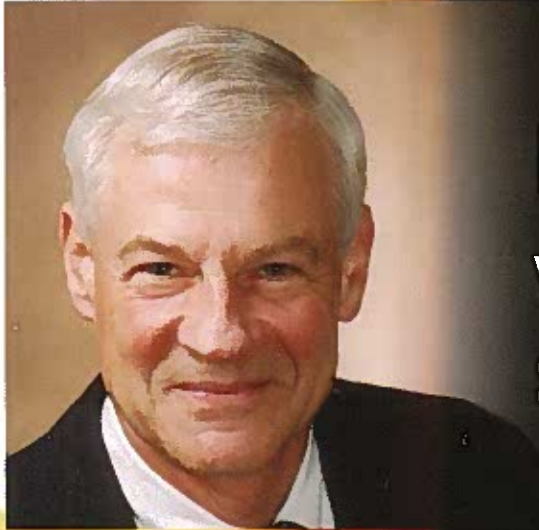


**Edison
Lecture
Series**

LASER-BASED DIAGNOSTICS FOR COMBUSTION AND PROPULSION: ABSORPTION AND FLUORESCENCE

Tuesday, April 30 • 3:30 p.m.

Lower Level Auditorium, Geddes Hall



R.K. Hanson

**Woodard Professor of Mechanical Engineering
Stanford University**

MEMBER

**National Academy
of Engineering**

FELLOW

**American
Institute of
Aeronautics and
Astronautics**

**American Society
of Mechanical
Engineers**

**Optical Society
of America**

Non-intrusive laser-based diagnostics play a major role in current combustion and propulsion research and development. This presentation will focus on two of the most commonly used methods, namely absorption and fluorescence, and provide a historical perspective on the development of these methods as well as several examples illustrating the state-of-the-art. Absorption methods generally rely on wavelength-tunable continuous-wave diode lasers providing access to visible, near-infrared and mid-infrared wavelengths, with the potential for accurate and sensitive measurements of multiple flow field quantities including temperature, species concentration and velocity, all along a line-of-sight. By contrast, fluorescence strategies typically utilize pulsed laser sources in the ultraviolet aimed at providing temporally and spatially resolved planar (i.e., two-dimensional) images of properties including temperature and species concentrations. Although fluorescence methods are most often applied in laboratory environments, absorption can be applied in large-scale engineering systems, some of which are hostile environments, as well in fundamental laboratory experimental facilities. Example applications to be presented include reactive and non-reactive flows in hypersonic shock tunnels, shock tubes, internal combustion engines, coal-fired combustors, scramjet combustors, and others.

**A reception will be held from
3:00 - 3:30 p.m. in the Geddes
Hall Coffee House.**