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## Department of Atmospheric Sciences Seminar Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa  
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# Influences of Saharan dust on air-sea interactions and cloud activities over North Africa and North Atlantic Ocean

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You are invited to our weekly online Atmospheric Sciences Spring 2022 seminars via Zoom meeting.

When: April 20, 2022 at 3:30PM HST

Meeting admission: 3:15PM HST

Register in advance for this meeting:

<https://hawaii.zoom.us/join/joinmeeting/register/tJcof--qqjMiEtXX9J8yHV3K8NrAjdJsakyN>

After registering, you will receive a confirmation email containing information about joining the meeting.

Please save this information for future seminars.

### Abstract:

Dust aerosols have various impacts on the Earth system, including their influences on weather, large-scale circulations, and climate through their interactions with clouds and radiation. While significant progress has been made within the past two decades toward understanding how dust affects weather and climate, many challenges remain. In this project, a fully coupled atmosphere-ocean-dust model is used to investigate the influences of Saharan dust on air-sea interactions, large-scale environment, and cloud activities over North Africa and the North Atlantic Ocean. Month- to seasonal-long simulations with and without dust-radiation-cloud interactions were conducted and compared. Numerical results indicate that the inclusion of the dust-cloud-radiation interactions improves the model performance over the main Saharan dust plume region and beyond. Dust can reduce surface downward radiation fluxes over the ocean with the maximum change of  $20\text{--}30\text{ W m}^{-2}$ , and the overall reduction pattern resembles the dust concentration pattern. However, the changes in sea surface temperature and surface latent heat and sensible heat fluxes by dust are quite different from the dust concentration pattern. This implies that in addition to the reduction in surface radiation fluxes, other dust-induced mechanisms also play an important role in the modulation of air-sea interactions, which will be presented. Dust also has a great impact on cloud activities over North Africa. How and to what extent Saharan dust affects these cloud activities will be presented as well.