Scientific Misconduct: the good, the bad, and the ugly.

Professor James A. Harrington
Rutgers State University.
New-Jersey

This non-technical talk is designed to explore the increasingly common problem of misconduct in the scientific community. All of us are normally guided in our work by ethical principles that we have learned through the years both at home and in our workplace. Yet scientific misconduct continues to plague our course work, publications, and decisions that we make in our professional lives. My interest in this subject comes from some personal experiences in scientific publishing and my efforts to establish the first ethics policy for SPIE-The International Society for Optical Engineering. Some surprising and very regrettable examples of scientific misconduct as it relates to the publication of scientific papers will be presented. Have you heard of the organic yellow laser, element 118, and outright plagiarism by a top Indian scientist of a paper on high energy theory done originally at Stanford University? All are glaring examples of fraud in science. While these examples are extreme there are many lesser avenues of misconduct that we must avoid. Many examples will be given along with some lessons learned along the way. The taxonomy of misconduct is complex as is the punishment for the crime.

James A. Harrington has over thirty years of research experience in the area of optical properties of solids. Since 1977, he has worked on all aspects of infrared fibers including fabrication, characterization, and applications. He is generally recognized as one of the world's leading experts in this continually evolving field. His current research interests include the development of specialty fiber optics for use in the delivery of laser power in surgical and industrial applications and for use as chemical and temperature fiber optic sensors. Specifically, these specialty fibers include hollow glass and plastic waveguides and solid core, single-crystal sapphire fibers. The hollow core waveguides are an excellent choice for the transmission of CO₂ and Er:YAG laser energy and both hollow and solid core fibers are useful as fiber links in spectroscopic and thermometric applications aimed at the identification of chemical species and the measurement of low and high (>1500°C) temperature radiation. Prior to joining the Fiber Optic Materials Research Program at Rutgers University in 1989, he was Director of Infrared Fiber Operations for Heraeus LaserSonics where he led the research and development of infrared fiber optic delivery systems for CO₂ laser surgery. He was the inventor of both the hollow sapphire and hollow glass waveguides, which today are being used as CO₂ laser delivery systems in a variety of surgical applications. Before joining Heraeus LaserSonics, he was the Program Manager for IR fiber optics at Hughes Research Laboratories in Malibu, CA. His current research interests include the development of a new class of ultra lowloss, photonic bandgap HGWs and the fabrication of HGW coherent image bundles for infrared imaging. Other research activities include the development of diffusing-tip silica fibers for use in photodynamic therapy (PDT) and prostate surgery, thin film coatings for hollow waveguides, IR fiber delivery systems for FEL medical lasers, and IR fibers for use in CO₂ laser-threat warning receivers.