

F.17 ECONOMIC, SOCIAL, AND POLICY ANALYSES OF ORBITAL DEBRIS AND SPACE SUSTAINABILITY

**NOTICE: March 17, 2022. This amendment adds this new program element to ROSES-2022. No preliminary statement (such as a notice of intent nor a step-1 proposal) is requested. Proposals are due June 17, 2022.**

1. Background

Analyzing the economic, social, and political impacts of orbital debris is a nascent field of study that would greatly benefit from more research. To this end, NASA will work with selected teams and experts from non-governmental organizations (e.g., university, industry, research non-profit) to evaluate the economic, social, and political elements of orbital debris and space sustainability, a strategic NASA and/or United States Government approach to orbital debris, and international space sustainability efforts.

A variety of multidisciplinary research groups focused on the orbital debris problem currently exist in the U.S. and internationally. This study effort will focus on U.S.-based non-governmental organizations, while a complementary effort led by the Organization for Economic Cooperation and Development (OECD) will garner contributions from international universities, and host conferences that both U.S. and international teams may participate in.

2. Scope of Program

Orbital debris research traditionally focuses on the critical task of understanding the physical space environment (characterizing debris, modeling proliferation, evaluating technical remediation and mitigation approaches, etc). This research call seeks to expand upon this important work by integrating physical and social science research. Space sustainability is a highly complex problem that will require an interdisciplinary approach. We seek original research that will yield insight into the economic, social, political and other factors that both exacerbate and may yield potential solutions to the problem.

Preference will be given to teams that feature a strong interdisciplinary research and analysis approach or interdisciplinary teams that feature expertise in both social sciences (economics, econometrics, policy analysis) and physical sciences (physics, engineering).

To be eligible, a proposal must be submitted by a non-governmental organization. Teams may include member(s) that are employees of, or affiliated with, the government, but the majority (>50%) of the team must be non-governmental.

Example research areas:

- 1) The development of an integrated behavioral-physical model of the orbital debris environment, including the use of existing probabilistic debris models and evaluations of the potential impacts of various mitigation approaches (e.g., greater compliance with 25-year de-orbit guidelines, expanded insurance requirements, Active Debris Remediation, etc).

- 2) The development of new indicators to measure trends in the space environment such as launch intensity, mass and quantity of satellites and other material launched into orbit, estimates of orbit capacity, fragmentation events, insurance premiums, satellite licensing, etc.
- 3) A more comprehensive evaluation of the risk of space debris, including the probability and severity of physical and economic impacts (both on orbit and on Earth).

### 2.1 Exclusion

Proposals to develop probabilistic debris models are not solicited, and proposers are encouraged to utilize existing models such as the Orbital Debris Engineering Model (ORDEM) model developed by the NASA Orbital Debris Program Office:

<https://orbitaldebris.jsc.nasa.gov/modeling/>.

### 2.2 Timeline

June 17, 2022: Proposals Due  
July/August, 2022: Announce selections  
February 2023: Interim workshop with research teams  
June 16, 2023: Final projects due. Prepare for publishing  
June/July 2023: Proposed timeframe for conference to present results

## 3. Proposal Preparation, Submission, and Evaluation

[Table 1 ROSES-2022](#) provides a checklist the default components of a ROSES proposal.

No preliminary statement (such as a notice of intent nor a step-1 proposal) is requested.

Proposals must be submitted by the date given in Tables [2](#) and [3](#) of this ROSES NRA. Proposals must follow all formatting requirements that are described in Section IV(b)ii of the [ROSES Summary of Solicitation](#). Violation of these rules is sufficient grounds to reject a proposal without review.

### 3.1 Evaluation and Selection

All proposals will be evaluated for Intrinsic Merit, Relevance, and Cost Reasonableness, as defined in Appendix D of the [NASA Guidebook for Proposers](#) and as specified in Section V(a) of the [ROSES Summary of Solicitation](#).

The selecting official will be the Associate Administrator for Office of Technology, Policy and Strategy. We anticipate sending out selection notifications in late July/early August.

### 3.2 Data Management Plan

Proposals submitted to this program need not include a Data Management Plan (DMP). However, proposers are reminded that if an award is made the standard requirements and expectations regarding release of supporting data and code still apply, see Section II.c of the [ROSES Summary of Solicitation](#). For example, the information needed to validate the scientific conclusions of peer-reviewed publications resulting from an award, including data underlying figures, maps, and tables, must be made available at the time of publication, publicly and electronically in a place where it can be found and it is likely to persist, e.g., in the supplemental material of the article, a community-

endorsed repository, a NASA repository such as data.nasa.gov or a repository supported by a division, or a combination of different resources as would be most appropriate to the data being shared.

Awardees will be expected to present their results at a future conference (either hosted by NASA or a NASA/OECD/Other Space Agency event) and/or in a NASA-sponsored or approved publication.

#### 4. Summary of Key Information

Expected program budget for first year of new awards	~ \$100 K
Number of new awards pending adequate proposals of Intrinsic Merit	~ 3-5
Maximum duration of awards	1 year
Due date for mandatory NOIs	See Tables <a href="#">2</a> and <a href="#">3</a> of this ROSES NRA.
Due date for full proposals	See Tables <a href="#">2</a> and <a href="#">3</a> of this ROSES NRA.
Planning date for start of investigation	September 1, 2022
Page limit for the central Science/Technical/Management section of proposal	15 pp; see also <a href="#">Table 1 of ROSES</a> .
Relevance	This program is relevant to the questions and goals of the Science Mission Directorate as described in the NASA Science Plan. Proposals that are relevant to this program are, by definition, relevant to NASA.
General information and overview of this solicitation	See <a href="#">the ROSES Summary of Solicitation</a> .
General requirements for content of proposals	See Table 1 and Section IV of <i>the ROSES Summary of Solicitation</i> , and Section 3 of the <i>NASA Guidebook for Proposers</i> .
Detailed instructions for the submission of proposals	See <a href="#">NSPIRES Online Help</a> , Sections 3.22-4.4 of the <a href="#">NASA Guidebook for Proposers</a> and Section IV(b) of <i>the ROSES Summary of Solicitation</i> .
Submission medium	Electronic proposal submission is required; no hard copy is permitted.
Web site for submission of proposals via NSPIRES	<a href="http://nspires.nasaprs.com/">http://nspires.nasaprs.com/</a> (help desk available at <a href="mailto:nspires-help@nasaprs.com">nspires-help@nasaprs.com</a> or (202) 479-9376)
Web site for submission of proposals via Grants.gov	<a href="http://grants.gov">http://grants.gov</a> (help desk available at <a href="mailto:support@grants.gov">support@grants.gov</a> or (800) 518-4726)
Funding opportunity number for downloading an application package from Grants.gov	NNH22ZDA001N-ESPOD

Point of contact concerning this program	Patrick Besha Email: <a href="mailto:patrick.besha@nasa.gov">patrick.besha@nasa.gov</a>
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