

## Gerald Lucovsky



University Professor Alumni Distinguished Graduate Professor

### Biography

Professor Lucovsky received his BS and MA degrees in Physics from the University of Rochester in 1956 and 1958, respectively, and his PhD degree in Physics from Temple University in 1960. He was employed by Philco Corporation from 1958 through 1965 as a Senior Research Specialist, where he worked on photo-diodes, and GaAs light-emitting-diodes and lasers. He fabricated the first photo-voltaic device in GaAs. He was employed by Xerox Corporation in Webster, NY from 1965 to 1970, and at the Xerox Palo Alto Research Center in Palo Alto, CA, where he was manager of the General Sciences Laboratory and a Senior Research Fellow. During this time he worked on amorphous semiconductors including chalcogenides and hydrogenated amorphous Si, as well as non-crystalline oxides. He joined the Faculty of NC State University in 1980, and has been there since that time.

Professor Gerald Lucovsky has worked on thin film gate dielectrics and surface passivation for Si and compound semiconductors by remote plasma processing for more than 25 yrs, with state of the art results for ultra-thin Si oxyitride devices. This approach has been applied to the passivation of GaN surfaces with excellent results, and is being extended to ternary III-V's as well.

### Select Publications

"Structure of Ultrathin SiO<sub>2</sub>/Si(111) Interfaces Studied by Photoelectron Spectroscopy"  
*J. Vac. Sci. Tech.* **A17**. J. W. Keister, J. E. Rowe, J. J. Kolodziej, H. Niimi, H.-S. Tao, T. E. Madey and G. Lucovsky. (1999). p. 1250-1257.

"Band Offsets for Ultrathin SiO<sub>2</sub> and Si<sub>3</sub>N<sub>4</sub> films on Si(111) and Si(100) from Photoemission Spectroscopy"  
*J. Vac. Sci. Tech.* **B17**. J. W. Keister, J. E. Rowe, J. J. Kolodziej, H. Niimi, T. E. Madey and G. Lucovsky. (1999). p. 1831-1835.

"The Effects of Interfacial Suboxide Transition Regions on Direct Tunneling in Oxide and Stacked Oxide-Nitride Gate Dielectrics"

*Microelectronic Engineering* **48(1-4)**. H. Yang, H. Niimi, Y. Wu, G. Lucovsky, J. W. Keister and J. E. Rowe. (1999). p. 307-310.

"Formation of MIS Devices with Oxide-Nitride-Oxide Dielectrics by Low-temperature Plasma-assisted Processing and High-temperature Rapid Thermal Annealing"

*J. Vac. Sci. Tech.* . G. Lucovsky.

"Epitaxial Growth of GaP by Remote Plasma-Enhanced Chemical-Vapor Deposition, RPECVD"

*J. Vac. Sci. Technol.* **A11**. S.W. Choi, K.J. Bachmann and G. Lucovsky. (1993). p. 326.

"Femtosecond Spectroscopic Study of Ultrafast Carrier Relaxation in Hydrogenated Amorphous Silicon a-Si:H"

*J. Appl. Phys.* **73**. A. Esser, H. Heesel H. Kurz, C. Wang, G.N. Parsons and G. Lucovsky. (1993). p. 1235.

"Transport Properties of Optically-Generated Free Carriers in Amorphous Silicon, a-Si:H in the Femtosecond Time Regime"

*Phys. Rev.* **B47**. A. Esser, H. Heesel H. Kurz, C. Wang, G.N. Parsons and G. Lucovsky. (1993). p. 3593.

"New approach to preparing smooth Si(100) surfaces: Characterization by spectroellipsometry and validation of Si/SiO<sub>2</sub> interface properties in metal-oxide-semiconductor devices"

*J. Vac. Sci. Technol.* (*in press*). D. Schmidt, H. Niimi, B. J. Hinds, D. E. Aspnes, and G. Lucovsky.

"Linear and nonlinear optical studies of absorption processes at Si-SiO<sub>2</sub> interfaces on vicinal Si(111) wafers"

*The Physics of Semiconductors*. G. Lucovsky, T. Yasuda, L. Mantese, G. Powell, D. E. Aspnes, S. V. Hattangady, D. R. Lee, V. Misa, J. J. Wortman, U. Emmerichs, C. Meyer, H. Bakker, and H. Kurz. World Scientific, Singapore, edited by D.J. Lockwood. (1995). p. 604-607.

"Effects of Pre-Deposition Processing on the Electrical Properties of SiO<sub>2</sub>/Si Structures Formed by Low-Temperature, Plasma-Assisted Oxidation and Deposition Process"

*J. Vac. Sci. Technol.* **A11**. T. Yasuda, Y. Ma. Y.L. Chen, G. Lucovsky. (1993). p. 945.

## Honors & Awards

- Fellow of the American Physical Society
- Fellow of the American Vacuum Society
- Alumni Distinguished Undergraduate Professor