Πρόσκληση σε Δημόσια Παρουσίαση της Διδακτορικής Διατριβής του

κ. Δημήτριου Μανσούρ

με θέμα:

«Design and Engineering of Structured Light Tailored for Materials Science Applications»

«Σχεδιασμός και Υλοποίηση Διαμορφωμένου Φωτός, Προσαρμοσμένου για Εφαρμογές στην Επιστήμη των Υλικών»

(Σύμφωνα με το άρθρο 41 του Ν. 4485/2017)

Τετάρτη 28 Ιουλίου 2021 και ώρα **14:00**

https://virtconf.materials.uoc.gr/b/sta-0ul-qkj-uyj

Η παρουσίαση θα διεξαχθεί με τηλεδιάσκεψη στον παραπάνω σύνδεσμο, σύμφωνα με το άρθρο τρίτο, παρ. 1 της με αριθμ. 115744/Ζ1/4.9.2020 Κοινής Υπουργικής Απόφασης (Β΄3707), όπως έχει τροποποιηθεί και ισχύει.

Abstract

The generation of custom light fields, often described as structured light, is a topic of wide interest in optics. Structured light provides a significant advantage compared to non-structured light, by enabling us to control the intensity distribution and the focus position in both linear and non-linear propagation regimes. Such a control is challenging for high-power beams, since as one increases the beam's power, nonlinear effects inevitably take place and as a result the beam's spatial structure is dynamically altered. Although a plethora of structured optical beams have been introduced to address this problem, their generation is not trivial. Their complexity challenges our current state of the art techniques for light structuring and has urged us to exploit, among others, unconventional approaches like the use of optical aberrations or spatial multiplexing.

This thesis is focused on theoretical and experimental design techniques for materializing structured optical wave packets, with higher efficiency and power and at broad spectral range, tailored for materials science applications. These novel techniques include among others the use of reflecting optics as broadband continuous phase masks, which allowed us to experimentally study the effect of spatiotemporal coherence on the propagation of accelerating wave packets and to generate curved plasma channels for THz generation in air. Likewise, using

rotationally symmetric accelerating beams as a template, we introduce a toolbox of versatile light scalpels, and demonstrate the generation of Tornado waves, an exciting new type of spiralling light that combines radial and angular acceleration with a precisely tuned focal distribution.