Opportunity Title: Ocean Modeling & Analysis
Opportunity Reference Code: 0010-NPP-NOV23-GISS-EarthSci

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Organization	National Aeronautics and Space Administration (NASA)
Reference Code	0010-NPP-NOV23-GISS-EarthSci
Application Deadline	11/1/2023 6:00:59 PM Eastern Time Zone
Description	The ocean plays a critical role in taking up heat and carbon and other gases and trace elements from the rest of the Earth System and thereby helping regulate climate and climate change. At the same time the ocean undergoes significant changes, both in terms of natural variability as well as due to extreme events and climate change trends. At NASA-GISS we are seeking to better understand all ocean related processes, using models, observations, and reanalysis products, in present, past and future climates as well as in exoplanets. The broad science topics include studies in:

1. Ocean uptake of heat, carbon, oxygen, etc; globally and/or regionally, due to natural climate and/or anthropogenic perturbations. We investigate pathways, transports of major water masses, their variability and trends, meridional overturning circulation changes in response to air-sea interaction, physical and biogeochemical processes, effect on transient climate sensitivity.
2. Air-Sea Interaction: buoyancy forcing variability at high latitudes; tropical instabilities and control of ocean processes at low latitudes; light attenuation and back-scattering in the ocean.
3. Sea-level change: as controlled by land-ocean and ocean-ice interaction changes as well as heat uptake.
4. Ocean tracer studies: CFC and other trace gas and atmospheric constituents' inventories, idealized tracer distribution and tracer acceleration methods.
5. Ocean carbon cycle: role of chemistry vs biology and physics, mixing and stirring processes, and air-sea fluxes and deposition, in hot-spot areas, the Western Boundary Current regions, the Eastern Boundary upwelling regions, at the land-ocean and ocean-ice interfaces, at the bottom of the euphotic zone (carbon export).
6. Extreme Events in the ocean: assessing present and future climate compound and cascading extreme events.
7. Utilizing novel data science techniques, machine learning and/or data mining to tune model parameterizations, build emulators, develop suite of parameter perturbation experiments to help gain insight of model processes, assess, and improve the model skill.

Successful proposals will leverage observational and observation-based data of relevant geophysical variables, with emphasis in NASA mission products, reanalysis products, data assimilation & inverse models, and climate or ocean-only models, high resolution, regional or process models. The use of innovative analysis techniques, particularly from the data mining and pattern recognition science, is encouraged.

Applicants preferred area of study: Mathematics/Physics/Engineering, Climate Science
Applicants specific computer programing skills: Fortran, python, MATLAB or
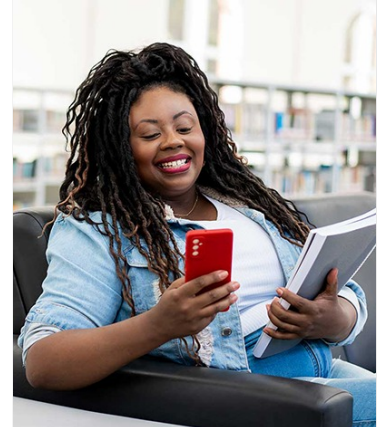
other similar visualization & analysis software.

Location:
Goddard Institute for Space Studies
New York City, New York

Field of Science: Earth Science

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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.