

Ηράκλειο 21/02/2022

## Η ΠΑΡΟΥΣΙΑΣΗ ΔΙΠΛΩΜΑΤΙΚΗΣ ΕΡΓΑΣΙΑΣ

της φοιτήτριας Χρυσούλας Νικολέτας Μανωλάκη, θα γίνει τη

**Παρασκευή 25/02/2022** και ώρα **10:00**

στην αίθουσα Συνεδριάσεων Τμήματος στο Κτήριο Μαθηματικού

### **Θέμα Διπλωματικής:**

**“Spectroscopic studies of pesticides in food through advanced and non-invasive techniques”**

**Επιβλέποντες: κ.κ. Στυλιανό Τζωρτζάκη και Παναγιώτη Λουκάκο**

Για την παρακολούθηση της παρουσίασης δια ζώσης, το κοινό θα πρέπει να έχει τα απαραίτητα δικαιολογητικά (πιστοποιητικό εμβολιασμού, νόσησης ή rapid test).

### **Περίληψη:**

Nowadays, there is a growing awareness of consumers about nutrition, with particular focus on safety and health issues. The quality and safety of food is now at the forefront with an increasing concern on the use of pesticides as well as on the diseases that occur in humans because of their frequent and reckless use. Therefore, the demand for high quality and safety during food production requires high standards of quality and process control.

In this work we employ a novel broadband time-domain Terahertz (THz) spectroscopy method to characterize pesticides commonly used in the cultivation of fruits and vegetables. The THz spectrum offers unique spectroscopic advantages, since in this part of the spectrum one can identify collective vibrational modes of small and large molecules. The THz studies were also complemented with Mid-Infrared (MIR) spectroscopic measurements, where vibrational transitions of molecules can be identified, giving spectral information from the intramolecular interactions.

During this thesis, most pesticides that are commonly used in the agricultural industry and their respective active substances were studied in both frequency regimes. In the THz frequency range, a parametric study at various temperature and humidity conditions was performed in order to mimic the real conditions met in an agricultural field. A complete database of these substances has been developed and preliminary results of spectroscopic analysis shows the advantages and limits of the technique.