

ExMAG 2023 Annual Meeting DRAFT Findings

Findings and Recommendations to PAC / NASA

F1. DEIA initiatives require accurate demographic data.

We appreciate the efforts that NASA Program managers make to analyze trends in funding cycles and programs, which helps illuminate possible actions our community can take (see for example, A1 below). However, data analysis using inferred personal characteristics, such as gender, do not conform to best practices. ExMAG recommends that NASA continue to adopt and use only self-identified demographics in their analyses¹.

¹Rasmussen et al. 2023. <https://arxiv.org/abs/2307.15802>

F2. Strengthening AstroMat as the extraterrestrial materials repository

ExMAG appreciates NASA's commitment to the AstroMat project and AstroMat's commitment to increasing access to planetary sample data. The sample analysis community needs to move away from relying on "supplemental material" in journal articles, which are variably reviewed and not always ingestible, to fulfill Open Data mandates². ExMAG recommends that AstroMat training become more widely available, perhaps targeting larger groups at universities and analytical centers, including defining and communicating the peer review process for ingesting data. To further ensure success for AstroMat, ExMAG recommends that NASA compensate AstroMat peer reviewers for their time and effort. In addition, ExMAG remains available to NASA and AstroMat to help facilitate training and further develop the data types and needs that are not currently available in AstroMat (for example, XCT data).

²ExMAG 002: Extraterrestrial Materials Analysis Group Response to RFI: Implementation and Changes to Science Policy Document (SPD)-41 - <https://www.lpi.usra.edu/exmag/documents/>

F3. Access to Chang'E samples

China has now opened access to the Chang'E 5 returned lunar samples to the international scientific community. The Chinese National Space Administration (CNSA) has outlined opportunities and set the rules for future management of international cooperation in lunar samples and scientific data³. ExMAG appreciates NASA's efforts to pursue avenues of sample sharing with China and their Chang'E samples, though we

recognize this is not possible under current restrictions. ExMAG understands that sample loans made via this mechanism are considered bilateral agreements, which are prohibited for US Government-funded researchers. ExMAG recommends that US Government-funded researchers who are interested in working on Chang'E 5 samples form or join research teams with researchers in other nations who can request the samples for joint work.

³See information on the CNSA website

<https://www.cnsa.gov.cn/english/n6465652/n6465653/c10086003/content.html>

F4. Planetary sample analysis facilities

ExMAG deeply appreciates the robust NASA commitment to the sample analysis community by investing in facilities and technique development via PSEF and LARS programs. However, ExMAG heard that it is currently challenging to support acquisition or replacement of “workhorse” instrumentation through existing programming. ExMAG recommends that NASA provide an avenue for investigator instrument purchases and maintenance. ExMAG also recently commented on the SPSS CAN⁴, noting that as written, the scope of work might result in an advantage to JSC-based PSEFs by increased usage of these facilities relative to other PSEFs. This is a concern as PSEF renewal is based on usage. ExMAG recommends that NASA consider how to enable logistical access to all PSEF-funded facilities for researchers who need to use them.

⁴ExMAG 006: Extraterrestrial Materials Analysis Group Response to draft Cooperative Agreement Notice (CAN) entitled “Support for Planetary Sample Science (SPSS)”

<https://www.lpi.usra.edu/exmag/documents/>

F5. Modernizing NASA curation facilities

NASA sample collections are priceless national treasures housed in aging facilities that require repair, modernization, and maintenance. ExMAG recommends that NASA prioritizes maintenance and repair for the unique assets housing the facilities and equipment in NASA Curation. ExMAG stands ready to work with NASA and JSC on increasing access to curation collections, IT infrastructure, and analysis facilities via the proposed JSC Exploration park concept.

F6. Mars Sample scientific analysis

Though NASA regards them as separate projects, ExMAG is interested in understanding the plans and practices for the whole of the Mars sample return chain from collection through Earth return, to activities in the SRP, and finally long-term curation and allocation. ExMAG remains committed to ensuring that Mars Sample science remains open to the ingenuity and access of the full community; ExMAG

recommends that NASA and the MSR project better define the Sample Safety and Preliminary Examination activities planned for the SRP and clearly delineate such activities from sample science, regardless of where such science were to take place. ExMAG stands ready to work with NASA activities across all MSR projects so that our community understands and is ready for the end-to-end plan.

F7. Siting of the Mars Sample Receiving Facility

NASA has stated that the Mars Sample Receiving Project (SRP) is considering potential sites for the Mars Sample biohazard facility in US states that have enacted legislation and policies that are exclusionary and actively harmful to pregnant people, People of Color, and LGBTQ+ people⁵, groups that are both historically and currently marginalized in planetary science. ExMAG recommends that NASA add a criterion to the SRP site selection process that is consistent with the NASA principles of Inclusion, Diversity, Equity, and Accessibility (IDEA)⁶ for future SRP personnel and guests. Otherwise, NASA risks losing members of these already underrecognized communities from their workforce, an issue that has been particularly problematic in recent years and has resulted in mission delays⁷.

⁵Biden, J.R. Jr., 2023. Executive Order #14035, Further Advancing Racial Equity and Support for Underserved Communities through the Federal Government.
<https://www.whitehouse.gov/briefing-room/presidential-actions/2021/06/25/executive-order-on-diversity-equity-inclusion-and-accessibility-in-the-federal-workforce/>

⁶NASA Equity Action Plan
https://www.nasa.gov/sites/default/files/atoms/files/nasa_-_equity_report_-_v10.pdf

⁷Porter, A. et al. 2020. 2020 Survey of the Planetary Science Workforce. AIP report
https://dps.aas.org/sites/dps.aas.org/files/reports/2020/Results_from_the_2020_Survey_of_the_Planetary_Science_Workforce.pdf

Activities and recommendations for ExMAG consideration

A1. The likely return of ANSMET to the field for the 2023-2024 season is welcome. ExMAG continues to support the importance of the ANSMET program and Cosmic Dust collection flights that provide crucial samples to our community.

- a) ExMAG and the Meteorite Subcommittee will work on a way to communicate to NSF and NASA the important, recent science that is being done on the ANSMET

samples to bolster the case that this program is yielding robust, timely scientific return.

- b) Cosmic dust and Genesis researchers noted the decline in sample requests and the challenges associated with preliminary work to identify appropriate samples. ExMAG and the Microparticle subcommittee will explore ways to help make the cosmic dust collection more useful and accessible, including additional analyses in the Curatorial facility and increasing the reach of microparticle handling workshops.

A2. New sample-return opportunities may be afforded by the Gateway architecture, particularly cosmic dust and micrometeorite impacted hardware. ExMAG will look into how these interesting new collections might be included in the Utilization allocation for missions that will be going to and returning from Gateway.

A3. Sample-return missions have unique technology needs and drivers. ExMAG will consider the technologies that may enable future sample return missions and work with the Planetary Exploration Science Technology Office (PESTO) to advocate for such technology development and maturation.

A4. ExMAG strongly supports the Mars Sample Return (MSR) project's efforts to return the carefully-selected, well-documented samples collected by the Mars 2020 Perseverance rover. We heard a widespread concern among our members that the cost of MSR was going to negatively affect other programs and projects, both within the sample analysis community and in other disciplines. Therefore, ExMAG appreciated the presentation by Lori Glaze (Director, Planetary Science Division) in which she explained that the funding for MSR has consistently been added to the PSD budget and so far, has not resulted in the diminishment of any other project or program. She also emphasized that as a share of the current PSD budget, MSR constitutes about 25% of the total funding, below the 35% threshold set by the Ocean Worlds and Life (OWL) report. ExMAG and the Mars Subcommittee will work with MEPAG to conduct jointly-sponsored activities that will further promote the scientific rationale and wide-reaching scientific benefits that MSR has for the planetary science community.

A5. ExMAG meetings have been conducted virtually during the COVID-19 pandemic. ExMAG envisions that they will continue to be virtual to enable wide participation among the community, who may be unable to travel for non-science meetings. However, we recognize the limitations that virtual meetings place on community discussion. ExMAG and the Meetings Chair will work to identify ExMAG sponsored or co-sponsored activities at widely-attended meetings (such as LPSC, AGU, GSA, Goldschmidt, and

Meteoritical Society) to continue to foster community and receive feedback among NASA-funded extraterrestrial sample analysts.