

European Congress on **LASER, OPTICS AND PHOTONICS**

May 23, 2022 | Webinar

Biophotonics, Genetics, and evolutionary role of Bio-Antenna Arrays**Sergey V. Petoukhov***Mechanical Engineering Research Institute of RAS, Russia*

The presentation is devoted to the author's results concerning an important role of biophotonic crystals and bio-antenna arrays in molecular-genetic system and genetically inherited physiological structures. As it is known, inherited sets of mutually coordinated biophotonic crystals determine species patterns on butterfly wings, peacock feathers, and on other animal bodies. These inherited sets of biophotonic crystals can be considered as one of the wide number of examples of inherited bio-antenna arrays. A few arguments exist that photonic crystals and bio-photonic arrays are important for functioning of molecular-genetic systems.

Modern technics widely uses antenna arrays, including nano-antenna arrays. Antenna arrays combine many separate antennas into a single coordinated ensemble with unique emergent properties, due to which antenna arrays are widely used in devices of medicine, astrophysics, avionics, hydro-location, etc. The author presents pieces of evidence of using wonderful emergent properties of bio-antenna arrays in the inherited physiological organization including molecular genetics. Some examples of inherited bio-antenna arrays with their electromagnetic and acoustical activities are considered: complex faceted eyes of insects; echolocation of dolphins and other animals; electroreception of some fishes, etc. The received biological and algebraic results allowed putting forward the author's doctrine of energy-information evolution based on bio-antenna arrays and their wave functioning. This new topic about the biological meaning of emergent properties of antenna arrays includes problems of biological evolution, the origin of the genetic code, biological self-organization, biophotonics, which are discussed. Additional information is available on the author's website <http://petoukhov.com/>.

Biography

S.V. Petoukhov has completed his PhD at the age of 27 years from Moscow Physical-Technical Institute and postdoctoral studies from the Institute of Crystallography of Russian Academy of Sciences. He is a chief of Laboratory of biomechanical systems in Mechanical Engineering Research Institute of RAS in Moscow. He is Laureate of the State prize of the USSR. In 2012, the Chinese government included S.V.Petoukhov in the official "List of Outstanding Scientists in the World" and financed his visit and lectures in China. He is the author of 7 books and more than 200 other scientific works. His website <http://petoukhov.com/>.