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#AzadiKaAmritMahotsav

Lecture Series on

Cloud and Precipitation Physics and Dynamics



सत्यमेव जयते

Ministry Of Earth Sciences

Government of India



Understanding and modeling aerosol impacts on convective clouds and precipitation

About the speaker:

Dr. Jiwen Fan is a laboratory fellow at Pacific Northwest National Laboratory (PNNL). She received her Ph.D. degree in 2007 from Texas A&M University. Her expertise encompasses atmospheric chemistry, aerosols, clouds, convective systems, and severe storms. She worked on improving both process-level understandings and model parameterizations. Her current work includes (1) physical factors impacting severe convective storms, particularly under the context of urbanization, wildfires, and climate warming, (2) understanding mesoscale convective systems (MCSs) and improving global model capability in simulating MCSs, (3) development of cloud microphysics parameterizations for weather and climate models, and (4) impacts of marine organic aerosols and dust on mixed-phase clouds.

Abstract : Deep convective clouds (DCCs) play important roles in the hydrological cycle, radiative budget, and general circulation. They generally have very complex dynamics and cloud microphysics. Our fundamental understanding of cloud microphysical processes, particularly in convective cores, is rather limited, hindering us from gaining a good understanding of the feedback between microphysics and dynamics. This feedback is one of the main pathways for aerosols to influence convective intensity, precipitation, and radiative effect by serving as cloud condensation nuclei (CCN) and nucleating particles (INP). This talk covers aerosol (CCN and INP) interactions with DCC systems ranging from individual storms, mesoscale convective systems, to weather hazards, and the significant challenges on both the observational and modeling fronts to reduce the large uncertainty in aerosol interactions with DCCs.



Dr. Jiwen Fan

Laboratory Fellow

Pacific Northwest National Laboratory (PNNL), USA

https://www.pnnl.gov/science/staff/staff_info.asp?staff_num=6030



<https://youtu.be/859Mn9ns3z8>