



University of Cyprus
Department of Physics

SEMINAR

**The Department of Physics of the University of Cyprus
organizes a Seminar by**

Assoc. Prof. Spiros S. Skourtis

The Seminar will take place on **Friday, September 20, 2024**
at **10:30 a.m.** in Room **LRC019** of the Library building

**“Molecular quantum transport of electrons and excitons in
chemistry, biology, and molecular nanotechnology”**

Molecular electron and exciton transport processes are ubiquitous in biology and chemistry. These processes are also central to the development of molecular-scale electronics and of novel quantum and energy-harvesting materials. The molecular structures of chemical and biological electron (exciton) transport systems have large structural variability. Due to this variability, overall transport distances may range from Angstroms to microns and even centimetres. Inter-molecular transport times can be as fast as picosecond or as slow as microseconds and milliseconds, depending on the underlying structures. Understanding charge and energy transport mechanisms at different length scales (single-molecule to molecular assembly), and in distinct environments (solution-phase, hybrid device, cellular), is a grand challenge. In a bottom-up approach one always starts at the single-molecule level, where transport is necessarily quantum, and then “zooms out” to larger length scales. A fundamental question to address is how molecular structure, electronic, and vibrational dynamics affect the transport mechanism. Another important question, relevant to device applications, is how to control transport speed by modifying molecular structure and by applying external fields. I will describe some of my recent research in this broad field.

The Seminar is open to the public and is part of the evaluation process for the promotion of Assoc. Prof. Spiros S. Skourtis.