FORTH - ARCHERS (NIARCHOS) Conference
ARCHERS FINAL (VIRTUAL) CONFERENCE
DECEMBER 6-8, 2021

Engineering quantum states in atomically-thin semiconductors

Ioannis Paradisanos[1]

[1]LPCNO-INSA-CNRS, Genie Physique, 135 Avenue de Rangueil, 31077 Toulouse, France

paradeis@insa-toulouse.fr

Abstract

Motivated by the success of graphene that resulted in the Nobel Prize in Physics 2020, atomically thin (or layered or two-dimensional) materials have become the focus of intense research due to their unique and exotic optical, electronic, and mechanical properties. Although semiconductor technology is presently based on the control of electronic charge, electrons possess additional degrees of freedom, such as spin and valley for information processing and encoding. However, it has proved challenging to harness and manipulate the spin-valley degree, prerequisite for potential applications in future optoelectronics, valleytronics and quantum technology.

In this talk, I will show that the energy and polarization of light emission can be considerably influenced by engineering the quantum states in layered semiconductors. I will discuss recent advances in the area of layered materials physics and explain the positive impact of the *"ARCHERS"* fellowship in my career.