

David L Shealy

A. Professional Preparation

- University of Georgia Physics Bachelor of Science, 1966
- University of Georgia Physics Doctor of Philosophy, 1973

B. Appointments

- 1984-present, Professor and Chair, Department of Physics, University of Alabama at Birmingham
- 1980-1984, Staff Scientist, Principal Engineer, Semiconductor Laboratories, Motorola, Inc.
- 1976-1984, Associate Professor, Department of Physics, University of Alabama at Birmingham
- 1973-1976, Assistant Professor, Department of Physics, University of Alabama at Birmingham

C. Publications

i. List up to 5 publications related to the project

1. D. L. Shealy and J. A. Hoffnagle, "Laser beam shaping profiles and propagation," *Appl. Opt.* 45.21, 5118-5131, 2006.
2. D.L. Shealy and J. A. Hoffnagle, "Aspheric Optics for Laser Beam Shaping," in *Encyclopedia of Optical Engineering*, edited by Ron Driggers, DOI: 10.1081/E-EOE-120029768, ISBN: 0-8247-0940-3 (paper) 0-8247-0939-X (electronic), (Taylor & Francis, 2006).
3. D. L. Shealy, "Chapter 9: History of Beam Shaping," in *Laser Beam Shaping Applications*, edited by Fred M. Dickey, Scott C. Holswade and David L. Shealy, ISBN 0-8247-5941-9, CRC Press, Taylor & Francis Group, Boca Raton, FL, 2006, pp. 307-347.
4. D. L. Shealy, J. A. Hoffnagle and K-. H. Brenner, "Analytic beam shaping for flattened output irradiance profiles," in *Laser Beam Shaping VII*, edited by Fred M. Dickey and David L. Shealy, *Proc. SPIE* **6290**, 6290006-1-11, 2006.
5. D. L. Shealy and S-H. Chao, "Geometrical optics-based design of laser beam shapers," *Optical Engineering* **42.11**, 3123-3138, November 2003.

ii. List of 5 other significant Publications

1. D. L. Shealy and J. H. Hoffnagle, "Beam shaping profiles and propagation," in *Laser Beam Shaping VI*, edited by Fred M. Dickey and David L. Shealy, *Proceedings SPIE* **5876**: OD1-11, 2005.
2. J. H. Hoffnagle and D. L. Shealy, "Effects if dispersion on the performance of a refractive beam shaper," in *Laser Beam Shaping VI*, edited by Fred M. Dickey and David L. Shealy, *Proceedings SPIE* **5876**: OG1-10, 2005.
3. D. L. Shealy and S-H Chao, "Design of GRIN laser beam shaper," in *Laser Beam Shaping V Conference*, edited by Fred M. Dickey and David L. Shealy, *Proceedings SPIE* **5525**, 138-147, 2004.
4. D. L. Shealy, "Optical design of laser beam shaping systems," in *International Optical Design Conference 2002*, edited by Jose Sasian and Paul K. Manhart, *Proceedings SPIE* **4832**, 344-358, 2002.
5. D.L. Shealy, "Chapter 4: Geometrical Methods," in *Laser Beam Shaping Theory and Techniques*, edited by Fred M. Dickey and Scott C. Holswade, Marcel Dekker, New York, 2000: 163-213.

D. Synergistic Activities

- Research Program: long-term research is directed towards fundamental understanding of new optical systems for applications using lasers and soft-x-rays to characterize and process materials. Recent work includes holographic projection processing of micro-optical devices, development of genetic algorithm optimization and differential equation methods for designing of laser beam shaping systems, and using diffraction theory and geometrical optics for simulating the performance of laser and free-electron laser cavities/systems and of soft-x-ray optical elements as applied to multi-layer and grazing incident microscopes and projection lithography. Keywords: geometrical optics; caustic theory; aberration theory; optical design; optimization; genetic algorithms; differential equations; laser beam shaping; numerical analysis; and mathematical physics.
- Teaching Program: The emphasis of my teaching program has been directed towards graduate education - as major professor of seven doctoral students during the past 18 years. Our group has weekly meetings using information technology – web, desktop/classroom video conferencing, multicast, e-mail, virtual organizations, and teleconferencing – to enhance communications and learning process. Each member reports on progress and problems associated with their work. During the past 18 years students working in the group have co-authored 41 publications and made 56 presentations at professional society meetings. This breadth of experience enables graduates to enter industrial, governmental, and academic jobs.
- Internet2 and Information Technology: Founded UAB Internet2 Program, 1997-present. Participated in the planning and implementation of the SURA Southern Crossroads Initiative - an Internet2 node at Georgia Tech and establishing an optical network in Alabama connecting to Southern LightRail and NLR at Georgia Tech, 1997- present. Currently, director of IT Infrastructure/HPC Services unit.
- Professional Societies: Memberships in Optical Society of America; SPIE - The International Society of Optical Science & Engineering. Topical Editor of *Applied Optics – Optical Technology*, co-Chair of SPIE Laser Beam Shaping Conferences II-VIII, SPIE 2000-07; Fellow, Optical Society of America, 1988; Research Paper Award, IEEE – Alabama Section, 1984. Silver Quill Awards, Motorola Semiconductor Product Sector, 1982. Phi Beta Kappa, June 1973, Phi Kappa Phi, June 1966;
- Publications & Funding: Published 137 journal and proceedings articles, book chapters, and reports; presented over 130 invited and contributed papers; and extramural funding 1997-2007 is approximately \$3.5M as PI or co-PI.

E. Collaborators & Other Affiliations

- **Collaborators & Co-Editors**: S.-H. Chao, F. M. Dickey, J. Gemmill, J. A. Hoffnagle, S. C. Holswade, L. Krannich, L. Lucas, J.-P. Robinson
- **Graduate and Postdoctoral Advisors**: Donald G. Burkhard, University of Georgia; Howard Berg, Motorola, Inc.
- **Thesis Advisor and Postgraduate-Scholar Sponsor**: Neal C. Evans, David B. Gore, Wu Jiang, David R. Gabardi, Cheng Wang, Shao-hua Chao, Abd M. Kassim, Issam H. Al-Ahdali, Patrick W. Rhodes, Joseph Tombrello, Jin Lin.