

Reminder: Your Inputs are Needed!!

Soliciting Community Input on Precursor Science Gaps for NASA Flagship Missions

The NASA ROSES-2023 call includes element D.16 (Astrophysics Decadal Survey Precursor Science; Mandatory NOI due 3/29/2024, proposal deadline 4/26/2024):

<https://nspires.nasaprs.com/external/solicitations/summary.do?solId={A621FB7D-1D57-40F9-FE89-70107E303940}&path=&method=init>

The Astrophysics Decadal Survey Precursor Science (ADSPS) program supports research in areas related to the recommendations from the National Academy of Science and Engineering report, "Pathways to Discovery in Astronomy and Astrophysics for the 2020s"

(<https://www.nap.edu/catalog/26141/pathways-to-discovery-in-astronomy-and-astrophysics-for-the-2020s>), also known as the Astro2020 Decadal Survey. Astro2020 envisioned three

future large missions for NASA Astrophysics: 1) a large Infrared/Optical/Ultraviolet space mission, now referred to as the Habitable Worlds Observatory (HWO), to search for biosignatures from nearby exoplanets and to perform transformative astrophysics investigations at these wavelengths; 2) a large Far Infrared observatory; and 3) a large X-ray observatory. Research proposals to ADSPS should describe how scientific progress in the areas being investigated will either reduce the design and development risk for one or more of these future large missions or help to define the requirements such missions must meet to enable transformative discoveries. ADSPS does not support technology development proposals for these missions, which should be submitted to the separate Strategic Astrophysics Technology (SAT) program.

To guide the community submissions to the ROSES-2022 ADSPS opportunity, an open process was used to define precursor science gaps where community work would be beneficial. A precursor science gap is the difference between the knowledge we have today, and the knowledge needed to finalize the architectures of the three large missions endorsed by Astro2020. It is not one of the strategic science goals of those missions, which were defined by Astro2020. Instead, a precursor science gap is a tactical concept - an area where work now can make a difference to defining the mission architecture or implementation. Two community workshops "Precursors to Pathways: Science Enabling NASA Astrophysics Future Great Observatories" were held in April and October 2022, which led to a list of precursor science gaps that guided proposers to the ROSES-2022 opportunity. That gap list remains available for review here: https://exoplanets.nasa.gov/exep/astro2020-precursor-sci-workshop2/ROSES_GAPS.pdf

For the ROSES-2023 ADSPS opportunity, an updated list of precursor science gaps would also be provided to guide proposers. Community input on the content of the updated gap list is now being solicited. Suggestions for new precursor science gaps not included on the ROSES-2022 list, as well as suggested revisions to the definitions of the existing gaps, are both welcome. The text of new gaps should follow the existing template by providing a gap title and four short paragraphs that give 1) A summary of what the gap is about, 2) A section explaining the relevance of the gap to defining the architecture for one of the three large missions

endorsed by Astro2020, 3) A section on the specific knowledge or capability needed to close the gap, and 4) A section on the knowledge or capability today. The deadline for submitting input for the ROSES 2023 precursor science gaps is Monday, November 27, 2023).

Input is collected by NASA Astrophysics Division supporting program offices. The input will be distilled and provided to the ADSPS Program Officer and NASA HQ scientists for consideration, and an updated Precursor Science Gap list is expected to be posted by January 2024.

* Input on precursor science gaps relevant to the NASA Exoplanet Exploration Program should be submitted to ExEP Program Chief Scientists Karl Stapelfeldt (karl.r.stapelfeldt@jpl.nasa.gov) and Eric Mamajek (mamajek@jpl.nasa.gov) with Subject "Precursor Science Gaps".

* Input on precursor science gaps relevant to the NASA Cosmic Origins (COR) Program should be submitted via the online form at: <https://cor.gsfc.nasa.gov/copag/science-gaps/science-gaps.php>

* Input on precursor science gaps relevant NASA Physics of the Cosmos (PhysCOS) Program should be submitted via the online form at: <https://pcos.gsfc.nasa.gov/phypag/science-gaps/science-gaps.php>

Discussion and submission of group input on precursor science gaps among the relevant Program Analysis Groups (ExoPAG, COPAG, PhysPAG) and their Science Analysis / Science Interest Groups is strongly encouraged.

[Submission to this process does not guarantee inclusion in the updated gap list that will be available for proposers interested in the ROSES2023 ADSPS.](#)

For reference, note that nine proposals were selected for ADSPS funding in ROSES-2022. The abstracts of those selected proposals are summarized here:

<https://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=950731/solicitationId=%7B916A49FB-D88F-3C76-5B06-6148E6748FE7%7D/viewSolicitationDocument=1/ADSPS22%20Abstracts.pdf>