

PHYSICAL COLLOQUIUM

INVITATION

Monday, 09.12.2019, 4.15 p.m., W2-1-148

speaks

Prof. Dr. Ilia Solov'yov,
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Theoretische Molekülphysik, Quantum Biology

about

“Quantum Origins of Magnetic Sensing”

Clearly, the laws of physics hold and are exploited in living organisms. Speaking as a physicist, most biological characteristics stem from the laws of classical physics that students learn in their first year. However, crucial characteristics in organisms are governed by quantum physics. The latter characteristics are those in which biological processes involve the jumps of electrons from one state to another: electrons are exemplary quantum particles. The quantum behavior of electrons cover all chemical transformations, for example in case of formation or breaking of chemical bonds, but it arises also in optical transitions induced through light absorption by biomolecules. In this talk I will discuss a fascinating example of quantum behavior in biology as it comes about in animal navigation. In the case of animal navigation, quantum effects apparently bring about a magnetic compass that can sense the geomagnetic field through its interactions of biomolecules despite the fact the interaction energy amounts to only a tiny fraction of thermal energy present at body temperature. Magnetoreception case study will then be used to define the emerging interdisciplinary field of quantum biology.

All interested persons are cordially invited.

Sgd. Prof. Dr. Ilia Solov'yov