

# **RADIATIVE TRANSFER: A NEW LOOK OF THE OLD THEORY**

Michael I. Mishchenko  
NASA Goddard Institute for Space Studies, 2880 Broadway,  
New York, NY 10025, USA

**ABSTRACT.** This tutorial paper discusses electromagnetic scattering by random many-particle groups and summarizes the microphysical approach to radiative transfer and coherent backscattering. It provides a detailed discussion of the exact meaning of such fundamental concepts as single and multiple scattering and explains how the theories of radiative transfer and coherent backscattering originate in the macroscopic Maxwell equations. It also exposes and corrects certain misconceptions of the traditional phenomenological approach to radiative transfer.