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# New principles of monitoring seismological and deformation processes occurring in the Moon rock massive

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Currently, interest in studying the processes occurring in other planets surrounding the Earth is becoming increasingly important. The Moon-satellite planet is the closest to the planet Earth and therefore it makes sense to organize a system for studying it first and foremost, incorporating the most advanced ideas about the physics of processes in rock massive, which are also used in terrestrial conditions. In this paper, new ideas on the organization of seismological and deformation monitoring are set out, based on the results obtained for the rock massive of the Earth and the theoretical ideas presented in the works of I. Prigogine and S. Hawking

In recent decades, a new science was born - the physics of non-equilibrium processes associated with such concepts as irreversibility, self-organization, and dissipative structures [1]. It is known that irreversibility leads to many new phenomena, such as the formation of vortices, vibration chemical reactions or laser radiation. Irreversibility plays a significant constructive role. It is impossible to imagine life in a world devoid of interrelations created by irreversible processes. The prototype of the universal law of nature is Newton's law, which can be briefly formulated as follows: acceleration is proportional to force. This law has two fundamental features. It is deterministic: since the initial conditions are known, we can predict movement. And it is reversible in time: there is no difference between predicting the future and restoring the past; movement to a future state and reverse movement from the current state to the initial state are equivalent. Newton's law is the basis of classical mechanics, the science of the motion of matter, of trajectories. Since the beginning of the XX century, the boundaries of physics have expanded significantly. Now we have quantum mechanics and the theory of relativity. But, as we shall see from the sequel, the basic characteristics of Newton's law — determinism and reversibility in time — are preserved. Is it possible to modify the very concept of physical laws so as to include in our fundamental description of the nature of irreversibility, events and the arrow of time? The adoption of such a program entails a thorough revision of our formulation of the laws of nature and it became possible due to the remarkable successes associated with the ideas of instability and chaos.

Returning to the results obtained for unstable mountain terrestrial massive, we can note that monitoring studies should be conducted in an active mode, i.e. there should be a source of excitation (seismic or of other nature), and the response of the rock massive is recorded for a not very long time, then the effect should be repeated and for this process, as a result, phase diagrams of the rock massive can be constructed (Hachay O.).