

## Identifying and Analyzing Astronomers' Preferences for the Next Decade of NASA

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In our research, we investigated the preferences of students and professionals in the astronomy and astrophysics communities to better understand what space-based missions and research activities the scientific community would most likely prioritize for the NASA Decadal Survey. The decadal is conducted by the United States National Academies of Sciences, Engineering, and Medicine to address past and present research as well as changes in civil policy, new programs, and how the community may respond to the results, among other topics of interest. The aim of the current research is to survey preferences in the astronomy and astrophysics community to better understand individual and community factors and present results on mission concepts, mission capabilities, and primary science. Understanding individual and group preferences can help researchers project likely outcomes for the coming decade to better inform industry and academia stakeholders on what mission concepts the community will be most likely to support. Every project is multi-faceted; therefore, knowing the community's interests provides the ability to show how a mission concept meets the needs of the group while simultaneously protecting their values as well. We aim to contribute knowledge about the nature of the preferences held by individuals in the community and the amount of consensus between subgroups in the astronomy and astrophysics community. The study was performed using a survey methodology to collect a total of 796 responses. Participants were a convenience sample of members from the astronomy and astrophysics community who attended the June 2018 AAS conference in Denver or the January 2019 AAS conference in Seattle. The researchers described two contextual community subgroups by their direct involvement in space-based missions and found that most did not have any prior experience. From the responses, topics were then classified into similar subthemes generating 9 overarching themes. We implemented thematic analysis to identify patterns across the qualitative open-ended responses and evaluated preferences by their prioritized astrophysics missions and research activities. Our results revealed strong community preferences for observational astronomy and science versatility, capability, and scientific return for the upcoming decadal period. Furthermore, our findings show degrees of consensus among subgroups of the scientific community. We present results on mission concepts, mission capabilities, and primary science that NASA should consider strategically investing in for the future of astrophysics and astronomy research.