

02 JUNE 2022

Thursday, 11:00-12:30 IST  
(5:30-7:00 UTC)

#AzadiKaAmritMahotsav

# Lecture Series on

Cloud and Precipitation Physics and Dynamics



सत्यमेव जयते

Ministry Of Earth Sciences

Government of India



## Super-Droplet Method and its Application to Mixed-Phase Clouds



### About the speaker:

Dr. Shin-ichiro Shima has been an associate professor at the University of Hyogo (Kobe, Japan) since 2011. After completing his Ph.D. in nonlinear dynamics at Kyoto University in 2005, he became a research scientist at the Earth Simulator Center, Japan Agency for Marine-Earth Science and Technology. With an eye on the future of supercomputers, he developed novel numerical algorithms for multiscale-multiphysics phenomena at this supercomputer center and constructed the super-droplet method (SDM), a Lagrangian particle-based algorithm for cloud microphysics. Since then, he has been working on this topic to explore the potential of the particle-based cloud modeling method.

**Abstract:** SDM is a particle-based numerical scheme that enables accurate cloud microphysics simulation with a lower computational demand than multidimensional bin schemes (Shima et al., 2009). Dr. Shima's group has developed a detailed numerical model of mixed-phase clouds using SDM that explicitly predicts ice morphology without making assumptions about ice categories or mass-dimension relationships (Shima et al., 2020). The performance of this model was evaluated by conducting a series of 2D large-eddy simulations of cumulonimbus clouds. In addition, preliminary results of 3D simulations are presented.

**Dr. Shin-ichiro Shima**

Graduate School of Information Science  
University of Hyogo



<https://youtu.be/TNkbv9tYt8Q>