

Modeling Interstellar and Circumstellar Grains: Using the Maximum Entropy Method and Monte Carlo Radiative Transfer Approaches

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We have recently used the Maximum Entropy Method to examine a sizedistribution of grains within the framework of a simple particle model: separate populations of spherical, homogeneous grains. We will present briefly the results of this simple approach for a series of extinction curves over the wavelength range of about 120 nm through the near-infrared (2.2 micrometers) and using a variety of sightline environments. Then, motivated by elemental abundance considerations, we will then examine the possibility and implication of using oxides, both as a separate population and as included in composite grains. This step necessitates the examination of the potential computational techniques (e.g., effective medium theory versus discrete element techniques), which we will also discuss. Finally, it is anticipated that we will make a contextual leap and touch on the use of interstellar-like grain models in the circumstellar venue, including the issues of grain alignment, size, and porosity.