

## **The Atmosphere Observing System (AOS): Future Space-Based Observations for the Study of Coupled Aerosol-Cloud-Convection-Precipitation Interactions**

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The NASA's Atmosphere Observing System (AOS) will provide key information of use in Earth System science and applications such as improving predictions of climate change and weather, mitigating natural hazards, and improving agricultural assessment. The AOS focuses on two of the five designated observables from the 2017 NASA Earth Science Decadal Survey: aerosol particles (A) as well as clouds, convection, and precipitation (CCP). The planned observing system is currently comprised of contributions from NASA, the Japanese Aerospace Exploration Agency (JAXA), the Canadian Space Agency, and the Centre National D'Etudes Spatiales (CNES) including space-borne and suborbital observation platforms. AOS is expected to deliver a comprehensive suite of observations to address coupled aerosol-cloud-precipitation interactions, with science objectives focused on low and high cloud feedbacks; the dynamics and structure of convective systems and properties of the aerosol particle environment; phase partitioning and precipitation formation in frozen and mixed-phase clouds; aerosol microphysical and optical properties, aerosol particle sources, and relationships to air quality; aerosol particle vertical redistribution and processing by clouds and precipitation; and aerosol particle direct and indirect effects.

The project entered formulation phase (known as Phase A) in January 2023 during which requirements will be finalized, trades for U.S. lidar and Doppler radar designs will be studied, and a final architecture structure will be determined. This talk will describe the science of AOS, the mission architecture and measurement capabilities, and current status.