

**DOUGLAS EARL HOLMGREN**

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**EDUCATION**

Ph.D. 1985, Stanford University  
M.S. 1982, Stanford University  
B.A. 1980, Oxford University  
B.A. 1977, Reed College

**PROFESSIONAL EXPERIENCE & ACTIVITIES**

2007-present	Senior member of scientific staff, Applied Materials, Inc.
2005-2007	Senior optical design engineer, Electro Scientific Industries, Portland, OR
1999-2005	Senior systems engineer, Etec Systems Inc., An Applied Materials Company, Hillsboro, OR
1989-1999	Director of Undergraduate Laboratories & Lecturer, Department of Physics and Astronomy, University of North Carolina at Chapel Hill
1987-1989	Visiting Assistant Professor, Department of Physics, Duke University
1984-1987	Assistant Professor, Institute of Optics, University of Rochester
1979-1980	Optical design engineer, Tektronix, Beaverton, OR
2019-2020	President, Columbia Section of the Optical Society of America

**HONORS**

Rhodes Scholar 1977-1979  
Presidential Young Investigator 1986-1989  
ESI New Innovator of the Year 2006

## **PATENTS**

U.S. 6,724,002	Multiple electron beam lithography system with multiple beam modulated laser illumination. (co-inventor)
U.S. 6,448,568	Electron beam column using high numerical aperture illumination of the photocathode. (co-inventor)
U.S. 7,888,620	Reducing coherent crosstalk in a dual-beam laser processing system. (co-inventor)
U.S. 8,026,158	Systems and methods for processing semiconductor structures using laser pulses laterally distributed in a scanning window. (co-inventor)
U.S. 8,970,963	Multiple beam combiner for laser processing apparatus (co-inventor)
U.S. 8,946,594	Optical design for line generation using microlens array (co-inventor)
U.S. 8,569,187	Thermal processing apparatus (co-inventor)
U.S. 9,395,545	Customized Pupil Stop Shape For Control of Edge Profile in Laser Annealing Systems
U.S. 9,146,337	Apparatus for speckle reduction, pulse stretching, and beam homogenization

U.S. Patent Applications in process:

20150165551 FIBER ARRAY LINE GENERATOR

## RECENT PUBLICATIONS AND PRESENTATIONS

“Optical design of laser-based systems: Fundamentals and Examples,”  
FEPertoire Talk, July 2013.

“Work toward a raster multibeam lithography tool,” S.T. Coyle, B. Shamoun,.  
M. Yu, J. Maldonado, T. Thomas, D. Holmgren, X. Chen, J. Vac. Sci. Tech. B  
22(2) (in press).

“A raster multibeam lithography tool for sub-100-nm mask fabrication utilizing  
a novel photocathode,” Maldonado, J.R.; Coyle, S.; Shamoun, B.; Yu, M.;  
Thomas, T.; Holmgren, D.;, Chen, X.; Proc. Of SPIE (2003) 5220, 46-51.

“Photocathode illumination module for raster multibeam lithography,” Invited  
Speaker, DARPA Conference on Advanced Lithography, New Orleans, April  
2002

“Construction of a 40-Degree See-Through Head Mounted Display,” D. E.  
Holmgren, Technical Report TR92-029, Department of Computer Science,  
University of North Carolina (1992).

“An Elliptical Polarization Machine,” L. E. McNeil and D. E. Holmgren, Am. J.  
Phys. 64, 1078-1080 (1996).

“Height Measurements of Astigmatic Surfaces by a Keratoscope,” N. K.  
Tripoli, K. L. Cohen, Pritvinath Obla, D. E. Holmgren, and J. M. Coggins,  
American Journal of Ophthalmology 121, 668-76 (1996).

“Assessment of Radial Aspheres by the Arc-Step Algorithm as Implemented  
by the Keratron Keratoscope,” N. K. Tripoli, K. L. Cohen, D. E. Holmgren, and  
J. M Coggins, American Journal. of Ophthalmology 120, 658 (1995).

“Assessment of the Power and Height of Radial Aspheres Reported by a  
Computer-assisted Keratoscope,” K. L. Cohen, N. K. Tripoli, D. E. Holmgren,  
and J. M Coggins, American Journal. of Ophthalmology 119, 723 (1995).

“Scanned Laser Displays for Virtual Reality: A Feasibility Study,” D. E.  
Holmgren and Warren Robinett, Presence 2 (MIT Press), 171 (Summer  
1993).

“Magnetically Compensated Supersonic Beams for Nonlinear Optics,” K.D.  
Stokes, C. Schnurr, J. Gardner, M. Marable, S. Shaw, M. Goforth, D. E.  
Holmgren, and J. Thomas, Opt. Lett. 14, 1324 (1989).