Πανεπιστήμιο Κύπρου
Τμήμα Φυσικής

Το **Τμήμα Φυσικής** του Πανεπιστημίου Κύπρου

διοργανώνει σεμινάριο την

Τρίτη, 9 Ιουνίου 2026, Ώρα 11.00 π.μ.

στην αίθουσα Β228 (Κτίριο 13, Πανεπιστημιούπολη)

με ομιλητή τον:

Dr. Ioannis Paradisanos

Assistant Professor
Department of Materials Science & Engineering, University of Crete

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"Twistronics and Exciton Engineering in 2D Semiconductors"

Two-dimensional (2D) materials, such as graphene and monolayers of transition metal dichalcogenides (TMDs), exhibit exceptional light-matter interactions due to their reduced dimensionality and unique crystal symmetries. While only a few dozen layered compounds have been experimentally synthesized, theoretical predictions suggest that thousands of stable 2D materials await discovery, with properties ranging from semiconducting to magnetic and topological. These materials can be vertically stacked to form van der Waals heterostructures or rotationally misaligned to generate moiré superlattices, enabling unprecedented control over their electronic and optical properties. The ability to manipulate these properties through interlayer twist, external fields, and material composition has established twistronics and quantum state engineering as central themes in the study of atomically thin materials.

In this seminar, I will discuss insights from our recent studies on the linear and nonlinear optical spectroscopy of atomically thin semiconductors and their heterostructures, emphasizing their potential in optoelectronics and nanophotonics. I will present approaches for confining and transporting excitonic states (i.e.Coulomb-bound electron-hole pairs that dominate the optical response of 2D semiconductors) paving the way for their implementation in information-processing technologies such as excitonic circuits. Special attention will be given to the investigation of hybridized states whose energies and interactions can be tuned through external electric and magnetic fields, as well as interlayer twist. Finally, I will highlight recent advances in the alloy engineering of excitons in TMD semiconductors, demonstrating how alloy composition offers continuous tuning of exciton energies, spin-orbit splitting, and phonon energies.

Για περισσότερες πληροφορίες παρακαλώ επικοινωνείτε:
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