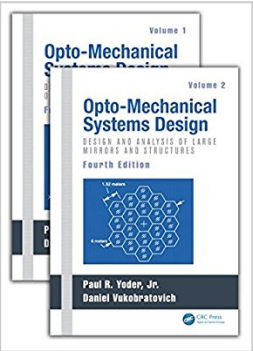

Opto-Mechanical Systems Design, Fourth Edition, Two Volume Set

By Paul Yoder, Daniel Vukobratovich

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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.

The first volume, **Design and Analysis of Opto-Mechanical Assemblies**, addresses topics pertaining primarily to optics smaller than 50 cm aperture. It summarizes the opto-mechanical design process, considers pertinent environmental influences, lists and updates key parameters for materials, illustrates numerous ways for mounting individual and multiple lenses, shows typical ways to design and mount windows and similar components, details designs for many types of prisms and techniques for mounting them, suggests designs and mounting techniques for small mirrors, explains the benefits of kinematic design and uses of flexures, describes how to analyze various types of opto-mechanical interfaces, demonstrates how the strength of glass can be determined and how to estimate stress generated in optics, and explains how changing temperature affects opto-mechanical assemblies.

The 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

"This is a great starting point and reference tool for engineers coming into this field. …it gives a concise review of metal mirrors identifying the key design and manufacturing practices that have been developed across the industry through the past two decades. The extensive list of references provides original source data for further reading on any topic."
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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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