Scared of Its Shadow:
Situating UAP within the Scientific Search for Extraterrestrial Intelligence

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Let’s imagine a scenario:

An extraterrestrial spacecraft from Proxima Centauri is traveling to visit Earth

If the spacecraft is observed at the **outer Solar System…**

…then it will be classified as an **interstellar object (ISO)**

An ISO intercept mission was identified as a priority by the Planetary Science and Astrobiology Decadal Survey. Lots of interest today in studying 3I/ATLAS.

Credit: European Southern Observatory/Science Photo Library

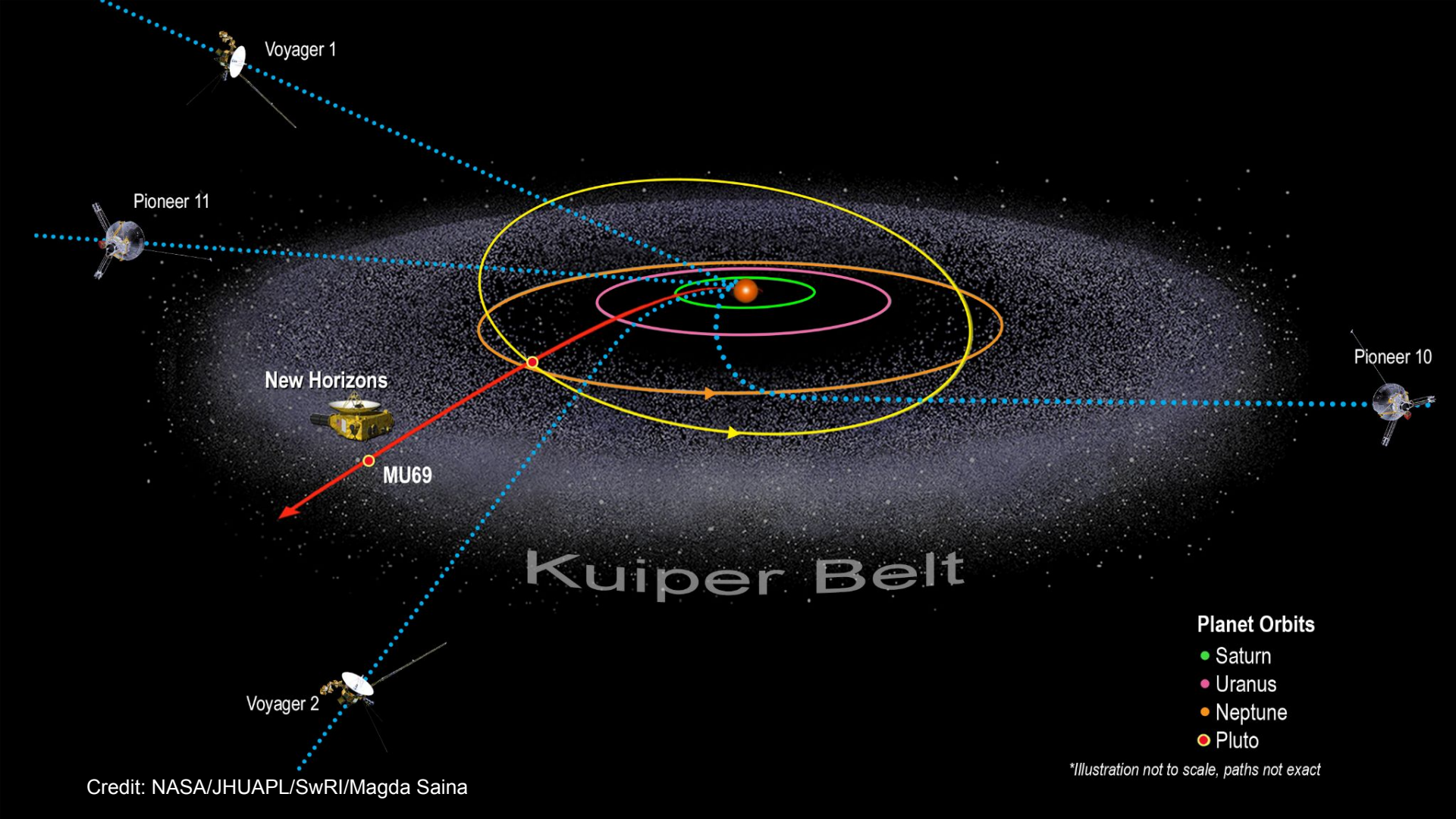
"We might better devote our efforts to scrutinizing our solar system for signs of probes sent here by our more advanced neighbors."

COMMUNICATIONS FROM SUPERIOR GALACTIC COMMUNITIES

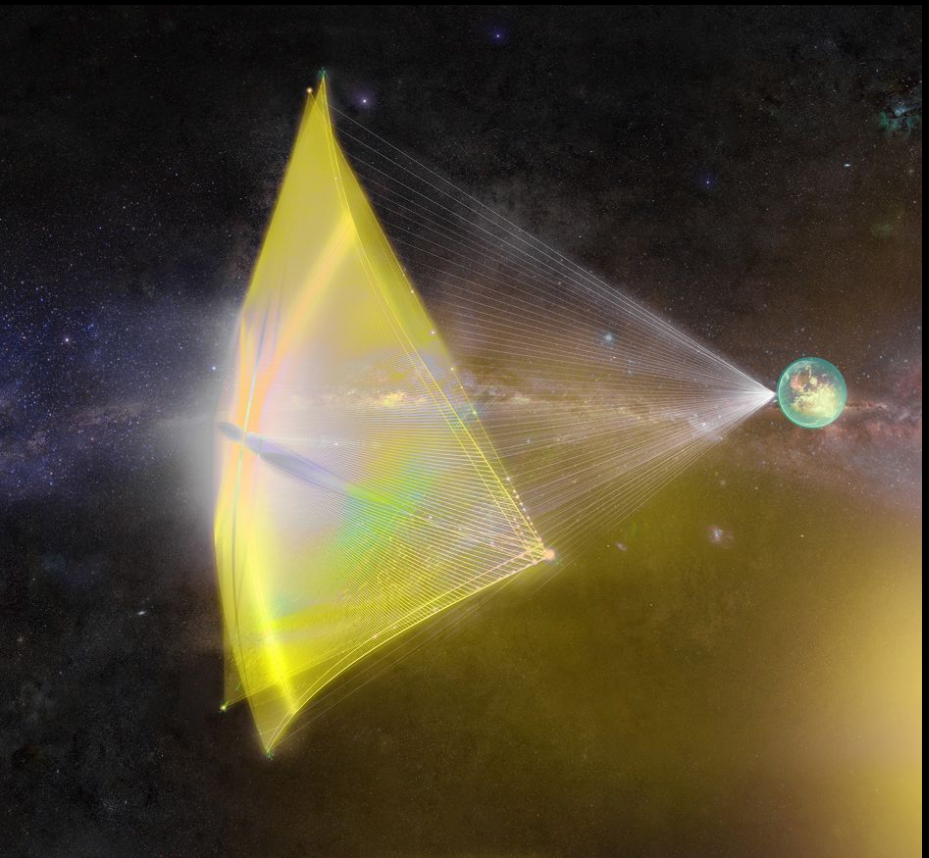
By Prof. R. N. BRACEWELL
Radioscience Laboratory, Stanford University, California

SINCE Morrison and Cocconi[1] published the suggestion that there might be advanced societies elsewhere in the Galaxy, superior to ourselves in

planetary systems. Beyond their immediate neighbourhood, it might be feasible for them to spray some number of suitable stars, say, one thousand, with


Voyager 1
Pioneer 11
New Horizons
MU69
Pioneer 10
Kuiper Belt
Voyager 2
Planet Orbits
Saturn
Uranus
Neptune
Pluto
*Illustration not to scale, paths not exact
Credit: NASA/JHUAPL/SwRI/Magda Saina

BREAKTHROUGH STARSHOT



INTERSTELLAR PROBE

Humanity's Journey to Interstellar Space

NASA Solar and Space Physics Mission Concept Study
for the Solar and Space Physics 2023-2032 Decadal Survey

December 13, 2021

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NASA TASK ORDER NNN06AA01C

Search #1: Radio Observations of ‘Oumuamua

Enriquez, J. E., Siemion, A., Lazio, T. J. W., Lebofsky, M., et al. (2018) Breakthrough Listen Observations of 1I/’Oumuamua with the GBT. *Research Notes of the American Astronomical Society* 2: 9.

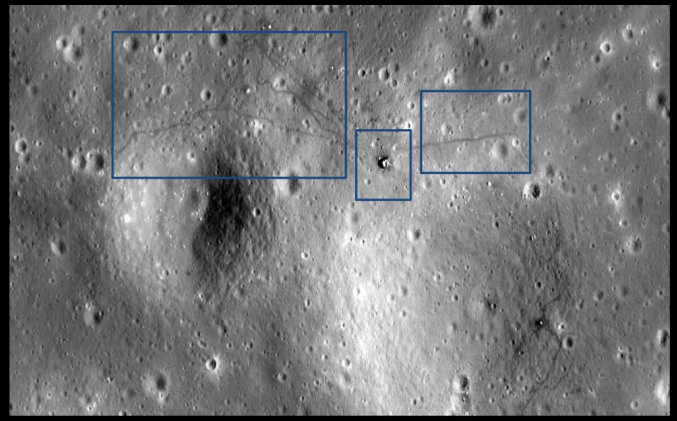
Park, R. S., Pisano, D. J., Lazio, T. J. W., Chodas, P. W., & Naidu, S. P. (2018) Search for OH 18 cm radio emission from 1I/2017 U1 with the Green Bank Telescope. *The Astronomical Journal* 155: 185.

Tingay, S. J., Kaplan, D. L., Lenc, E., Croft, S., et al. (2018) A serendipitous MWA search for narrowband signals from ‘Oumuamua. *The Astrophysical Journal* 857: 11.

Harp, G. R., Richards, J., Jenniskens, P., Shostak, S., & Tarter, J. C. (2019) Radio SETI observations of the interstellar object ‘Oumuamua. *Acta Astronautica* 155: 51-54.

Credit: European Southern Observatory/Science Photo Library

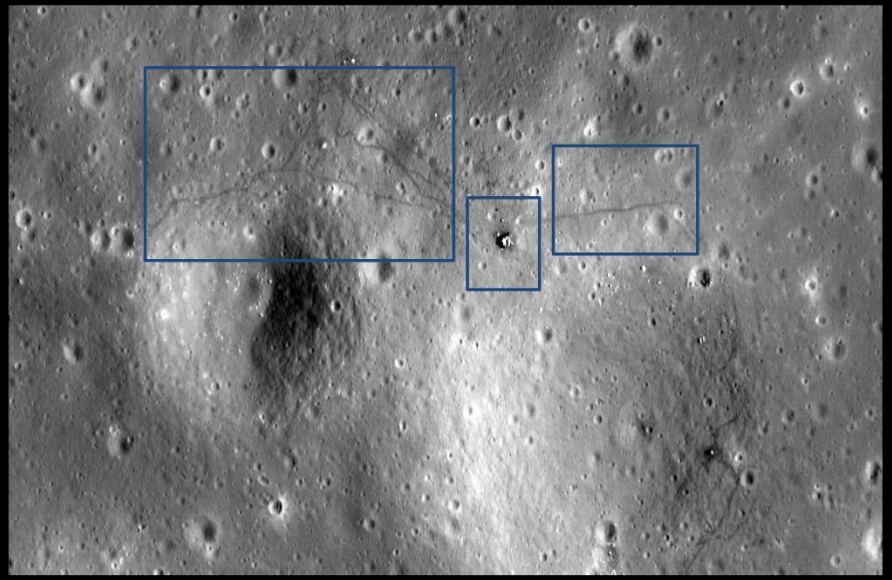
If the spacecraft is observed near or on the **lunar surface…**



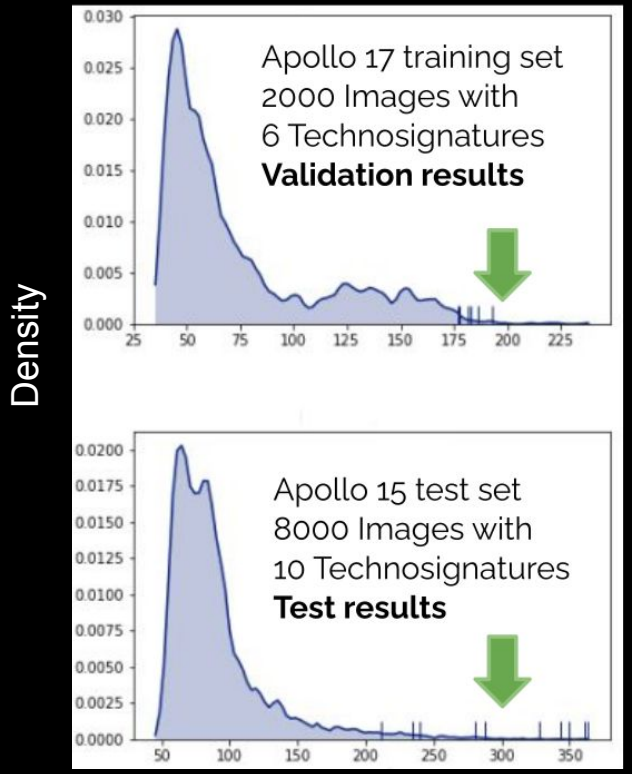
…then it will be classified as a **non-terrestrial artifact (NTA)**

Analysis of existing high-resolution images can place constraints on NTAs on the moon, Mars, and other bodies

Search #2: Image Analysis of Lunar Surface

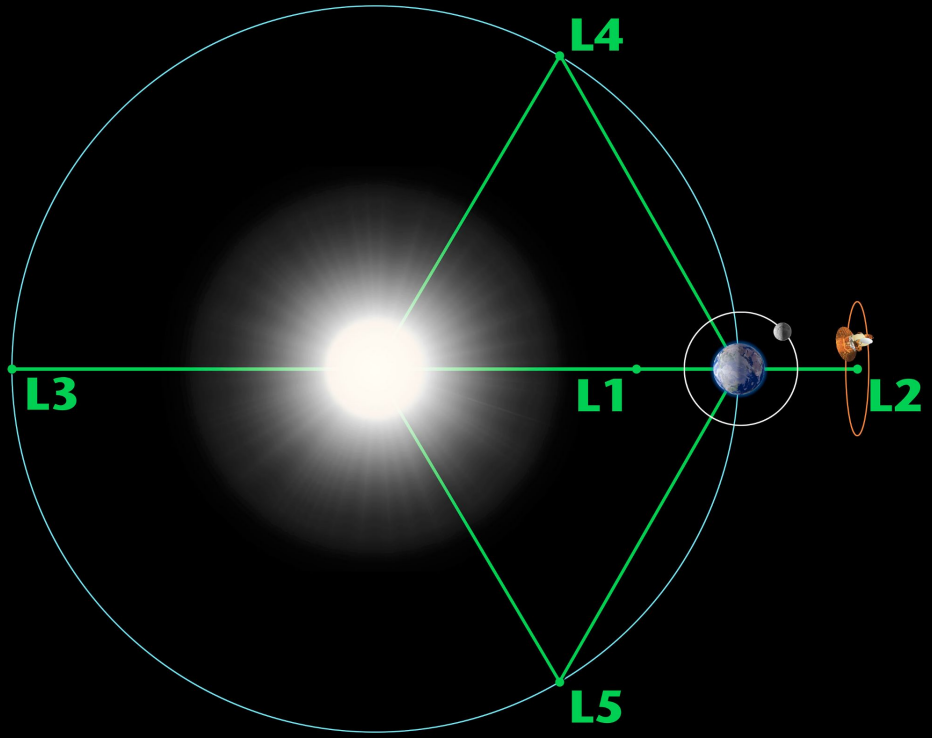


Apollo 12 Landing Site and Tracks **(NAC image)**



Lesnikowski, A., Bickel, V. T., & Angerhausen, D. (2020) Unsupervised distribution learning for lunar surface anomaly detection. arXiv:2001.04634.

Search #3: Earth-Moon Lagrangian Points

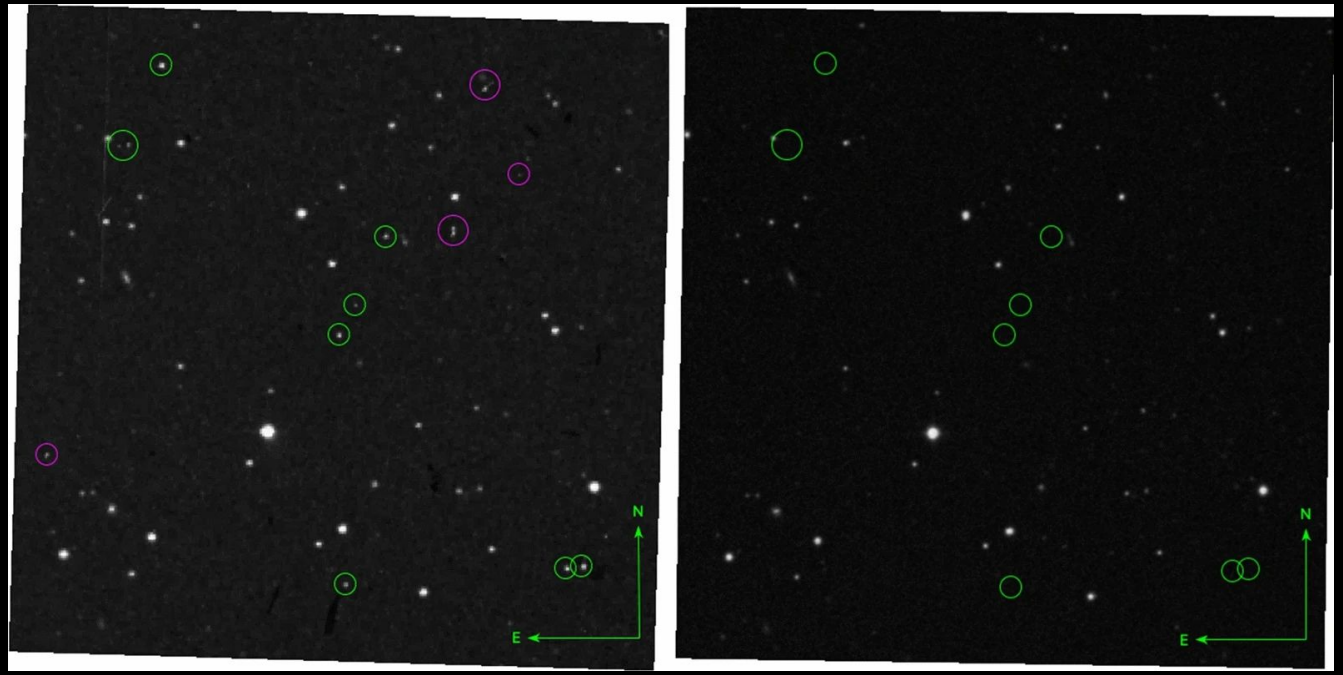


Credit: NASA / WMAP Science Team

Freitas Jr, R. A., & Valdes, F. (1980) A search for natural or artificial objects located at the Earth-Moon libration points. *Icarus* 42: 442-447.

Valdes, F., & Freitas Jr, R. A. (1983) A search for objects near the Earth-Moon lagrangian points. *Icarus* 53: 453-457.

Search #4: Transients in Photographic Plates



Villarroel, B., Marcy, G. W., Geier, S., Streblyanska, A., et al. (2021) Exploring nine simultaneously occurring transients on April 12th 1950. *Scientific Reports* 11: 1-8.

Villarroel, B., Mattsson, L., Guergouri, H., Solano, E., et al. (2022) A glint in the eye: Photographic plate archive searches for non-terrestrial artefacts. *Acta Astronautica* 194: 106-113.

But if the spacecraft is observed as it enters **Earth's atmosphere…**

…then it will be classified as **unidentified aerial phenomena (UAP) or a UFO**

Study of UAP has traditionally been considered beyond the scope of SETI science

Credit: Marco Langbroek (Starlink)

Why is SETI afraid of its shadow?

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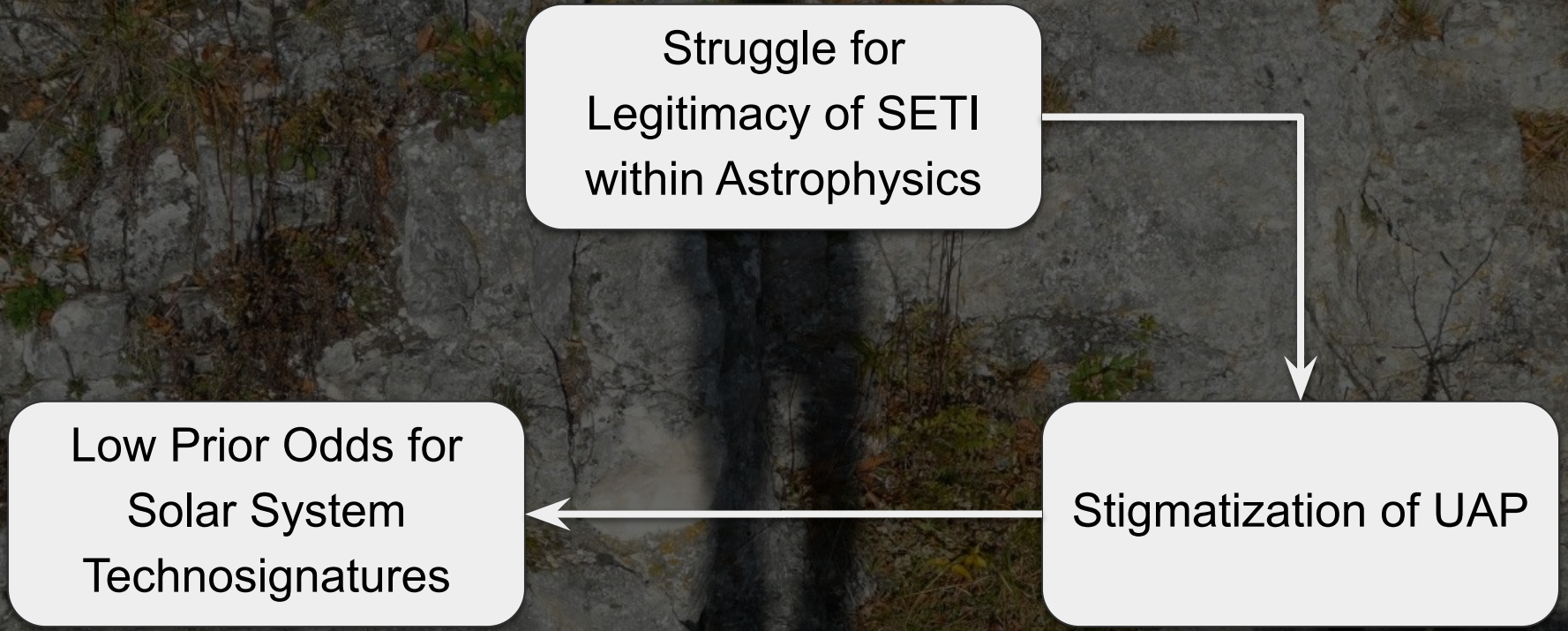
Struggle for
Legitimacy of SETI
within Astrophysics

Why is SETI afraid of its shadow?

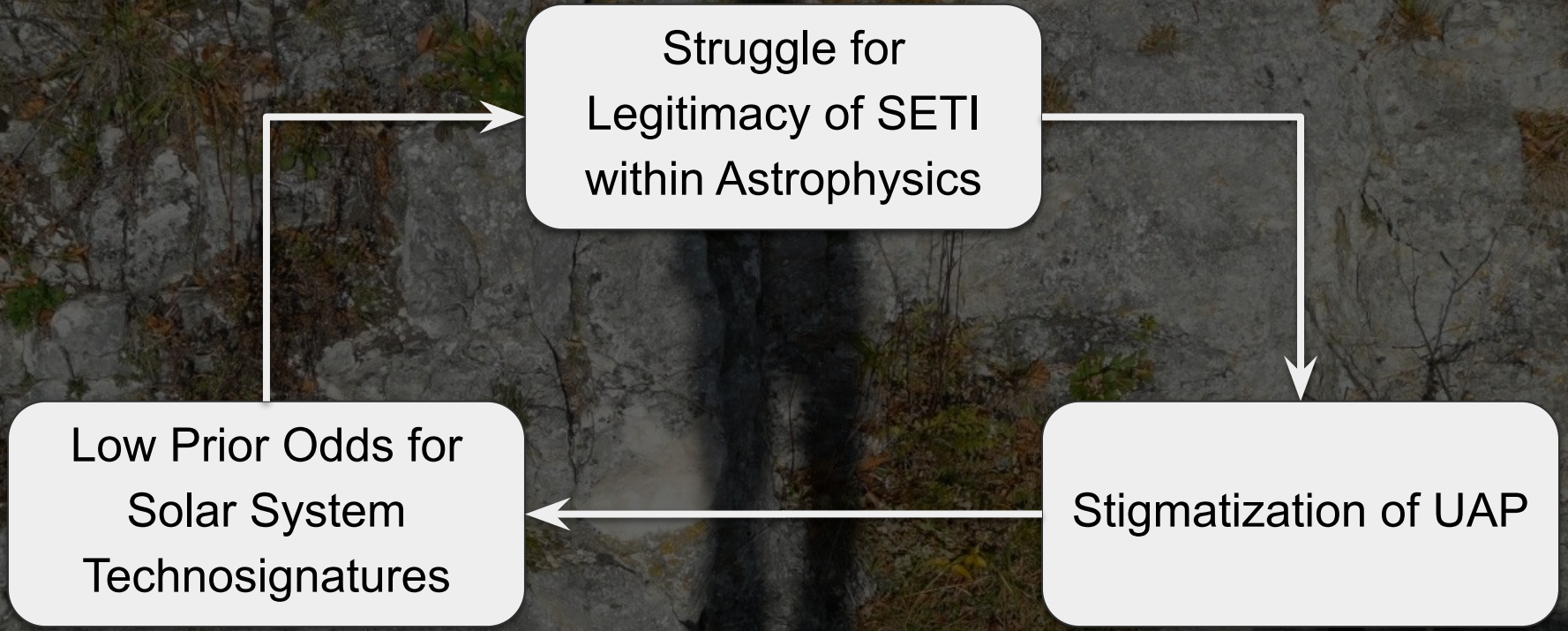
Struggle for Legitimacy of SETI within Astrophysics

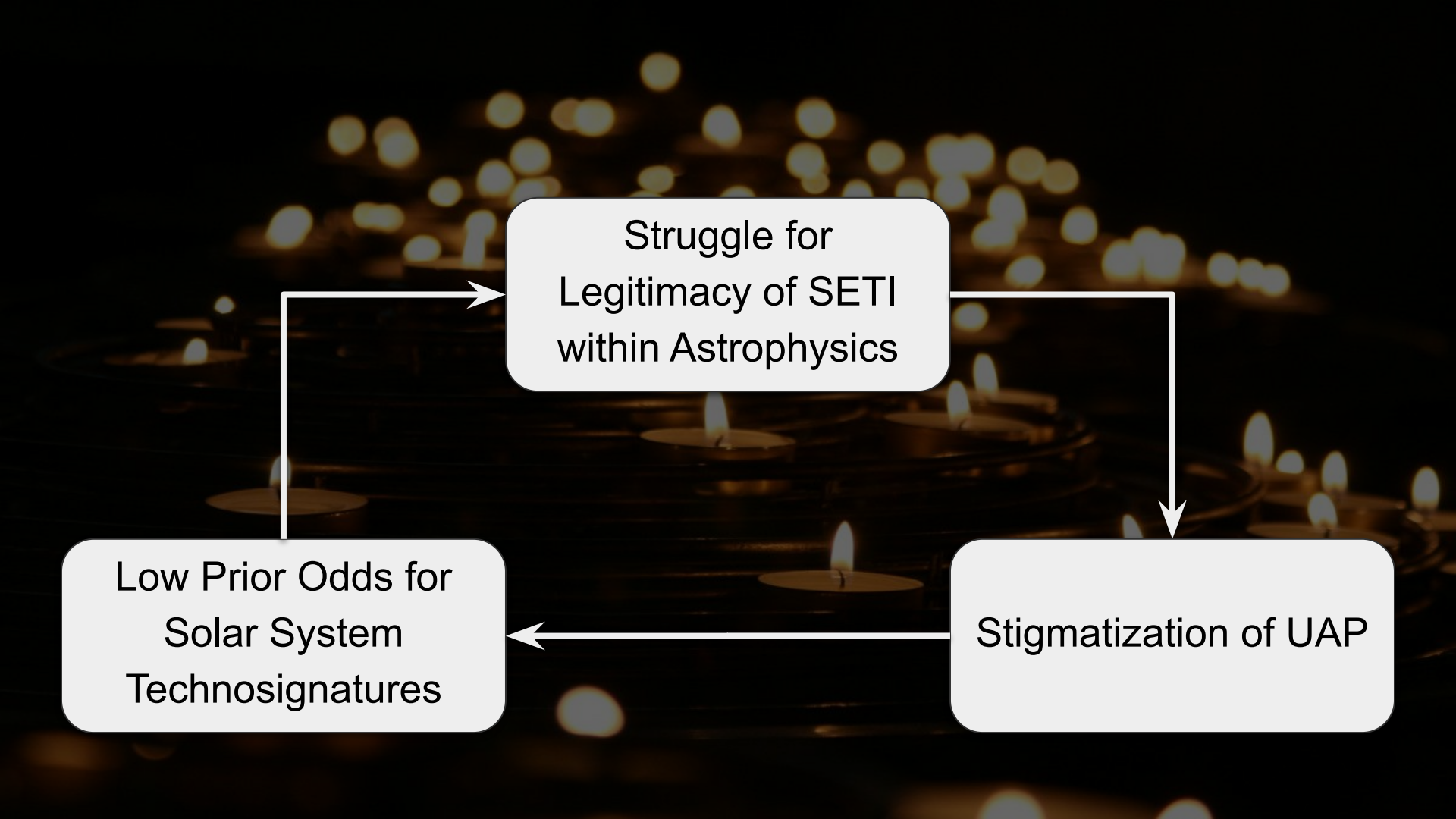
Stigmatization of UAP

Why is SETI afraid of its shadow?



Why is SETI afraid of its shadow?




Struggle for Legitimacy of SETI within Astrophysics
Stigmatization of UAP
Low Prior Odds for Solar System Technosignatures

BREAKTHROUGH LISTEN

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Acceptance of
Legitimacy of SETI
within Astrophysics

Stigmatization of UAP

Low Prior Odds for
Solar System
Technosignatures

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Acceptance of Legitimacy of SETI within Astrophysics

SOL

THE GALILEO PROJECT

Destigmatization of UAP

Low Prior Odds for Solar System Technosignatures

SCU

UAP Disclosure Fund

UAPx

BREAKTHROUGH LISTEN

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Acceptance of Legitimacy of SETI within Astrophysics

Opportunities for Technosignature Science in the Planetary Science and Astrobiology Decadal Survey

Jacob Haqq-Misra, Reza Ashtari, James Benford, Jonathan Carroll-Nellenback, Niklas A. Döbler, Wael Farah, Thomas J. Fauchez, Vishal Gajjar, David Grinspoon, Advait Huggahalli, Ravi K. Kopparapu, Joseph Lazio, George Profitiliotis, Evan L. Sneed, Savin Shynu Varghese, Clément Vidal

SOL

THE GALILEO PROJECT

Higher Prior Odds for Solar System Technosignatures

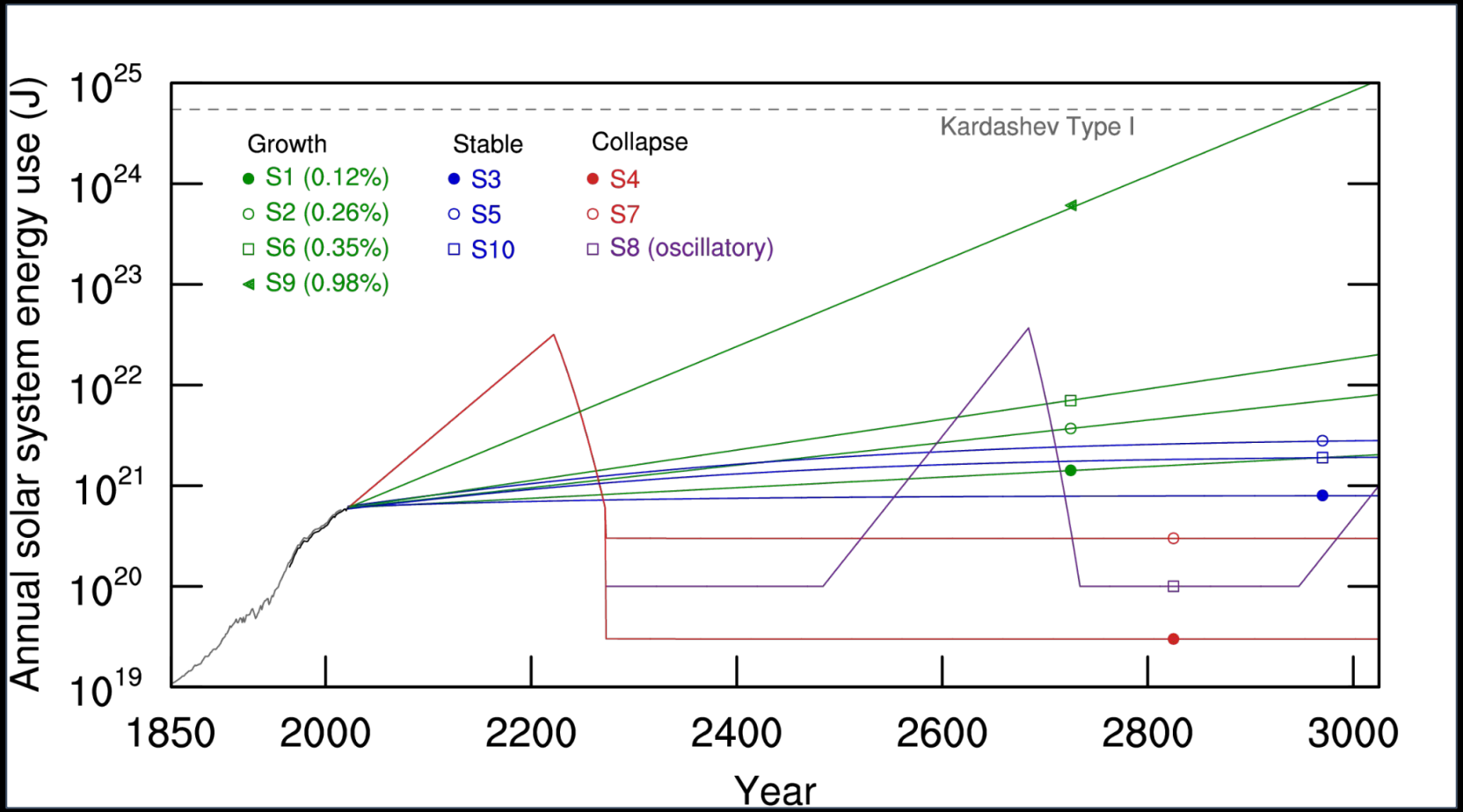
Destigmatization of UAP

SETI-situated Theoretical Framings are Needed!

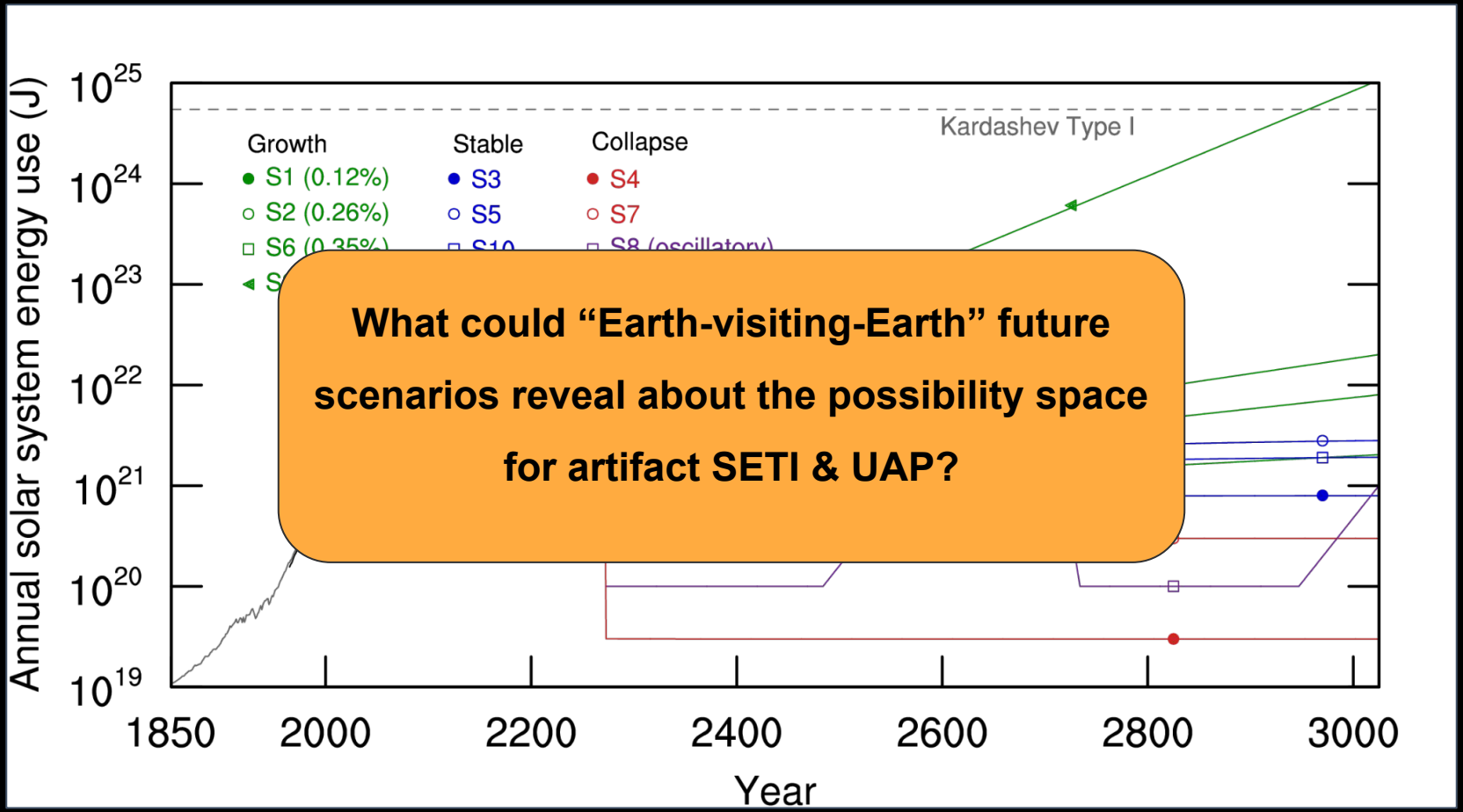
SCU

UAP Disclosure Fund

UAPx



Haqq-Misra, J., Profitiliotis, G., & Kopparapu, R.K. (2025) Projections of Earth's technosphere: Scenario modeling, worldbuilding, and overview of remotely detectable technosignatures. *Technological Forecasting & Social Change* 218: 124194.



Haqq-Misra, J., Profitiliotis, G., & Kopparapu, R.K. (2025) Projections of Earth's technosphere: Scenario modeling, worldbuilding, and overview of remotely detectable technosignatures. *Technological Forecasting & Social Change* 218: 124194.

Is Spring Around the Corner?

Conclusions

- SETI cannot run from its shadow forever
- Destigmatization of UAP will only benefit SETI
    - If no UAP are extraterrestrial, then SETI has less to search
    - If some UAP are found to be extraterrestrial, then SETI will have succeeded
- Theoretical framings that are situated within the academic SETI discourse could harmonize UAP and artifact SETI research

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