

Dr Petridis Konstantinos (PhD, St-Andrews) – Assistant Professor

Short CV

Dr Konstantinos Petridis received his Bachelor in 1996 from the Department of Physics of the University of Crete, Greece. He received his MSc in Optoelectronics and Laser Devices from the University of St-Andrews in 1996. In 1998 he joined the Nonlinear Optics Group of the University of St-Andrews in Scotland, UK as a research student. In 2001 he awarded his PhD. The title of his thesis is "External Cavity Diode Lasers as a Pump Source for Continuous Wave Optical Parametric Oscillators". Dr Konstantinos Petridis in 2003 he joined, as post-doctoral researcher, the Non-Linear Optics Group of Professor Ebrahimzadeh in The Institute of Photonic Sciences in Barcelona, Spain. In 2004 he joined the Department of Electronics of TEI of Crete as a contract assistant professor and as a researcher in the Optoelectronics, Lasers and Nonlinear Optics Research Group of TEI of Crete. In 2008 he got a tenure position as a lecturer in the Department of Electronics of TEI of Crete. Since 2012 is a member of the Nanomaterials & Organic Electronics Research group of TEI of Crete. In 2013 he promoted to tenure assistant professor in the Department of Electronic Engineering of TEI of Crete. Dr Petridis since 2004 he has organized and taught 6 theoretical modules (taught in Greek and in English) and taught 6 laboratory modules. Dr Petridis since 2011 is the Erasmus academic coordinator of the Department of Electronic Engineering of TEI of Crete. Dr Petridis **research interests** involve Organic BHJ Photovoltaics, Graphene based materials for Organic Photovoltaics, CW laser systems & technology, CW OPOs, SHG laser configurations, laser process of graphene and its derivatives, laser production & decoration of 2D materials, laser induced forward transfer (LIFT), laser patterning and modern educational methods in HEIs. **He has 26 journal publications and 61 conference publications and presentations. His research work has received 597 citations (March 2019).** He is journal reviewer in (1) Applied Physics Letters, (2) Applied Physics B, (3) Optical Materials, (4) Applied Physics A, (5) Thin Solid Films, (6) Surface Science, (7) Optics Letters, (8) Graphene Technology, (9) Journal of Materials Chemistry A. He is in the Editorial Board of Heliyon and also member of the Advisory board of Elsevier.

He **has coordinated** 8 Erasmus and Erasmus Plus projects and he actively participated as a teacher, manager, sub-coordinator in another six Erasmus projects. He has participated as a researcher in 12 national & international research programs.

Taught Modules (for 2018-19)

- Applied Electromagnetism
- Analysis of Electrical Circuits II
- Electronics II

- Laser Technology & Applications
- Electrical Circuits II
- An Introduction to Optoelectronics (in collaboration with Prof. Tatarakis)
- Applied Electromagnetism (theory in English – spring semester)
- An Introduction to Optoelectronics (theory in English – fall & spring semester)
- An Introduction to Quantum Mechanics (MSc module in PLAPA MSc course)
- An Introduction to Laser Physics (MSc module in PLAPA MSc course)
- An Introduction to Laser Physics (MSC module in OREA MSC course)
- Journal Club (MSC module in MSc course)
- An Introduction to Organic and Perovskite Solar Cells (MSc course OREA)
- How to write, publish and present your work (MSc Course, Electronic Systems and Automations, Department of Electronic Engineering of TEI of Crete)

Administration Duties (for 2018 - 19)

- Member of the Scientific Committee of the Erasmus Weeks hosted by the Department the last three years / Responsible for the Photonics & Education Sections
- Substitution National representative in the COST Action MP1307 - Stable Next-Generation Photovoltaics
- Substitution National representative in the COST Action MP1406 - Multiscale in modelling and validation for solar photovoltaics (MultiscaleSolar)
- Academic Coordinator of the Erasmus Plus Capacity Building Project entitled “Innovative Photonics Education in Nanotechnology” (2017 – 19)
- Academic Coordinator of the Erasmus Plus Capacity Building Project entitled ‘Innovative Teaching Education in Mathematics’ (2018 – 2021)
- Academic Coordinator of the Erasmus Plus Strategic Alliance Project entitled ‘Critical Skills of Electronic Engineers of 2020’ (2018 – 2020)
- Member of various committees in the Department of Electronic Engineering of TEI of Crete

Research Interests

As a member of the Nanomaterials and organic electronics research group of TEI of Crete my recent research activities include:

- Pulsed laser processing of graphene and graphene derivatives thin films and electronic devices
- Pulsed laser production of nanoparticles
- Pulsed laser decoration of 2D materials (GO, BN, MoS₂) with metal nanoparticles
- Transparent and Conductive Electrodes for Organic Photovoltaics

- Pulse laser sintering of ZnO, In₂O₃ oxide films
- Inverted Planar Perovskite Solar Cells & their stability issues
- Laser Printing (in collaboration with Technical University of Athens)
- Gas Sensing (in collaboration with IESL – FORTH)
- Laser Patterning (in collaboration with IESL-FORTH)
- Massive Online Courses & Modern Educational Methods in Higher Education

Selected Publications

1. M.M. Stylianakis, T. Maksudov, A. Panagiotopoulos, G. Kakavelakis, **K. Petridis**, ‘Inorganic and Hybrid Perovskite Based Laser Devices: A Review’, Invited Paper in *Materials* 2019, 12(6), doi:10.3390/ma12060859, I.F. 2.46
2. M. Stylianakis, G. Viskadourous, C. Polyzoidis, G. Veisakis, G. Kenanakis, N. Kornilios, **K. Petridis**, E. Kymakis, ‘Updating the Role of Reduced Graphene Oxide Ink on Field Emission Devices in Synergy with Charge Transfer Materials’, *Nanomaterials* 2019, 9, 137; doi:10.3390/nano9020137, I.F. 3.5
3. G. Kakavelakis, E. Kymakis, **K. Petridis**, ‘Two - dimensional materials beyond graphene for metal halide perovskite solar cells’, *Advanced Materials Interfaces (I.F. 4.5), Advanced Materials & Interfaces (2018) 5, 22, 1800339*
4. S. Papazoglou, **K. Petridis**, E. Kymakis, S. Kenou, Y.S. Raptis and I. Zergioti, "In-situ sequential laser transfer and laser reduction of graphene oxide films", *Applied Physics Letters (2018) 112, 183301* (impact factor: 3.4)
5. **K. Petridis**, G. Kakavelakis, E. Kymakis, “The renaissance of graphene-related materials in photovoltaics with the emergence of metal-halide perovskite solar cells”, *Energy and Environmental Science*, (impact factor: 29.518), <http://dx.doi.org/10.1039/C7EE03620E>, Accepted, 2018.
6. **K. Petridis**, G. Kakavelakis, M.M. Stylianakis and E. Kymakis, “Graphene Based Inverted Planar Perovskite Solar Cells: Advancements, Fundamental Challenges and Prospects”, *Chemistry - An Asian Journal* (2018)13, 3, 240–249, (impact factor: 4.083)
7. G. Kakavelakis, E. Gagaoudakis, **K. Petridis**, V. Petromichelaki, V. Binas, G. Kiriakidis, E. Kymakis, “A solution processed CH₃NH₃PbI₃-xCl_x perovskite based self-powered ozone sensing element operated at room temperature”, *ACS Sensors*, Accepted, 2018.
8. G. Kakavelakis, **C. Petridis**, E. Kymakis, “Recent advances in plasmonic metal and rare earth element upconversion nanoparticles doped perovskite solar cells”, *Journal of Materials Chemistry A* (impact factor: 8.9), 5, 21604 – 21624, 2017.
9. M. Sygletou, **C. Petridis**, E. Kymakis and E. Stratakis, “Advanced Photonic Processes for Photovoltaic and Energy Storage Systems”, *Advanced Materials* (impact factor: 18.96), 29, 39, 1700335, 2017.

10. M. Stylianakis, D. Konios, **C. Petridis**, G. Kakavelakis, E. Stratakis and E. Kymakis, "Ternary solution processed organic solar cells incorporating 2D materials", *2D Materials* (impact factor: 9.6), 4, 042005, 2017.
11. **C. Petridis**, K. Savva, E. Kymakis and E. Stratakis, "Laser Generated Nanoparticles based photovoltaics", *Journal of Colloid and Interface Science* (impact factor: 3.368), 1, 489, 28-37, 2017.
12. **C. Petridis**, E. Kymakis and E. Stratakis, "Photonic Processes for Energy Production", DOI: 10.1109/MCSI.2016.012, 2017.
13. **C. Petridis**, D. Konios, MM Stylianakis, G. Kakavelakis, M. Sygletou, K. Savva, P. Tzourmpakis, M. Krassas, Naoum Vaenas, E. Stratakis and E. Kymakis, "Solution processed reduced graphene oxide electrodes for organic photovoltaics", Issue 5, *Nanoscale Horizons* (impact factor is under pending), 2016.
14. D. Konios, G. Kakavelakis, **C. Petridis**, K. Savva, E.Stratakis, E. Kymakis, "Highly Efficient organic photovoltaics utilizing work function tuned graphene oxide derivatives as the anode and cathode charge extraction layers", *Journal of Materials Chemistry A* (impact factor: 8.262), 4, 1612-1623, 2016 – Citations Received: 5.
15. Sygletou M., Tzourmpakis P., **Petridis C.**, Konios D., Fotakis C., Kymakis E., Stratakis E., "Laser induced assembly of plasmonic nanoparticles on two-dimensional nanosheets for organic photovoltaics", *Journal of Materials Chemistry A* (impact factor: 8.262), 4, 1020-1027, 2016 – Citations Received: 4.
16. L. Syngellou, G. Viskadourous, **C. Petridis**, E. Kymakis, C. Galiotis, D. Tasis, E. Stratakis, "Effect of the reduction process on the field emission performance of reduced graphene oxide cathodes", *RSC Advances* (impact factor 3.708), 5, 53604-5361, 2015.
17. Konios D., **Petridis C.**, Kakavelakis G., Sygletou M., Savva K., Kymakis M., Stratakis M., "Reduced Graphene Oxide Micromesh Electrodes for large area, flexible photovoltaic devices", *Advanced Functional Materials* (impact factor 11.382), 25, 15, 2213-2221 [Appeared in the inside front cover of Adv. Funct. Mater], Citations received: 41.
18. Savva K., Y. Lin, **C. Petridis**, T.D. Anthopoulos, E. Kymakis and E. Stratakis, "In-situ Photo-Induced Chemical Doping of Solution-Processed Graphene Oxide for Electronic Applications", *Journal of Materials Chemistry C* (impact factor 6.101), Manuscript ID TC-ART-02-2014-000404.R1, 2014.
19. Stratakis E., Savva K., Konios D., **Petridis C.**, Kymakis E., "Improving the efficiency of organic photovoltaics by tuning the work function of grapheme oxide hole transporting layers", *Nanoscale* (impact factor: 6.23), DOI: 10.1039/C4NR01539H, 2014.
20. E. Kymakis, **C. Petridis**, T.D. Anthopoulos, E. Stratakis, "Laser Assisted Reduction of Graphene Oxide in Flexible, Large Area Optoelectronics", invited review paper in *IEEE Journal of Selected Topics in Quantum Electronics* (impact factor: 4.078), 20 (1), art. no.

6573325, 2014.

21. **C. Petridis**, K. Savva, Y. Lin, G. Eda, E. Kymakis, T.D. Anthopoulos, E. Stratakis, “Post – Fabrication in situ laser reduction of graphene oxide devices”, *Applied Physics Letters* (impact factor: 3.974), vol. 102, pp.093115, 2013.
22. A Skoulakis, GC Androulakis, EL Clark, SM Hassan, P Lee, J Chatzakis, M Bakarezos, V Dimitriou, **C Petridis**, NA Papadogiannis, M Tatarakis, “A Portable Pulsed Neutron Generator”, *International Journal of Modern Physics: Conference Series*, vol. 27, 2014.
23. J Chatzakis, SM Hassan, EL Clark, **C Petridis**, P Lee, M Tatarakis, "High repetition rate pseudospark trigger generator", *Review of Scientific Instruments* (impact factor: 1.336), 79 (8), 2008. – Citations received: 3.
24. SM Hassan, EL Clark, **C Petridis**, GC Androulakis, J Chatzakis, P Lee, N. Papadogiannis and M. Tatarakis, “Filamentary structure of current sheath in miniature plasma focus”, *IEEE Transactions on Plasma Science*, 39 (11), 2432-2433, 2011.
25. **C. Petridis**, I. Lindsay, D. Stothard, and M. Ebrahimzadeh, “Mode – hop free tuning over 80 GHz of an extended cavity diode laser without antireflection coating”, *Review of Scientific Instruments* (impact factor: 1.336), vol. 72, pp. 3811-3815, 2001.
26. I. Lindsay, **C. Petridis**, M.H. Dunn and M. Ebrahimzadeh, “Continuous wave pumped enhanced singly resonant optical parametric oscillator by an extended cavity diode laser”, *Applied Physics Letters* (impact factor: 3.974), vol. 78, pp. 871 – 873, Feb. 2001.

Book Chapter

1. M.M. Stylianakis, D. Konios, **C. Petridis** and E. Kymakis, “Solution Processed Graphene Based Transparent Conductive Electrodes as ideal ITO Alternatives for Organic Solar Cells” in GRAPHENE Materials, ISBN 978-953-51-3142-7, Print ISBN 978-953-51-3141-0, 238 pages, InTech Publisher, DOI:10.5772/intehopen.686679, 2017
2. G. Kakavelakis, Y. Tischler, I. Kaliakatsos and **C. Petridis**, ‘TMD Photovoltaics’ in book volume entitled “Two Dimensional Transition Metal Dichalcogenides - Synthesis, Properties and Applications”, in Springer Nature, 2019, under publication

Conference Publications for 2019

1. Invited Speaker in 12th International Symposium on Flexible Organic Electronics (ISFOE19), 1-4th of July 2019, Thessaloniki, Greece, ‘Graphene and Perovskite Based Gas Sensors’

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