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THE NATURE OF SOLAR SYSTEM BODIES PHYSICS OF EARTH-TYPE PLANETS

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Abstract: Solar system bodies can vary greatly in composition, size, and properties. Planets like Earth are rocky terrestrial bodies with solid surfaces, while others like Jupiter and Saturn are gas giants composed mostly of hydrogen and helium. There are ice giants like Uranus and Neptune, as well as dwarf planets, moons, asteroids and comets. The physics of Earth-like planets includes the study of their atmospheres, geology, and climates. Factors such as a planet's distance from the sun, size, and composition play an important role in determining its physical characteristics and behavior. Understanding these factors provides insight into the potential habitability of exoplanets and helps us understand Earth's place in the universe.

Keywords: The solar system is made up of many different types of bodies, including planets, moons, asteroids, comets, and dwarf planets. Terrestrial planets, also known as terrestrial planets, have solid surfaces and are composed of rock or metal. They also have relatively thin atmospheres compared to gas giants like Jupiter and Saturn. These planets, including Earth, Mars, Venus, and Mercury, have similar compositions and physical features such as mountains, valleys, and rocky surfaces. The physics of terrestrial planets involves understanding their gravitational forces, geological processes, atmospheres, and other physical properties that contribute to their formation and motion in the Solar System.

Introduction: Objects entering the solar system do not emit light. We see parts of them illuminated by the Sun, and special methods have been developed to examine them. Currently, automatic measuring devices are being lowered to the surface of the planet with the help of automatic stations, and the composition and temperature of the planet's atmosphere and body structure are being determined. However, with the help of automatic devices, such accurate measurements are not yet carried out on a large scale. The reason for this is that they require a lot of money, and not every country can carry out such inspections. The unique experiments performed with the help of space apparatuses do not negate the results obtained from traditional astrophysical methods, but complement and enrich them. Traditional astrophysical methods of investigation, measuring the light rays of the Sun returned from the surface (atmosphere) of the planet (photometry), spectrum arc Photometry of planets. In terms of spectral composition, Moonlight is exactly the opposite of Sunlight. However, due to the low ability of the Moon's surface to reflect light, the brightness of the Moon's halo is much (1000 times) less than that of the Sun's halo. The ratio of the luminous flux (F) radiating from the planet or its moon to the flux falling on it (Fo) from the Sun is called the spherical albedo (As) of the planet or moon: A = F. The spherical albedo of the Moon is A = 0.067, that of Mercury 0.086. Venus's is 0.72, Earth's is 0.39. Among these bodies, the surface of Mercury and the Moon has the lowest, and Venus has the highest ability to reflect light. The brightness of the planet's surface can be compared to the brightness of structures found on Earth. For example: lightness of light snow and cloud is R =0.9; that of sand is 0.34; 0.06 of volcanic basalt and black soil; 0.24 and hakazo of clay and gravel. The luminance coefficient, spherical albedo, is a relative unit that indicates the reflectivity of a surface. The albedo (brightness) of the Moon is close to that of black soil or cooled volcanic material, that of Venus to that of clouds, and that of Earth to that of sand. As a result of such comparisons, it is possible to make a conclusion about what kind of rock the surface of a planet or any other celestial body is made of. The surface of the Moon and Mercury is a volcanic basalt flow, and that of Venus is a cloud layer (surrounded by clouds). Venus is always surrounded by clouds, its surface layers are not visible to an observer on Earth. If a planet has clouds, then it has an atmosphere. The brightness of the surface of a planet with an atmosphere also depends on the absorption and scattering of radiation in its atmosphere. From the planet The returning Sun's rays pass through its atmosphere twice: the first time on the surface of the planet (when falling, and the second time after returning from its surface until it reaches us. The physical properties of the planet's atmosphere are studied, and the energy falling on its surface from the Sun is considered. Indicating that the planet has an atmosphere There are several other symptoms. First of all, if the planet is surrounded by an atmosphere, the luminosity (brightness) is highest in the center of the planet's rim and decreases as it moves away from it. Because it is returned from the planet. The sun's rays pass through the planet's atmosphere and it is absorbed and scattered. At the center of the fringe, the Sun's rays fall directly into the atmosphere, and it takes the shortest path and is absorbed the least. The further away from the center of the fringe, the layer through which the rays cross becomes thicker and the amount of absorption increases, i.e. luminosity decreases from the center toward the edge of the flange The luminosity is maximum at the center of the flange of Venus or Mars and decreases as it moves away from it. So these planets have atmospheres. As bright as it is near the edge of Mercury's rim. So, Mercury has no atmosphere. If a planet is surrounded by an atmosphere, as it passes the star, the light from the star will be slightly dimmed near the edge of the halo, before being blocked. This is explained by the absorption of starlight as it passes through the planet's atmosphere. If the planet has an atmosphere, the brightness does not change sharply at the border between the part illuminated by the Sun and the night part, but gradually decreases (increases). If the planet has an atmosphere, clouds and clusters are observed in its gas shell. For example: Jupiter has an atmosphere because we can see the changing cloud formations on its surface. In low-dispersion spectra, they appear as broad bands. In the adjacent spectrum, several such bands can be seen in the energy distribution curve. The sunlight reflected from the planet passes through the atmospheric layers three times before it reaches us: first it passes through the atmosphere of the planet and falls on its surface, and then it returns and passes through these atmospheric layers again, and when it reaches the Earth, it now leaves the Earth's atmosphere. passes. Such a complicated "journey" during the solar radiation is first scattered and absorbed in the atmosphere of the planet, the radiation changed as a result of absorption-scattering falls on the surface of the planet and is absorbed and scattered in it when the reflection returns and passes through the atmosphere of the planet. The radiation returned from the planet now passes through the Earth's atmosphere, where it is also absorbed and scattered. In the planet's atmosphere, solar radiation is scattered by dust particles and its spectral composition does not change. as a result of absorption, lines and stripes are formed. If there are the same molecules in the atmosphere of the planet and the Earth, their lines overlap. In such cases, if the amount of atoms or molecules in the atmosphere of the planet is less than that of the Earth, then it is necessary to separate the lines of the planet from the lines of the Earth based on the Doppler effect. Otherwise, the molecular bands formed in the planet's atmosphere are clearly visible in its spectrum. Usually, the planet's spectrum is compared to the Moon's spectrum (the Moon's spectrum is a subset of the Sun's spectrum). From such comparisons, it is possible to determine the bands of molecules in their spectra and estimate the amount of molecules by measuring their intensity in the spectrum. Solar system bodies, including Earth-type planets, are objects of interest in both astronomy and physics. Earth-type planets are rocky and dry, with hard surfaces and thin atmospheres. They orbit in the habitable zone of their parent stars, where conditions exist for liquid water to exist on their surface. The physics of terrestrial planets involves understanding their composition, internal structure, and geophysical processes such as plate tectonics, erosion, and weathering. Planetary physics also includes the study of the interactions between their atmospheres, climates, surfaces, atmospheres, and oceans. The study of solar system bodies and the physics of Earth-type planets is critical to understanding the processes that shaped our planet and the possibility of life on other worlds. Astronomers and physicists study these bodies using a variety of observational and theoretical tools, including telescopes, spacecraft, computer simulations, and laboratory experiments. varies greatly up to the bodies. The physics of terrestrial planets includes an understanding of their formation, composition, and geological processes, as well as the interactions between the atmosphere, hydrosphere, lithosphere, and biosphere. This includes the study of processes such as plate tectonics, erosion, carbon and water cycles. In addition, understanding the physics of Earth-type planets involves studying their magnetic fields, atmospheres, and climate systems. If you have specific questions about any of these topics, feel free to ask! Solar system bodies are diverse and can be classified into different types based on their composition and properties. The main categories include: The terrestrial planets are the rocky planets such as Earth, Mercury, Venus, and Mars. They have a hard surface and relatively high density. Gas giants: Gas giants like Jupiter and Saturn are composed mostly of hydrogen and helium, with thick atmospheres and no solid surfaces. Ice giants: Uranus and Neptune are classified as ice giants, consisting of a mixture of water, ammonia and methane ice along with a rocky core. Dwarf planets: Bodies like Pluto and Eris are dwarf planets that are smaller than conventional planets and have not cleared their orbits of other debris. The physics of terrestrial planets includes the study of their structure, composition, atmosphere, magnetic fields, and plate tectonics and weathering. Understanding the physics of these planets can help scientists better understand their formation, evolution, and potential habitability. This knowledge is essential for understanding the dynamics and behavior of Earth and other terrestrial planets, and for evaluating the existence of life beyond our planet. Gravitational force is the force acting on an object falling on the Earth's surface. Gravity is directly proportional to the mass of each object, so an object with a greater mass has a greater gravitational force. In addition, how close an object is to the surface of the earth also affects the force of gravity. A greater force of gravity affects objects closer to the surface. Therefore, gravity is an important concept for understanding physical phenomena and systems. the branch of science used to measure time by converting it into motion. Planets can be devices such as clocks, stopwatches, wall clocks. The operation of a mechanical watch begins with the reception and storage of energy by the source through the clockwork. First, an energy source such as a power supply or battery is stored in the clockwork. Energy is converted into rotational motion by a clockwork mechanism. To achieve this movement, components such as rotating gears, gears, and balances are used. They start and maintain the movement in the watch by transferring energy to other parts of the watch movement. The movement mechanism then moves the pointers used to track the time. These indicators are the components on the watch face, such as the hour and minute hands. Numbers and symbols indicate minutes and hours. Several physical principles must be considered for the planets to function properly. For example, factors such as friction and weight can affect the movement of a watch and affect its ability to tell the exact time. External factors such as touch, temperature and magnetic fields can also affect the performance of the watch. Therefore, precision watches are designed and manufactured in a way that minimizes these negative effects. In short, planetary physics studies the working principles of clockwork, which is used to convert energy into mechanical motion and measure time. This area is a topic highlighted by watch enthusiasts and those working in the fields of watchmaking and watch engineering.

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