

There and Back Again

A Journey Through the World of Quantum Dynamics and Quantum Control

From Einstein's bewilderment about "spooky action at a distance" to widespread interactive access to quantum computers, our understanding and mastery of quantum mechanics has grown immensely during the past century.

The active harnessing of quantum effects is at the core of many emerging technologies. One of the main drivers of this development is our ability to steer quantum systems in a desired way. This is commonly achieved by investigating the quantum dynamics of a physical system and employing tools from the ever-growing toolbox of quantum control.

In this talk I will take you on a diverse journey through the quantum world and show you that several recent experimental results can be understood in a surprisingly simple manner.

Such an understanding of the fundamental mechanisms is pivotal to bridge the gap between theory and experiment and to unlock the full capabilities of quantum control.

Whether it is the employment of a rotating frame to explain bicircular high-harmonic generation or the numerical simulation of "chiral helium" to elucidate photoelectron circular dichroism, I will demonstrate the power of "simple quantum mechanics" in the investigation of molecular systems and more!