Alexandros Gerakis, PhD *ORCID:* 0000 − 0002 − 3356 − 2304

Research Interests

Laser-matter interaction, Laser-plasma interaction, Non-linear optics, Nanoparticle diagnostics, Atomic & Molecular scattering, Gas flow measurements, Cold and ultracold matter, Diode pumped solid state (DPSS) laser engineering.

Education

Doctor of Philosophy (October 2009 − August 2014)
School of Physics & Astronomy, University College London, England, UK
- Doctoral Thesis Title: "Controlling and probing molecular motion with optical lattices"
- Advisor: Prof. Peter F. Barker

Master of Science "Photonics & Optoelectronic Devices" (Sept. 2008 − Sept. 2009)
School of Physics & Astronomy,University of St. Andrews, Scotland, UK
- Master's Thesis Title: "Development of a tunable, Q-Switched Yb:KYW laser"
- Advisor: Prof. Bruce Sinclair

Diploma of Science (eq. to MSc) (September 2002 − July 2008)
National Technical U. of Athens, School of Applied Mathematical & Physical Sciences
- Diploma Thesis Title: "Monte Carlo simulation of corneal and retinal Optical Coherence Tomography imaging and design of an OCT laboratory setup"
- Advisor: Associate Prof. Mirsini Makropoulou

Professional Experience

Senior Research & Technology Associate (January 2021 - *present*)
Advanced Instr. for Nano-Analytics, Luxembourg Institute of Science & Technology
Adjunct Professor (January 2021 - *present*)
Department of Aerospace Engineering, Texas A&M University
Assistant Professor *Tenure Track* (September 2018 - December 2020)
Head - Optical Probing & Manipulation Group
Department of Aerospace Engineering, Texas A&M University
Research Assistant Professor (March 2018 - August 2018)
Department of Aerospace Engineering, Texas A&M University
Associate Research Physicist (December 2014 - February 2018)
Princeton Plasma Physics Laboratory (PPPL) - Laboratory for Plasma Nanosynthesis
Post-Doctoral Research Fellow (April 2014 - November 2014)
Department of Chemistry & Chemical Biology, Harvard University
Post-Doc in Prof. Kang-Kuen Ni's cold molecules group
Post-Doctoral Research Assistant (October 2013 - March 2014)
School of Physics & Astronomy, University College London
PDRA in Prof. Peter Barker's cold molecules group

Teaching Experience

- Taught "AERO212 - Aerothermodynamics" and "AERO301 - Theoretical Aerodynamics" for a total of 5 semesters while a Professor at Texas A&M, at class capacities ranging from 25 to 95 students. Student evaluation grades were higher than 4 out of 5, for all semesters.
- Teaching assistant and marker in the 1^{st} year undergraduate Physics laboratories for a total of 8 semesters, while a PhD student at University College London.

Supervision Experience

- LIST: Currently supervising 3 PhD students and 1 Post-Doctoral Researcher.
- TAMU: Supervised 1 Post-Doctoral Researcher, 1 PhD student and 6 Undergraduate students. Co-Supervised 1 PhD student.
- PPPL: Supervised 3 undergraduate interns holding a highly competitive Science Undergraduate Laboratory Internship (SULI) from the U.S. Department of Energy; the work carried out with one of them lead to a patent. 2 of the 3 students are currently PhD candidates at R-1 Universities in the USA.

Previous Projects & Research Grants (competitive)

Luxembourg National Research Fund CORE Grant 2023: Velocity Distribution Function Shaping Of Ions With Intense Optical Lattice (VERITAS), **Principal Investigator**, Funding level: €672.000 for 4 years.

Luxembourg National Research Fund ATTRACT Consolidator Grant 2021: Development of advanced 1-D, non-perturbative, laser based diagnostics of neutral and charged species, using FRequency AGile Optical LAttices, **sole-Principal Investigator**, Funding level: €2.000.000 for 5 years.

U. S. National Science Foundation Award #1903481: Investigation of Thermodynamic Conditions in an Arc Discharge Plasma, **Principal Investigator**, Funding level: $300.000 for 3 years.
U.S. National Science Foundation Award #2011994: Texas Plasma Physics Undergraduate Workshop, **Principal Investigator**, Funding level: $15.000 for applicant travel & participation costs.
U.S. Department Of Energy Award #DE-SC0021183: Development of theory and experimental operational framework for coherent Thomson scattering, **Principal Investigator**, Funding level: $35.342 for 1 year.
U.S. Department Of Defense, Office Of Naval Research Award #: N00014-20-1-2348: Forward Thomson Scattering for the Measurement of Weakly Ionized Plasmas in Hypersonic Flows, **Co-Principal Investigator**, Funding level: $740.629 for 3 years.
U.S. National Aeronautics & Space Administration, NIAC #80NSSC19K0974 Award: Self-Guided Beamed Propulsion for Breakthrough Interstellar Missions, **Co-Principal Investigator**, Funding level: $499.639 for 2 years.

Publications

Refer to my *Google Scholar* page for a complete and updated list of publications.

Patents

Gomez; M. G., Bagley; C. A., Tobias; B. J., Zolfaghari; A., **Gerakis; A.**, ***Demetillo; M. A., *Self-aligning deflector device for transmission line offset correction*, US Patent 10,162,138

Invited Conference Presentations

[5] 73^{rd} APS Gaseous Electronics, Virtual Conference, 10/2020.
[4] AIAA Aviation 2020, Virtual Conference, 06/2020.
[3] Laser Diagnostics in Plasmas Workshop, 72^{nd} APS Gaseous Electronics Conference, College Station, TX, 11/2019
[2] Laser Assisted Plasma Diagnostics Conference, Whitefish, Montana, 09/2019
[1] SPIE Optical Trapping and Optical Micromanipulation XIV, San Diego, CA, 09/2017

Invited Colloquia/Seminars

[8] Optical Society of America, 2^{nd} Engineering Week webinar, 04/2021.
[7] Optical Society of America, 1^{st} Engineering Week webinar, 02/2020.
[6] Department of Physics, West Virginia University, Colloquium seminar, WV, 02/2020.
[5] CNRS/ICARE Colloquium Seminar, Orleans, France, 06/2019.
[4] Department of Physics Colloquium, University of Patras, Greece, 07/2018.
[3] The College of New Jersey, Physics Department Colloquium, 10/2017.
[2] PPPL Research Meeting Colloquium, 04/2017.
[1] Rutgers University, Materials Engineering Department Colloquium, 02/2017.

Awards

- **Engineering and Physical Sciences Research Council** Doctoral Training Studentship
- **Engineering and Physical Sciences Research Council** Master's Training Studentship
- **The Onassis Foundation** travel and participation award for attending the **2013 Lectures in Physics and Chemistry: Nanoscience and Nanotechnology**

Professional Memberships

Institute of Physics (UK), **Optical Society of America**, **American Physical Society**, **American Institute of Aeronautics and Astronautics**

Service

- Panel Reviewer for: **National Science Foundation**, **U.S. Department of Energy**.
- Reviewer for peer reviewed journals: **Optics Express**, **Journal of Physics B**, **Optics Letters**, **Journal of Applied Physics**, **New Journal of Physics Journal of Visualized Experiments**, **AIP Advances**, **Journal of Optics**, **Optics Communications**, **Physica Scripta**, **Review of Scientific Instruments**

Technical Skills

Programming: LabVIEW (Certified Associate Developer), MATLAB, Mathematica.
Applications: Autodesk Inventor, LaTeX, Origin, ZEMAX, Microsoft Office.
Operating Systems: Windows, Linux.

Language Skills

Greek - *Native speaker*, **English** - *Fluent*, **French** - *Fluent*