PHYSICS DEPARTMENT
SEMINAR

Thursday, December 14, 14:00-15:00

Physics Department- H Block Seminar Hall (Tea & coffee at 13:45)

Bird's-Eye View of the Quantum Control

(Image credit: agsandrew via Shutterstock)

In the first part of our talk, we make a popular introduction to feedback control algorithms in physical 'toy' models and discuss the basic model for driving the states of qubits. We will compare different types of feedback approaches: gradient algorithms and forming target attractors in the dynamical systems, and then discuss their pros and cons.

In the second part of our talk, we will pay attention to some models of control in quantum systems, focusing on driving energy characteristics of quantum bits and control over the performance of quantum devices: batteries, sensors, and matter-wave amplifiers.

In the final part, we discuss briefly the network applications of control methods to photonic memristors and quantum-state tomographers.

Keywords: feedback control algorithms, quantum bits, quantum batteries, quantum sensors, photonic memristors, quantum matter-wave amplifiers, quantum neuromorphic computing.

Speaker: **Assoc. Prof. Dr. Sergey Borisenok**

Department of Electrical and Electronics Engineering, Abdullah Gül University, Kayseri

Sergey Borisenok obtained his Ph. D. in 1996 in Theoretical and Mathematical Physics from St. Petersburg State University. He worked in Herzen State Pedagogical University (St. Petersburg, Russia), Abdus Salam School of Mathematical Sciences (Lahore, Pakistan) and Istanbul Kultur University. His research interest inludes control in quantum physics; control in networks, chaos and nonlinear dynamics, brain dynamics and qEEG; topological data analysis.