A.17 ATMOSPHERIC COMPOSITION: RADIATION SCIENCES PROGRAM

NOTICE: The Radiation Sciences program will not solicit proposals in ROSES-2015. Funds currently available in fiscal year 2015 for the Radiation Sciences Program are committed to the support of awards selected from previous solicitations. The Radiation Sciences Program expects to solicit proposals for an airborne campaign in ROSES-2016. Interested researchers are encouraged to consult other program elements for potential funding opportunities.

1. Scope of Program

Atmospheric composition changes affect air quality, weather, climate, and critical constituents, such as ozone. Atmospheric exchange links terrestrial and oceanic pools within the carbon cycle and other biogeochemical cycles. Solar radiation affects atmospheric chemistry and is, thus, a critical factor in atmospheric composition. Atmospheric composition is central to Earth system dynamics, since the atmosphere integrates surface emissions globally on time scales from weeks to years and couples several environmental issues. NASA's research for furthering our understanding of atmospheric composition is geared to providing an improved prognostic capability for such issues (e.g., the recovery of stratospheric ozone and its impacts on surface ultraviolet radiation, the evolution of greenhouse gases and their impacts on climate, and the evolution of tropospheric ozone and aerosols and their impacts on climate and air quality). Toward this end, research within the Atmospheric Composition Focus Area addresses the following science questions:

- How is atmospheric composition changing?
- What trends in atmospheric composition and solar radiation are driving global climate?
- How does atmospheric composition respond to and affect global environmental change?
- What are the effects of global atmospheric composition and climate changes on regional air quality?
- How will future changes in atmospheric composition affect ozone, climate, and global air quality?

NASA expects to provide the necessary monitoring and evaluation tools to assess the effects of climate change on ozone recovery and future atmospheric composition, improved climate forecasts, based on our understanding of the forcings of global environmental change and air quality forecasts that take into account the feedbacks between regional air quality and global climate change. Achievements in these areas via advances in observations, data assimilation, and modeling enable improved predictive capabilities for describing how future changes in atmospheric composition affect ozone, climate, and air quality. Drawing on global observations from space, augmented by suborbital and ground-based measurements, NASA is uniquely poised to address these issues. This integrated observational strategy is furthered via studies of atmospheric processes using unique suborbital platform-sensor combinations to investigate, for example: (1) the processes responsible for the emission, uptake, transport, and chemical transformation of ozone and precursor molecules associated with its production in the troposphere and its destruction in the stratosphere; and (2) the formation, properties, and

transport of aerosols in the Earth's troposphere and stratosphere, as well as aerosol interaction with clouds. NASA's research strategy for atmospheric composition encompasses an end-to-end approach for instrument design, data collection, analysis, interpretation, and prognostic studies.

2. Point of Contact

For further information on this program, contact:

Hal Maring
Earth Science Division
Science Mission Directorate
NASA Headquarters
Washington, DC 20546
Telephone: (202) 358-1679
E-mail: hal.maring@nasa.gov