An Introduction to Radiative Transfer: Methods and Applications in Astrophysics, *Annamaneni Peraiah*, Cambridge University Press, 2001, pp: 475, ISBN 0521779898 (pbk) / 0521770017 (hc); Price: US$40/110

Radiative transfer is important to many topics in astrophysics; for example, in the study of stellar atmospheres, planetary nebulae and supernovae. This book is an introduction to the analytical methods and the latest advanced computational techniques for solving the radiative-transfer equation. Besides the first two chapters, the entire book is devoted to discussing detailed analytical and numerical solutions of specific models of physical systems. These range from relatively simple systems, such as planetary atmospheres, to complicated hydrodynamical systems such as the interior of a supernova. The high level of the technical discussion is rather hard to follow for beginners in this subject.

The first two introductory chapters provide a brief overview of the relevant concepts and quantities as well as the geometric systems and equations used in radiative transfer. Chapter 3 deals specifically with analytic solutions in a parallel medium, whereas Chapter 4 describes numerical methods of solving the equations with various boundary conditions. Homogeneous, plane-parallel scattering atmospheres are treated in Chapter 5 by using principles of invariance in semi-infinite and finite media. The more general case of non-uniform media is treated using discrete-space theory in Chapter 6.

From Chapter 7 to Chapter 10, the radiative-transfer equation in moving media is studied. Numerical methods in the observer's frame and in the co-moving frame are discussed in Chapters 7 and 8 respectively. The escape probability and operator perturbation methods are introduced in Chapters 9 and 10. In Chapters 11 and 12, polarization of light in various scattering and magnetic media is described. The last chapter gives a very brief discussion of multi-dimensional radiative transfer.

At the end of each chapter, the author provides detailed references to the literature and also relevant exercises for putting the methods into real practice in astrophysics.

Overall, the book gives a broad overview of techniques and methods. Although this book is not suitable as a first course in radiative transfer, it is a good source book for graduates and researchers in this subject.

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