

# MEETING IN ST. PETERSBURG

Abstracts  
Papers by Young Scientists



Joint Institute for Nuclear Research

***MEETING IN ST. PETERSBURG***

Fourth International Conference, Dedicated to  
N. W. Timofeeff-Ressovsky and His Scientific School  
«MODERN PROBLEMS OF GENETICS, RADIOBIOLOGY,  
RADIOECOLOGY, AND EVOLUTION»

Fourth Readings after V. I. Korogodin & V. A. Shevchenko

IUR Advanced Research Workshop  
«RADIOECOLOGY MEETS RADIOBIOLOGY:  
A REAPPRAISAL OF BASIC MECHANISMS OF RADIATION»

St. Petersburg, 2–6 June 2015

***ABSTRACTS  
PAPERS BY YOUNG SCIENTISTS***

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## THE PRINCIPLE OF SIGNATURES IN BIOLOGY

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It is shown that both animals and machines can be included in the class of things a distinctive feature of which is the presence of control systems (Wiener, 1958). Later A.A. Lyapunov (1963) makes the logical conclusion that the management, based on the transmission of information, is an integral part of every activity, moreover, the management is a characteristic property of life in a broad sense. The main feature of living beings is their enormous complexity. All biological processes occurring in the organism, on the one hand, and carried out in its interactions with the environment of biogeocenoses, on the other, are correlated into a single system by the organism, which is the basic unit in the organic nature (Schmalhausen, 1983). Thus biological evolution is a combined result of Darwinian natural selection and self-organization, in consequence of irreversible processes (Prigozhin, Kondepudi, 2002). The results of the processes of speciation, the formation of higher taxa and the forming of species complexes of biotic communities can be described through an elementary systems of signs of species. This description assumes evolutionary load, characterizing these processes as biological systems of different rank and different levels and planes of hierarchy. In the process of "analysis" by which population and coenotic matrices can determine the sequence of acting factors of the biogeocenosis, recognized not all of their pool, but only some of the signature. Organization of living beings on many levels based on the principle of signatures, according to which only one or some of the many features of any complex whole are used as information (Waterman, 1968). Under the signature comprehends the part of the characteristics of the various components involved in the integration of the entrance, law and outputs in a single whole. Conducted phenetic analysis of the painting signs mollusc's shells of Geophila order and simultaneously studied the structure of biodiversity of malacocoenoses biota of the Ural mountain country. Terrestrial molluscs, describing quite definitely biogeocenoses of the Urals as a typical mountain, at the same time largely reflect changes in the biodiversity of mountain ecosystems caused by anthropogenic pollution of the natural environment.

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