



Opto-Mechanical Systems Design, Third Edition (Optical Science and Engineering)

By Jr., Paul R. Yoder

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After nearly two decades, Paul Yoder's **Opto-Mechanical Systems Design** continues to be the reference of choice for professionals fusing optical and mechanical components into advanced, high-performance instruments. Yoder's authoritative systems-oriented coverage and down-to-earth approach fosters the deep-seated knowledge needed to continually push the field to new limits.

Extensively revised and updated, this Third Edition reflects the massive growth and advancement achieved in the field over the past few years. It systematically examines the building blocks for new optical instruments and details new tools and techniques for designing, building, and testing optical systems hardware. The book includes revised, broad-based standards, equations for designing 26 types of prisms and lens, mirror, and prism mounts, state-of-the-art examples of designs for large mirrors and their mounts, and an expanded chapter that consolidates information on the design and mounting of metal mirrors. New sections include special protective coatings, manufacturing techniques, mounting lenses on flexures, and techniques for aligning lenses and lens systems in addition to two new chapters: one on designing and mounting small mirrors, gratings, and pellicles; the other, on analysis methods including damage and failure analysis.

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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."

?Dr. Alan R. Hedges, II-VI Incorporated

"... [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

"... main strength of this book is very comprehensive coverage of the key optomechanical design concepts and analytical methods that can be applied directly in the design and development of simple to very complex optical system. The information is easy to understand and therefore easy to customize and apply to new optical systems or instruments being developed. It is rare to find such a wealth of knowledge about many related topics in a single book."

?Anees Ahmad, Raytheon Missile Systems & College of Optical Sciences, University of Arizona, Tucson, USA

"... an industry standard in the field of Opto-mechanical design for many years. A must for mechanical engineers involved in mounting and design of high acuity optical systems."

?John Pepi, L-3 Communications SSG

"... a great reference book which covers many interesting topics and technologies which are practical and applicable to high precision optical systems."

?Myung Cho, National Optical Astronomy Observatory (NOAO)

"... probably the most comprehensive, detailed, and up-to-date text on opto-mechanics."

Professor Nathan Kopeika

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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James Peters:

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