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Research Article

Beautifulness of Some Space Objects and Other Unusual Properties

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Abstract

During the last years the interest of the people and scientists to the planets of Solar system and far space objects with relation to the search of potential exoplanets is increasing constantly. One of the reasons is that space missions are more and more oriented to the possible colonization of near-field space bodies. Among all engineering problems of exploring the properties of the space objects one is very exciting. This is related to the properties adapted to the human feelings and senses. More people are interested to the properties available to our senses like smell, taste, dactylic sensations, sounds, etc. Most of these feelings are adapted to the Earth's atmosphere and humans' evolution of senses. The question is – how the human being with its senses will have feelings on the space bodies? The complicated engineering solutions can transform the chemical components and physical properties of the space objects, obtained by different remote sensing methods and spacecraft's missions to the familiar to humans' feelings. This short presentation is targeted to the description about some organoleptic properties of the space objects (taste, smell, sounds), including as well such subjective feeling like "beautifulness". The analysis shows that the nice-looking space bodies frequently are not very hostable to the humans. Even more – they are really dangerous for the potential visitors.

Introduction

The beautifulness of the space objects is a subjective property depending of human perception. Some people like color, others – the dynamic of color changes [1]. Some people are interested by other properties, like sound, smell, taste, fractality, etc. [2]. On a first glance these subjective human feelings are difficult to determine quantitatively, but during the last years it is more and more an engineering problem – to transfer the physical and chemical properties into human senses [3,4]. The space exploration of the planets in the solar system and other astronomical objects is developing at a rapid and accelerating temporal domain. Missions with spacecraft orbiting closer and more distant objects are now a daily occurrence and bring more and more reliable information about various properties of the planets [4]. One of the most interesting for the science are the taste, smell and possible sounds that can be felt during eventual visits to the various distant space objects - planets, satellites, comets, asteroids. Beautyfullness is a subjective feeling, and it is most often associated with the color range and dynamics of the layers enveloping the space bodies [5].

Does the modern engineering science have the possibilities for such research and to what extent do they bring reliable information? At the basis of the methodologies for studying and collecting information which are well-developed and worked-out methods of physics, chemistry, astrophysics, remote measurements and other branches of science can help a lot to these achievements. The reliability of the obtained data is ensured by repeated missions of the spacecraft visits aimed at the study of the bodies of the Solar System and carried out by the various space countries. The interest of all developing space research countries in remote sensing and direct technologies is constantly growing and the number of missions is already over a hundred, which requires enormous scientific, technical and financial potential.

How is the Information Collected?

The basis of these important studies is the chemical composition (elements and compounds) of the solid, liquid and gaseous envelopes of the studied space objects. Planetary chemistry methods are based both on remote methods from Earth and on the capabilities of the various analytical approaches used by spacecraft's (remote or direct sampling) as well as by direct astronauts' sampling (for example - on the Moon). These methods include several well developed and reliable techniques as spectral analysis (in transmitted or reflected light, in the infrared and/or ultraviolet spectral window), remote light and laser probing, gas chromatography, direct testing methods with various indicator reactions between chemicals sensitive to the action of one or another substance and other methods for determination of the chemical composition.

The sensitivity of such methods is monstrous - concentrations of up to 1 ppm or even billionth parts of the substance can be determined (most people are familiar with this highly sensitive analysis - when crossing the border points between countries, especially at the airports, the security people sometimes wipe sensitive tissue on clothes and/or other surfaces of our body and after seconds, the analyst says whether you have touched drugs - accidentally or on purpose). Similar high sensitivity methods are often used to determine the presence or absence of a substance (for example, in the atmosphere of planets, satellites or other space objects - comets, asteroids, etc.). The main way to collect information about the chemical composition (atoms, molecules and chemical compounds) and physical parameters (elevation, gravitational and magnetic field, radiation, etc.) are the space missions performed by various spacecraft reaching closer or farther of the studied space objects.

Beautifulness, Smell, Taste, Sounds of Objects in the Solar System (excluding the Earth) [illustrations are from a public domain] (Figure 1)

https://www.google.com/search?channel=nus5&client=firefox-b-1-d&q=Pics+of+the+planets]

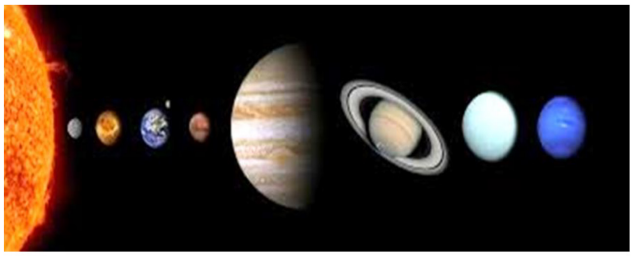

Figure 1: The variety of the planets in the Solar system.

The Moon

The Moon is the only space body so far visited by space crews. Beautifulness: visible every evening from the Earth during the clear sky nights (even during the day). Color is gray brownish, elevation relief is full of craters, view, as of a volcanic desert (Figure 2). Main chemical substances: Hydrogen, Helium, Oxygen, Sulphur, Iron, Silicates. Odor: Gunpowder (organoleptically detected by the astronauts. When the samples come into contact with oxygen – this smell disappears over time). Taste: matchsticks with a sour undertone. Sound: sharp tone resounding from the collected solid rock samples when kick on them, seismographs register seismic waves (their "sound" is much longer than that one of the seismic sounds on Earth), the crackle of meteorite impacts.

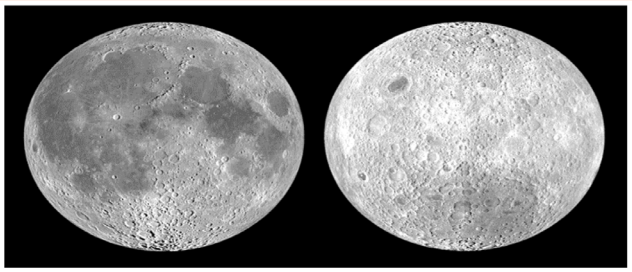

Figure 2: Sides of the Moon (visible and invisible).

Mercury

Beautifulness: color is brown-grey, elevation relief is full of craters, view is as a shining volcanic desert. Chemical substances: Hydrogen, Helium, Sulphur, Silicates. Smell: probably like the Moon. Taste: sour. Sound: low-frequency echo (boom on impact) (Figure 3).

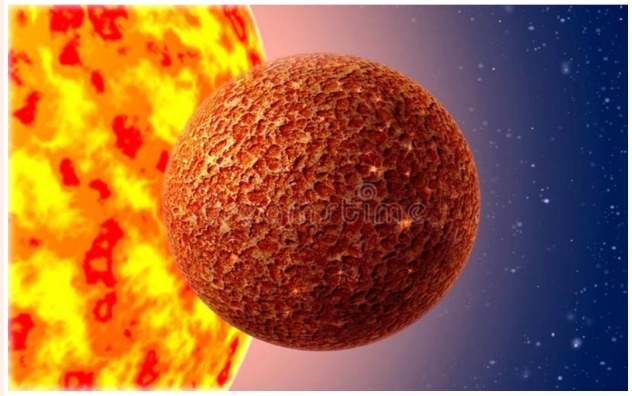

Figure 3: Mercury – The planet burnt by the Sun.

Venus

Beautifulness: color – silvery with brown components, relief – heavily disintegrated with river valleys and plateaus; view - closer to Earth, predominantly desert, with mountains and plains, volcanic craters and meteorite impacts. Chemical substances: Sulfuric acid, Carbon monoxide and dioxide, Hydrogen sulfide, Phosphine, Silicates. Smell: Stifling, rotten eggs, rotten fish, highly poisonous atmosphere. Taste: intensively sour. Sound: of blowing winds, seismic waves observed (Figure 4).

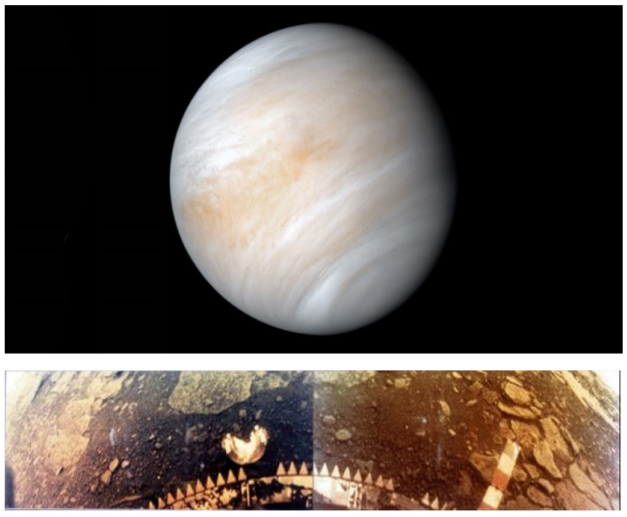

Figure 4: Venus – general view and a panorama.

Mars

Beautyfullness: color - predominantly grey-reddish-brown; relief – craters, river valleys and the plateaus, strongly cut and with high amplitudes; view - closest to Earth, predominantly desert, with mountains and plains, volcanic craters and meteorite impacts. Chemical substances: Sulfur, Hydrogen sulfide, Iron and iron oxides, Silicates. Smell: Safety Matches, Rotten Eggs, Rust. Taste: of rust. Sound: of blowing winds, seismic waves, sometimes rolling stones (Figure 5).

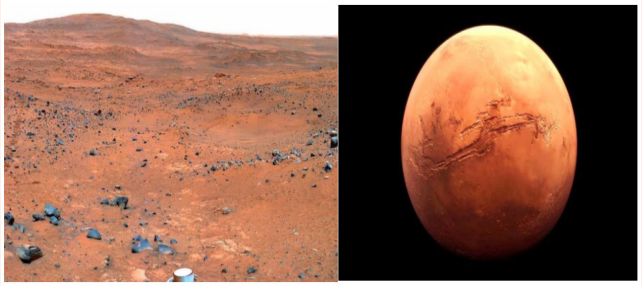

Figure 5: Mars – A panorama and general view.

Jupiter

Beautifulness: color - silvery white and light brown and tan undulations from heavy storms and hurricanes, attractive. Chemical substances: Hydrogen, Helium, Hydrogen sulfide, Ammonia, Phosphine, Hydrogen cyanide. Odor: Strong stench of rotten eggs, intestinal gases, urine, rotten fish, bitter almonds. Taste: sharp sour-bitter, poisoning. Sound: Roaring, low-frequency humming, frightening sounds (Figure 6).

Figure 6: Jupiter and Saturn.

Saturn

Beautifulness: color – bluish-brown, famous rings and many satellites (probably the most beautiful view). Chemical substances: Hydrogen, Helium, Hydrogen sulfide, Ammonia, Phosphine, Hydrogen cyanide, Ammonium hydrosulfide. Smell: Very strong stench of rotten eggs, intestinal gases, urine, rotten fish, bitter almonds, hair dye. Taste: sour-bitter, poisoning. Sound: Roaring, low-frequency humming, heavy wheezing (Figure 6).

Titan (The Saturn moon)

Beautifulness: color - bluish, brown, violet, beautiful view, (probably most similar in colors to the Earth's). Chemical substances: nitrogen (98%) Methylacetylene, Cyanoacetylene, atmosphere and liquid substances envelopes. Smell: Gas station. Taste: extremely unpleasant. Sound: whistling from geysers.

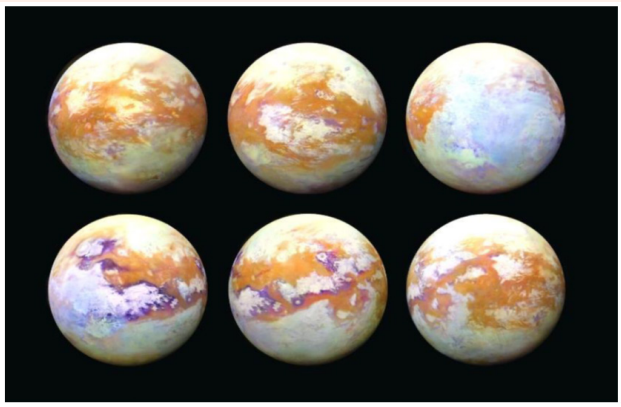

Figure 7: Titan – the moon of Saturn.

Uranus

Beautyfullness : color – bluish, view – attractive, with rings vertical on the rotation axis. Chemical substances: Hydrogen, Helium, Hydrogen sulfide, Ammonia (less), Phosphine, Hydrogen cyanide, Ammonium hydrosulfide. Odor: Strong stench of rotten eggs, intestinal gas, urine, rot, bitter almonds, hair dye. Taste: sour-extremely unpleasant. Sound: No data (Saturn-like) (Figure 8).

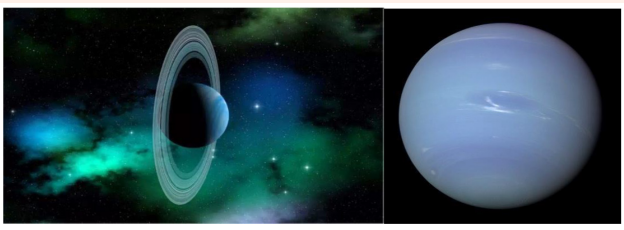

Figure 8: Uranus (left) and Neptune.

Neptune

Beautifulness: color – bluish, cold. Chemical substances: Hydrogen, Helium, Hydrogen sulfide, Ammonia (less), Phosphine, Hydrogen cyanide, Ammonium hydrosulfide. Odor: Strong stench of rotten eggs, intestinal gas, urine, rot, bitter almonds, marzipan, hair dye. Taste: sour-extremely unpleasant. Sound: No data (Saturn-like) (Figure 8).

Other Space Objects

Comet 67P/Churyumov-Gerasimenko

Beautifulness: color – ice-semitransparent white, sometimes with dark spots. Chemical substances: CO, CO^2, Traces of: Hydrogen sulfide, Sulfur dioxide, Ammonia (less), Hydrogen cyanide. Odor: Matches with hints of rotten eggs, urine, bitter almonds. Taste: sour-bitter. Sound: Whistling, falling chunks (Figure 9).

Figure 9: Comet 67P/Churyumov-Gerasimenko.

Sagittarius Nebula B2

Beautifulness: color – variable-rainbow colors, extremely beautiful. Chemical substances: Ethyl alcohol, Formaldehyde, Formic and Acetic acid. Smell: Alcohol with a hint of rum and raspberries, hospital smell, sour. Taste: sour-salty (vodka with pickle salad). Sound: No data (Figure 10).

Figure 10: Sagittarius Nebula B2.

Conclusion

The beautifulness of some space objects is under discussion. Along this subjective feeling of the humans, some engineering problems arise to determine more important subjective properties like smell, sounds, even taste of space objects. Due to the engineering advances in probing space objects by spacecraft the convincing results are obtained due to the transformations of the chemical and some physical properties into the human feelings and senses. This branch of the knowledge seems to be in the frontiers of the near future space science. The analysis shows that the nice-looking space bodies frequently are not very hostable to the humans. Even more – they are really dangerous for the potential visitors (Figure 10).

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