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Opportunity Title: Earth Science: Atmospheric Aerosol, Climate, and Air Quality Studies
Opportunity Reference Code: 0123-NPP-NOV23-GSFC-EarthSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0123-NPP-NOV23-GSFC-EarthSci

Application Deadline 11/1/2023 6:00:59 PM Eastern Time Zone

Description We make innovative use of spacecraft and sub-orbital data to better understand the impact of airborne particles on the climate of the Earth, by squeezing multiple data sets for their information content. Our approach to data analysis is inter-disciplinary, applying techniques from atmospheric science, geology, and statistics, and interpreting discoveries using simple physical models. Although our primary focus is Earth, analogies to other planets, especially to Mars, are within the purview of this research announcement.

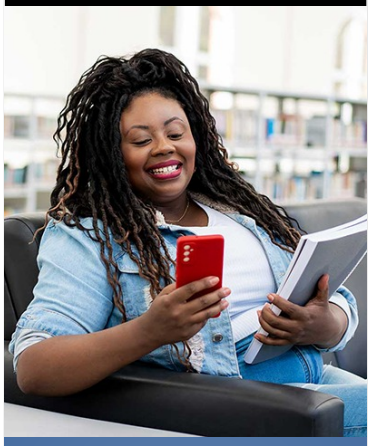
A major component of our current work involves mapping the distribution of particles in the atmosphere; wildfire smoke, desert dust, volcanic ash, urban pollution particles; and studying their environmental, particularly air quality, and climate impacts. The advisor is the Aerosol Scientist for the NASA Earth Observing System's MISR instrument (http://www-misr.jpl.nasa.gov); we have developed a number of specialized tools for MISR data analysis, including the MISR Research Aerosol Retrieval algorithm. We study these data along with observations from other spacecraft (MODIS, CALIPSO, OMI), aircraft and ground-based measurements, and models, both by comparing these data sets, and by integrating them to improve cutting-edge climate models. Among our recent projects are studies of volcanic plume injection heights and particle properties, with implications for the geology of multiple, active volcanoes in Iceland and the Kamchatka Peninsula, Russia, wildfire smoke production and downwind transport, globally, aerosol-cloud interactions in the Arctic and the subtropical North Atlantic, mapping aerosol pollution air over underserved, populated regions, planning a future aircraft campaign to better characterize particle microphysical properties for major aerosol air masses statistically, and advancing remote-sensing aerosol retrieval algorithms in support of current spacecraft instruments, and ones being proposed for future missions.

Sample References:

deSouza, P., R.A. Kahn, et al., 2020. *Atm. Meas. Tech.,* doi: 10.5194/amt-13-5319-2020.
Flower, V.J.B., and R.A. Kahn, 2020. *J. Geophys. Res.*, doi:10.1029/2019JD031625.
Junghenn, K.T., R.A. Kahn, et al. 2020. *Remote Sens*. 12, 769; doi:10.3390/rs12050769.
Kahn, R.A. 2012. *Surveys in Geophysics*, doi:10.1007/s10712-011-9153-z.
Kahn et al. 2017. *Bull. Am. Meteoro. Soc*. doi:10.1175/BAMS-D-16-0003.1.
Kahn, R.A., 2020. *EOS, American Geophysical Union*, doi.org/10.1029/2020EO138260.
Limbacher, J. A. and R.A. Kahn, 2019. *Atmos. Meas. Tech.*, doi:10.5194/amt-12-675-2019.

NPP NASA Postdoctoral Program

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Petrenko, M., et al., 2017. *J. Geophys. Res*. doi:10.1002/2017JD026693.
Zamora, L.M., and R.A. Kahn, 2020. *J. Climate.* doi:10.1175/JCLI-D-20-0083.1.

Location:
Goddard Space Flight Center
Greenbelt, Maryland

Field of Science: Earth Science

Advisors:
Ralph A. Kahn
Ralph.A.Kahn@nasa.gov
301-614-6193

Applications with citizens from Designated Countries will not be accepted at this time, unless they are Legal Permanent Residents of the United States. A complete list of Designated Countries can be found at: https://www.nasa.gov/oiir/export-control.

Eligibility is currently open to:

- U.S. Citizens;
- U.S. Lawful Permanent Residents (LPR);
- Foreign Nationals eligible for an Exchange Visitor J-1 visa status; and,
- Applicants for LPR, asylees, or refugees in the U.S. at the time of application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status

Eligibility Requirements

- **Degree:** Doctoral Degree.