Alexandros Gerakis, PhD

Contact Information

Department of Aerospace Engineering,
Texas A&M University
743D H.R. Bright Building
77843-3141, College Station, TX, USA

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Personal Information

Citizenship: Hellenic

Research Interests

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

Education

Doctor of Philosophy
October 2009 – August 2015
University College London, School of Physics & Astronomy
- Thesis Title: "Controlling and probing molecular motion with optical lattices"
- Advisor: Prof. Peter F. Barker

Master of Science (Merit) in Photonics & Optoelectronic Devices
September 2008 – September 2009
University of St. Andrews, School of Physics & Astronomy
- Thesis Title: "Development of a tunable, Q-Switched Yb:KYW laser"
- Advisor: Prof. Bruce Sinclair

Bachelor of Science
September 2002 – July 2008
National Technical University of Athens, School of Applied Mathematical and Physical Sciences
- Thesis Title: "Monte Carlo simulation of corneal and retinal Optical Coherence Tomography imaging and design of an OCT laboratory setup"
- Advisor: As. Prof. Mirsini Makropoulou

Professional Experience

Assistant Professor
September 2018 - *present*
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)
Working in PPPL's Laboratory for Plasma Nanosynthesis (LPN), employing CRBS spectroscopy in plasma assisted nano-particle synthesis (*nano.pppl.gov*).

Post-Doctoral research fellow
April 2014 - November 2014
Department of Chemistry & Chemical Biology, Harvard University
PostDoc 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 Assistant
October 2009 - March 2013 (8 academic semesters)
School of Physics & Astronomy, University College London
Teaching assistant and marker in the 1^{st} year undergraduate Physics laboratories.

Master's project intern
May - August 2009
Elforlight Ltd, 4b Brunel Close, Drayton Fields, Daventry, Northants, NN11 8RB, UK.
- Topic: Development of an actively Q-switched, tunable Yb:KYW laser.

Publications (peer reviewed)

B. C. Stratton, **A. Gerakis**, I. Kaganovich, M. Keidar, A. Khrabrov, J. M. Mitrani, Y. Raitses, M. N. Shneider, V. Vekselman, S. Yatom, "In Situ Diagnostics for Plasma Synthesis of Nanomaterials", Plasma Sources Sci. Technol. 27, 084001 (2018)

A. Gerakis,Y.-W. Yeh, M. N. Shneider, J. M. Mitrani, B. C. Stratton and Y. Raitses, "Four-wave mixing approach to *in-situ* detection of nanoparticles", Phys. Rev. Applied 9, 014031 (2018)

A. Gerakis, M. N. Shneider, B. C. Stratton and Y. Raitses, "An all-optical, in situ diagnostic for large molecule and nanoparticle detection" Proc. SPIE 10093, Synthesis and Photonics of Nanoscale Materials XIV, 100930O (2017)

A. Gerakis, M. N. Shneider, and B. C. Stratton, "Remote-sensing gas measurements with coherent Rayleigh-Brillouin scattering" Appl. Phys. Lett. 109, 031112 (2016) (*featured as an Editor's pick*)

A. Gerakis, M. N. Shneider, and P. F. Barker, "Single shot coherent Rayleigh-Brillouin scattering using a chirped optical lattice" Opt. Letters 38, 4449-4452 (2013)

A. Gerakis, M. N. Shneider, and P. F. Barker, "Coherent Brillouin scattering" Opt. Express 19, 24046-24054 (2011)

A. Gerakis, M. Yu Kirillin, E.A.Sergeeva, M. Makropoulou, A.A. Serafetinides, "Monte Carlo modeling of corneal and retinal Optical Coherence Tomography imaging," 8th IEEE International Conference on BioInformatics and BioEngineering, 2008, pp.1,6, 8-10 Oct. 2008

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

Conferences attended

A. Gerakis, M. N. Shneider, B. C. Stratton and Y. Raitses, "Electrostrictive in-situ nanoparticle detection with coherent Rayleigh-Brillouin scattering ", in SPIE Optical Trapping and Optical Micromanipulation XIV, San Diego, CA, 2017. (*Invited* oral presentation)

A. Gerakis, M. N. Shneider, B. C. Stratton and Y. Raitses, "An all-optical, in situ diagnostic for large molecule and nanoparticle detection", in SPIE Photonics West, San Francisco, CA, 2017. (poster presentation)

A. Gerakis, M. N. Shneider, B. C. Stratton and Y. Raitses, "An all-optical, in situ diagnostic for gas and nanoparticle detection", in MRS Fall Meeting, Boston, MA, 2016. (poster presentation)

A. Gerakis, N. Coppendale, C. Maher-McWilliams, P. Douglas, and P. Barker, "A high-energy chirped laser system for fast manipulation of gases", in Conference on Lasers and Electro-Optics 2012, OSA Technical Digest (Optical Society of America, 2012), paper QW3E.4. (oral presentation)

A. Gerakis, M. N. Schneider and P. F. Barker, "A high-energy, chirped laser system for single shot coherent Rayleigh-Brillouin scattering", in European Conference on Non-linear Optical Spectroscopy (ECONOS), Aberdeen, 2012.(oral presentation)

A. Gerakis, M. N. Schneider and P. F. Barker, "Coherent Brillouin scattering", in Quantum, Atomic, Molecular and Plasma physics (QuAMP), Oxford, 2011.(poster presentation)

A. Gerakis, P. Douglas, C. Maher-McWilliams, N. Coppendale and P. F. Barker, "Chirped optical Stark deceleration/acceleration", in Workshop on Cold and Controlled Molecular Collisions,Ringberg castle, Germany, 2011.(poster presentation)

Invited talks/seminars

-Laser, Non-linear and Quantum Optics Group, Department of Physics, University of Patras, Greece, July 2018: "In Situ Gas and Nanoparticle Measurements with Coherent Rayleigh-Brillouin Scattering"

-The College of New Jersey, Physics Department Colloquium, October 2017: "Measuring gases and nanoparticles with coherent Rayleigh-Brillouin scattering"

-Mainz University, Helmholtz-Institut Mainz, Budker Group, May 2017: "In Situ Gas and Nanoparticle Measurements with Coherent Rayleigh-Brillouin Scattering"

-Princeton Plasma Physics Laboratory, Research Meeting, April 2017: "In-situ detection of nanoparticles in an atmospheric pressure plasma with coherent Rayleigh-Brillouin scattering"
-Rutgers University, Materials Engineering Department, Graduate Seminar, February 2017: "In Situ Gas and Nanoparticle Measurements with Coherent Rayleigh-Brillouin Scattering"
-Princeton University, Mechanical & Aerospace Engineering Department, Applied Physics Group (Prof. Richard Miles), March 2016: "Measuring (not only) gas properties with coherent Rayleigh Brillouin Scattering"

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**

Reviewer for peer reviewed journals

- **Journal of Physics B**
- **Optics Letters**
- **Journal of Applied Physics**
- **Journal of Visualized Experiments**
- **AIP Advances**
- **Journal of Optics**
- **Optics Communications**
- **Physica Scripta**

Technical Skills

Programming: LabVIEW (Certified Associate Developer), MATLAB, Mathematica.
Applications: Autodesk Inventor, LaTeX, Origin, ZEMAX, spreadsheet and presentation software.
Operating Systems: Windows, Linux.

Language Skills

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

References

Available upon request