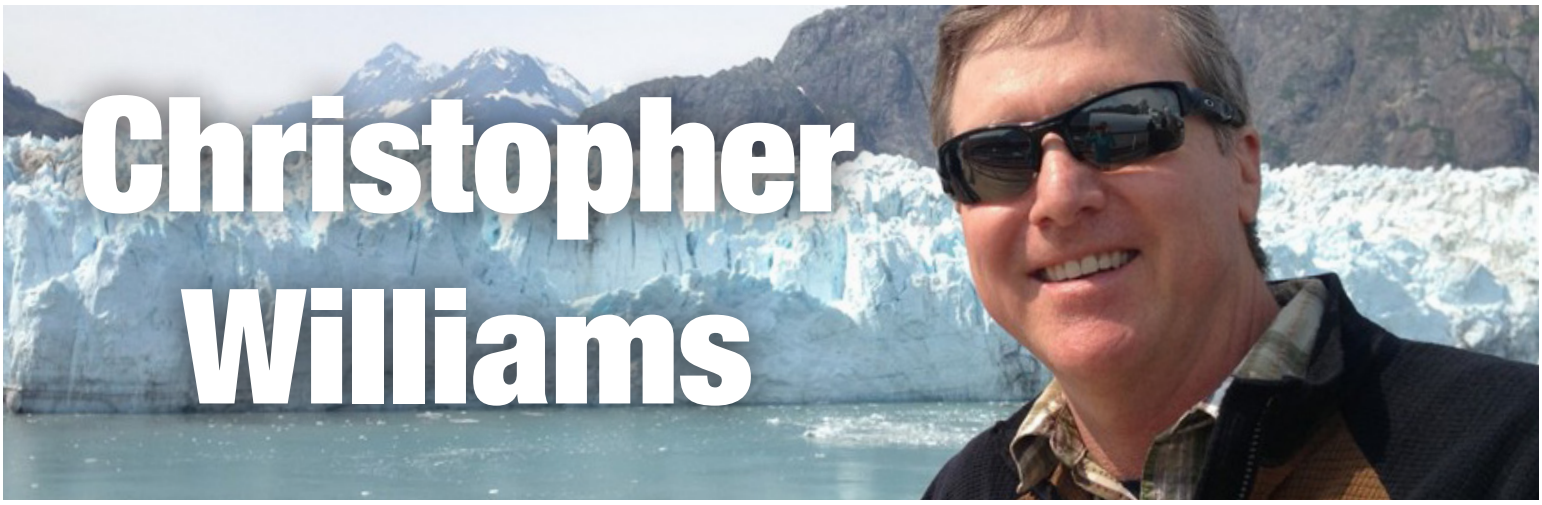
Aerospace Seminar



Research Scientist - Cooperative Institute for Research in Environmental Sciences (CIRES), CU Boulder

Diagnosing Raindrop Breakup and Coalescence from Multi-Frequency Vertically Pointing Radar Observations

Monday, September 25, 2017 | Onizuka | 12:00 P.M.

Abstract: Abstract: In our quest to better understand precipitating cloud systems, we must realize that radars do not directly observe microphysical processes. Rather, changes between successive radar observations over time and space provide information on the processes acting upon the falling raindrops. For example, evaporation and accretion will appear as the subtraction or addition of mass to the observed raindrop size distribution (DSD), while raindrop breakup and coalescence will appear as modifications of how liquid is distributed between different sized raindrops.

Dr. Williams will describe how the Rayleigh and Mie scattering signatures from two vertically pointing radars operating side-by-side and at different frequencies are used to retrieve the raindrop size distribution and vertical air motion within precipitating clouds. To explore the processes acting on the falling raindrops, vertical decomposition diagrams are introduced to quantify net raindrop evaporation, breakup, and coalescence.

Bio: Dr. Williams is a University of Colorado CIRES Research Scientist working in the Physical Sciences Division of NOAA / ESRL. His research bridges engineering and geosciences by analyzing multi-frequency radar observations to advance our understanding of precipitation microphysical processes and cloud dynamics with the ultimate aim of improving parameterizations in numerical models and satellite rainfall retrieval algorithms. Dr. Williams is a PI with the DOE Atmospheric System Research (ASR) program and the NASA Global Precipitation Measurement (GPM) mission.