ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ **UNIVERSITY OF CRETE**

ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

DEPARTMENT OF MATERIALS SCIENCE AND TECHNOLOGY

Ηράκλειο, 20/10/2021

ΑΝΑΚΟΙΝΩΣΗ

Η ΠΑΡΟΥΣΙΑΣΗ ΔΙΠΛΩΜΑΤΙΚΗΣ ΕΡΓΑΣΙΑΣ

Του Φοιτητή **Απόστολου Κυριακάκη,** θα γίνει τη

Παρασκευή 22/10/2021 και ώρα **13:00**

στην αίθουσα Α2 του Κτιρίου Επιστήμης Υπολογιστών

Θέμα Διπλωματικής:

« Accelerating laser photopolymerization through beam shaping »

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

Abstract:
Laser photopolymerization is one of the most used methods when fabrication of 3D-micro or nano- structures is required. However, conventional laser writing techniques, especially when the fabrication of large area structures is needed, are very time-consuming because of the point-by-point writing. In this thesis, multi-beam interference is proposed as a simple and time-efficient method, able to accelerate the production of complex structures by reducing the fabrication time up to two orders of magnitude in comparison with the conventional point-by-point techniques.

Multi-beam interference as a well-established technique in the world of nonlinear optics can create periodic structures according to the intensity distribution of the interfering beams. Moreover, less or more complicated structures are realized as phase or amplitude modulation occurs, leading to a diversity of possible motifs. On these terms, this thesis is, also, investigating the possible patterns that are produced in an interference process as well as the basic changes that are observed when appropriate beam shaping is applied. The analysis focuses on the interaction between two, three, four and five beams, and the shaping includes alteration of the distance between the interfering beams and both phase and amplitude modulation.

Finally, we demonstrate the fabrication of complex periodic patterns that can be used in biomedical applications or in catalysis, using the controlled multi-beam interference technique. The samples can be fabricated in macroscopic dimensions and in short processing times, opening thus potential market applications

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