RAL/MMM SEMINAR SERIES

Winter Storms in Complex Terrain: Perspectives from the Greatest Snow Climates on Earth

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Winter storms frequently lead to snow- or ice-bound traffic, air-travel disruptions, infrastructure damage, and other hazards, but are also vital for water resources in mountainous regions with snow-driven hydroclimates. In this talk we examine orographic precipitation processes and extremes in some of the world's "greatest" snow climates including the Tug Hill Plateau of eastern New York, the "Gosetsu Chitai" (Heavy Snow Region) of Japan, and Little Cottonwood Canyon in the Wasatch Range of northern Utah. Using field-program data, conventional observations, and analyses, and mesoscale and LES modeling we illustrate the coastal and orographic processes influencing the intensity and inland penetration of landfalling lake- and sea-effect storms and the characteristics of winter storms that produce orographic precipitation extremes in Little Cottonwood Canyon, including environments with limited integrated vapor transport (IVT) but highly efficient conversion of water vapor to snowfall. Although reliable local prediction of such storms has proven challenging, we are accelerating into a new frontier for sub-kilometer scale prediction of winter hazards in mountainous regions.