

WHAT IS HEAT?

The lack of knowledge on the existence of the world of energy quanta makes physicists explain the phenomena of heat and temperature with what they know, that is the world of atoms. They explain this by means of the kinetic molecular theory.

Heat is the part of the internal energy which is transmitted from a warmer body to a cooler body and is based on a microscopic mechanism of collisions between particles/atoms.

Temperature is connected with the average kinetic energy of motion and vibrations of all particles/atoms forming a given structure and is a measure of this energy.

It follows from the above definitions that all atoms in the Universe are in perpetual motion.

Now the question arises. What is the cause of the perpetual motion of atoms in the Universe? The answer to this question cannot be found in any physics textbook. The answer must be found or else it will have to be acknowledged that the Universe is a perpetuum mobile, a hypothetical machine in perpetual motion.

According to Model 31, each neutralized proton is a carrier of an elementary gravitational charge. Each atom in the Universe is formed from neutralized protons. This means that all atoms in a given body attract one another. Atoms of all bodies in the Universe are in perpetual motion and they constantly collide. If the atoms do not bond into a single, firm, immovable body, this means that there must be an antigravity agent which does not allow for such a situation. This agent means energy quanta constantly produced from dark energy by electrons vibrating after collisions of atoms. Quanta are in perpetual, chaotic motion. Being in chaotic motion, quanta constantly collide, whereas in intervals between collisions they oscillate, pulsate, vibrate with a defined frequency. The constant motion of quanta is evoked and maintained by dark energy. It takes place in such a way that in intervals between individual collisions of quanta, particles of dark energy prevent from a deceleration of the quanta. After a collision, atoms bounce from each other, and ubiquitous quanta make them accelerate, which results in the fact that before the next collision the velocity of an atom is the same as before the previous collision. This is a velocity of the order of several hundred

kilometers per second. As described above, energy quanta work in a micro scale. However, the same antigravity agent is also active in a macro scale with respect to galaxies. With interstellar and intergalactic distances, gravitational forces are so small that they are equalized by the resistance of quantum gas filling the Universe, which allows stars and galaxies to remain at constant distances from each other.

Heat is quantum gas constantly produced and emitted by vibrating electrons of atoms. Heat really exists, just like atoms really exist.

Energy quanta vibrate with a defined frequency. Figuratively speaking, quanta are oscillators vibrating with different frequencies, always moving at a speed of 299792458 m/s. Each quantum has a specific power. This power is proportional to the frequency of vibrations of quantum and is expressed in the equation.

$$P = h\nu$$

P - quantum of energy power,

$h = 6,62 \times 10^{-34} J$ - the Planck constant,

ν – frequency of vibrations of energy quantum.

The power of quanta emitted by a given body is proportional to its temperature and is expressed in the equation appearing from the Stefan-Boltzmann law

$$P = \sigma T^4$$

P – the power of the energy quanta radiated from the area unit of the body [W/m^2],

σ - the Stefan-Boltzmann constant,

T – the temperature in Kelvin

It follows from the above that temperature is an inherent feature of energy quanta, it is completely independent from the world of atoms.

Since all bodies constantly produce new quanta, already existing quanta have to leave the bodies. Energy quanta which leave the bodies are not absorbed by other bodies, they do not disappear, but they are stored in the depths of Space in the form of quantum gas, and they maintain a certain temperature of Space. This temperature has been measured very precisely and it is 2.725 K.

The fact that the Universe has a temperature is evidence for the existence of quantum gas, that is the subatomic level of the organization of matter.

Each body emits thermal radiation, because this is a condition of its existence.

To illustrate the above, each body is an engine in which the combusted fuel is dark energy, and the product of this combustion (exhaust gas) is energy quanta. After coming into being and fulfilling their role inside the bodies, energy quanta, like all exhaust gases, are released to the environment. This process:

- occurs at any temperature,
- is not dependent on the presence of other bodies,
- cannot be stopped, it can only be slowed down, and slowing down this process leads to an increase in the temperature of the body (the details of this issue are presented in the note "HOW TO RAISE THE BODY TEMPERATURE WITHOUT HEAT SUPPLY FROM THE OUTSIDE?")