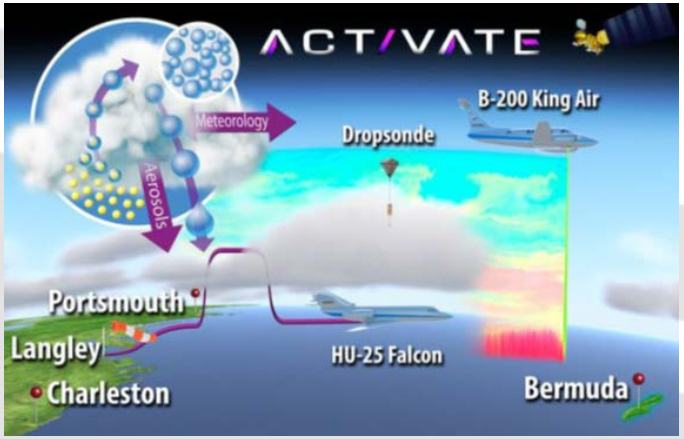
EVS-3 Aerosol Cloud meTeorology Interactions oVer the western ATlantic Experiment (ACTIVATE)

Start Date:	**January 28, 2019**
Confirmation:	**October 23, 2019 (scheduled)**
End Date:	**January 27, 2024**
Airborne Platforms:	**HU-25 Falcon (LaRC)** **B200 King Air (LaRC)**
Data Center:	**not assigned**
Principal Investigator:	**Armin Sorooshian (U. of Arizona)**
Investigation Manager:	**Mary Kleb (LaRC)**
Deputy PI:	**Xubin Zeng (U. of Arizona)**
Investigation Scientist:	**Johnathan Hair (LaRC)**
Program Executive:	**Bruce Tagg (HQ)**
Program Scientist:	**Hal Maring (HQ)**
ESSP Mission Manager:	**Jennifer Olson (LaRC)**
Project Cost Cap:	**$30M over five years (2019-2024)**

Summary: ACTIVATE will study how aerosol particles change clouds and vice versa in ways that affect Earth's climate system. The data obtained will be used to quantify relationships between aerosol number concentration (N_a), cloud condensation nuclei (CCN) number concentration, and cloud drop number concentration (N_d), in order to reduce uncertainty in model parameterizations of cloud droplet activation. The results obtained will improve process-level understanding and model representation of factors that govern cloud micro/macro-physical properties and how they couple with cloud effects on aerosol. Also as part of ACTIVATE, the investigation will assess advanced remote sensing capabilities for retrieving aerosol and cloud properties related to aerosol-cloud interactions.



Implementation: ACTIVATE will acquire a unique, extensive in situ and remote sensing dataset of aerosols, atmospheric boundary layer clouds, and meteorological conditions during 150 joint aircraft flights over the western North Atlantic Ocean using two complementary aircraft: the LaRC HU-25 Falcon and B-200 King Air. Deployments over the western Atlantic study region will occur throughout February-June for three years.

NASA Earth Science Relevance: ACTIVATE addresses four NASA Earth Science Focus Areas: "Atmospheric Composition", "Water & Energy Cycle", "Climate Variability & Change", and "Weather". Our measurements complement, augment, and validate aerosol and cloud retrievals from existing and planned satellite missions. We will also assess existing and demonstrate new lidar and polarimeter remote sensing retrievals of aerosols and clouds, which are directly relevant to the Decadal Survey recommendation for a designated mission to study aerosols and clouds as one of the "Most Important" priorities for the Earth observing system.