

Opto-Mechanical Systems Design, Fourth Edition, Volume 2: Design and Analysis of Large Mirrors and Structures

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Opto-Mechanical Systems Design, Fourth Edition is different in many ways from its three earlier editions: coauthor Daniel Vukobratovich has brought his broad expertise in materials, opto-mechanical design, analysis of optical instruments, large mirrors, and structures to bear throughout the book; Jan Nijenhuis has contributed a comprehensive new chapter on kinematics and applications of flexures; and several other experts in special aspects of opto-mechanics have contributed portions of other chapters. An expanded feature—a total of 110 worked-out design examples—has been added to several chapters to show how the theory, equations, and analytical methods can be applied by the reader. Finally, the extended text, new illustrations, new tables of data, and new references have warranted publication of this work in the form of two separate but closely entwined volumes.

This second volume, **Design and Analysis of Large Mirrors and Structures**, concentrates on the design and mounting of significantly larger optics and their structures, including a new and important topic: detailed consideration of factors affecting large mirror performance. The book details how to design and fabricate very large single-substrate, segmented, and lightweight mirrors; describes mountings for large mirrors with their optical axes in vertical, horizontal, and variable orientations; indicates how metal and composite mirrors differ from ones made of glass; explains key design aspects of optical instrument structural design; and takes a look at an emerging technology—the evolution and applications of silicon and silicon carbide in mirrors and other types of components for optical applications.

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Editorial Review

Review

"... [the previous edition] is my go-to reference for all things optomechanics, so I anticipate the new edition will get just as much use. ... The large number of illustrations, real-world examples, material property data, and additional references make this an excellent resource for any practicing optomechanical engineer."

?Katie Schwertz, Edmund Optics

About the Author

Paul Yoder (BS physics, Juniata College, Huntingdon, Pennsylvania, 1947, and MS physics, Penn State University, University Park, Pennsylvania, 1950) learned optical design and opto-mechanical engineering at the U.S. Army's Frankford Arsenal (1951–1961). He then applied those skills at Perkin-Elmer Corporation (1961–1986) and served the optical community as a consultant in optical and opto-mechanical engineering (1986–2006). A fellow of the OSA and SPIE, Yoder has authored numerous chapters on opto-mechanics, published more than 60 papers, been awarded 14 U.S. and several foreign patents, and taught more than 75 short courses for SPIE, U.S. government agencies, and industry.

Daniel Vukobratovich is senior principal multidisciplinary engineer at Raytheon Systems, Tucson, Arizona, and adjunct professor at the University of Arizona. He has authored more than 50 papers, taught short courses in opto-mechanics in 12 different countries, and consulted for more than 40 companies. A SPIE fellow, he is a founding member of the opto-mechanics working group. He holds international patents and received an IR-100 award for work on metal matrix composite optical materials. He led development on a series of ultra-lightweight telescopes using new materials, and worked on space telescope systems for STS-95, Mars Observer, Mars Global Surveyor, and FUSE.

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