NATIONAL SCIENCE FOUNDATION
2415 EISENHOWER AVENUE
ALEXANDRIA, VIRGINIA 22314

NSF 22-032

Dear Colleague Letter: Geoscience Lessons for and from Other Worlds (GLOW)

December 17, 2021

Dear Colleague:

Discovery of new planets orbiting other stars has driven forward the discussion of exoplanets, that centers on the concept of habitability, e.g., having environments that can support liquid water. Research on the habitability of other worlds would benefit from the application of methods and results from a variety of geoscience disciplines that have addressed similar questions relating to the climate, upper atmosphere, magnetosphere, volatile cycles, and early evolution of the Earth. Conversely, research that considers the Earth in the context of planetary bodies accessible to astronomical observations could offer new insights and fresh perspectives for geoscience. For the purposes of this Dear Colleague Letter (DCL), "other worlds" refers to planetary bodies that are both outside our solar system (exoplanets) and within (e.g., Venus, Titan, Ganymede, asteroids, and comets), and projects could include remote observations, model simulations, or the direct study of derived materials.

This DCL is to inform the community that NSF's Divisions of Earth Sciences (EAR), Atmospheric and Geospace Sciences (AGS), and Astronomical Sciences (AST) encourage the submission of proposals that bring together researchers and experts to develop projects which: 1) use the study of other worlds as a way to broaden and deepen our understanding of the Earth and its evolution, including all processes and systems from the core to the magnetosphere, and/or 2) use our geoscience knowledge to understand the environments of other worlds.

Science drivers include but are not limited to:

- What can the study of other worlds reveal about the first billion years of Earth history?
- What can the study of other worlds reveal about Earth's past and its future climate?
- What can the study of other worlds reveal about interactions between the Earth and space environment?
- What can the study of Earth's systems reveal about environments and processes that shape other worlds?
- How can our basic science understanding of Earth processes and systems guide the

identification of other habitable worlds?

Successful projects will include creative, integrative, and effective broader impacts activities developed within the context of the mission, goals, and resources of the organizations involved, and should be reflected in the expertise of collaborators, the proposal budget, and budget justification.

PROPOSAL PREPARATION, SUBMISSION, AND MERIT REVIEW

After any solicitation specific requirements, the title of the proposal should be prefaced with "GLOW:" to indicate that the proposal is to be considered under these activities. Given the breadth of disciplines represented, proposals should be submitted to the most relevant program participating in this DCL. Proposers are encouraged to reach out to participating programs before submission to confirm relevance. Projects that could benefit from co-review may be shared among multiple programs. Proposals submitted in response to this DCL should be prepared and submitted in accordance with the general guidelines contained in the NSF Proposal & Award Policies & Procedures Guide (PAPPG) and the relevant Program Description or Program Solicitation (see below). This is not an announcement of a new funding opportunity. Proposals will undergo merit review alongside other proposals submitted to the participating programs.

If interested in submitting other types of proposals described in the PAPPG (e.g., EAGER, Conference, etc.), proposers should contact the relevant program to discuss.

PARTICIPATING PROGRAMS AND SOLICITATIONS

- AGS Aeronomy: https://beta.nsf.gov/funding/opportunities/aeronomy
- AGS Magnetospheric Physics: https://beta.nsf.gov/funding/opportunities/magnetospheric-physics
- AGS Climate and Large-scale Dynamics: https://beta.nsf.gov/funding/opportunities/climate-and-large-scale-dynamics-cld
- EAR Cooperative Studies of the Earth's Deep Interior: https://beta.nsf.gov/funding/opportunities/cooperative-studies-earths-deep-interior-csedi
- EAR Petrology and Geochemistry: https://beta.nsf.gov/funding/opportunities/petrology-and-geochemistry-ch-0
- EAR Geophysics: https://beta.nsf.gov/funding/opportunities/geophysics-ph-0
- EAR Geomorphology and Land-use Dynamics: https://beta.nsf.gov/funding/opportunities/geomorphology-and-land-use-dynamics
- AST Astronomy and Astrophysics Grants: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf18575

Questions concerning this opportunity may be emailed to:

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Sincerely,

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