

MExAG Final Findings from the 2021 Annual Meeting
Approved February 25, 2021.

1. MExAG expresses great appreciation to our colleagues at NASA HQ and in the PAC for supporting the creation of this Mercury assessment group. The Mercury community is vibrant and active, thanks in large part to MESSENGER and BepiColombo, but until now lacked an organized, community-based voice within NASA's planetary science community. MExAG is critical to the long-term support and strength of the Mercury community and for advocating for the continued exploration of the innermost planet.
2. MExAG appreciates PAC support for the inclusion of a Mercury mission concept study in the lead-up to the current Decadal Survey process. That finding addressed an important gap in the CAPS 2017 report *Getting Ready for the Next Planetary Science Decadal Survey* where the planet Mercury was mentioned only once—in the context of the Moon's polar volatiles. MExAG encourages NASA to provide clear direction in its Statements of Task for future reports such that they assess priorities and knowledge gaps across the PSD portfolio and the previous Decadal Survey report.
3. MExAG encourages NASA to enhance cross-divisional support for opportunistic mission science. NASA spacecraft often have opportunities within their cruise and primary operational phases to conduct science activities of primary interest to other NASA Science Mission Directorate Divisions. MExAG encourages NASA to develop mechanisms for early identification and planning for support (i.e., planning and funding) of opportunistic science activities that serve communities outside the primary mission division.
4. MExAG encourages NASA to facilitate ground-based observations of Mercury. Despite their importance in Mercury exploration, such observations are often difficult to obtain owing to observational and facility requirements. Optical observations are vital for monitoring changes in the exosphere and radar observations are essential for geological and geophysical studies of Mercury, including investigating the polar volatiles and constraining its interior structure. Ground-based observations are also a critically important bridge between missions to Mercury. MExAG encourages NASA to:
 - a. Work with optical telescope facilities on which NASA acquires time (e.g., Keck Observatory) and their Telescope Allocation Committees (TACs) to ease the scheduling of twilight-time observations for Mercury. Many telescopes require half-night or even full night proposals; however, Mercury is only available for 1-2 hours at the beginning or end of the night, disadvantaging observers of the innermost planet.
 - b. Engage with Goldstone and Green Bank Telescope, to ensure that there are equitable opportunities for planetary science observations, particularly now that Arecibo is no longer an option.
 - c. As the loss of the Arecibo Observatory planetary radar presents a significant loss in the scientific return of ground-based radar observations because it was several times more powerful and sensitive than other current facilities, we encourage NASA to participate in discussions regarding the future of Arecibo Observatory.

- d. Allow observers to obtain letters of endorsement from NASA for Mercury observations in support of the BepiColombo mission during the upcoming flybys and orbital mission.
5. MExAG expresses its appreciation to its ESA/JAXA BepiColombo mission colleagues for their efforts in expanding international cooperation by welcoming US-based investigators for the interdisciplinary scientist (IDS) and guest investigator (GI) programs for BepiColombo. MExAG also applauds NASA's current support of US participation in the ESA/JAXA BepiColombo IDS and GI programs and encourages NASA to support as robust a program as possible for the next expected call for IDS and GI proposals.
6. MExAG appreciates NASA's inclusion of the analysis of BepiColombo data in the ROSES-2021 Discovery Data Analysis Program (DDAP) solicitation, which is consistent with past practice for Rosetta and the NASA contribution to BepiColombo. MExAG hopes to see continued and specified support for BepiColombo data analysis throughout the mission.
7. MExAG encourages NASA to expand upon existing opportunities for early career researchers to build a diverse and sustainable community for the future. These efforts are generally important for the community as a whole. However, they are of special relevance for diversifying and sustaining the Mercury community, as small communities such as ours are vulnerable to unintentional generational gaps because of infrequent missions. This effect is further exacerbated by the ongoing COVID-19 pandemic. Specifically, MExAG encourages NASA to sustain and grow the PI Launchpad, Planetary Science Summer School, mission science team meeting observing, and the Early Career Award programs. Efforts to further broaden and facilitate networking and mentoring opportunities for early-career researchers, including undergraduate and graduate students as well as postdoctoral fellows, within and beyond academia are encouraged.