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SPONTANEOUS ENTROPY DECREASE IN AN ISOLATED MATTER-FIELD SYSTEM

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The ordered molecular systems, which stand at the basis of our life and activity, are generally believed as being necessarily submitted to a so called Principle II of thermodynamics, asserting their evolution to disorder. In this scientific framework, the appearance of life on Earth, and of so many ordered systems as, for instance, of the fuels, which sustain our civilization, remained as a mystery. However, very recently, a physical system evolving from disorder to order, in this way converting environmental heat into usable energy, has been discovered, in spite of the Principle II of thermodynamics. This is because this principle has been thought and defined for a molecular system, while when a coherent electromagnetic field is present in a resonant cavity it is no more valid. Author invented a semiconductor device which, by heat absorption from the environment, generates a coherent electromagnetic field in the infrared domain (λ~2 μ). This field is generated in a sequence of n-p-n semiconductor regions, by quantum transitions from the higher states of the n-regions to the lower states of the p-regions, while the heat absorption is undertaken by the electron transfer on the deep-level paths of the p-n Ohmic junctions–when a current is injected in the device, the lower states of the p-regions are enhanced, while the higher states of the n-regions are depleted, which means a temperature decrease of the p-n junctions, and consequently, a heat absorption from the adjacent regions which excites the electrons through these junctions. Since in a structure with N junction, one electron generates N photons, on the account of N processes of energy absorption, in some conditions, the energy consumed for the current injection is much smaller than the radiation energy produced by heat absorption. They studied this phenomenon in detail, in the framework of quantum mechanics.

BIOGRAPHY

Eliade Stefanescu graduated Faculty of Electronics, Section of Physicist Engineers, in 1970, and after a long activity in the field of the research and development of the semiconductor devices, he obtained a PhD in Theoretical Physics in 1990. He discovered a phenomenon of penetrability enhancement of a potential barrier by dissipative coupling. He developed a microscopic theory of open quantum systems, discovered a physical principle and invented a device for heat conversion into usable energy and produced a unitary quantum relativistic theory. He is Member of American Chemical Society and Academy of Romanian Scientists. He received the Prize of Romanian Academy for Physics in 1983 and the Prize "Serban Titeica" in 2014, for his book entitled "OPEN QUANTUM PHYSICS AND ENVIRONMENTAL HEAT CONVERSION INTO USABLE ENERGY". He has been invited to present his results in numerous international conferences, as speaker, keynote speaker and member of the Organizing Committee.

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