ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΗΣ ΔΙΠΛΩΜΑΤΙΚΗΣ ΕΡΓΑΣΙΑΣ

Τίτλος

«Μελέτη Εναπόθεσης Διηλεκτρικών σε Διδιάστατους Ημιαγωγούς με τη Μέθοδο Ατομικών Στρωμάτων»

του **Γεώργιου Φανουράκη,** μεταπτυχιακού φοιτητή του

Τμήματος Επιστήμης και Τεχνολογίας Υλικών του Πανεπιστημίου Κρήτης

Επιβλέπων: Παύλος Σαββίδης

Συνεπιβλέπων: Γεώργιος Δεληγεώργης

Τρίτη 15/02/2022

11:00

Η παρουσίαση θα πραγματοποιηθεί στην **αίθουσα Β2 του Τμήματος Χημείας,** του Πανεπιστημίου Κρήτης.

ABSTRACT

Semiconductors have been crucial in the advancement of technology. As technology advances, devices continue to shrink in size, and have now shrunk to the nanometer scale. This resulted in the quantum confinement of semiconductors and a corresponding degradation of device properties. Fortunately, this rapid scaling down of three-dimensional semiconductors occurred within the same decade as the isolation of graphene, the first two-dimensional material. Due to the fact that two-dimensional materials are by nature two-dimensional make them good candidates to replace conventional three-dimensional semiconductors.

The interface between those novel materials and high-k dielectrics is critical for nanoelectronics and optoelectronics. Atomic Layer Deposition (ALD) can deposit thin films that are uniform and pinhole-free at the atomic level. This indicates that ALD can be employed for this purpose; however, the primary disadvantage is that ALD relies on self-limiting surface reactions to achieve dielectric deposition, whereas the surface of an ideal 2D material is completely self-passivated.

This work seeks to study dielectric performance and deposition conditions on 2D-materials. To do so, we first investigate the deposition of Hafnium Oxide on Platinum using Atomic Layer Deposition. We tested the dielectric growth at 250 °C, at 200 °C, and at 150 °C. We also investigated the ALD growth at 250 °C using HfO2 and Yttria as buffer layers. Based on our findings, we investigated ALD growth of Hafnium Oxide on Molybdenum Disulphide using the optimal conditions. Our findings contribute to our understanding of high-k material development on inert surfaces.