

ATS/CIRA Colloquium

Michael Diamond
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Hosted by Maria Rugenstein

3 p.m. Thursday, Jan. 19
ATS 101 and Zoom

**Anatomy of an enigma: A components-based
perspective on the mystery of Earth's observed
hemispheric albedo symmetry**

Since the 1960s, we have observed that Earth's Northern and Southern Hemispheres reflect identical amounts of sunlight to within measurement uncertainty, but we still don't know why this is the case and whether or not this hemispheric albedo symmetry is maintained by Earth system processes. Climate models do not systematically simulate hemispherically symmetric albedos and simple energy balance arguments do not withstand scrutiny as outgoing longwave radiation is not symmetric between the hemispheres and is balanced by cross equatorial heat transport. The overall albedo symmetry consists of two large asymmetries: The Northern Hemisphere is brighter in clear-skies whereas the Southern Hemisphere is cloudier. I will argue that better understanding how the surface, aerosol, and cloud-type components of these cloudy and clear-sky asymmetries change over time can help generate and test hypotheses for how (and whether) Earth's hemispheric albedo symmetry is maintained.

Colloquia page: atmos.colostate.edu/colloquia