

## APPLICATIONS OF FIBER OPTICS IN CIVIL ENGINEERING

by

John A. Gilbert, Ph.D.  
Director, Civil Engineering Program  
University of Alabama in Huntsville  
Huntsville, Alabama 35899

Fiber optics, available as both individual fibers and coherent arrays of many thousands of fibers, provide convenient new tools for the transmission and manipulation of coherent light from a laser. This presentation describes how combinations of fiber optics, optical methods, and computer processing provide the means of making experimental measurements in civil engineering-related applications. Several new developments currently being researched at UAH will be discussed, including transmitting and recording holographic interferograms through fiber optic systems, profiling the interior of cavities using structured light and radial metrology, monitoring groundwater contaminants through fiber optic nervous systems, and detecting flaws using thermal-acousto photonic (TAP) non-destructive evaluation.

\* \* \* \* \*



**John A. Gilbert** received the B.S. (aerospace) and M.S. (applied mechanics) degrees from the Polytechnic Institute of Brooklyn in 1971 and 1973, respectively. His Ph.D. was obtained from the Illinois Institute of Technology in 1975.

After working as a lecturer at both the Illinois Institute of Technology and the University of Wisconsin-Milwaukee, he was appointed Assistant Professor at UWM in 1976. He received his tenure and promotion to

Associate Professor in 1981 and joined the faculty at the University of Alabama in Huntsville as Professor in 1985.

Professor Gilbert specializes in experimental stress analysis and applied optics, with principal expertise concentrated in the areas of remote sensing through fiber optic systems, holographic interferometry, and speckle photography. He is an active member of several technical societies including the Society for Experimental Mechanics (SEM), the British Society for Strain Measurement (BSSM), the Society of Photo-Optical Instrumentation Engineers (SPIE), the American Academy of Mechanics (AAM), the American Society for Engineering Education (ASEE), the American Society of Civil Engineers (ASCE), and Sigma Xi.