Georgia Theano Papadakis

ICFO - The Institute of Photonic Sciences
Mediterranean Technology Park
Av. Carl Friedrich Gauss 3
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Nationality: U.S. and Greek

Current position

Group leader 7/2021
Institute of Photonic Sciences (ICFO) | Spain

Research areas: Thermal radiation & infrared photonics

Education

Postdoctoral studies - TomKat Center for Sustainable Energy 2018-2021
Stanford University | San Francisco, California, USA

Postdoctoral advisor: **Shanhui Fan**

Doctoral studies - Applied Physics 2012-2018
California Institute of Technology | Los Angeles, California, USA

"Optical response in planar heterostructures: From artificial magnetism to Angstrom-scale metamaterials"
PhD thesis advisor: **Harry A. Atwater**
Thesis committee: Kerry J. Vahala, Andrei Faraon, Chiara Daraio, Keith C. Schwab

Master of Science - Applied Physics 2012-2014
California Institute of Technology | USA

Master of Science - Electrical and Computer Engineering 2010-2011
National Technical University of Athens | Greece

Master thesis: *"Study of Broadband Plasmonic Structures for Datacom Applications"*
Thesis advisor: H. A. Avramopoulos, Photonics Communications Research Laboratory

Bachelor of Science - Electrical and Computer Engineering 2006-2010
National Technical University of Athens | Greece

Majors: Telecommunications & Networks, Microelectronics
Minors: Physics and Medical Engineering

Research Positions

Associate Researcher (part-time during doctoral studies) 2016-2018
Northrop Grumman Corporation | Redondo Beach, California, USA
NG NEXT (Division of Fundamental Research), Section of Materials & Devices

Visiting Student Researcher (during doctoral studies) 2014
FOM Institute AMOLF | Amsterdam, Netherlands

Supervisor: Albert Polman, Photonic Materials Group

Technical Student Fellow 2011-2012
European Organization for Nuclear Research (CERN) | Geneva, Switzerland

Supervisor: Suitbert Ramberger, BE-RF Department

Summer Student Fellow 2010
European Organization for Nuclear Research (CERN) | Geneva, Switzerland

Supervisors: Dr. Javier Serrano, Dr. Juan David Gonzalez Coba, BE-CO Department

Fellowships

La Caixa Postdoctoral Junior Leader Fellowship 2021-2024
From Heat to Light and Energy
EU's Horizon 2020 Marie Sklodowska-Curie Agreement No 847648
Institute of Photonic Sciences - ICFO (Spain)

Princeton Pathway into the Academy Program 2019-2020
Princeton University (USA)

TomKat Postdoctoral Fellowship in Sustainable Energy 2018-2020
Thermal Management with Polarization-Insensitive Nanophotonic Design
Stanford University (USA)

Marie Sklodowska-Curie Individual European Postdoctoral Fellowship 2018-2020
Metabeyond (795249)
King's College London (UK)
[Maximum amount granted (183,454.80 euros), top 7% - award not accepted]

PhD Dissertation Fellowship 2016-2017
American Association for University Women (AAUW) distinguished award
California Institute of Technology (USA)

National Science Foundation (NSF) Graduate Research Fellowship 2013-2016
California Institute of Technology (USA)

Technical Student Fellowship 2011-2012
European Organization for Nuclear Research (CERN) Summer Student Fellowship

Summer Student Fellowship 2010
European Organization for Nuclear Research (CERN) Summer Student Fellowship

Awards & Distinctions

Best Paper of the 2023 2023
Journal of Applied Physics, Early Career Investigator Selection
"Dynamic modulation of thermal emission - a tutorial", M. Picardi, K. Nimje, G. T. Papadakis

Early Career Award 2023
Nanophotonics
"for pioneering contributions to thermophotovoltaics and non-reciprocity in low-dimensional materials"

Best Early Career Presentation 2023
The 14th World Conference on Thermophotovoltaic Generation | Online
"Near-field Thermophotovoltaics: The route to High V_{oc}", G. T. Papadakis

Best Student Paper, Metamaterials 2016 10th International Congress 2016
Metamaterials' 2016 | Chania (Greece)
"Broadband Non-Unity Magnetic Permeability in Planar Hyperbolic Metamaterials", G. T. Papadakis & H. A. Atwater

Outstanding Poster Award, Metamaterials Science & Technology Workshop 2015
Center for Metamaterials & Integrated Plasmonics | University of California San Diego (USA)
"Tunable graphene-based hyperbolic metamaterial", G. T. Papadakis, H. A. Atwater *et al.*

Best Poster Award, Spring Material Research Society (MRS) Meeting 2014
Emerging Nanophotonic Materials & Devices | San Franscisco (USA)
"Field effect frequency-tunable epsilon-near-zero metamaterial in the visible", G. T. Papadakis, H. W. Lee, H. A. Atwater

Grants

European Defense Project 2024-2027
CAmouflage THERmal INtelligent and Adaptive (CATHERINA)
Funding Agency: European Defense Fund (EDF)
Amount granted: 3,997.445.19 euros
Institute of Photonic Sciences - ICFO (Spain)

Proyectos Estratégicos a la Transición Ecológica y a la Transición Digital 2022-2024
Exploring Material Anisotropy and Nonceprocity for Thermal Management (MAnNon)
Funding Agency: Ministerio de Ciencia, Innovacion y Universidades (ES)
Amount granted: 138,000.00 euros
Institute of Photonic Sciences - ICFO (Spain)

National Plan of Scientific Research and Innovation 2022-2025
Directional and Near-Field Radiant Heat for Energy (DiNFEn)
Funding Agency: Ministerio de Ciencia, Innovacion y Universidades (Spain)
Amount granted: 72,600.00 euros

Institute of Photonic Sciences - ICFO (Spain)

Ayudas científica de los grupos de investigación de Cataluña 2022-2024
SGR GRC Quantum nano-optoelectronics
Funding Agency: Generalitat de Catalunya (Spain)
Amount granted: 60,000.00 euros
Joint with Frank Koppens
Institute of Photonic Sciences - ICFO (Spain)

Breakthrough Starshot seed grant 2016
For research on ultra-lightweight photonic materials for lightsail propulsion
Funded by Breakthrough Initiatives
In collaboration with P. Narang (Harvard), N. Engheta (UPENN), M. Soljačić (MIT)
NG NEXT (Northrop Grumman Corp.) (USA)

Publications

M. Picardi, V. I. Moerbeek, M. Pascale, G. T. Papadakis , "*Nonreciprocity in transmission mode with planar structures for arbitrarily polarized light*" (accepted in Optical Materials Express) (2024)

M. Giteau, M. F. Picardi, G. T. Papadakis , "*Thermodynamic figure of merit for thermophotovoltaics: a perspective*" Journal of Photonics for Energy, 14 (4) 042402 (2024)
[News coverage in SPIE.org]

M. Sarkar, M. T. Enders, M. Shokooh-Saremi, K. Watanabe, T. Taniguchi, H. H. Sheinfux, F. Koppens, G. T. Papadakis , "*Retrieving optical parameters of emerging van der Waals flakes*" arxiv:2305.13994 (2024)

K. N. Nimje, M. Giteau, G. T. Papadakis , "*Hot-carrier thermophotovoltaic systems*" Journal of Optics 26, 075902 (2024)

E. Cortes, G. T. Papadakis, F. P. Garcia de Arquer , "*Photonics for Energy Special Issue*" ACS Photonics 11, 1360 [Editorial] (2022)

M. T. Enders, M. Sarkar, M. Giteau, A. Deeva, H. H. Sheinfux, M. Shokooh-Saremi, F. Koppens, G. T. Papadakis , "*Deep-subwavelength Phase Retarders at Mid-Infrared Frequencieswith van der Waals Flakes*" Communications Materials 5, 16 (2024)

M. Shokooh-Saremi, M. Giteau, M. Sarkar, G. T. Papadakis , "*Design of narrowband infrared emitters by hybridizing guided-mode resonance structures with van der Waals materials*" Optical Materials 148, 114845 (2024)

M. Sarkar, M. Giteau, M. T. Enders, G. T. Papadakis , "*Lithography-free directional control of thermal emission* " Nanophotonics 10, 0595 (2024)

M. Giteau, M. F. Picardi, G. T. Papadakis , "*Thermodynamic performance bounds for radiative heat engines* " Phys. Rev. Applied 20, L061003 (2023)

L. Wang, F. Javier Garcia de Abajo, G. T. Papadakis , "*Maximal violation of Kirchhoff's law in planar heterostructures* " Phys. Rev. Research 5, L022051 (2023)

M. Giteau, G. T. Papadakis , "*Design rules for active control of narrowband thermal emission using phase-change materials*" Phys. Rev. Applied 19, L051002 (2023)

M. F. Picardi, K. N. Nimje, G. T. Papadakis , "*Dynamic modulation of thermal emission - A Tutorial*" J. Appl. Phys. 133, 111101, Special Collection Recognizing Women in Applied Physics (2023)

M. Pacale, M. Giteau, G. T. Papadakis , "*Perspective on near-field radiative heat transfer*" Appl. Phys. Lett. 122, 100501 (2023)

M. Pacale, G. T. Papadakis , "*Tight bounds and the role of optical loss in polariton-mediated near-field heat transfer*" Phys. Rev. Applied 19, 034013 (2023)

Y. Xiao, M. A. Kats, J. J. Greffet, G. T. Papadakis , "*Materials and Devices for Engineering of Thermal Light: feature issue introduction*" Opt. Materials Express 12, 4, 1450 [Editorial] (2022)

G. T. Papadakis, M. Orenstein, E. Yablonovitch & S. Fan , "*Thermodynamics of light management in near-field thermophotovoltaics*" Phys. Rev. Applied 16, 064063, Collection on Photovoltaic Energy Conversion (2021)

G. T. Papadakis, C. Ciccarino, L. Fan, P. Narang & S. Fan , "*Deep subwavelength thermal switch via resonant mode coupling in monolayer hexagonal boron nitride*" Phys. Rev. Applied 15, 054002 (2021)

A. M. Morsy, M. T. Barako, V. Jankovic, V. D. Wheeler, M. Knight, G. T. Papadakis, L. A. Sweatlock, P. W. C. Hon & M. L. Povinelli , "*Experimental Demonstration of Dynamic Thermal Regulation using Vanadium Dioxide Thin Films*" Scientific Reports 10, 13694 (2020)

S. Buddhiraju, A. Song, G. T. Papadakis & S. Fan , "*Nonreciprocal metamaterial obeying time-reversal symmetry*" Phys. Rev. Lett. 124, 257403 (2020)

L. Fan, Y. Guo, G. T. Papadakis, B. Zhao, Z. Zhao, S. Buddhiraju, M. Orenstein & S. Fan , "*Nonreciprocal radiative heat transfer between two planar bodies*" Phys. Rev. B 101, 085407 (2020)

G. T. Papadakis, S. Buddhiraju, Z. Zhao & S. Fan , "*Broadening near-field emission for performance enhancement in thermophotovoltaics*" Nano Letters 20, 3, 1654-1661 (2020)

J. Brouillet, G. T. Papadakis & H. A. Atwater , "*Experimental demonstration of tunable graphene-polaritonic hyperbolic metamaterial*" Optics Express 27, 30225 (2019)

G. T. Papadakis, B. Zhao, S. Buddhiraju & S. Fan , "*Gate-tunable near-field heat transfer*" ACS Photonics 6, 709 (2019)

G. T. Papadakis, A. Davoyan, P. Yeh & H. A. Atwater , "*Mimicking surface polaritons for unpolarized light with high-permittivity materials*" Phys. Rev. Materials 3, 015202 [*Editors' Suggestion] (2019)

G. T. Papadakis, D. Fleischman, A. Davoyan, P. Yeh & H. A. Atwater , "*Optical Magnetism in*

Planar Metamaterial Heterostructures" Nature Communications 9, 296 (2018)

G. T. Papadakis, P. Narang, R. Sundararaman, N. Rivera, H. Buljan, N. Engheta & M. Soljacic , "*Ultra-light Å-scale Optimal Optical Reflectors*" ACS Photonics 5, 384 (2018)

G. T. Papadakis & H. A. Atwater , "*Field effect-induced tunability in hyperbolic metamaterials*" Phys. Rev. B 92, 184101 (2015)

G. T. Papadakis, P. Yeh & H. A. Atwater , "*Retrieval of material parameters for uniaxial metamaterials*" Phys. Rev. B 91, 155406 (2015)

H. W. Lee, G. T. Papadakis, S. P. Burgos, K. Chander, A. Kriesch, R. Pala, U. Peschel & H. A. Atwater , "*Nanoscale Conducting Oxide PlasMOStor*" Nano Letters 14, 11, 6463-6468 (2014)

Patents

Device for Emitting Infrared Radiation, System Comprising the Device, Use of the Device, and Method for Fabricating the Device 2024
[Submitted to European Patent Office]
M. Giteau, L. Conrads, T. Taubner, G. T. Papadakis
Institute of Photonic Sciences - ICFO (ES)

Nanoscale plasmonic field-effect modulator 2018
Patent no. US 9,864,109 B2
H. W. Lee, Stanley Burgos, G. T. Papadakis, H. A. Atwater
California Institute of Technology

Meta-Structure and tunable optical device 2017
Patent no. US 9,851,589 B2
S. Han, Y-W. Huang, G. T. Papadakis, H. A. Atwater
California Institute of Technology, Samsung Advanced Institute of Technology

Extreme, broadband tunable values of birefringence and dichroism and tunable optical band-gaps 2016
Patent no. US 20170045759 A1
G. T. Papadakis, S. Han, H. A. Atwater
California Institute of Technology, Samsung Advanced Institute of Technology

Nanoscale Plasmonic Field-Effect Modulator 2015
Patent no. US 20170059894 A1
H. W. Lee, S. P. Burgos, G. T. Papadakis, H. A. Atwater
California Institute of Technology

Invited Talks

1. **Spring MRS** 4/2025
   Talk [invitation rejected] | Seattle, USA
   Symposium: EL12 Emerging Material Platforms and Fundamental Approaches for Plasmonics, Nanophotonics, and Metasurfaces

2. **CLEO/EQEC Europe** 3/2025
   title TBD
   Talk | Munich, Germany
   Session EH - Plasmonics and Metamaterials
3. **Annual International Conference on Optics, Photonics, and Lasers (AICOPL2025)** 3/2025
   Talk [invitation rejected] | Rome, Italy

4. **Nanophotonics of 2D Materials (N2D)** 11/2024
   Talk [invitation rejected] | Seoul, South Korea

5. **Extreme Sensing and Chirality International Workshop** 10/2024
   Talk [invitation rejected] | Cetraro, Italy

6. **Simons Collaboration on Extreme Wave Phenomena Annual Meeting** 10/2024
   title TBD
   New York, USA
7. **The 15th World Conference on Thermophotovoltaic Generation (TPV-15)** 10/2024
   "The role of photonics in TPV design"
   Talk | Madrid, Spain
8. **The 1st Photonics Hellenic Symposium (PHOS)** 10/2024
   title TBD
   Talk | Heraklion, Greece
9. **The 31st CMD - General Conference of the Condensed Division** 9/2024
   Talk [invitation rejected] | Brage, Portugal
   Colloquium MC15 - Phononics and Thermal Transport
10. **SPIE Optics+Photonics** 8/2024
    Talk [invitation rejected] | San Diego, USA
    Session: New Concepts in Solar and Thermal Radiation Conversion VI
11. **SPIE Metamaterials, Metadevices and Metasystems 2024** 8/2024
    Talk [invitation rejected] | San Diego, USA
    NanoScience+Engineering Track
12. **Nanoscale and Microscale Heat Transfer VIII** 8/2024
    Plenary Talk [invitation rejected] | Girona, Spain

13. **The XXXIX RSEF Physics Biennial** 07/2024
    "Far-field thermal photonics with polaritonic materials"
    Talk | San Sebastian, Spain
    Session: Light-matter interactions in 2D materials (DFMC-GEFES)

14. **The XXXIX RSEF Physics Biennial** 07/2024

"Thermophotovoltaics: fundamental limits and avenues to approach them"

Talk | San Sebastian, Spain

Session: Energy transition: materials, technologies, and sustainability(DFMC-GEFES, GEE)

15. **Frontiers in Light: Light for Energy and Information Processing** 7/2024

"Thermal Photonics with Polar Materials, Extreme Anisotropies and Crystallographic Phase Changes"

Talk | Barcelona, Spain

16. **Frontiers in Plasmonics and Nano-Photonics (NANOPLAM)** 06/2024

"Thermal Photonics with Polar Materials, Extreme Anisotropies and Crystallographic Phase Changes"

Talk | Cetraro, Italy

17. **The 45th PIERS (PhotonIcs and Electromagnetics Research Symposium)** 4/2024

Talk [invitation rejected] | Chengdu, China

Session: Thermal Photonics: Fundamental Physics and Applications

18. **Nanolight** 02/2024

"Thermal photonics with low-dimensional materials"

Talk | Benasque, Spain

19. **Fall MRS** 12/2023

"Thermal Photonics with Low-Dimensional Materials"

Talk | Boston, USA

Symposium: EL06.10 Metamaterials Innovation in Photonics and Thermal Sciences

20. **Metamaterials 2023** 09/2023

"Mid-IR and Thermal Photonics with Emerging Low-dimensional Materials"

Talk | Chania, Greece

Session: Thermal effects and metadevices

21. **SPIE Optics+Photonics** 08/2023

"Emerging low-dimensional and phase-change materials for thermal photonics"

Talk | San Diego, USA

Session: Active Photonic Platforms

22. **SPIE Metamaterials Conference** 08/2023

"Leveraging materials anisotropy for polarization and chirality control"

Talk | San Diego, USA

23. **META '2023** 7/2023

"Harnessing the properties of emerging low-dimensional and phase-change materials for mid-IR photonics"

Talk | Paris, France

Session: Advanced Passive and Active Metasurfaces and Zero-Index Materials

24. **Nanophotonics and its applications for society (EPFL)** 7/2023
"Thermal photonics "
Talk & Lecture | EPFL, Lausanne, Switzerland

25. **Spanish Conference on Nanophotonics** 6/2023
"Thermal photonics with emerging materials "
Talk | Zaragoza, Spain

26. **The 9th International Conference on Antennas and Electromagnetic Systems** 6/2023
"Thermodynamic limits for radiative heat engines"
Talk | Torremolinos, Spain

27. **The 14th World Conference on Thermophotovoltaic Generation** 5/2023
"Near-field Thermophotovoltaics: The route to High V_{oc}"
Talk | Online

28. **Institute of Materials Science of Barcelona (ICMAB)** 03/2023
"Thermal Photonics with emerging materials"
Colloquium | Barcelona, Spain

29. **The Foremost Nanophotonics** 10/2021
"Thermal emission in the far-field and near-field"
Talk | Erice Italy

30. **SPIE Optics+Photonics** 08/2022
"Thermal Photonics with Low-Dimensional Materials"
Talk | PSan Diego, USA
Session: Hyperbolic Metamaterials

31. **Ludwig-Maximilians-Universität München (LMU)** 06/2021
"Thermal Photonics and Thermophotovoltaics"
Colloquium | Munich, Germany

32. **Nanolight** 03/2021
Colloquium, "Thermodynamics of light management in near-field thermophotovoltaics"
Talk | Benasque, Spain

33. **Fall MRS** 12/2021
"Key opportunities in near-field thermophotovoltaics"
Talk | Boston, USA
Symposium: EN10 Advanced materials for thermal energy management and harvesting

34. **Frontiers in Light: Photons for greeen energy** 10/2021
"Key opportunities in nanoscale thermophotovoltaic systems"
Tutorial | Barcelona, Spain

35. **Institute of Scientific Research of San Luis Potosi (IPICYT)** 10/2021
"Thermal photonics and heat-to-energy conversion: the power of the near-field"
Colloquium, IPICYT, Dept. of Materials Science and Nanotechnology | Mexico

36. **Metamaterials 2021** 9/2021
"Light management in near-field thermophotovoltaics"
Talk | New York, NY
Session: Photodetection and Light Management

37. **EOS Annual Meeting** 9/2021
"Key opportunities in near-field thermophotovoltaics"
Talk | Rome, Italy
Session: Thermal radiation and energy management

38. **Fundacio Catalunya-La Pedrera Ignacio Cirac Program** 8/2021
"Thermal Photonics and Thermophotovoltaics: the Power of the Near-Field"
Summer Lecture, ICFO | Barcelona, Spain

39. **META '2021** 7/2021
"Active tuning of thermal radiation in the far-field and near-field range with emerging low-dimensional materials"
Talk | Warsaw, Poland
Session SP13. Light-matter interactions in new materials and meta-architectures

40. **Barcelona Institute of Science and Technology (BIST)** 11/2020
Seminar in advanced research, "From heat to light and energy"
Seminar | Barcelona, Spain

41. **TomKat Center for Sustainable Energy** 5/2020
"Broadening near-field emission for performance enhancement in thermophotovoltaics"
Seminar, TomKat Center | Stanford, CA

42. **Photonics at Thermodynamic Limits Energy Frontier Research Center** 4/2020
"Broadening near-field emission for performance enhancement in thermophotovoltaics"
Postdoc tutorial, Stanford University | Stanford, CA

43. **SPIE Photonics West** 1/2020
"Tunable graphene-based hyperbolic metamaterials: experimental demonstration and beyond"
Session: Hyperbolic Metamaterials | San Francisco, USA

44. **Dartmouth College** 1/2020
Jones Seminar on Science, Technology, and Society, "Tailoring the flow of light and radiant heat"
Thayer School of Engineering | Hanover, USA

45. **Boston College** 1/2020
Colloquium, "Tailoring the flow of light and radiant heat"
Dept. of Physics | Boston, USA

46. **Photonics at Thermodynamic Limits Energy Frontier Research Center** 7/2019
Postdoc tutorial, "Near-field heat transfer for thermophotovoltaics and thermal radiation tuning"
Stanford University | Stanford, USA

47. **Stanford University** 4/2019
"Tailoring optical and thermal properties with nanophotonics"
Seminar, Dept. of Applied Mathematics | Stanford, USA

48. **Wesleyan University** 3/2019
"Tailoring optical and thermal properties with nanophotonics
Colloquium, Dept. of Physics | Middletown, USA

49. **NG NEXT (Northrop Grumman Corp.)** 12/2018
"Gate-tunable near-field heat transfer"
Seminar, Section of Materials & Devices, Dept. of Nanophotonics | Redondo Beach, USA

50. **TomKat Center for Sustainable Energy** 11/2018
"Nanophotonic design for near-field heat transfer"
Seminar, TomKat Center | Stanford, USA

51. **FOM Institute AMOLF** 8/2017
"Magnetic effects, active tunability and supermetals with planar metamaterials"
Seminar, AMOLF Nanophotonics Groups | Amsterdam, Netherlands

52. **MIT Lincoln Laboratory** 7/2017
"Magnetic effects, active tunability and supermetals with planar metamaterials"
Seminar, Group of chemical, microsystem and nanoscale technologies | Boston, USA

53. **Intel Corporation** 6/2017
"Magnetic effects, active tunability and supermetals with planar metamaterials"
Seminar, Non-Volatile Solutions Memory Group (Intel) | Boise, USA

54. **NG NEXT (Northrop Grumman Corp.)** 12/2016
"Ultra-high reflection with graphene-based Van der Waals heterostructures"
Seminar, Section of Materials & Devices, Dept. of Condensed matter | Redondo Beach, USA

55. **Quantum Metaphotonics & Metamaterials MURI Review** 11/2016
"Optical magnetism in metallo-dielectric metamaterials"
Student Highlight Talk, Basic Research Innovation and Collaboration Center | Arlington DC, USA

56. **Foundation for Research and Technology Hellas (FORTH)** 9/2016
"Layered optical metamaterials: effective parameters, magnetic effects and active tunability"
Seminar, Institute of Electronic Structure & Laser (IESL) | Heraclion, Greece

57. **NG NEXT (Northrop Grumman Corp.)** 4/2016
"Metamaterials parameter retrievals, active tunability and new magnetic effects in hyperbolic media"
Seminar, Section of Materials & Devices, Dept. of Condensed matter | Redondo Beach, USA

58. **NG NEXT (Northrop Grumman Corp.)** 9/2015
"Tunable hyperbolic metamaterials at visible and infrared frequencies"
Seminar, Section of Materials & Devices, Dept. of Nanophotonics | Redondo Beach, USA

Editorial Activities

Editorial Advisory Board, Journal of Applied Physics 2024-

Selection Committee, Journal of Applied Physics 2024
Early Career Investigatior and Best Annual Papers

Editorial Board of Advanced Photonics Nexus (SPIE/CLP) 2024-

Guest Editor, ACS Photonics 2024
Special issue: "Photonics for Energy"

Guest Editor, Journal of Photonics for Energy 2024
Special issue on Thermophotovoltaic Systems

Editorial Board of Journal for Photonics for Energy 2023-

Guest Editor in Optical Materials Express 2021
Special issue: "Materials and Devices for Engineering of Thermal Light"

Conference Organization Activities

Scientific Committee in European Optical Society Annual Meeting 2024
TOM Nanophotonics, Naples (Italy)

Program Committee Co-Organizer TPV-15 2024
15th World Conference on Thermophotovoltaic Generation
Madrid, Spain

Conference Session Co-Organizer and Chair FALL MRS 2023
Symposium: SF05 Infrared Materials and Devices for Thermal Radiation Control
Boston, USA

Metamaterials 2023 Awards Committee 2023

Program Committee Co-Organizer TPV-13 2022
Advances in thermophotovoltaics: materials, devices and systems
Miyazaki, Japan

Conference Session Co-Organizer and Chair FALL MRS 2021
Symposium: Infrared and Thermal Photonic Materials and their Applications
Boston, MA

International School Co-Organizer 2021
"Frontiers in Light: Photons for green energy".
Participants: ICFO, Stanford University, University of Toronto

Barcelona, Spain

Special Event Organizer CLEO 2021
"Discussion of Seminal Papers" with Eli Yablonovitch
San Jose, USA

Special Symposium Organizer CLEO 2021
Symposium: Thermal radiation control and energy
San Jose, CA

Session Chair CLEO 2021
Symposium: THz and Infrared Photonics
San Jose, CA

Conference Committee Member CLEO 2021-2024
Symposium: S&I 6 Optical Materials, Fabrication and Characterization
San Jose, CA

International Doctoral School Session Chair 2016
"From THz to Optics" Metamaterials 2016 10^{th} International Doctoral School
Chania, GR

Workshop Organizer 2016
"Physics of Light-Matter Interactions & Excited States Dynamics" Workshop, Northrop Grumman Corp.
Redondo Beach, California, USA

Other Synergistic Activities

Executive Committee Member OSA 2020
Photonic Metamaterials Technical Group

Advisor Committee for DARPA JUMP 2017
Center 1 - RF to THz sensors and communication systems
Center 6 - Advanced devices, packaging and materials
Serving as an associate researcher at Northrop Grumman Corp. (USA)

Internal (ICFO) Activities & Mentorship

Admissions and Research Recruitment Committee 2023-2025

Mentorship

- Kartika Nimje - 3rd Colloquium on the Physics of Metasurfaces (2024)
- Kartika Nimje - ICFO Mobility Grant (2024)
  Secondment Supervisor: Alejandro Rodriguez (Princeton University)
- Onasis Lectures (2024)
  Michael T. Enders, Kartika Nimje, Aleksandra Deeva, Vera Moerbeek
- K. Nimje, Dr. M. Giteau - Best Poster Presentation (2023)
  "Hot-carrier thermophotovoltaics", The 14th World Conference on Thermophotovoltaic Generation

- Kartika Nimje, Dr. Michela Picardi - Best Paper of 2023
  Journal of Applied Physics
  "Dynamic Modulation of Thermal Emission", J. Appl. Phys. 133, 11101 (2023)
- Dr. Michela Picardi - la Caixa Junior Leader Fellowship (2023-2026)
  Secondment Supervisor: Shanhui Fan (Stanford University)
- Dr. Michela Picardi, Dr. M. Giteau - Best Talk Award (2023)
  "Thermodynamic limits for radiative heat engines", The 9th International Conference on Antennas and Electromagnetic Systems
- Dr. Michela Picardi - Optica Foundation Challenge (2023)

Hosted lectures

- Kenneth Burch (Boston College, USA) | 6/2024
- Artur Davoyan (UCLA, USA) | 5/2024
- Benjamin Vest (CNRS, France) | 1/2024
- Shanhui Fan (Stanford, USA) | 6/2023
- Alejandro Datas (Universidad Politécnica de Madrid, Spain) | 6/2022

Energy Book Club Organizer 2021-

Doctoral Theses Committees

Thesis committee - Dr. Pablo Alonzo Gonzalez (Universidad de Oviedo) 2024
"Fundamentals of nano-optics in hyperbolic van der Waals materials"
Asturias, Spain

Thesis committee - Dr. Julien Legendre (Université de Lyon) 2023
"Theoretical and numerical analysis of near-field thermophotonic energy harvesters"
Lyon, France

Thesis committee - Dr. Ipsita Das (Ludwig-Maximilians-Universität München) 2023
"Investigation of the Interaction Driven Quantum Phases in Magic-Angle Twisted Bilayer Graphene"
Lyon, France

Thesis committee - Dr. Pablo de Roque (ICFO) 2022
"Contributions to nanophotonics: linear, nonlinear and quantum phenomena"
Barcelona, Spain

Thesis committee - Dr. Niels Hesp (ICFO) 2021
"Exploring Twisted Bilayer Graphene with Nano-Optics"
Barcelona, Spain

International Conference Presentations

1. **International Society for Optics and Photonics SPIE** | San Diego, CA, USA 8/2019

   Oral Presentation | Session: Tunable and Dynamic Photonic Platforms XI
   "*Gate-tunable near-field heat transfer*", G. T. Papadakis, B. Zhao, S. Buddhiraju, S. Fan

2. **American Physical Society March Meeting** | Los Angeles, CA, USA 3/2018

   Oral Presentation | Session: Nanostructures and Metamaterials
   "*Phonons and excitons for omnipolarization surface waves*", G. T. Papadakis, A. Davoyan, P. Yeh, H. A. Atwater

3. **CLEO Laser Science to Photonic Applications** | San Jose, CA, USA 5/2017

Oral Presentation | Session: Fundamental Science - Nonlinear and Hyperbolic Metamaterials
"*Artificial magnetism in one-dimensional multilayer metamaterials*", G. T. Papadakis, D. Fleischman, A. Davoyan, P. Yeh, H. A. Atwater

4. **Metamaterials' 2016 10th International Congress** | Chania, Greece 9/2016

   Oral Presentation | Session: Hyperbolic Metamaterials
   "*Non-Unity Magnetic Permeability in Planar Hyperbolic Metamaterials*", G. T. Papadakis & H. A. Atwater

5. **Plasmonics Gordon conference** | Newry, ME, USA 7/2016

   Poster Presentation
   "*Broadband non-unity magnetic permeability in planar hyperbolic metamaterials*", G. T. Papadakis, D. Fleischman, A. Davoyan, P. Yeh, H. A. Atwater

6. **American Physical Society March Meeting** | Baltimore, MA, USA 3/2016

   Oral Presentation | Session: Acoustic, Thermal and Photonic Metamaterial Concepts
   "*Broadband non-unity magnetic permeability in planar hyperbolic metamaterials*", G. T. Papadakis, D. Fleischman, A. Davoyan, P. Yeh, H. A. Atwater

7. **Material Research Society (MRS), Fall Meeting** | Boston, MA, USA 11/2015

   Oral Presentation | Symposium: Emerging Materials and Platforms for Optoelectronics
   "*Tunable Hyperbolic Metamaterials Based on Multilayer Graphene/Dielectric Structures*", G. T. Papadakis, M. C. Sherrott, Philip W. Hon, Luke A. Sweatlock, P. Yeh & H. A. Atwater

8. **Meta'15** | New York, NY, USA 8/2015

   Poster Presentation
   "*Hyperbolic-gap-hyperbolic tunable band structure metamaterials*", G. T. Papadakis, K. Thyagarajan, H. A. Atwater

9. **Metamaterials Science & Technology Workshop, Center for Metamaterials & Integrated Plasmonics** | University of California San Diego, CA, USA 7/2015

   Poster Presentation
   "*Tunable graphene-based hyperbolic metamaterial*", G. T. Papadakis, M. C. Sherrott, Wei-Hsiang Lin, Philip W. Hon,Luke A. Sweatlock, P. Yeh & H. A. Atwater

10. **Surface Plasmon Polariton (SPP) 7** | Jerusalem, Israel 6/2015

    Oral Presentation | Session: Nanoantennas and Hyperbolic Metamaterials
    "*Hyperbolic Metamaterial with Field-Effect Induced Transitions of the Dispersion Surface*", G. T. Papadakis, H. A. Atwater *et al.*

11. **Surface Plasmon Polariton (SPP) 7** | Jerusalem, Israel 6/2015

    Poster Presentation
    "*Gate-Tunable Conducting Oxide Metasurfaces*", Y-W. Huang, H. W. Lee, R. Sokhoyan, K. Thyagarajan, G. T. Papadakis, S. Han, D. P. Tsai, H. A. Atwater

12. **Material Research Society (MRS), Fall Meeting** | Boston, MA, USA 12/2014

    Oral Presentation | Symposium: Optical Metamaterials and Novel Optical Phenomena Based on Nanofabricated Structures
    "*Field-effect tuning of the optical band gap of hyperbolic metamaterials*", G. T. Papadakis, H. W. Lee, P. Yeh & H. A. Atwater

13. **Julius Springer Forum on Applied Physics** | Amsterdam, Netherlands 9/2014

    Poster Presentation
    "*Field effect frequency- tunable epsilon-near-zero metamaterial in the visible*", G. T. Papadakis, L. A. Sweatlock, H. W. Lee, H. A. Atwater

14. **International Society for Optics and Photonics SPIE** | San Diego, CA, USA 8/2014

    Poster Presentation
    "*Field effect frequency- tunable epsilon-near-zero metamaterial in the visible*", G. T. Papadakis, L. A. Sweatlock, H. W. Lee, H. A. Atwater

15. **International Society for Optics and Photonics SPIE** | San Diego, CA, USA 8/2014

    Poster Presentation
    "*Spontaneous Emission Dynamics of Quantum Emitters Coupled to Epsilon-Near-Zero Metamaterials*", R. Sokhoyan, G. T. Papadakis, H. W. Lee, H. A. Atwater

16. **Plasmonics Gordon conference** | Newry, ME, USA 7/2014

    Poster Presentation
    "*Field effect frequency-tunable epsilon-near- zero metamaterial in the visible*", G. T. Papadakis, H. W. Lee, H. A. Atwater

17. **Material Research Society (MRS), Spring Meeting** | San Fransisco, CA, USA 4/2014

    Poster Presentation | Symposium: II-Emerging Nanophotonic Materials & Devices
    "*Field-effect tuning of the optical band gap of hyperbolic metamaterials*", G. T. Papadakis, H. W. Lee, H. A. Atwater

Other contributions

18. **Nanolight** | Benasque, Spain 3/2016

    "*Dynamic Control of Mid-IR Light via Graphene-Based Structures*", M. C. Sherrott, G. T. Papadakis, P. W. Hon, L. A. Sweatlock, P. Yeh & H. A. Atwater

19. **Frontiers in Nanophotonics** | Zurich, Switzerland 9/2015

    "*Tunable metasurfaces using the field-effect*", Y. W. Huang, H. W. Lee, R. Sokhoyan, K. Tyagarajan, G. T. Papadakis, S. Han, R. Saive, D. P. Tsai, H. A. Atwater

20. **Meta'15** | New York, NY, USA 8/2015

    Keynote talk
    "*Electronically Tunable Metamaterials*", H. A. Atwater, G. T. Papadakis, M. C. Sherrott, V. W. Brar, M. S. Jang, S. Kim, L. Kim, M. Choi, L. A. Sweatlock

21. **Meta'15** | New York, NY, USA 8/2015

    Invited Oral Presentation
    "*Gate-tunable conducting oxide metasurfaces*", Y-W. Huang, H. W. Lee, R. Sokhoyan, K. Thyagarajan, S. Han, G. T. Papadakis, D. P. Tsai, H. A. Atwater

22. **Surface Plasmon Polariton (SPP) 7** | Jerusalem, Israel 6/2015

    Poster Presentation
    "*Graphene/SiO_2 Multilayer Stack as a Hyperbolic Metamaterial*", M. C. Sherrott, G. T. Papadakis, W-S. Lin, P. W. Hon, L. A. Sweatlock, H. A. Atwater

23. **Material Research Society (MRS), Fall Meeting** | Boston, MA, USA 12/2014

Oral Presentation

"*Gate-Tunable Conducting Oxide Plasmonic Lightwave Circuits: Modulators and Multistate Logic in Guided Wave Networks*", H. W. Lee, G. T. Papadakis, A. Kriesch, S. P. Burgos, K. Chander, U. Peschel, H. A. Atwater

24. **Surface Plasmon Polariton (SPP) 6** | Ottawa, Canada 5/2013

Poster Presentation

"*Nanoscale conducting oxide plasmonic slot waveguide modulator*", H. W. Lee, S. P. Burgos, G. T. Papadakis, H. A. Atwater

Participation in Schools, Seminars & Other Meetings

Stanford University Photonics Retreat 4/2019
Marshall, CA, USA

Quantum Metaphotonics & Metamaterials MURI Review 11/2016
Basic Research Innovation and Collaboration Center | Arlington, DC, USA

Triservice Metamaterials Review 11/2016
Basic Research Innovation and Collaboration Center | Arlington, DC, USA

Doctoral School: Metamaterials from THz to optics 9/2016
EUPROMETA Doctoral Programme, Metamaterials 2016 International Congress | Chania, Greece

Plasmonics Gordon Research Seminar 7/2016
Newry ME, USA

Metamaterials Science & Technology Workshop 7/2015
Center for Metamaterials & Integrated Plasmonics | San Diego, CA, USA

Plasmonics Gordon Research Seminar 7/2014
Newry ME, USA

Teaching Experience

Introduction to Nanophotonics-Teaching assistant 2014
California Institute of Technology | Instructor: Harry A. Atwater

- Graduate course. Gave lectures on Green's functions & Green's dyadics, energy transfer, plasmonics, Mie scattering theory & effective media. Developed problem sets & solutions, taught finite element methods for nanophotonics. Held problem solving sessions & office hours.
- **Evaluation:** Overall teaching effectiveness: 4.5/5, Presented material clearly in section or lab: 4.5/5, Was well prepared for section, office hours or lab: 4.75/5. Answered questions clearly and concisely: 4.25/5, Provided helpful comments on assignments, papers, exams: 4.25/5
- **Students' comments:** *"Georgia was extremely knowledgeable on the subject and always happy to assist with homework questions, even outside of her scheduled office hours. She was also helpful during lecture, interjecting to help answer other students' questions and raising some of her own. She was a thorough grader and always included comments whenever she removed points. Georgia is a first-rate TA", "Excellent TA. Always explained topics clearly and marked fairly"*

Solid State Electronics for Integrated Circuits-Teaching assistant 2012
California Institute of Technology | Instructor: Axel Scherer

- Undergraduate course. Lab sessions fabricating integrated devices: Schottky Diodes, PN Diodes, MOSFETS, Microfluidic devices. Developed problem sets & solutions.

- **Evaluation:** Overall teaching effectiveness: 4/5, Presented material clearly in section or lab: 4.17/5, Was well prepared for section, office hours or lab: 4/5. Answered questions clearly and concisely: 4.33/5, Provided helpful comments on assignments, papers, exams: 4/5
- **Students' comments:** *"Always prepared and helped us a lot with understanding the material."*, *"Very nice and helpful in the lab and regarding material taught in class. Answered questions clearly and made sure everybody understood. Was well prepared in lab and went over theory while doing the labs."*

Outreach

- Women in Science and Engineering (WISE), Stanford, 2018
- Fundraising via the American Association for University Women (AAUW), Southern California, 2017

Extracurricular Interests & Activities

Musical Studies

- Degree of teaching theory & harmony of music 2005

  Awarded by the Hellenic Ministry of Culture
- Degree of Piano, Theory & Harmony of Music, Solfége, Byzantine Music, Conservatory Choir 1998-2005

Athletics

- Track & field 2001-2006

  Bronze national medal (Greece) in pentathlon (2002), bronze national medal in heptathlon (2003)
- Gymnastics (rhythmic gymnastics, floor, trampoline) -2000

  Bronze national medal (Greece)
- Synchronized swimming, swimming, & sailing -2006