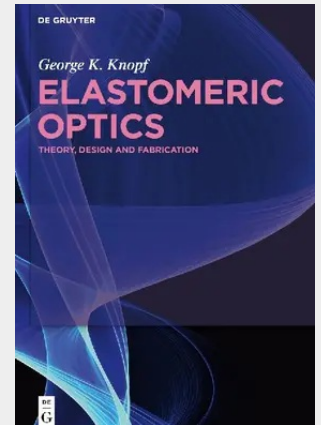


Elastomeric Optics

Theory, Design, and Fabrication

Elastomeric optics exploit light transparent, variable translucent, and reflective stretchable polymers to create novel strain-tunable optical elements and flexible multifunctional optical sheets. Optical sheets are thin, large-area polymer light guide structures that can be used to create a wide variety of passive light harvesting and illumination systems. The book introduces the theoretical principles of elastomeric optics and explores how simple and complex mechanically deformable optical devices can be designed and fabricated. The transmission of light through these optical components or waveguides depends on the selected materials, surface interface, geometric design, optical coupling of embedded micro-structures, and degree of device deformation. In addition to providing a technical foundation for building adaptable optics, the book seeks to inspire the next generation of scientists and engineers to develop innovative solutions far beyond anything imagined today.

Flexible elastomeric optical sheets are thin, large-area (cm² to m²) polymer light guide structures that can be used to create innovative passive light harvesting and illumination systems, designed to be draped over arbitrary surfaces or hung like a curtain. The book introduces the optical principles and theoretical foundation of optical sheets, and summarizes the critical design guidelines for creating multifunctional monolithic optical sheets.



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