

On-line interview with:
Professor Avi Loeb
Harvard University

9.12.2021, questions by prof. Janusz Gluza, <https://us.edu.pl/institut/ifiz/rok-lema-2021/>

Extraterrestrials: The Next Copernican Revolution.

If we dare to look through new telescopes, we might find them.

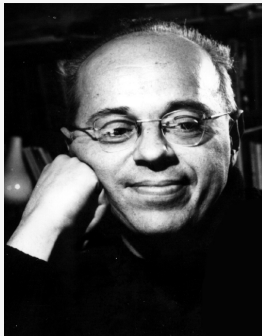


Twitter post from Galileo Project (@GalileoProject) dated 12 Sep 2021. The tweet text is: "The first religious sermon for the high holidays has kicked off with a piece on Prof. Avi Loeb's writing! Take a look! robdobrusin.com/searching-for-... @uaptwitter #ufotwitter #TheGalileoProject #Science #religion #Harvard". Below the text is a quote from robdobrusin.com: "SEARCHING FOR OTHER PATHS - Rabbi Rob Deb... I will begin this morning with a phrase from the Bosh Hashana musaf service, 'וְנִשְׁאָר לָנוּ דִּי...'. 1:27 pm · 12 Sep 2021 · Twitter Web App". The tweet also features a profile picture of Avi Loeb and a 'Follow' button for Galileo Project.

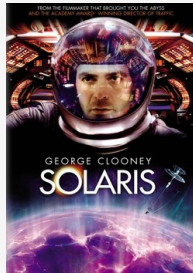
<https://lweb.cfa.harvard.edu/~loeb/> → commentaries, essays, opinions

Lem's Physics: yesterday Fiction, today Science

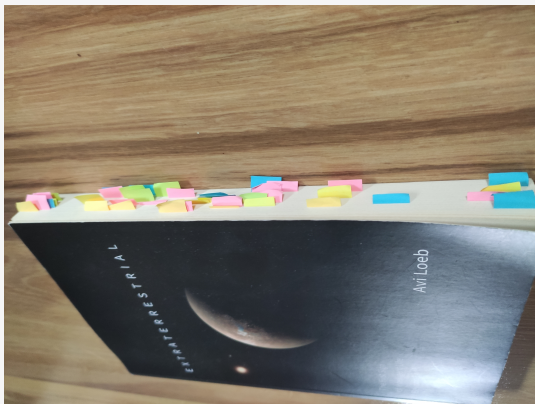
<https://us.edu.pl/institut/ifiz/rok-lema-2021/>



1921-2006



From wiki: *In 1970's Lem was the most widely read science fiction writer in the world.*



Q1: Oumuamua (in Hawaiian: scout, 'a messenger from afar arriving first')

Your Book goes around the event from 2017 when during some weeks a strangely behaving object came across our Solar system.

Q1: Can we ever be 100% sure that Oumuamua was the "the first sign of intelligent life beyond Earth"?



<https://www.eso.org/public/images/>

Interstellar Asteroid Animation (wiki)

Q2: Copernicus, Galileo, Loeb

Extraterrestrials: The Next Copernican Revolution. If we dare to look through new telescopes, we might find them.

Q2: What kind of new telescopes do you have in mind?

Are we blind and do not use our research potential properly?

https://pl.wikipedia.org/wiki/Aleksander_Wolszczan



19th-century painting depicting Galileo Galilei displaying his telescope to Leonardo Donato, Doge of Venice, in 1609 (wiki)

Gatekeepers and orthodoxy in science

<https://projects.iq.harvard.edu/galileo>

I once asked a prominent astronomer who studies objects in the Kuiper Belt—the ring of icy bodies beyond Neptune’s orbit—if he was looking for brightness changes way out there that might indicate artificial light. He scoffed at the very suggestion: “Why? There is nothing to look for.”



p. 106. Many scientists see themselves as a breed apart, members of an elite intelligentsia. Consciously or subconsciously, they want to separate themselves from the rabble. Such thinking motivates, at least in part, an argument made by many scientists I know: that scientists should communicate with the public only after they figure something out to a certainty. If laypeople knew the messy reality of science—that it’s full of starts and stops and dead ends—they’d brand every result as preliminary or questionable, the reasoning goes. Every important scientific consensus—such as the effect of human beings on Earth’s climate and the potentially disastrous consequences for us and all other life on the planet—could, some scientists fear, be summarily dismissed. This withholding strategy has the added benefit of making scientists look smarter than we actually are, and, adding to its appeal, it limits outside criticism.

But this approach is wrong.

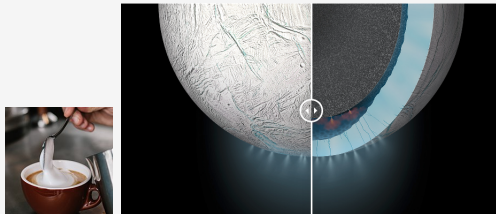
Q3: How complex is complex (life)?

Avogadro number of stars in Universe $N \sim 10^{23}$, ↗

Planets: $\sim N/2$. Now ~ 5000 exoplanets.

Q3: *Is life as we know unique?*

Panspermia <https://en.wikipedia.org/wiki/Panspermia>



<https://solarsystem.nasa.gov/missions/cassini/science/enceladus/>

Mediocrity vs anthropic principles (essay, November 2021),

<https://www.scientificamerican.com/article/when-did-life-start-in-the-universe1>

Q3: Are they similar to us?

Q3: Forms of life? Intelligence? Art? Culture?



From Beyond the Far Side, Gary Larson, 1983

Q4: Where is everybody? (Enrico Fermi)

What is our future as mankind with a doom of the **Great Filter** (Robin Hanson)?

https://en.wikipedia.org/wiki/Great_Filter <https://www.youtube.com/watch?v=aspMV6ERqpo>

Q4: How to find them?

Mediocrity vs anthropic principles (essay, November 2021),

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1. bio- and techno-signatures;
2. powerful 'candles';
3. wreckages,

https://en.wikipedia.org/wiki/Cosmic-Ray_Extremely_Distributed_Observatory



<https://medium.com/on-the-trail-of-the-saucers/searching-for-anomalies-3a1f06d03e42>

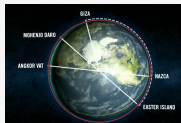
Q5: Should we afraid them?



<https://www.scientificamerican.com/article/harvard-s-avi-loeb-thinks-we-should-study-ufos-and-he-s-not-wrong/>

Q6: Or maybe, traces of extraterrestrials (aliens) on Earth?

*Q6: Is alignment of ancient monoliths accidental?
(Peru, Mexico, England, Ireland, Egypt, China, India, ...)*



Q7: What is the status of the Starshot project?



Images: ESO

Q7: Human travellers: max. speed? Risks.

<https://breakthroughinitiatives.org/> Animation: <https://youtu.be/xRFXV4Z6x8s>



Is time travel possible? → BHI <https://bhi.fas.harvard.edu/>

Q8: Can finding life elsewhere change us?

Finding equipment from an extraterrestrial technological civilization would have a major impact on the future of humanity.

in: <https://inference-review.com/letter/attention-to-anomalies>

as the response to Paul Sutter's review:

<https://inference-review.com/article/interstellar-overdrive>

Q9: Science, basic research, shaping views in society

WHAT'S THE USE OF BASIC SCIENCE?



Christopher Llewellyn Smith,
Director-General of CERN from 1994-1998

by C.H. Llewellyn Smith,
former Director-General of CERN
Original: [The use of basic science](#)

Content:

- [1. Introduction](#)
- [2. Basic versus applied science](#)
- [3. Benefits of basic science](#)
- [4. Why governments must support basic science](#)
- [5. Can it be left to others? Lessons from Japan?](#)
- [6. What science to fund](#)
- [7. Concluding remarks](#)

Video: <https://cds.cern.ch/record/388110?ln=en>

https://www-zeuthen.desy.de/~jknapp/JK/Reading_files/basic_science.html

Q9: Is it worth for individuals and humanity to study basic science?

Q10: Future of Physics

Q10: Coming back to Lem, and as an intro to the discussion panel which follows.

What is a future of Physics?

*"in this field, almost everything is
already discovered, and all that remains
is to fill a few unimportant holes"*



Philipp von Jolly
(1809-1884)

advice to the young Max Planck
not to go into physics, Munich 1878

Prophecy is hard, Albert Michelson (1894):

"It seems probable that most of the grand underlying principles have been firmly established (...) **the future truths of physical science are to be looked for in the sixth place of decimals**"

Unknown unknowns, thank you and goodbye

Extraterrestrial Life: Are We the Sharpest Cookies in the Jar?

<https://cds.cern.ch/record/2764720?ln=en>

Longer: (about Science 10 min., research 30 min., 'plumber' 32 min.)

<https://www.youtube.com/watch?v=uFrBcy0P6iM>

Q10: What would be your message to take home with 'Extraterrestrials'?

<https://lweb.cfa.harvard.edu/loeb/Photos/p1.html>



Peaceful, healthy and successful 2022! ... and 2023: <http://indico.if.us.edu.pl/event/9/overview>

<https://www.youtube.com/watch?v=Y2rDb4Ur2dw>