

# Stylianos Petrakis, Ph.D.

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## Education

- 2024 **Ph.D., University of Ioannina - Hellenic Mediterranean University**  
Thesis title: *Coherent Ultrashort Extreme Ultraviolet Sources and Quantum Control of their Characteristics with Applications to Multispectral Diffraction Microscopy* link: <http://hdl.handle.net/10442/hedi/56465>
- 2013 **M.Sc. Physics Department University of Crete** in Optoelectronics - Microelectronics.  
Thesis title: *Study of the High Harmonic Generation in Xe-gas through control of the polarization of two time-delayed femtosecond laser pulses.*
- 2008 **BS Bachelor of Science, School of Science and Technology Hellenic Open University**  
Studies in Natural Sciences.

## Employment History

- 2016 – . . . . **Researcher.** Hellenic Mediterranean University.
- 2016 – 2018 **Lecturer.** Technological Institute of Crete.
- 2009 – 2010 **Teacher.** High-school teacher.
- 1995 – 2010 **Manufacturing Industry.** Administrative and Technical staff.

## Skills

- Laboratory skills, including **Las**er infrastructures (45 TW, 7 fs laser). High vacuum systems. Laser-matter interaction. Coherent radiation production. XUV radiation manipulation (multilayer filters, designing, analyzing, studying). Design and implementation of scientific apparatus for coherent diffraction imaging. Image processing and image reconstruction from diffraction data.
- Specialized Software **M**athematica, **M**atlab, **M**aple, **O**originLAB, **C**OMSOL, **A**NSYS, **O**pen-FOAM, and **Z**emax.
- Automation & Electronics **D**esign and implementation of laboratory automation using **L**abView and **A**gilent Vee. **C**ircuit design, simulation, and analysis with **P**SPICE & **M**ULTISIM.
- Languages **E**nglish (C2), **I**talian (B2).
- Office Programs **M**icrosoft Office, **O**penOffice.
- Computer Certifications **E**CDL Core, **I**CT Advanced in the units of **C**ommunication System Management, license to practice the profession of **E**lectrician.
- Design & Image Editing **A**utodesk Inventor, **S**ketchUp, **I**mageJ, **I**nkscape, **G**IMP.
- Misc. **L**ATEX typesetting and publishing.

## Research Publications

### Journal Articles

- 1 K. Kaleris, Y. Orphanos, S. Petrakis, M. Bakarezos, M. Tatarakis, J. Mourjopoulos, and N. A. Papadogiannis, "Laser-plasma sound sources in atmospheric air: A systematic experimental study," *Journal of Sound and Vibration*, vol. 570, p. 118 000, 2024. [DOI: 10.1016/j.jsv.2023.118000](#).
- 2 K. Kosma, K. Kaleris, E. Kaselouris, E. Kaniolakis-Kaloudis, S. Petrakis, Y. Orphanos, E. Gagaoudakis, V. Binas, E. Bakarezos, M. Tatarakis, V. Dimitriou, and N. A. Papadogiannis, "Pump-probe reflectivity studies of ultrashort laser-induced acousto-mechanical strains in ZnO films," *Applied Physics A: Materials Science and Processing*, vol. 129, no. 8, pp. 1–11, Aug. 2023, ISSN: 14320630. [DOI: 10.1007/s00339-023-06837-1](#).
- 3 V. Mylona, E. Anagnostaki, S. Petrakis, K. Kosma, S. Parker, M. Cronshaw, N. Papadogiannis, and M. Grootveld, "Unleashing the Hidden Potential: The Dynamic Duo of Antimicrobial Photodynamic Therapy and Photobiomodulation: A Spectrophotometric Study," *Applied Sciences*, vol. 13, no. 13, p. 7647, Jun. 2023, ISSN: 20763417. [DOI: 10.3390/app13137647](#).
- 4 I. Ftilis, A. Grigoriadis, I. Tazes, S. Petrakis, G. Andrianaki, V. Dimitriou, E. Bakarezos, E. P. Benis, I. Tsiapa, T. Boursianis, G. Kalaitzakis, G. Bontzos, D. A. Liakopoulos, E. Pappas, E. T. Detorakis, E. L. Clark, T. G. Maris, N. A. Papadogiannis, and M. Tatarakis, "Polymer-Gel Radiation Dosimetry of Laser-Based Relativistic Electron Sources for Biomedical Applications: First Qualitative Results and Experimental Challenges," *Frontiers in Physics*, vol. 10, 2022, ISSN: 2296424X. [DOI: 10.3389/fphy.2022.727511](#).
- 5 S. Petrakis, M. Bakarezos, M. Tatarakis, E. P. Benis, and N. A. Papadogiannis, "Spectral and Divergence Characteristics of Plateau High-Order Harmonics Generated by Femtosecond Chirped Laser Pulses in a Semi-Infinite Gas Cell," *Atoms*, vol. 10, no. 2, 2022, ISSN: 22182004. [DOI: 10.3390/atoms10020053](#).
- 6 S. Petrakis, A. Skoulakis, Y. Orphanos, A. Grigoriadis, G. Andrianaki, D. Louloudakis, N. Kortsalioudakis, A. Tsapras, C. Balas, D. Zouridis, E. Pachos, M. Bakarezos, V. Dimitriou, M. Tatarakis, E. P. Benis, and N. A. Papadogiannis, "Coherent XUV Multispectral Diffraction Imaging in the Microscale," *Applied Sciences (Switzerland)*, vol. 12, no. 20, 2022, ISSN: 20763417. [DOI: 10.3390/app122010592](#).
- 7 E. L. Clark, A. Grigoriadis, S. Petrakis, I. Tazes, G. Andrianaki, A. Skoulakis, Y. Orphanos, E. Kaselouris, I. Ftilis, J. Chatzakis, E. Bakarezos, V. Dimitriou, E. P. Benis, N. A. Papadogiannis, and M. Tatarakis, "High-intensity laser-driven secondary radiation sources using the ZEUS 45 TW laser system at the Institute of Plasma Physics and Lasers of the Hellenic Mediterranean University Research Centre," *High Power Laser Science and Engineering*, vol. 9, p. 53, 2021, ISSN: 20523289. [DOI: 10.1017/hpl.2021.38](#).
- 8 S. Petrakis, M. Bakarezos, M. Tatarakis, E. P. Benis, and N. A. Papadogiannis, "Electron quantum path control in high harmonic generation via chirp variation of strong laser pulses," *Scientific Reports*, vol. 11, no. 1, p. 23 882, 2021, ISSN: 20452322. [DOI: 10.1038/s41598-021-03424-3](#).
- 9 J. Pasley, G. Andrianaki, A. Baroutsos, D. Batani, E. P. Benis, A. Ciardi, D. Cook, V. Dimitriou, B. Dromey, I. Ftilis, G. Gatti, A. Grigoriadis, M. Huault, J. A. P. Hernandez, E. Kaselouris, O. Klimo, M. Koenig, G. Koundourakis, M. Kucharik, J. Limpouch, R. Liska, C. S. Lopez, S. Malko, S. Olmos-Miguelanez, Y. Orphanos, V. Ospina, N. A. Papadogiannis, S. Petrakis, J. Psikal, M. S. Rivetta, M. J. Rodriguez-Conde, J. J. Santos, M. Sinor, A. Skoulakis, I. Tazes, L. T. Pascua, C. Tsitou, P. Vachal, L. Volpe, J. Vyskocil, S. White, M. Yeung, G. Zerouli, and M. Tatarakis, "Innovative education and training in high power laser plasmas (PowerLaPs) for plasma physics, high power laser matter interactions and high energy density physics: Experimental diagnostics and simulations," *High Power Laser Science and Engineering*, vol. 8, p. 5, 2020, ISSN: 20523289. [DOI: 10.1017/hpl.2020.4](#).
- 10 J. Pasley, G. Andrianaki, A. Baroutsos, D. Batani, E. P. Benis, M. Borghesi, E. Clark, D. Cook, E. D'Humieres, V. Dimitriou, B. Dromey, M. Ehret, I. Ftilis, A. Grigoriadis, S. Kar, E. Kaselouris, O. Klimo, M. Koenig, K. Kosma, G. Koundourakis, M. Kucharik, A. Lavery, J. Limpouch, Y. Orphanos,

N. A. Papadogiannis, S. Petrakis, D. Riley, M. Serena Rivetta, L. Tejada Pascual, J. Jorge Santos, A. Skoulakis, I. Tazes, V. Tikhonchuk, J. Trela, C. Tsitou, L. Volpe, S. White, M. Yeung, and M. Tatarakis, "Innovative Education and Training in high power laser plasmas (PowerLaPs) for plasma physics, high power laser-matter interactions and high energy density physics - Theory and experiments," *High Power Laser Science and Engineering*, vol. 7, p. 23, 2019, ISSN: 20523289. [DOI: 10.1017/hpl.2019.7](https://doi.org/10.1017/hpl.2019.7).

11 M. Bakarezos, E. Tzianaki, S. Petrakis, G. Tsibidis, P. A. Loukakos, V. Dimitriou, C. Kosmidis, M. Tatarakis, and N. A. Papadogiannis, "Ultrafast laser pulse chirp effects on laser-generated nanoacoustic strains in Silicon," *Ultrasonics*, vol. 86, pp. 14–19, May 2018, ISSN: 0041624X. [DOI: 10.1016/j.ultras.2018.01.008](https://doi.org/10.1016/j.ultras.2018.01.008).

12 E. Tzianaki, M. Bakarezos, G. D. Tsibidis, S. Petrakis, P. A. Loukakos, C. Kosmidis, M. Tatarakis, and N. A. Papadogiannis, "Controlling nanoscale acoustic strains in silicon using chirped femtosecond laser pulses," *Applied Physics Letters*, vol. 108, no. 25, p. 254 102, 2016, ISSN: 00036951. [DOI: 10.1063/1.4954636](https://doi.org/10.1063/1.4954636).

## Conference Proceedings

1 S. Petrakis, E. Benis, A. Skoulakis, Y. Orphanos, V. Dimitriou, M. Bakarezos, M. Tatarakis, N. Kortsalioudakis, A. Tsapras, P. Tsopelas, C. Balas, D. Zouridis, E. Pachos, and N. Papadogiannis, "Coherent femtosecond x-ray multi-spectral microscopy system: The xmmas project," in *Papadogiannis 18th International Conference on Nanosciences & Nanotechnologies (NN21)*, Thessaloniki, 2021.

2 E. Clark, A. Grigoriadis, I. Tazes, G. Andrianaki, I. Ftilis, S. Petrakis, A. Skoulakis, E. Kaselouris, T. Maris, I. Tsiapa, M. Bakarezos, I. Nikolos, V. Dimitriou, E. Benis, N. Papadogiannis, and M. Tatarakis, "Novel gel dosimetry diagnostic for the secondary sources of ZEUS 45TW laser system at CPPL," in *3rd European Conference on Plasma Diagnostics (ECPD)*, Lisbon and Portugal, 2019.

3 E. Clark, A. Grigoriadis, I. Tazes, G. Andrianaki, I. Ftilis, S. Petrakis, A. Skoulakis, E. Kaselouris, T. Maris, I. Tsiapa, M. Bakarezos, I. Nikolos, V. Dimitriou, E. Benis, N. Papadogiannis, and M. Tatarakis, "Secondary sources generated with the ZEUS 45TW laser system at CPPL," in *International Conference on Applications of Nuclear Techniques*, Rethymno, Crete, and Greece, 2019.

4 G. Andrianaki, A. Grigoriadis, I. Tazes, E. Clark, I. Ftilis, S. Petrakis, A. Skoulakis, E. Kaselouris, T. Maris, I. Tsiapa, M. Bakarezos, I. Nikolos, V. Dimitriou, E. Benis, N. Papadogiannis, and M. Tatarakis, "Energetic particles source using the Zeus 45 TW laser at CPPL," in *35th European Conference on Laser Interaction with Matter*, Rethymno, Crete, and Greece, 2018.

5 S. Petrakis, Y. Orphanos, I. Ftilis, E. Clark, V. Dimitriou, M. Bakarezos, M. Tatarakis, E. Benis, and N. Papadogiannis, "High harmonics generation and characterization using the Zeus laser at CPPL," in *35th European Conference on Laser Interaction with Matter*, Rethymno, Crete, and Greece, 2018.