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Review

Fishing for “16 Psyche”

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Abstract: 16 Psyche is one of the most massive asteroids in the asteroid belt. This object has a diameter of over 200 km and contains about 1% of the mass of the entire asteroid belt. It is believed to be the exposed iron core of a protoplanet and is the most massive metallic M-type asteroid. It was discovered by the Italian astronomer Annibale de Gasparis on March 17, 1852, in Naples and named after the Greek mythological figure Psyche. The prefix "16" means that it was the sixteenth minor planet in the order of discovery. 16 Psyche is the most massive metallic asteroid of type M. Radar observations indicate a fair pure iron-nickel composition. For a long time, scientists have imagined the possibility of fishing for metals from asteroids, or meteorites, close to our planet. Today, those predictions may come true. NASA is going to build a robot, called "Psyche", which will have the mission to explore an asteroid in the main asteroid belt between Mars and Jupiter. The asteroid "16 Psyche" has a diameter of 226 kilometers and is made of metals such as iron, nickel and gold. The metals that make up this unique asteroid could be worth more than $ 10 trillion. Radar observations indicate that Psyche has a dense and mostly metallic composition, consistent with one of the highest radar albedos in the asteroid belt (0.37±0.09). The psyche appears to have a surface that is 90% metallic and 10% silicate rock, with 6±1% orthopyroxene. Scientists believe that these metals can be mostly iron and nickel. NASA's infrared telescope installation at Mauna Kea Observatories reported evidence (~ 3 μm absorption characteristics) of hydroxyl ions on the asteroid in October 2016 that could suggest water ice. Because the psyche is believed to have formed in dry conditions without the presence of water, hydroxyl could have reached the psyche through previous impacts of low-carbon asteroids. The psyche appears to be an exposed metal core or a fragment of a metal core in a larger differentiated parent body, about 500 kilometers in diameter. If the Psyche is really one, there could be other asteroids in similar orbits. However, Psyche is not part of any identified asteroid family. One hypothesis is that the collision that formed the Psyche occurred very early in the history of the Solar System and all other remains were transformed into fragments by subsequent collisions or had their orbits beyond recognition. However, this scenario is considered to have a probability of only 1%. An alternative is that the psyche has been broken by impacts, but not catastrophically. In this case, it may be a candidate for the parent body of mesoseiderites (a class of meteorites with stony stones). Another possibility is that the Psyche is the end of the various relic bodies left by the formation of the inner planet. The asteroid's mantle may have been stripped not of a single collision, but of multiple (> 3) relatively slow side collisions with bodies of comparable or larger size. What is left is a metal core covered by a thin layer of silicates, which is revealed spectrally. In such a case, the Psyche would be analogous to Mercury, but much less massive.

Keywords: NASA, 16 Psyche, Asteroid, Resources

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Introduction

Extraterrestrial life (or life in outer space) is a hypothesis that in the Universe there could be life whose natural environment is not Earth. This concept refers to any type or form of life, from the simplest biological systems (e.g., viruses and prokaryotes) to the most complex life forms with their own intelligence and social organization.

However, the existence of life outside the Earth would have been 95% proven in 2013 by a team of British researchers from the Department of Molecular Biology and Biotechnology at the University of Sheffield (Sagan, 1985).

The age of the Universe, huge, as well as the enormous number of stellar systems, suggest that if the Earth were a model of celestial bodies with generally valid life, then extraterrestrial life should be encountered in the Universe quite often. There is also an obvious contradiction between the probability of the existence of extraterrestrial civilizations in the Universe, probability estimated to be small but real and the lack of contacts with such civilizations or other evidence of their existence, a contradiction called Fermi's paradox.

The stars are too hot to house life phenomena. But because the Milky Way alone probably contains billions of planets, scientists assume that extraterrestrial life exists. As of August 1, 2014, more than 1,800 exoplanets had already been discovered, but all of them are too far from Earth and therefore too difficult to investigate for the existence of life forms.

Minimum conditions for the existence of life on an alien planet are:

- Energy (present for example through the relatively hot phenomena on Enceladus)
- Molecules containing carbon (organic substances), the water

Many of the planets already discovered or suspected orbit a binary or multiple solar systems; in these cases, their trajectories are very complicated geometric curves, which approach and depart from the respective Suns at large. That is why on these planets there are large variations in temperature, which practically exclude the existence of life. In other words, an additional condition is that the planet revolves around a single central star (as is the case with the Earth around the Sun).

Within our solar system are known several celestial bodies that meet the minimum conditions necessary for the appearance of life:

- Enceladus - a satellite of the planet Saturn
- Mars
- Europe - a satellite of the planet Jupiter
- Titan - a satellite of the planet Saturn

On November 26, 2011, the US space agency NASA launched the Mars Science Laboratory (MSL) space mission to Mars, whose main purpose is to investigate in detail whether life exists or has existed there.

There are several methane lakes on Titan. This is the simplest organic compound. Methane has been thought to be produced artificially by man (or possibly by another intelligent being) or naturally by fermenting plant or animal waste - see also methanogenesis. In reality, hydrocarbons exist throughout the universe in very large quantities and their genesis seems to have other origins (Petrescu, 2020).

The first contact between humanity and an alien civilization may be beneficial, but it will most likely be dangerous, shocking and result in our destruction. Astrobiology Professor Charles Cockell of the University of Edinburgh believes that autotrophic beings are generally not intelligent. This is because collecting sunlight (stellar) is a great way to gather energy, yet never gather enough energy for a creature to become intelligent. This means that an extraterrestrial being that has reached interstellar travel technology must necessarily be a predator: Only the consumption of other beings can provide the energy needed for a highly developed brain. Charles Cockell believes that it is not obligatory as a civilization, just because it can travel through space, it should also be altruistic. Mankind, for example, has successfully placed spacecraft on the frozen Titan satellite and yet we have wars and murders every day. Technological progress does not go hand in hand with altruism and a supposed extraterrestrial civilization may be quite dangerous. Stephen Hawking agrees, believing that we should be afraid of aliens, who are likely to come to Earth in search of resources and be put to our destruction. After the Mantell Case, historian David Michael Jacobs concludes about the UFO phenomenon: "They could be not only aliens but also potentially hostile to us."

Physicist Michio Kaku of City College in New York believes that Hollywood has "washed" people's brains with movies in which extraterrestrial superior forces are defeated by the underdeveloped resistance of the Earth, a kind of titanic battle between David and Goliath. He thinks more than likely that some kind of fight will break out between Bambi and Godzilla.

American astronomer Seth Shostak does not believe that these scenarios in the movies are plausible, it would make no sense for an advanced civilization to come to Earth in search of resources or to do an unauthorized reproduction experiment. This is because space travel is expensive and requires a huge investment and they would use very advanced robotic cars instead of coming themselves. The resources they would need and produce on their own or find closer to their mother planet.

Albert Harrison, professor emeritus of psychology at the University of California, Davis, believed that a very advanced civilization could teach mankind things like a

theory of all things in physics, how to use zero-point energy or how to travel faster than light.

Even if an ancient and advanced extraterrestrial civilization wanted to help humanity, humans could have suffered a loss of identity and trust due to the technological and cultural development of extraterrestrial civilization. However, a friendly civilization can calibrate its contact with humanity so as to minimize unwanted consequences. Michael AG Michaud suggests that a friendly and advanced extraterrestrial civilization can even avoid any contact with an emerging intelligent species, such as humanity, to ensure that less advanced civilization can develop naturally at its own pace. known as the zoo hypothesis.

Physicists classify hypothetical extraterrestrial civilizations into three classes:

- Type I - extraterrestrial civilizations that would use all the energy resources of the planet on which they appeared. These civilizations, for example, exploit volcanoes and hurricanes
- Type II - which would use 10 billion times more energy than type I - by capturing it from the parent star. These civilizations exploit the stars
- Type III - which would use the energy of entire galaxies

On this scale, humanity has long remained of the "zero" type; that's why she can be instantly annihilated at the first contact, concludes Michio Kaku (Alien life, From Wikipedia).

SETI is an acronym for Search for Extra-Terrestrial Intelligence. It is about searching the cosmos for signals that could come from developed, intelligent extraterrestrial civilizations. There is also an international research institute in this field, called SETI Institute. SETI uses radio telescopes to search for narrowband bandwidth radio signals. These signals are not known to occur naturally, therefore their detection can provide evidence of extraterrestrial technology.

In the Solar System, even if there were primitive extraterrestrial life, intelligent extraterrestrial life does not exist. It must be sought in much larger areas of the cosmos.

Since 1960, several scientific programs have been launched to search for it, including searches for signals in the field of radio in the spectrum of electromagnetic waves.

For interstellar travel, which is so common in science fiction novels, it is far too early for mankind, the difficulties of such a journey are still invincible, the main cause being the overwhelming distances between Earth and other planets (exoplanets) and time necessary, corresponding to the distance.

Instead, astronomers are already researching the sky with radio telescopes, hoping that one day they will receive signals from a civilization on a distant planet, somewhere in the universe. This hope requires that distant civilization in turn have systems for the production and transmission of radio signals over long distances. In addition, it is necessary for that civilization to be in a stage of development and social organization somewhat appropriate to ours, so there is a need for a coincidence in time, which is also very unlikely.

However, even the research conducted here on Earth is not simple, again because of the vast expanses of the universe and galaxies. Our galaxy, the Milky Way alone, contains over 100 billion stars and has a diameter of about 100,000 light-years. Other galaxies contain even more distant stars. A small percentage of these stars could have planets with life-friendly physical conditions. However, in order to find a still totally unknown signal, coming from somewhere in the cosmos, it is undoubtedly necessary techniques, but also very sophisticated search strategies. To this day (2011) it is still not possible to even estimate the number of possible civilizations in the Milky Way with which human civilization could come into contact in the future. In addition, it is not possible to appreciate how long the search will take: Decades, millennia, or maybe even millions of years?

Planetary reserves are beginning to run out as consumption grows rapidly, with the development of planetary economies and the growth of our planet's population. For this reason, the problem of finding new planetary resources was desperately raised. A more normal method of resolving this anticipated crisis would be the conquest of outer space by mankind followed by our extension into outer space, but today we are a little behind with these desires, the necessary programs being only in the early stages. It is quite difficult to quickly build a strong, fast stellar fleet, able to ensure our extension in outer space when money is spent primarily on a small part of the population of the extremely rich planet that still wants to be even richer, for pointless arming, or on many useless projects. Medicine, the development of humanity, the greening of the planet we live on so that we can maintain it, our expansion as humanity, are less important desires for the great concerns and therefore also for the vast majority of the world's politicians. In the current conditions, it was necessary to endure several major planetary crises, followed by land wars, which automatically led to the depletion of the planet's population and a momentary slowdown in growth, which they also partially achieved and by the various pandemic. Fortunately, today the planet's energy problem is much better managed, primarily due to better management of classical resources, which in this way has enough time to recover (Petrescu, 2020).

A major improvement in the energy situation of the planet has occurred in large part due to new energy developed, nuclear, wind, solar, tidal, geothermal, bio, cogeneration... Today, when the fusion nuclear energy, clean energy indefinitely, it is almost ready to be achieved

on an industrial scale, we are a little calmer in terms of energy. In addition, energy is already obtained from hydrogen by various methods and hydrogen is already obtained by decomposing water, by new methods, which require less energy to perform this process, methods reminiscent of photovoltaic processes performed by plants.

Clothing and footwear, as well as various materials, are produced today from oil and gas, given that oil is regenerating, as well as natural gas, which in addition have been discovered in massive additional quantities at great depths and today are already extracted through modern technologies.

Medicine takes precedence, without waiting for major sponsorships and today many diseases considered incurable in the past can be cured by modern methods. As an alternative method of support, recycling of metals, wood and paper, plastic, sometimes the glass is practiced all over the planet and this is a very good job that must continue much longer, based on the principle, "we used them, I no longer throw them to pollute nature but I recycle and thus save on raw materials" (Sagan, 1985; Rulkov *et al*., 2016; Agarwala, 2016; Babayemi, 2016; Gusti, 2016; Mohamed *et al*., 2016; Wessels and Raad, 2016; Rajput *et al*., 2016; Rea and Ottaviano, 2016; Zurfi and Zhang, 2016a; 2016b; Zheng and Li, 2016; Buonomano *et al*., 2016a; 2016b; Faizal *et al*., 2016; Ascione *et al*., 2016; Elmeddahi *et al*., 2016; Calise *et al*., 2016; Morse *et al*., 2016; Abouobaida, 2016; Rohit and Dixit, 2016; Kazakov *et al*., 2016; Alwetaishi, 2016; Riccio *et al*., 2016a; 2016b; Iqbal, 2016; Hasan and El-Naas, 2016; Al-Hasan and Al-Ghamdi, 2016; Jiang *et al*., 2016; Sepúlveda, 2016; Martins *et al*., 2016; Pisello *et al*., 2016; Jarahi, 2016; Mondal *et al*., 2016; Mansour, 2016; Al Qadi *et al*., 2016b; Campo *et al*., 2016; Samantaray *et al*., 2016; Malomar *et al*., 2016; Rich and Badar, 2016; Hirun, 2016; Bucinell, 2016; Nabilou, 2016; Barone *et al*., 2016; Chisari and Bedon, 2016; Bedon and Louter, 2016; dos Santos and Bedon, 2016; Minghini *et al*., 2016; Bedon, 2016; Jafari *et al*., 2016; Chiozzi *et al*., 2016; Orlando and Benvenuti, 2016; Wang and Yagi, 2016; Obaiys *et al*., 2016; Ahmed *et al*., 2016; Jauhari *et al*., 2016; Syahrullah and Sinaga, 2016; Shanmugam, 2016; Jaber and Bicker, 2016; Wang *et al*., 2016; Moubarek and Gharsallah, 2016; Amani, 2016; Shruti, 2016; Pérez-de León *et al*., 2016; Mohseni and Tsavdaridis, 2016; Abu-Lebdeh *et al*., 2016; Serebrennikov *et al*., 2016; Budak *et al*., 2016; Augustine *et al*., 2016; Jarahi and Seifilaleh, 2016; Nabilou *et al*., 2016; You *et al*., 2016; AL Qadi *et al*., 2016a; Rama *et al*., 2016; Sallami *et al*., 2016; Huang *et al*., 2016; Ali *et al*., 2016; Kamble and Kumar, 2016; Saikia and Karak, 2016; Zeferino *et al*., 2016; Pravettoni *et al*., 2016; Bedon and Amadio, 2016; Chen and Xu, 2016; Mavukkandy *et al*., 2016; Yeargin *et al*., 2016; Madani and Dababneh, 2016; Alhasanat *et al*., 2016; Elliott *et al*., 2016; Suarez *et al*., 2016; Kuli *et al*., 2016; Waters *et al*., 2016; Montgomery *et al*., 2016; Lamarre *et al*., 2016; Petrescu, 2012b; Aversa *et al*., 2017a; 2017b; 2016a; 2016b; 2016c; 2016d; 2016e; 2016f; 2016g; 2016h; 2016i; 2016j; 2016k; 2016l; 2016m; 2016n; 2016o; Petrescu and Petrescu, 2016; 2015a; 2015b; 2015c; 2015d; 2015e; 2014a; 2014b; 2014c; 2014d; 2014e; 2014f; 2014g; 2014h; 2014i; 2013a; 2013b; 2013c; 2013d; 2013e; 2013f; 2013g; 2012; 2011; 2005a; 2005b; 2005c; 2005d; 2005e; 2003; 2002a; 2002b; 2000a; 2000b; 1997a; 1997b; 1997c; 1995a; 1995b; Petrescu, 2018; 2015a; 2015b; 2012a; Petrescu *et al*., 2016; 2017a; 2017b; 2017c; 2017d; 2018a; 2018b; 2018c; 2018d; Petrescu and Calautit, 2016a; 2016b; Daud *et al*., 2008; Taher *et al*., 2008; Zulkifli *et al*., 2008; Pourmahmoud, 2008; Pannirselvam *et al*., 2008; Ng *et al*., 2008; El-Tous, 2008; Akhesmeh *et al*., 2008; Nachiengtai *et al*., 2008; Moezi *et al*., 2008; Boucetta, 2008; Darabi *et al*., 2008; Semin and Bakar, 2008; Al-Abbas, 2009; Abdullah *et al*., 2009; Abu-Ein, 2009; Opafunso *et al*., 2009; Semin *et al*., 2009a; 2009b; 2009c; Zulkifli *et al*., 2009; Ab-Rahman *et al*., 2009; Abdullah and Halim, 2009; Zotos and Costopoulos, 2009; Feraga *et al*., 2009; Bakar *et al*., 2009; Cardu *et al*., 2009; Bolonkin, 2009a; 2009b; Nandhakumar *et al*., 2009; Odeh *et al*., 2009; Lubis *et al*., 2009; Fathallah and Bakar, 2009; Marghany and Hashim, 2009; Kwon *et al*., 2010; Aly and Abuelnasr, 2010; Farahani *et al*., 2010; Ahmed *et al*., 2010; Kunanoppadon, 2010; Helmy and El-Taweel, 2010; Qutbodin, 2010; Pattanasethanon, 2010; Fen *et al*., 2011; Thongwan *et al*., 2011; Theansuwan *et al*., 2011; Al Smadi, 2011; Tourab *et al*., 2011; Raptis *et al*., 2011; Momani *et al*., 2011; Ismail *et al*., 2011; Anizan *et al*., 2011; Tsolakis and Raptis, 2011; Abdullah *et al*., 2011; Kechiche *et al*., 2011; Ho *et al*., 2011; Rajbhandari *et al*., 2011; Aleksic and Lovric, 2011; Kaewnai and Wongwises, 2011; Darwazeh and Ahmed, 2011; Ebrahim *et al*., 2012; Abdelkrim *et al*., 2012; Mohan *et al*., 2012; Abam *et al*., 2012; Hassan *et al*., 2012; Jalil and Sampe, 2013; Jaoude and El-Tawil, 2013; Ali and Shumaker, 2013; Zhao, 2013; El-Labban *et al*., 2013; Djalel *et al*., 2013; Nahas and Kozaitis, 2014).

Materials and Methods

A major problem that still plagues our planet is the massive need for metals, heavy, light, special, rare, precious, alloys, which are increasingly needed, while planetary surface resources are increasingly limited.

Given the declining planetary resources and increasing their consumption, at least some of them could be brought from outside the planet, such as metals or diamonds, so as not we try to find them or supplements in the depths of the earth, so as not to disturb the balance of our planet.

The attempt to dig deeper into the earth's crust, embarking on a journey to the depths, in search of new metals and other deposits, has failed, being even more

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difficult today than a journey through outer space, an underwater, one in space, or one to a nano size world. For this reason, scientists have recently remembered about an older idea of trying to bring metals from outer space, where they exist in massive quantities, especially since some sources (asteroids) are quite close and today we already have very fast ships capable to realizes of such a brave and daring enterprise.

Astronomers created icon-like symbols for the first fifteen asteroids to be discovered, as a type of shorthand notation consistent with older notation for the classical planets. Psyche was given an iconic symbol, as were a few other asteroids discovered after 16 Psyche. The symbol 16 Psyche, a semicircle topped by a star, represents a butterfly's wing, a symbol of the soul (psyche is the Greek word for "soul") and a star.

However, the iconic symbols for all asteroids were superseded and Psyche's symbol never came into use. With more than a dozen asteroids discovered, remembering all their individual emblems became increasingly unwieldy and in 1851, German astronomer J.F. Encke suggested using a circled number instead. The first new asteroid that was designated in 1852 using this new scheme was 16 Psyche when American astronomer James Ferguson published his observations.

Psyche (Fig. 1), is massive enough that its gravitational perturbations on other asteroids can be observed, which enables a mass measurement. The values for the mass of $3.38\pm0.28\times10^{-11}M_{\odot}$ and the density of 6.98 ± 0.58 g/cm^3 obtained from a 2002 analysis by Kuzmanoski and Kovačević, of a close encounter with asteroid (13206) 1997 GC22. The new, high-density estimate suggests that 16 Psyche must be composed mostly of metals. As of 2019, the best mass estimate is $(2.41\pm0.32)\times10^{19}$ kg, with a derived bulk density of (3.99 ± 0.26) g/cm^3.

The first size estimate of Psyche came from IRAS thermal infrared emission observations. They showed that it had a diameter of about 253 km, although it was likely an overestimate as Psyche was viewed pole-on at that time. Light curve analysis indicates Psyche appears somewhat irregular in shape. There is a pronounced mass deficit near the equator at about 90° longitude comparable to the Rheasilvia basin on Vesta. There are also two additional smaller (50-70 km in diameter) crater-like depressions near the south pole. Psyche's north pole points towards the ecliptic coordinates $\beta = 28°$, $\lambda = -6°$, with a 4° uncertainty. This gives an axial tilt of 95°.

Observations of two multi-chord stellar occultations of 2010 and 2014 allow the matching of light curve inversions DAMIT model 1806 that give an equivalent-volume mean diameter of 216±12 km and an equivalent surface means the diameter of 227±13 km. The density of Psyche derived from these estimates -3.7±0.6 g/cm^3 - is consistent with that of other metallic asteroids.

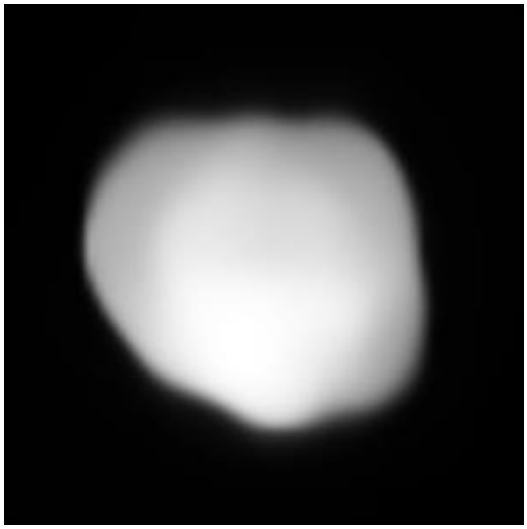

Fig. 1: 16 Psyche imaged by the Very Large Telescope's adaptive optics SPHERE imager

Observations of Psyche with Very Large Telescope's adaptive optics SPHERE imager revealed two large craters, which were informally named Meroe and Panthia, after the twin witches in the Roman novel Metamorphoses by Apuleius.

NASA is going to build a robot, called "Psyche", which will have the mission to explore an asteroid in the main asteroid belt between Mars and Jupiter. The asteroid "16 Psyche" has a diameter of 226 kilometers and is made of metals such as iron, nickel and gold. The metals that make up this unique asteroid could be worth more than $ 10 trillion.

Located in the main asteroid belt between Mars and Jupiter, "16 Psyche" is rich in metals including iron, nickel and the core is made of gold.

Researchers believe that the asteroid's core is similar to that of Earth, which means it could be the heart of a dead planet that has lost its rocky outer layers or suffered violent collisions. The metals that make up this asteroid could be worth $ 10 trillion.

The "Psyche" robot is scheduled to be launched in 2022, using a SpaceX Falcon Heavy rocket. A year later, in 2023, it will pass over the planet Mars and only in 2026 will it orbit the asteroid "16 Psyche".

The "Psyche" mission is part of NASA's low-cost robotic space mission program.

The team must now build the three scientific tools that the robot will be equipped with:

- A magnetometer to measure the asteroid's magnetic field
- A multispectral imager to capture images of the asteroid's surface

Spectrometers that analyze neutrons and gamma rays coming from the surface to reveal what the asteroid is made of.

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The assembly and testing of the robotic spacecraft begin in February 2021. The mission will also test NASA's new laser communications technology, called "Deep Space Optical Communications".

Results and Discussion

The reserves of natural gas and even the oil reserves of our planet are preserved and restored periodically, or rather they are refreshed from somewhere in the depths of the planet, a fact already established and confirmed by scientists. At a rational use of them, ie at a normal operation, the natural reserves of hydrocarbons are permanently restored. However, today we are also able to produce hydrocarbons in unlimited quantities not only by chemical reactions but also by nuclear or other reactions, directly from air or water, or from other planetary resources, the energy cost being quite reasonable. The problem now is one of ethics, if it is still ethical to produce and burn hydrocarbons when in fact it would be more normal to try to eliminate hydrocarbons from atmospheric air introduced by man through pollution in the last 160 years since we burned oil and natural gas. Today we have sufficient energy resources, nuclear, wind, solar, geothermal, from tides or waves and others, so that the continued use of hydrocarbon resources would be a great hoax for mankind because major pollution to the atmosphere, water and land, it would be far too large and the imbalances would add many other negative consequences on the planet's climate and life on earth, which is already hampered by pollution and overpopulation of the planet with declining basic resources. On the other hand, many of the products obtained today from oil and/or gas were made in the past from plants or other non-polluting natural raw materials. Let's just think about polluting the planet's waters with plastic bottles and bags dumped into the planet's waters, which eventually end up in seas and oceans and severely pollute planetary waters with serious consequences for our ecosystem, including fish and aquatic animals.

It would probably be time to think a lot more about what we do and how we do it if we love the planet we live on, especially since we don't even have a spare one at the moment.

Radar observations indicate that Psyche has a dense and mostly metallic composition, consistent with one of the highest radar albedos in the asteroid belt (0.37±0.09). The psyche appears to have a surface that is 90% metallic and 10% silicate rock, with 6±1% orthopyroxene. Scientists believe that these metals can be mostly iron and nickel.

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Another possibility is that the Psyche is the end of the various relic bodies left by the formation of the inner planet. The asteroid's mantle may have been stripped not of a single collision, but of multiple (> 3) relatively slow side collisions with bodies of comparable or larger size. What is left is a metal core covered by a thin layer of silicates, which is revealed spectrally. In such a case, the Psyche would be analogous to Mercury, but much less massive.

No spacecraft has visited Psyche, but in 2014 a mission to Psyche was proposed to NASA. A team led by Lindy Elkins-Tanton, director of the Arizona State University School of Earth and Space Exploration, presented a concept for a robotic psychic orbiter. This team claimed that 16 The Psyche will be a valuable object for the study, as it is the only body similar to the metal core discovered so far.

The spacecraft would orbit the Psyche for 20 months, studying topography, surface features, gravity, magnetism and other features and would rely on current technology, avoiding high costs and the need to develop new technologies. On September 30, 2015, the dizzying psychic mission was one of the five semifinalist proposals of the Discovery Program.

The mission was approved by NASA on January 4, 2017 and was originally intended to launch in October 2023, with a gravitational assistance maneuver of the Earth in 2024, a roof of Mars in 2025 and which reached the asteroid in 2030. In May 2017, the launch date has shifted to a more efficient trajectory, launching in 2022, with gravitational assistance to Mars in 2023 and reaching 2026.

On February 28, 2020, NASA awarded SpaceX a $ 117 million contract to launch the Psyche spacecraft and two small side missions on a Falcon Heavy rocket in July 2022.

Conclusion

Given the declining planetary resources and increasing their consumption, at least some of them could be brought from outside the planet, such as metals

or diamonds, so as not we try to find them or supplements in the depths of the earth, so as not to disturb the balance of our planet.

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Ethics

Author declares that are not ethical issues that may arise after the publication of this manuscript. This article is original and contains unpublished material.

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