References

1. Advances in Imaging and Electron Physics. Chapter One - New Physical Principle for Interference of Light and Material Particles. ScienceDirect: веб-сайт. URL: https://www.sciencedirect.com/science/article/pii/S107656701730085X (дата звернення: 15.10.20)
2. Blender tutorials: blender: веб-сайт. URL: https://www.blender.org/support/tutorials/ (дата звернення: 16.10.20)

Language adviser: *Simkina M.A., Teacher of the Department of Foreign languages, Dmytro Motornyi Tavria State Agrotechnological University*

PARALLEL WORLD HYPOTHESES IN PHYSICS

Kostandov T. A., *castim234@gmail.com*
Dmytro Motornyi Tavria State Agrotechnological University

The problem of parallel worlds is one of the most speculative and controversial in modern science, philosophy and the media. Basing on the studies by Nikolai Kuzansky (Krebs), J. Bruno, H. Huygens, G. Leibniz, S. Hawking it is sensible to believe that such worlds exist. Most people professing a materialistic worldview, Cartesian rational science and philosophical materialism, prefer to estimate tangible evidences on their own rather than trust clever theories of symplectic geometry or exalted incantations. One remarkable idea known as the many-worlds interpretation of quantum mechanics postulates that all the outcomes that can possibly occur actually do happen, but only one outcome can happen in each universe. It takes an infinite number of parallel universes to account for all the possibilities, but this interpretation is just as valid as any other.

A stable parallel world is possible if connected (closed) structures (atoms, bodies) and interactions between them are possible in it, as in our world. The physical cohesion of the structural elements is provided by the holding (centripetal) forces of interaction of the elements themselves or some central body (core). For the atoms of our material world, these are electromagnetic (mainly electrostatic) forces of interaction between the nucleus and electrons, for planets – the force of attraction of the central star. The viability of structures is determined by the ratio of centripetal and centrifugal intrastructural forces. In an atom, centrifugal forces are the forces of inertia of rotating electrons, in a planetary system.

The joint action of centripetal and centrifugal intrastructural forces (taking into account the laws of conservation of energy and angular momentum in a dimensional Euclidean space) was first studied by the Austrian-Dutch physicist P. Ehrenfest in 1917 for the electrostatic interaction of two charges (nucleus and electron) and gravitational interaction of two bodies (stars and planets). The Pythagoreans, Aristotle, I. Kant, A. Poincaré, A. Einstein, G. Minkowski, G. Weil, P. Uryson and others were engaged in the problem of the dimension of space in various aspects. But it was Ehrenfest who obtained fundamental results in the field of physics of dimensional Euclidean spaces. So, Ehrenfest's theory is functional within the boundaries from the atom to the solar system in Euclidean space. And outside these boundaries? In the submicroworld, strong and weak intranuclear interactions do not obey the inverse square law of the three-dimensional macrocosm, and, accordingly, several hypotheses of the multidimensional microcosm have been proposed, the fact that there are no free quarks has led to the emergence of a hypothesis about the one-dimensionality of space inside microparticles. At the same time, the currently known laws of deep space do not yet give serious refutation of the three-dimensionality of macrospace, and, accordingly, there are no serious theories of stable multidimensional macrocosm. Scientists like Stephen M. Feeney claimed to find evidence suggesting that our universe collided with other (parallel) universes in the distant past. Nobel laureate Steven Weinberg in his last work suggested that if the multiverse existed, too. B. Greene, the author

of The Elegant Universe and The Fabric of the Cosmos, tackles the existence of multiple universes in his latest book.

To conclude, modern science has quite a sphere of action. On the other hand, people know too little to make hasty conclusions based on sensational hypotheses and theories.

References

1. Ehrenfest P. In what way does it become manifest in the fundamental laws of physics that space has three dimensions? Amsterdam: Proc. Amsterdam acad., 1917. Vol. 20. 200p.

2. Green B. Hidden Reality. URL: http://www.briangreene.org/the-hidden-reality/ (дата звернення: 20.11.2020)

Language adviser: *Zaitseva N.V., Senior Teacher of the Department of Foreign languages, Dmytro Motornyi Tavria State Agrotechnological University*

ALTERNATIVE SOURCES OF ENERGY IN UKRAINE

Kriestov V.G., *krestov.vsevolod@ukr.net*
Dmytro Motornyi Tavria State Agrotechnological University

Nowadays alternative energy has become an important part of the modern world. Due to the reduction of traditional energy sources, rising prices for them, concern about environmental issues, Ukraine as the world economy is increasingly paying attention to the search and development of non-traditional and renewable sources. But the development of alternative sources of energy is constrained by:

- lack of scientific elaboration of this issue;
- lack of material and technical base;
- organizational and administrative reasons.

The most interesting and renewable source is the Sun. The intensity of solar radiation in Ukraine shows that almost all its regions are suitable for the development of solar energy. South regions of our country have the most convenient conditions for the use of solar energy. But current situation can be characterized as the initial stage of development of this process. Solar energy is used in grain dryers, desalination plants, in power plants of space stations and so on. It can be obtained in different ways: by thermoelectric converters, photoelectric converters, and steam turbines.

Thermoelectric converters work in the following way: the direct conversion of the thermal energy of solar radiation into electricity is based on the Seebeck effect – if you solder the ends of two conductors of different chemical composition and place the joints in environments with different temperatures, then between them there is a thermal energy.

Photoelectric converters work by the principle of knocking out electrons from semiconductor materials by light. Radiant energy will be converted into electricity.

Steam turbines. The tower with the receiver is located on the southern edge of the field of heliostats rotating after the Sun. Mirrors reflect the sun rays on the heat sink, which produces high-temperature steam (500-600 ° C), which is fed to a steam turbine that rotates the generator. Usually steam turbines also contain solar batteries for producing more power.

In conclusion it should be pointed out that if a person wants to get one of solar panels for himself, he or she can actually sell energy that they do not use to the state. This is called green tariff. In Ukraine it is a mechanism that stimulates the use of renewable energy sources. You are installing a solar power plant in a private house or in another territory. Thus, in 4-7 years the cost of the equipment is fully paid off, and then the net income can be received.