



Modern Devices: The Simple Physics of Sophisticated Technology

By Charles L. Joseph, Santiago Bernal



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Focuses on the common recurring physical principles behind sophisticated modern devices

This book discusses the principles of physics through applications of state-of-the-art technologies and advanced instruments. The authors use diagrams, sketches, and graphs coupled with equations and mathematical analysis to enhance the reader's understanding of modern devices. Readers will learn to identify common underlying physical principles that govern several types of devices, while gaining an understanding of the performance trade-off imposed by the physical limitations of various processing methods. The topics discussed in the book assume readers have taken an introductory physics course, college algebra, and have a basic understanding of calculus.

- Describes the basic physics behind a large number of devices encountered in everyday life, from the air conditioner to Blu-ray discs
- Covers state-of-the-art devices such as spectrographs, photoelectric image sensors, spacecraft systems, astronomical and planetary observatories, biomedical imaging instruments, particle accelerators, and jet engines
- Includes access to a book companion site that houses Power Point slides

Modern Devices: The Simple Physics of Sophisticated Technology is designed as a reference for professionals that would like to gain a basic understanding of the operation of complex technologies. The book is also suitable as a textbook for upper-level undergraduate non-major students interested in physics.



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Editorial Review

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About the Author

Charles L. Joseph, PhD, is a retired research professor from the Department of Physics and Astronomy at the Rutgers University, who specialized in technology development for NASA flight missions. Prof. Joseph has more than 30 years' experience working closely with aerospace and electro-optical companies as well as government laboratories, taking technologies from experimental breadboard devices to ruggedized instruments suitable for NASA missions. He was a co-investigator and the detector scientist on STIS, a second-generation instrument for the Hubble Space Telescope.

Santiago Bernal, PhD, is an associated research scientist at the Institute for Research in Electronics and Applied Physics (IREAP) at the University of Maryland. Dr. Bernal received his B.S. in physics from the National University of Colombia in 1981. He joined the IREAP in 2000 and has since been the leading experimentalist on the University of Maryland Electron Ring.

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