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ICFO
The Institute
of Photonic
Sciences



Master in Photonics – “PHOTONICS BCN” Master ERASMUS+ “EuroPhotonics”

MASTER THESIS PROPOSAL

Dates: April 2020 - September 2021

Laboratory: Quantum Optics Theory
Institution: ICFO Institute of Photonic Sciences
City, Country: Castelldefels, Spain

Title of the master thesis: Strong field phenomena driven by waveforms

Name of the master thesis supervisor and co-supervisor: Maciej Lewenstein and Daniel González

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Keywords: quantum simulators, quantum many body systems, quantum information, topological order, lattice gauge theories and related models

Summary of the subject (maximum 1 page):

Ultracold atoms, molecules and ions provide an ideal platform to simulate various challenging models of condensed matter physics and even high energy physics: from Fermi Hubbard model to quark-gluon plasma. In this project, we will focus on models that can be realized with cold atoms, but go beyond the condensed matter and high energy physics standard models. These novel systems might lead to novel quantum phases and properties that might become very useful for all four branches of quantum technologies.

Additional information (if needed):

* Required skills : basic understanding of theoretical physics methods and numerical approaches

* Miscellaneous :