

High Energy Density Radiative Transfer

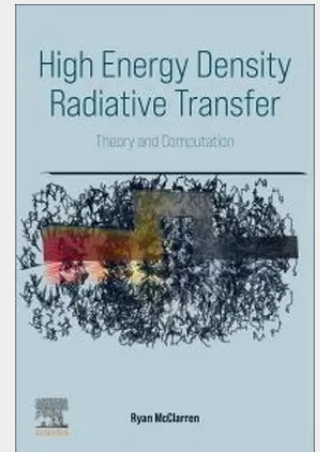
Theory and Computation

High Energy Density Radiative Transfer: Theory and Computations is a comprehensive guide that delves into the intricate world of radiative transfer phenomena in the high energy density (HED) regime. This book presents a wealth of scientific contributions and essential insights for researchers, students and engineers seeking to understand the dominant physical processes in inertial fusion energy scenarios. From exploring simple approximate models to conducting detailed calculations on cutting-edge supercomputers, readers will gain valuable tools to navigate the complexities of radiative transfer in HED applications. The book's extensive content covers a wide range of topics essential for mastering radiative transfer in HED contexts. Starting with an exploration of the High Energy Density regime and transport of thermal x-rays, readers are guided through key concepts such as absorption and emission of radiation, infinite medium solutions, frequency discretizations, equilibrium and non-equilibrium diffusion models, spherical harmonics and discrete ordinates methods, finite element discretizations, preconditioning and convergence acceleration, implicit Monte Carlo Methods, photon Monte Carlo methods, and Compton scattering. Each chapter provides in-depth insights and practical knowledge necessary for tackling HED radiative transfer challenges effectively. High Energy Density Radiative Transfer: Theory and Computations is an indispensable resource for those involved in inertial fusion energy and related fields. Whether you are a university student, physicist, engineer, or researcher, this book equips you with the tools to simulate and analyze radiative transfer phenomena in HED scenarios. By offering methods to solve common problems, detailed examples with numerical results, and insights into potential pitfalls, this book empowers readers to enhance their understanding and proficiency in addressing HED radiative transfer challenges with confidence.

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