



Special Seminar

Karri Muinonen

Visiting ATS from the University of Helsinki

Scattering of Light by Complex Atmospheric Particles

Hosted by Chris O'Dell

Thursday, November 6, 2014

ACRC Classroom, Discussion will begin at 2:00pm

We consider scattering of light by complex atmospheric particles with carbonaceous, silicate, and icy compositions. First, we pay attention to modeling the particle shapes with the so-called Gaussian-random-sphere and Gaussian-random-ellipsoid geometries, where the undulations on the basic regular shape are described by multivariate Gaussian statistics. Scattering by such particles is studied using next-to-exact (e.g., the discrete-dipole approximation) and approximate methods (e.g., the ray-optics approximation). Second, for complex particles large compared to the wavelength, such as large agglomerates of carbon particles, we describe a multiple-scattering method based on radiative transfer and coherent backscattering. For a successful comparison of this method and the exact superposition T -matrix method as applied to scattering by finite volumes of spherical particles, see the work by Muinonen et al. (*Astrophys. J.* 760, 118, 2012). Third, we consider theoretical modeling for experimental scattering-matrix measurements of irregular aerosol particles. Finally, we describe applications to remote sensing of atmospheric particles as well as interrelations to the studies of small Solar System objects (asteroids, comets).

Link to colloquium videos and announcement page: <http://www.atmos.colostate.edu/dept/colloquia.php>