SAG on Technosignatures

The search for signs of technological life in the universe ("technosignatures"), also called SETI, has seen rapid growth in its sophistication in recent years, while expanding beyond radio SETI into searches for other forms of technology, such as atmospheric technosignatures in exoplanetary spectra. Importantly, many of the same techniques currently used for biosignature studies, including atmospheric modeling and retrieval and standards for life detection, can also be applied to technosignature searches. As such, there are strong and growing connections between technosignature studies and the fields of exoplanetary research and astrobiology.

The field of astrobiology has been nurtured and matured by NASA for decades, so that it now has a robust portfolio of the study of life in the universe across the Earth Science, Planetary Science, and Astronomy communities. This support has been catalyzed by the discovery of ubiquitous terrestrial planets and the near-term possibility of measuring the surface and atmospheric properties of potentially habitable worlds. NASA has an opportunity to similarly support the small but vibrant and growing community of technosignature researchers who seek to make NASA's astrobiology portfolio more comprehensive and inclusive of the search for technological life. Indeed, as has been demonstrated, there is no apriori reason to exclude technosignatures as they may be more abundant, longlived, and less ambiguous than biosignatures.

The scope of the SAG will be searches for technosignatures beyond Earth and its atmosphere, including the solar system and beyond, especially via means familiar to astronomers and planetary scientists. This SAG will produce analysis and findings on how NASA's efforts in astrobiology, exoplanetary astrophysics, and other areas can better serve the search for technosignatures, consistent with NASA's goals to understand the prevalence of life in the universe.

Specifically, the SAG will:

1) Investigate which technosignature investigations should play a role in NASA's exoplanet and planetary science portfolios.

2) Identify the most promising technosignature investigations to prioritize for funding and mission development

3) Identify science and technology gaps relevant to technosignature searches

4) Identify existing NASA programs most relevant to technosignature searches, especially those in exoplanets and planetary science, and determine how they can be more responsive to and supportive of technosignature searches.

5) Identify best practices for NASA program officers to select and provide guidance for review panelists to grade and discuss technosignature proposals in XRP and other programs.

6) Identify potential new initiatives to build community and intercommunications with other astrobiology efforts.

A SAG proposed by:
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Anticipated length of the study: two years (~2024-2026)