# Radiative Processes in Astrophysics

*By George B. Rybicki, Alan P. Lightman*

Radiative Processes in Astrophysics: This clear, straightforward, and fundamental introduction is designed to present-from a physicist's point of view-radiation processes and their applications to astrophysical phenomena and space science. It covers such topics as radiative transfer theory, relativistic covariance and kinematics, bremsstrahlung radiation, synchrotron radiation, Compton scattering, some plasma effects, and radiative transitions in atoms. Discussion begins with first principles, physically motivating and deriving all results rather than merely presenting finished formulae. However, a reasonably good physics background (introductory quantum mechanics, intermediate electromagnetic theory, special relativity, and some statistical mechanics) is required. Much of this prerequisite material is provided by brief reviews, making the book a self-contained reference for workers in the field as well as the ideal text for senior or first-year graduate students of astronomy, astrophysics, and related physics courses. Radiative Processes in Astrophysics also contains about 75 problems, with solutions, illustrating applications of the material and methods for calculating results. This important and integral section emphasizes physical intuition by presenting important results that are used throughout the main text; it is here that most of the practical astrophysical applications become apparent.

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About the Author
George B. Rybicki received his B.S. degree in physics from Carnegie-Mellon University and his Ph.D. in physics from Harvard University. He is a physicist at the Harvard-Smithsonian Center for Astrophysics and lecturer in the Astronomy Department at Harvard. His research interests include stellar atmospheres, stellar dynamics and radiative transfer. Alan P. Lightman received his A.B. degree in physics from Princeton University and his Ph.D. in theoretical physics from the California Institute of Technology. He was a research fellow at Cornell and then an Assistant Professor of Astronomy at Harvard University from 1976-1979. He is presently at the Harvard-Smithsonian Center for Astrophysics. His research includes work in general relativity, the astrophysics of black holes, radiation mechanisms, and stellar dynamics. He is also a coauthor of Problem Book in Relativity and Gravitation (1975).

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