

UNIVERSITY OF TEXAS AT DALLAS - DEPARTMENT OF PHYSICS DALLAS CHAPTER, IEEE LASERS AND ELECTRO-OPTICS SOCIETY COLLOQUIUM

<http://www.utdallas.edu/physics/lectures/info/>

Wednesday, August 30, 2006; 4:00-5:00 PM
Kusch Auditorium, FN 2.102

I. Lasers: Solution Looking for a Problem

Lawrence Sutherland

Tarrant County College in Arlington



L. Sutherland, an independent filmmaker in Arlington, has produced a 17.5 min documentary that explores some of the history, current uses and potential future uses of lasers -- and connects this important technology back to theoretical physics. The documentary was videotaped on several occasions over North Texas, Austin and the San Francisco areas. Included are uses of lasers in sheet metal cutting, vision correction, semiconductor applications and traffic enforcement (lidar). There are also several interview segments with Dr. Charles Townes at the campus of the University of California at Berkeley. Dr. Townes developed important research in the 1950s that led to the first laser, created by Ted Maiman in 1960. The documentary also looks at possible futuristic uses of lasers in quantum computers, holographic television and hydrogen fusion.

II. Lasers: Applications

- **Prof. Austin Cunningham** (*UTD Physics*). The advent of laser spectroscopy has greatly enhanced our basic understanding of cluster ion formation and binding, product states formed in recombination of molecular ions and electrons, and in binding energy of negative ions. Each topic will be briefly reviewed.
- **Prof. Robert Glosser** (*UTD Physics*) will describe three ways in which lasers can be used as a contactless probe of materials' properties. These are Raman, photoluminescence and photorefectance spectroscopies. It is worth noting that lasers are not absolutely necessary for these measurements but life is much, much easier with a laser as compared with conventional light sources.
- **Prof. Duncan MacFarlane** (*UTD Electrical Engineering*) will describe the current work and future vision for information engineering with lasers. The programmable photonic integrated circuits under development in North Texas show promise for Terabit rate filtering, signal processing and computation.