagnosed with cancer in 2005, and the estimated number of people dying this year due to various types of cancer is 570,280. The five year survival rate for a patient with Stage 1 breast cancer is 98%, while the survival rate for later detection, Stage 2 or greater, drops to 16%. Detection of cancer at an early stage is a critical step in improving cancer treatment. The application of nanotechnology to cancer research is particularly attractive for its potential to deliver innovative tools that can transform promising molecular discoveries into benefits for cancer patients. To detect cancerous cells, doctors can use quantum dots that bind to sequences of DNA that are associated to the cancer. When these dots are stimulated with light, they emit a unique color barcode that makes the cancer associated with DNA sequences visible. Nanodevices such as Nanoshells and Dendrimers would serve as drug delivery systems that transported radiation doses only to the malignant cells.*

## **Tasneem Maistry**

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### ***“X-Ray LIGA and Its Use in the Development of Micro-Electro Mechanical Systems (MEMS)”***

*LIGA has become one of the most important and widely used processes for the creation of complex micro-machines. LIGA makes it possible to manufacture high accuracy, sub-micron components from a variety of materials at costs comparable to current IC manufacturing methods. This talk will review the essential concepts behind synchrotron radiation, x-ray masks, metal deposition, and molding techniques as they relate to LIGA and pseudo-LIGA manufacturing processes. LIGA has many industrial applications and the strength of this process as compared to Electron Discharge Machining (EDM). Deep Reactive Ion Etching (DRIE), and various other manufacturing methods will be emphasized.*

## **Attila Kabai**

**Tuesday, May 10, 2005**

**4:00-5:20 PM MND 1015**

**OPEN & FREE TO ALL STUDENTS & FACULTY**