



SAG Proposal:

Technosignature Research Through NASA

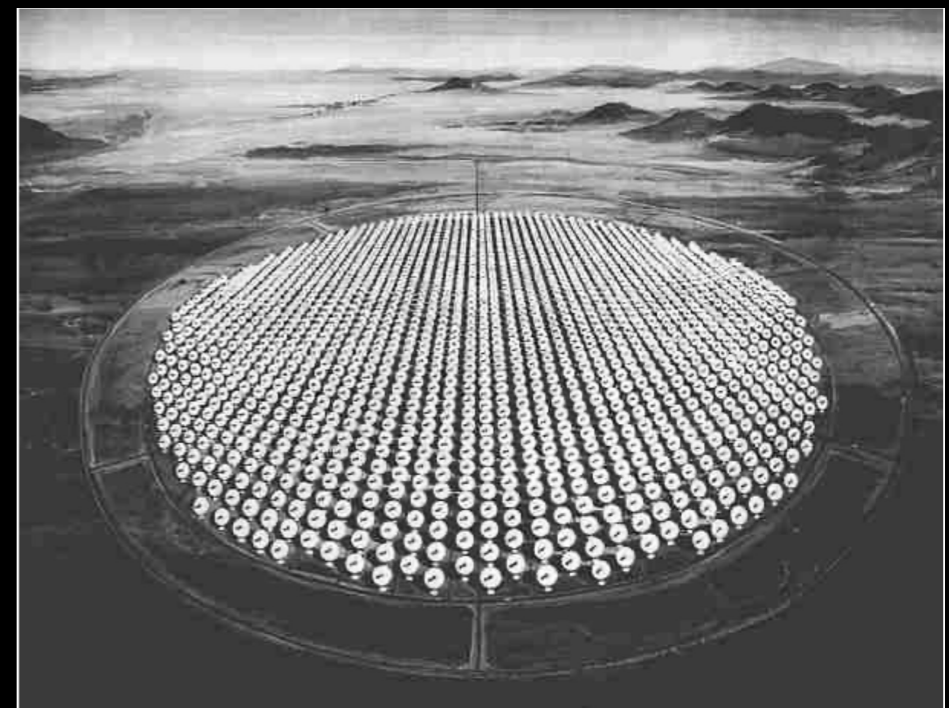
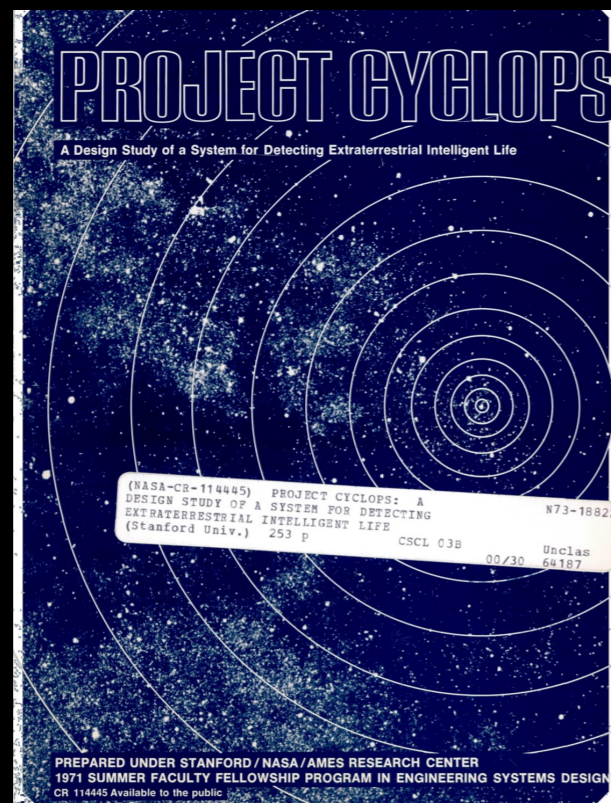
Jason T Wright, Mark Elowitz,
Eddie Schwiterman, Adam Frank

ExoPAG Meeting
Jan 6, 2024
New Orleans, LA



SETI @ NASA

- The first large-scale SETI program in the world was funded at NASA
- NASA Ames produced the *Cyclops Report*, an influential and ambitious program in radio SETI
- Together with JPL, they launched the “SETI” project, including use of the NASA DSN, with both deep and wide surveys planned.





SETI @ NASA

- In 1978 Senator William Proxmire gave the program his “Golden Fleece” Award and ended the program

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..But Proxmire debunks space encounters

Newhouse News Service

WASHINGTON — A \$14-million search for intelligent life in outer space strikes Sen. William Proxmire as a low-priority item on the national agenda.

Proxmire (D-Wis.) is chairman of the Senate Appropriations subcommittee that passes on the space agency's budget. His opposition to the project, dims chances NASA will get the \$2 million it is seeking to begin a seven-year, \$14-million, “all-sky, all frequency” radio search for extraterrestrial life.

Proxmire plans hearings in April on the space agency's funding request for a “Search for Extraterrestrial Intelligence” that would use the deep space tracking network station known as the Goldstone Antenna in California to listen for radio signals.

“First, while theoretically possible, there is now not a scintilla of evidence that life be-

yond our own solar system exists,” Proxmire said today.

“Second, what if from someplace, somewhere a radio message had been sent? The earth is 4½ billion years old. Some solar systems are 10 to 15 billion years old. If we intercept messages from them, they could have been sent not only before Columbus discovered America, or the birth of Christ, but before the earth itself existed. The overwhelming odds are that such civilizations, even if they once existed, are now dead and gone.”

The project, Proxmire said, gets his “Golden Fleece of the Month” award as the most ironic or ridiculous example of wasteful spending.

Proxmire suggested that the project be postponed until the federal budget is balanced and income and Social Security taxes are reduced to zero, or for a few million light-years — whichever comes first.

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"This hopefully will be the end of Martian hunting season at the taxpayer's expense"

SEN. RICHARD BRYAN
D-NEVADA

C-SPAN2
LIVE

CH. 02

09-29-93

19:20:35



SETI @ NASA

- NASA learned its lesson, and developed an institutional aversion to the search for technological life to avoid Congressional opprobrium
- NASA did not stop “Martian hunting”!
- Since then, NASA has nurtured and curated the field of astrobiology, with conferences, institutes, and substantial internal and external funding to develop a robust portfolio of (non-technological) life detection
- NASA’s measurements of η_{\oplus} have made the search for life more compelling



SETI @ NASA

- Congress changed its mind and in 2018 had budget language *requiring* NASA to spend \$10 million / year on technosignatures
- To prepare for the language NASA held the 2018 NASA Technosignatures Workshop, kickstarting a renaissance in all forms of SETI (not just radio)

NASA TECHNOSIGNATURES WORKSHOP



Houston, Texas
September 26-28, 2018

#technosigs18



SETI @ NASA

- At the workshop NASA officials were made aware of extensive exclusionary language throughout NASA calls for proposals.
- *Some* of this language was removed
- Since then, at least 3 SETI grants have been approved for radio and other SETI projects
- ExEP is currently conducting a technosignatures technology gap list study, including a comprehensive catalog of SETI approaches



Context

- SETI is a small and rapidly growing field
 - There is not a lot of proposal pressure!
 - Like astrobiology 2 decades ago.
- SETI is naturally a part of astrobiology but does not benefit from NASA's extensive investment in it (conferences, workshops, dedicated funding calls)
- It is unclear which programs are good fits for technosignatures proposals, and where some technosignature proposals should go
- Many would-be proposers say they are dissuaded by vague or exclusionary language in existing calls, or contradictory instructions from program officers and feedback from panels.



Context

- Many forms of SETI use the same techniques and instruments used for other astrobiology and exoplanet studies. A few:
 - Atmospheric biosignatures \leftrightarrow atmospheric technosignatures
 - In transmission
 - In reflection
 - Exoplanet/disk imaging \leftrightarrow Artificial orbital material imaging
 - DSN downlinks \leftrightarrow Ecliptic plane radio SETI



SAG Proposal

- We propose a technosignatures SAG to study:
 - which technosignature investigations should play a role in NASA's exoplanet and planetary science portfolios.
 - the most promising technosignature investigations to prioritize for funding and mission development
 - science and technology gaps relevant to technosignature searches
 - 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
 - potential new initiatives to build community and intercommunications with other astrobiology efforts