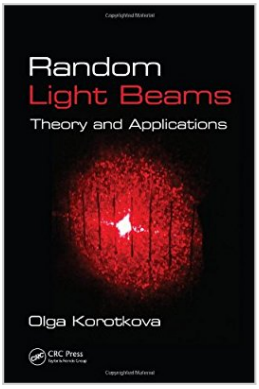

Random Light Beams: Theory and Applications

By Olga Korotkova

Random Light Beams: Theory and Applications By Olga Korotkova

Random Light Beams: Theory and Applications contemplates the potential in harnessing random light. This book discusses light matter interactions, and concentrates on the various phenomena associated with beam-like fields. It explores natural and man-made light fields and gives an overview of recently introduced families of random light beams. It outlines mathematical tools for analysis, suggests schemes for realization, and discusses possible applications.

The book introduces the essential concepts needed for a deeper understanding of the subject, discusses various classes of deterministic paraxial beams and examines random scalar beams. It highlights electromagnetic random beams and matters relating to generation, propagation in free space and various media, and discusses transmission through optical systems. It includes applications that benefit from the use of random beams, as well as the interaction of beams with deterministic optical systems.

• Includes detailed mathematical description of different model sources and beams

• Explores a wide range of man-made and natural media for beam interaction

• Contains more than 100 illustrations on beam behavior

• Offers information that is based on the scientific results of the last several years

• Points to general methods for dealing with random beams, on the basis of which the readers can do independent research

It gives examples of light propagation through the human eye, laser resonators, and negative phase materials. It discusses in detail propagation of random beams in random media, the scattering of random beams from collections of scatterers and thin random layers as well as the possible uses for these beams in imaging, tomography, and smart illumination.

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Editorial Review

Review

"This book is a remarkably thorough discussion of the physics of optical beam propagation. ‘Random Light Beams’ serves as a great overview of the last thirty years of classical coherence theory, as well."
—Greg Gbur, Department of Physics and Optical Science, University of North Carolina, Charlotte, USA

About the Author

Dr. Olga Korotkova received her Ph.D. from the University of Central Florida, Orlando, in December 2003. In her Ph.D. thesis and in other publications she showed the advantages of using random optical beams for communications and sensing through random media. She is currently an Associate Professor at the Department of Physics, University of Miami, Coral Gables, Florida. She has recently introduced several schemes of correlation and polarization diversity for mitigation of effects of turbulence and scatterers. Korotkova has published more than 100 scientific papers in peer-referred journals, which have been cited more than 1800 times. She chaired six SPIE conferences relating to atmospheric and oceanic propagation of EM waves in 2007-2012 and has been a member of the editorial board for Optics Letters since 2010.

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