

Emmanouil PETRAKAKIS

PERSONAL DATA

PLACE AND DATE OF BIRTH: Heraklion, Crete, Greece | 23 July 1990
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WEB OF SCIENCE: <https://publons.com/researcher/AAD-9953-2019>
RESEARCHGATE: https://www.researchgate.net/profile/_Epetrakakis
GOOGLE SCHOLAR: <https://bit.ly/2QcdgSp>

EDUCATION

JAN 2020 PhD Student - Material Science Department, UNIVERSITY OF CRETE
Ultrafast Laser Micro- and Nano- Processing Laboratory , IESL - FORTH
Multiscale Modelling of Ultrafast Laser - Matter Interaction
Advisor: G.D.Tsibidis
Research Advisor: Emmanuel Stratakis

| [Description](#)

SEPT 2016 Master of Science in Advanced Theoretical Physics, UNIVERSITY OF CRETE
Thesis: "Quantum Coherence in Multi-Nuclear Radical-Ion Pairs
by the use of Parallel Supercomputer."

JUNE 2014 Bachelor of Science in Physics, UNIVERSITY OF CRETE
Thesis: "Metamaterial Perfect Absorbers in THz and Optical Regime"

WORK EXPERIENCE

SEPT 2017 Temporary Associate Researcher at TEXAS A&M UNIVERSITY, Qatar
Non - Linear Schrodinger Equation

PUBLICATIONS

E. Petrakakis, Tsibidis G.D., E. Stratakis 'Modelling of the ultrafast dynamics and surface plasmon properties of silicon upon irradiation with mid-IR femtosecond laser pulses'
[Physical Review B 99,195201](#) (2019)

WORKSHOPS AND CONFERENCES

'Towards Understanding and Modelling Intense Electronic Excitation' Poster Presentation and Attendance at the TUMMIE Cost Action 17126. Rethymno, Crete, Greece [COST ACTION '8th International Young Scientists Conference in Computational Science'](#), Poster Presentation and Attendance, Heraklion, Crete, Greece <http://ysc.escience.ifmo.ru/2019/>

COLLABORATIONS

Lasers, Plasmas et Procédés Photoniques, Aix-Marseille University www.lp3.univ-mrs.fr

SCHOLARSHIPS AND CERTIFICATES

SEPT. 2014 Scholarship During Bachelor Thesis (IESL - FORTH)

LANGUAGES

GREEK: Mothertongue
ENGLISH: Fluent
GERMAN: Basic Knowledge

COMPUTER SKILLS

Intermediate Knowledge: PYTHON, FORTRAN 90, LINUX, \LaTeX
Great Knowledge: COMSOL MULTIPHYSICS, MatLab, Mathematica

INTERESTS

Finite Element Analysis in Time Domain
Damage of Solids in the Mid - Infrared spectrum regime
Laser - Induced Non -Linear Phenomena in Semiconductors and Dielectrics
Plasma Formation and Surface Plasmon excitation
Non - Thermal Electronic Excitation in Metals
Reaction - Diffusion Kinetic Equations - Plasma Dynamical Impact on laser induced Damages
Periodic Structure Formation via Surface Plasmon Excitation
Out of Equilibrium Excitation Dynamics in Laser Excited Metals - Non - Thermal Electrons

PHD OBJECTIVE AND SCIENTIFIC IMPACT

Recent experimental observations on femtosecond Laser Induced Periodic Surface Structures (LIPPS), such as periodicity, roughness depth, damage thresholds, indicated the need for a predictive theoretical framework. To provide such a realist model, time - scale dependent physical mechanisms have to be separately studied and then unified in a consistent and robust way. Thus, the main research interest is to unify the relevant fundamental physical mechanisms, related to near - field electrodynamics, electron excitation, non-thermal electron distribution, relaxation and scattering processes, phase transitions, and hydrodynamics.