

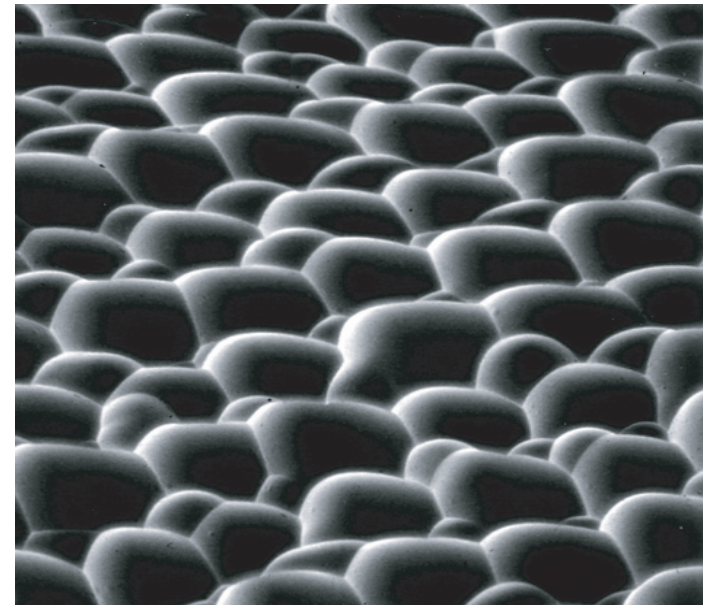
## Optics for Solid-State Lighting



**Dr. G. Michael Morris**  
**Chief Executive Officer**  
**RPC Photonics, Inc.**  
**Apollo Optical Systems, Inc.**

BS, University of Oklahoma  
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U of R Optics faculty, 1982-2001

This presentation will focus on the role that optics plays in the efficient extraction and distribution of light from solid-state light sources.



Electron micrograph of an Engineered Diffuser™ surface,

**3:00 pm, Monday, November 10, 2008**  
Sloan Auditorium, Goergen Building  
Refreshments provided

# Optics for Solid-State Lighting

Dr. G. Michael Morris

Chief Executive Officer

RPC Photonics, Inc. & Apollo Optical Systems, Inc.

## Abstract

A key driver in the development of new products and applications of solid-state lighting is efficiency – efficient conversion from electrons to photons, followed by efficient extraction and distribution of the photons. This presentation will focus on the role that optics plays in the efficient extraction and distribution of light from solid-state light sources. Precision structured surfaces consisting of a complex array of refractive microlenses, called Engineered Diffusers™, used in conjunction with compound parabolic concentrators (CPCs) are found to be a particularly useful design form for beam shaping and homogenization of light produced from LEDs. The general design principles, fabrication methods, and applications of Engineered Diffusers™ and CPCs for the rapidly expanding field of solid-state lighting will be discussed.

## Biography

Dr. Morris is the Chief Executive Officer and Founder of RPC Photonics, Inc. and Apollo Optical Systems, Inc. These firms specialize in the design, prototyping, and manufacturing of innovative diffractive, micro-optics and polymer-based optical components and subsystems for the commercial products, medical, defense and automotive markets.

From 1982 to 2001, Dr. Morris was a Professor at the Institute of Optics, where he supervised 22 doctoral and 5 Master of Science dissertations. His research has spanned a wide variety of topics in optical information processing, statistical optics, quantum-limited imaging, automatic pattern recognition, and diffractive-optics & micro-optics technology.

He holds 18 U.S. patents and 6 pending patent applications, and has published more than 70 referred journal articles, 3 book chapters and numerous conference proceedings. He served as President of the Optical Society of America in 2003. He is the recipient of the 2005 OSA Joseph Fraunhofer/Robert M. Burley Prize; the 2002 Rochester Engineering Society's Leo H. East Engineer of the Year Award; and the 1997 Rochester Chamber of Commerce Civic Award for Science and Technology. He is also an Honorary Member of the OSA, Rochester Section, and a Fellow of the Optical Society of America and SPIE.

He received his B.S. degree with Special Distinction in Engineering Physics from the University of Oklahoma in 1975, and his M.S. and Ph.D. degrees in Electrical Engineering from the California Institute of Technology in 1976 and 1979, respectively.