

TechSlam



BIG IDEAS FORUM



Where people, who are not satisfied they have learned enough, meet

June 5, 2025

Animal vocalization

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https://www.ted.com/talks/karen_bakker_could_an_orca_give_a_ted_talk?language=en



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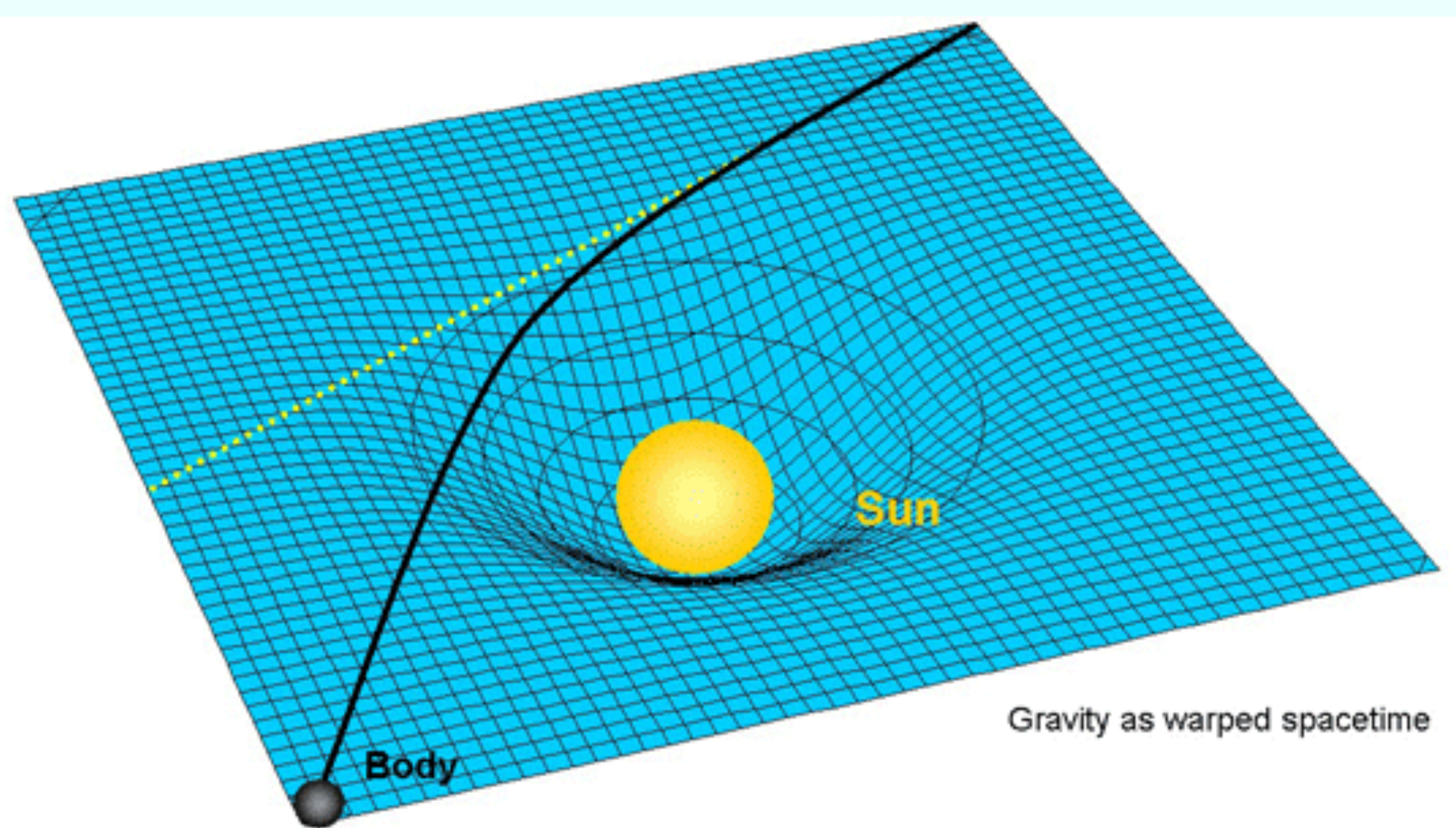
Einstein Rings/Gravitational lenses

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We get to see a background galaxy through the warped space and time of a very nearby foreground galaxy.”

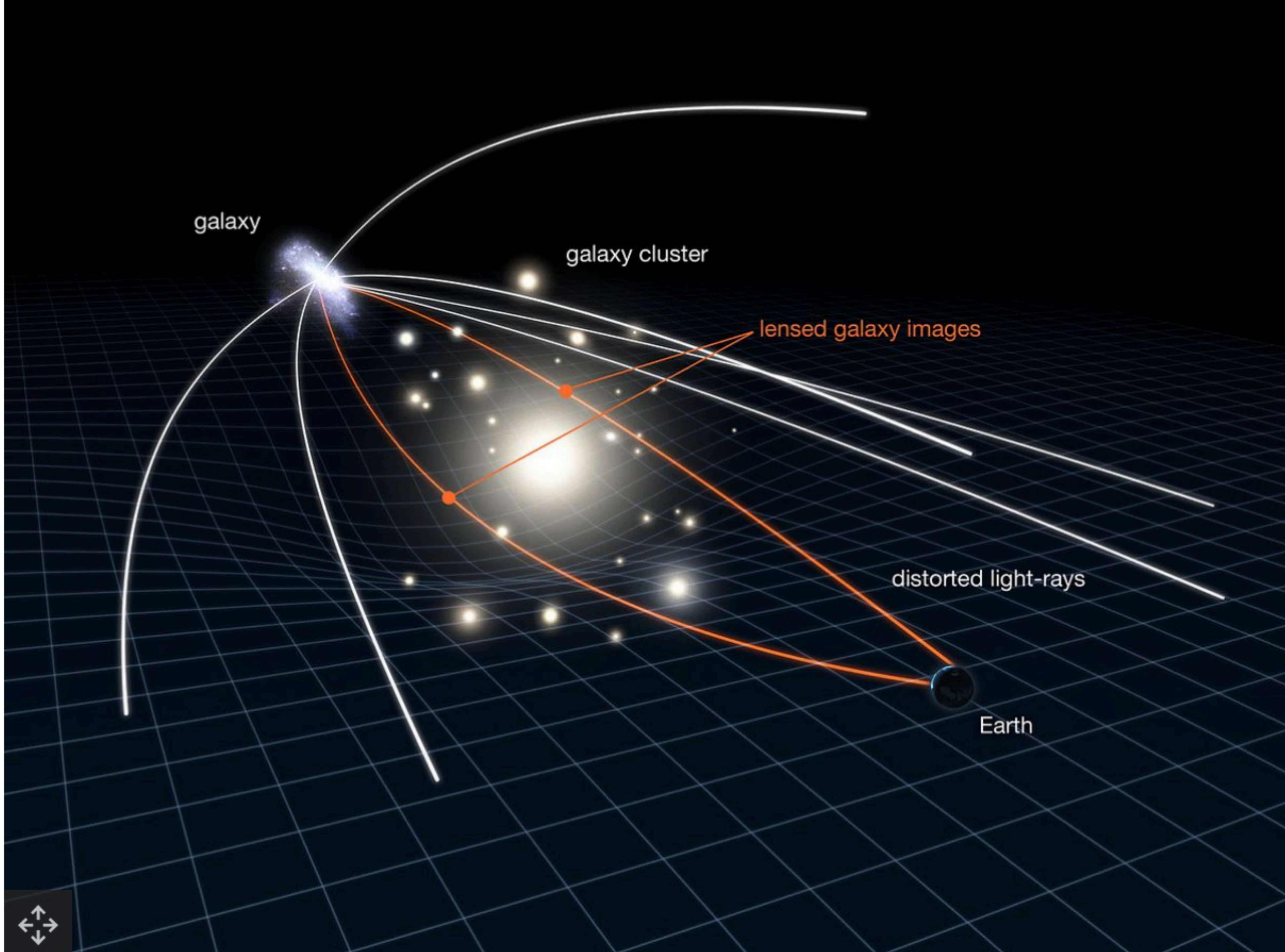


Albert Einstein's general theory of relativity predicts that light will bend around massive objects in space, meaning that galaxies can act as vast lenses.

Einstein rings are a powerful tool for astronomers because

- they reveal objects that would otherwise be obscured from view and

- indicate the mass of the intermediate galaxy, *incl.* any hidden mass in the form of dark matter.



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Grace Roman Space
Telescope, set
for launch in
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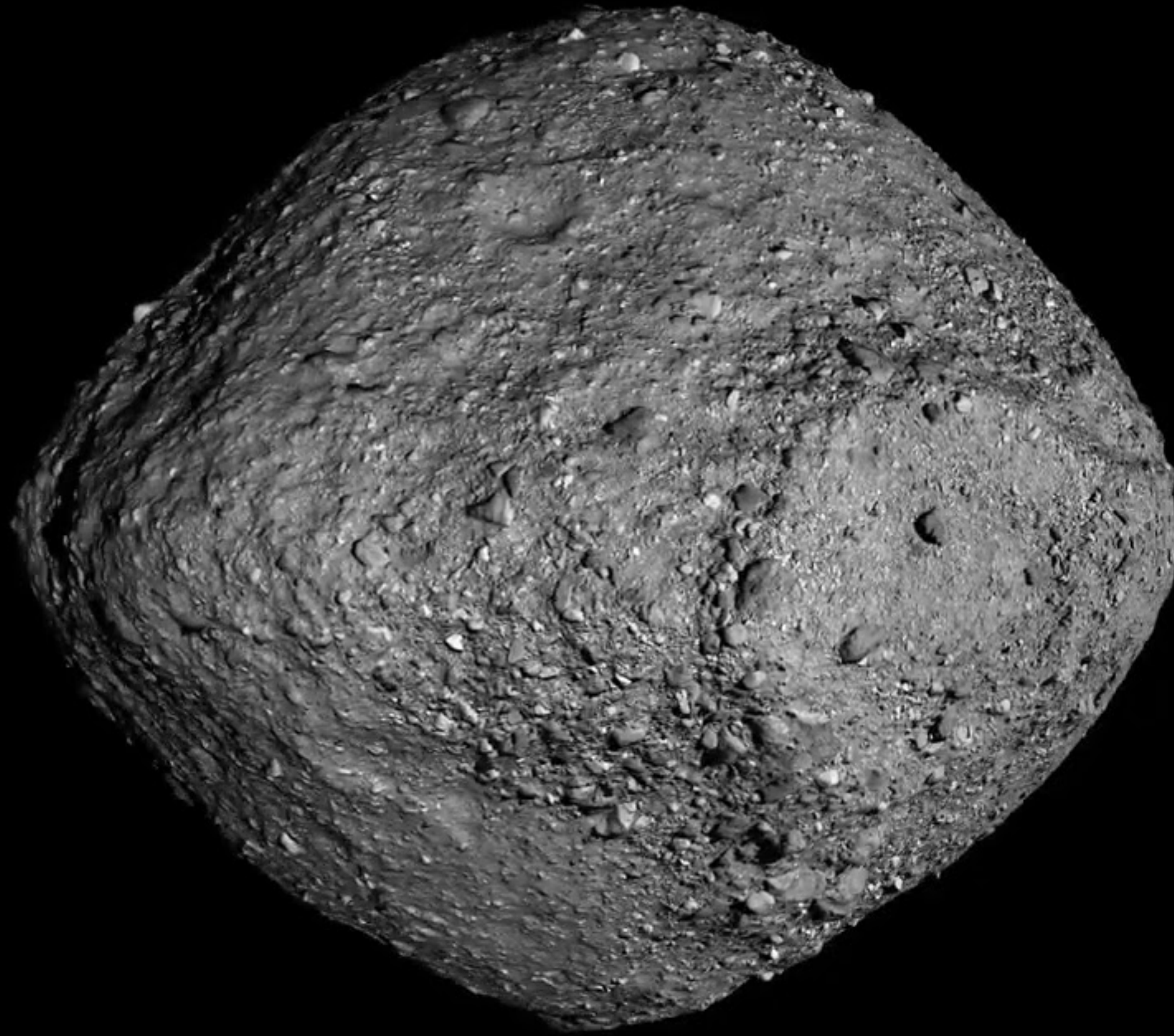


A massive galaxy cluster, Abell S1063, forms a gravitation lens, revealing the warped light from more distant galaxies dating back to the early universe in this James Webb Space Telescope image.
(Image credit: ESA/Webb, NASA & CSA, H. Atek, M. Zamani (ESA/Webb))

Astroid BENNU

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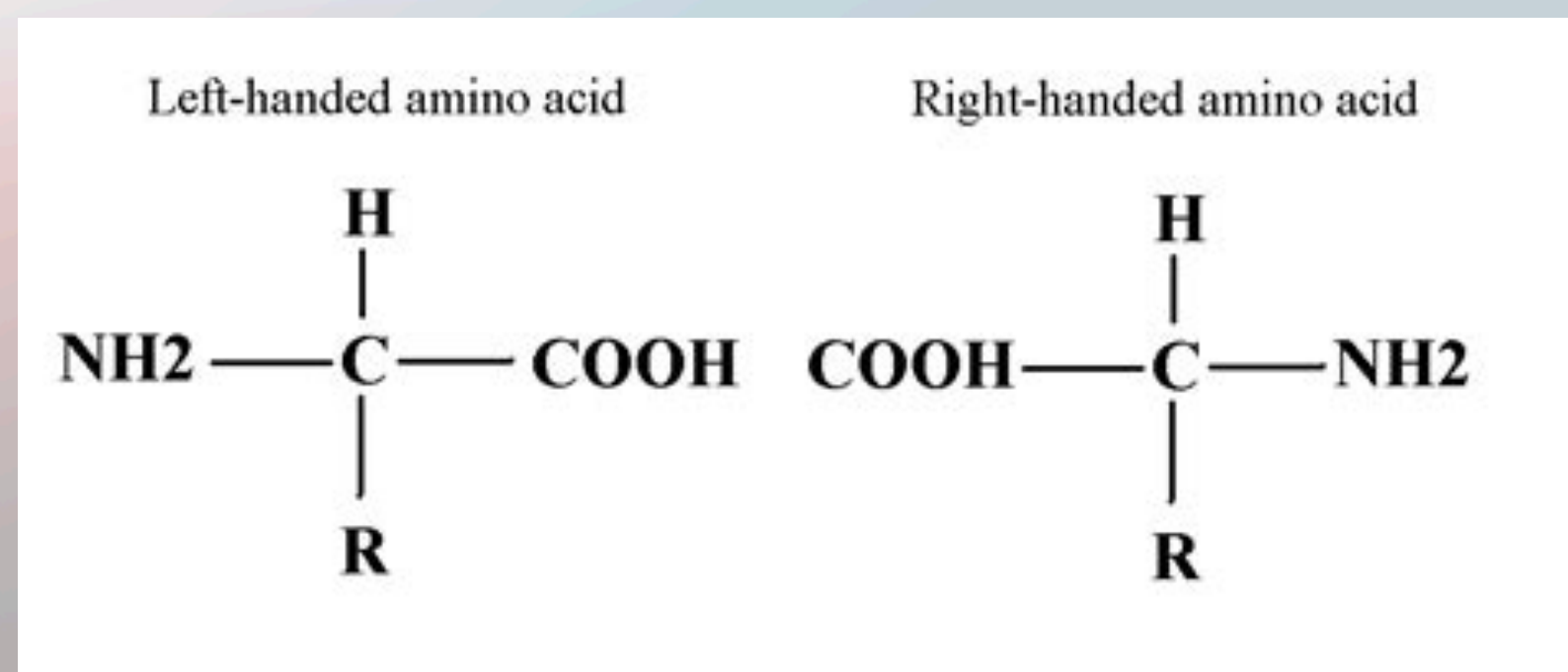
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A recent sample analysis has shown that 14 out of the 20 known amino acids that are the essential building blocks of life.

The presence of the amino acids re-introduces the question:
Could life have originated in space?

Also, the amino acids held another surprise: They were *evenly mixed* between left- and right-handed amino acids . . . On Earth, ALL naturally occurring amino acids are left-handed (why that is, is not known).



Place of amino-group (NH₂) determines L or R



Evo-1 and Evo-2 - AI & Genetics

An AI program that can model and design genetic code across all domains of life (UC Berkeley, Arc Institute, UCSF, Stanford University and NVIDIA)



Significance: Evo 2, can read, write, and think in the language of nucleotides:

- accurately predict the effects of all types of genetic mutations
- identifying disease-causing mutations in human genes
- design new genomes that are as long as the genomes of simple bacteria.

Evo-2, the largest AI model in biology to date, was built on its predecessor, Evo 1, which was trained entirely on single-cell genomes

Evo 2 is trained on over 9.3 trillion nucleotides from over 128,000 whole genomes as well as meta-genomic data.

It includes genomes from >100,000 species

- bacterial, archaeal, and phages
- plants, other single-celled species
- multi-cellular species in the eukaryotic domain of life, incl. kingdom of animals/humans

The cration of hybrid cells

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Fluorescent microscope image of the animal cells with embedded chloroplasts (magenta)

Mitochondria in animal cells convert chemical energy from food into an energy form our cells can use.

Chloroplasts in plant cells converts energy from sunlight through photosynthesis

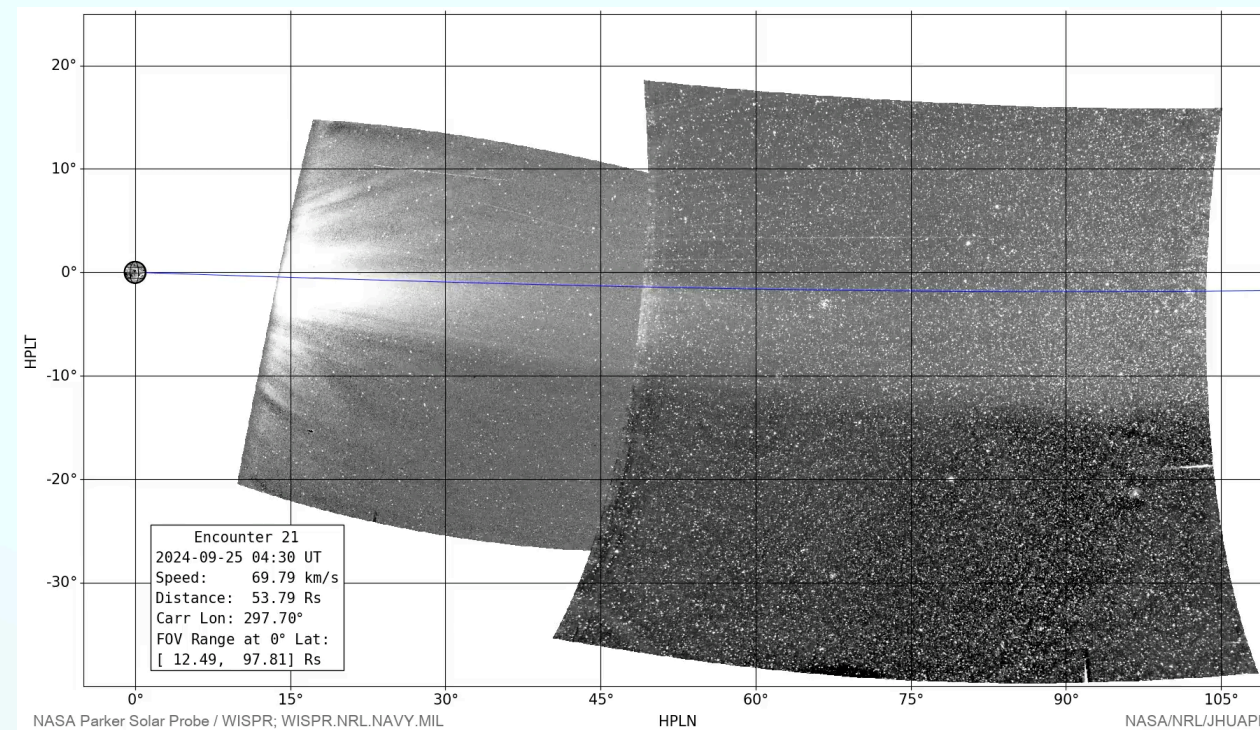
Scientists in Japan have created hybrid **plant-animal cells**, i.e. *animal cells* (hamsters) that can gain energy from sunlight by embedding them with *chloroplasts from plants* (red algae).

They verified the result by making the chloroplasts fluoresce under certain wavelengths of light.

When the team shone a specific type of laser light on the cells

The breakthrough could have major benefits for growing organs and tissues for transplant, or lab-grown meat.

The Solar system - in a way you have never seen it



<https://wispr.nrl.navy.mil/encounter21-summary>

This video shows our Solar System from inside the orbit of Mercury as recorded by NASA's Parker Solar Probe looping around the Sun.

What you see is:

- coronal streamers into the solar wind
- a small Coronal Mass Ejection
- planets (in order of appearance: Mercury, Venus, Saturn, Earth, Mars, and Jupiter) . . . in between Earth and Mars, Comet Tempel 1 appears with a distinctive tail
- streaks of high energy particles from the Sun

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Mosquito vaccination

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We know mosquitoes do a superb job of spreading diseases like malaria . . .

Now researchers have shown it's possible to hijack them and distribute vaccines via mosquito bite.

In human trials, these mozzie-borne vaccines proved around 90% effective.

Researchers modified the mosquitos and let them infect people.

About six days into the infection, the modified parasites simply stop developing in the liver and the secondary parasites do not get a chance to live in the blood stream. *But*, they release a lot of antigens, which prime the human immune system with a strong inflammatory response.

That immune response is quickly triggered next time an *unmodified*, malaria-carrying parasite shows up in a liver cell.



Full article:

<https://newatlas.com/infectious-diseases/mosquito-bite-vaccine-malaria/>