JEREMY NATHAN MUNDAY

University of Maryland
Institute for Research in Electronics and Applied Physics
Energy Research Facility, Room 1201G
College Park, Maryland 20742-3511
jnmunday@umd.edu
mundaylab.umd.edu

EDUCATION

Harvard University — **Cambridge, MA**
PhD in Physics (Adviser: Federico Capasso) — June 2008
AM in Physics — June 2005

Middle Tennessee State University — **Murfreesboro, TN**
BS in Physics, summa cum laude — May 2003

EMPLOYMENT

University of Maryland — **College Park, MD**
Associate Professor — July 2017 – Present
Assistant Professor — August 2011 – June 2017

California Institute of Technology — **Pasadena, CA**
Postdoctoral Scholar (Group of Harry Atwater) — August 2008 – August 2011

HONORS & AWARDS

DARPA Young Faculty Award (2018)
Clark School Junior Faculty Outstanding Research Award – UMD (2017)
National Academy of Engineering FOE invited session organizer (2017)
Research and Scholarship Award (RASA) – UMD (2017)
NSF CAREER Award (2016)
ONR Young Investigator Program Award (2016)
OSA Adolph Lomb Medal (2015)
IEEE Photonics Society Young Investigator Award (2015)
Research and Scholarship Award (RASA) – UMD (2015)
SPIE Early Career Achievement Award (2014)
George Corcoran Award (2014)
NASA Early Career Faculty Space Technology Research Award (2012)
Minta Martin Research Award (2012)
SPIE Green Photonics Award (2012)
QFEXT09 Junior Paper Award from the European Science Foundation (2009)
National Science Foundation Graduate Research Fellowship (2005-2008)
Harvard Purcell Fellowship (2003-2004)

SPONSORED RESEARCH

Sponsored research from NSF, ONR, NASA, DARPA, and Google (totaling >$4M as PI).

JOURNAL COVERS

Work has been featured on the covers of several scientific journals including ***Nature***, ***Nano Letters***, ***ACS Photonics***, ***Advanced Materials, Advanced Energy Materials, Advanced Optical Materials, Applied Physics Letters***, ***Journal of Applied Physics***, ***ACS Applied Materials & Interfaces***, ***Journal of Physics Condensed Matter***, and ***Nanotechnology***

PROFESSIONAL ACTIVITIES & SERVICES

Referee for Nature Photonics, Nature Nanotechnology, Nature Materials, Nature Communications, Physical Review Letters, Physical Review A, B, D & E, Applied Physics Letters, Nano Letters, Optics Express, ACS Nano, Optics Letters, IEEE Journal of PV, Joule, etc.
Editorial board: Associate Editor for SPIE Journal of Photonics for Energy (2015-2019)
Member of Sigma Pi Sigma, APS (lifetime member), SPIE (lifetime member), OSA (lifetime member) IEEE, and MRS
Participant in NSF and DOE Panels and in workshops for DARPA, DOE, OSA, and NAE.
Mentor for UMD undergraduate Gemstone research team and high school students
University Service: IREAP Executive Committee (2012-2014), ECE Plan of Organization Review Committee (2012), ECE Facilities and Services Committee (2013), ECE's Distinguished Dissertation Fellowship Committee (2015), Paint Branch Lectureship Selection Committee (2015-2017), ECE Department Council (2015-2016), IREAP Hiring Committee (2015), ECE Salary Committee (2017-2018), ECE Faculty Search Committee (2017-2018); ECE Promotion and Tenure Committee (2018-2019)

Symposium Co-Organizer for Materials Research Society Spring Meeting (2013, 2014), IEEE Photovoltaics Specialists Conference (2015-2017), APS March Meeting (2016), OSA Optics and Photonics Congress on Renewable Energy and the Environment: SOLAR (2017)
Organizational Committee: Frontiers in Optics (2013), OSA Optics and Photonics Congress on Renewable Energy and the Environment (2014-2017), CLEO (2015-2018), IEEE Photonics Conference (2016, 2017)
International award committees: Jülicher prize for excellence (2015), SPIE Award Committee (2016)

PATENTS

J. N. Munday, "Si-Based Infrared CMOS Imaging Sensor," US Utility Patent Application (2017)

J. Garrett and J. N. Munday, "Heterodyne Ambient Condition Kelvin Probe Force Microscopy (HAC-KPFM)," US Provisional Patent Application (2016)

J. Murray, D. Ma, and J. N. Munday, "Self-Powered, Switchable Solar Windows," US Provisional Patent Application (2015)

J. Garrett, E. Tennyson, J. N. Munday, and M. Leite, "Photovoltage Force Microscopy (PVFM)," US Provisional Patent Application (2015)

J. N. Munday, "Sub-bandgap Hot Carrier Solar Cell," US Provisional Patent Application (2015)

J. N. Munday and E. Waks, "High Efficiency Photovoltaics Through Engineering Spontaneous Emission," US Provisional Patent Application (2015)

M. Leite, J. N. Munday, E. Tennyson, J. Garrett, "Illuminated-Kelvin Probe Force Microscopy for Imaging Open-Circuit Voltage in Optoelectric Devices with Nanoscale Spatial Resolution," US Provisional Patent Application (2014)

J. Grandidier, D. M. Callahan, J. N. Munday and H. A. Atwater, "Whispering gallery solar cells," US Patent Application 20120060913 (2011)

Davide Iannuzzi, Jeremy N. Munday, and Federico Capasso, "Ultra-low friction configuration," US Patent Application 20070066494 (2005)

BOOK CONTRIBUTIONS

Yunlu Xu, Joseph Murray, and Jeremy N. Munday, "Photonics and plasmonics for enhanced photovoltaic performance," in *Quantum Dot Solar Cells*, Edited by J. Wu and Z. M. Wang, Springer (2014)

F. Capasso, J. N. Munday, and H. B. Chan "Attractive and repulsive Casimir-Lifshitz forces, QED torques, and applications to nanomachines," in *Casimir physics*, Edited by D. Dalvit, P. Milloni, D. Roberts, F. da Rosa, Springer-Verlag (2011)

J. N. Munday and F. Capasso, "Repulsive Casimir and van der Waals forces: from measurements to future technologies," in *Quantum field theory under the influence of external conditions (QFEXT09)*, Edited by K. A. Milton and M. Bordag, World Scientific (2010)

PUBLICATIONS

Students/Postdocs advised by J. N. Munday are indicated in **bold**. Undergraduates are denoted by an *.

69 Curtis P. Berlinguette, Yet-Ming Chiang, Jeremy N. Munday, Thomas Schenkel, David K. Fork, ross Koningstein & Matthew D. Trevithick, "Revisiting the cold case of cold fusion" *Nature*, **in press** (2019)

68 **Lisa J. Krayer, Jongbum Kim,** and Jeremy N. Munday, "Near-perfect absorption throughout the visible using ultra-thin metal films on index-near-zero substrates [Invited]," *Optical Materials Express*, **9**, 330-338 (2019)

67 Elizabeth M. Tennyson, Bart Roose, **Joseph L. Garrett**, Chen Gong, Jeremy N. Munday, Antonio Abate, and Marina S. Leite, "Cesium-Incorporated Triple Cation Perovskites Deliver Fully Reversible and Stable Nanoscale Voltage Response," *ACS Nano*, **13**, pp 1538–1546 (2019)

66 P. Solano, J. A. Grover, **Y. Xu**, P. Barberis-Blostein, J. N. Munday, L. A. Orozco, W. D. Phillips, and S. L. Rolston, "Alignment-dependent decay rate of an atomic dipole near an optical nanofiber," *Phys. Rev. A*, **99**, 013822 (2019)

65 **David A. T. Somers, Joseph L. Garrett, Kevin Palm,** and Jeremy N. Munday, "Measurement of the Casimir torque," *Nature*, **564**, 386–389 (2018)

64 **Kevin J. Palm, Joseph B. Murray, Tarun C. Narayan,** and Jeremy N. Munday, "Dynamic Optical Properties of Metal Hydrides," *ACS Photonics*, **5**, 4677–4686 (2018)

63 **Dakang Ma** and Jeremy N. Munday, "Measurement of wavelength-dependent radiation pressure from photon reflection and absorption due to thin film interference," *Scientific Reports*, **8**, 15930 (2018)

62 **Joseph L. Garrett**, Marina S. Leite, and Jeremy N. Munday, "Multiscale Functional Imaging of Interfaces through Atomic Force Microscopy Using Harmonic Mixing," *ACS Appl. Mater. Interfaces*, **10**, 28850–28859 (2018)

61 **Yunlu Xu**, Elizabeth M. Tennyson, Jehyung Kim, Sabyasachi Barik, **Joseph Murray**, Edo Waks, Marina S. Leite, and Jeremy N. Munday, "Active Control of Photon Recycling for Tunable Optoelectronic Materials,"*Adv. Opt. Mat.* (**Cover**)*,* 6, 1701323 (2018)

60 **Joseph B. Murray, Kevin J. Palm, Tarun C. Narayan,** David K. Fork, Seid Sadat, and Jeremy N. Munday, "Apparatus for combined nanoscale gravimetric, stress, and thermal measurements," *Rev. Sci. Instr.* **89**, 085106 (2018)

59 **Lisa J. Krayer**, Elizabeth M. Tennyson, Marina S. Leite, and Jeremy N. Munday, "Near-IR Imaging Based on Hot Carrier Generation in Nanometer-Scale Optical Coatings," *ACS Photonics* (**Cover**), **5**, 306–311 (2018)

58 **Joseph L. Garrett, David A. T. Somers** and Jeremy N. Munday, "Measurement of the Casimir force between two spheres," *Phys. Rev. Lett.,* **120**, 040401 (2018)

57 **David A. T. Somers** and Jeremy N. Munday, "Casimir-Lifshitz Torque Enhancement by Retardation and Intervening Dielectrics," *Phys. Rev. Lett.,* **119**, 183001 (2017)

56 **Joseph L. Garrett,** Elizabeth M. Tennyson, Miao Hu, Jinsong Huang, Jeremy N. Munday, and Marina S. Leite, "Real-Time Nanoscale Open-Circuit Voltage Dynamics of Perovskite Solar Cells," *Nano Lett.* **17**, 2554–2560 (2017)

55 **Joseph Murray, Dakang Ma,** and Jeremy N. Munday, "Electrically Controllable Light Trapping for Self-Powered Switchable Solar Windows," *ACS Photonics* (**Cover**), **4**, 1–7, (2017)

54 **Dakang Ma, Joseph Murray,** and Jeremy N. Munday, "Controllable Propulsion by Light: Steering a Solar Sail via Tunable Radiation Pressure," *Adv. Opt. Mat*. (**Cover**), **5**, 1600668 (2017)

53 **Tao Gong** and Jeremy N. Munday, "Aluminum-based hot carrier plasmonics," *Appl. Phys. Lett*. **110**, 021117 (2017)

52 **David A. T. Somers** and Jeremy N. Munday, "Conditions for repulsive Casimir forces between identical birefringent materials," *Phys. Rev. A,* **95**, 022509 (2017)

51 **Joseph Murray** and Jeremy N. Munday, "A generalized approach to modeling absorption and photocurrent in solar cells with light scattering structures," *J. Appl. Phys.* (**Cover**) **120,** 165304 (2016)

50 Qing Zhang, Wenzhong Bao, Amy Gong, Tao Gong, Dakang Ma, Jiayu Wan, Jiaqi Dai, Jeremy N. Munday, Jr-Hau He, Liangbing Hu and Daihua Zhang**, "**A highly sensitive, highly transparent, gel-gated MoS2 phototransistor on biodegradable nanopaper," *Nanoscale*, **8**, 14237-14242 (2016)

49 **Dongheon Ha**, Chen Gong, Marina S Leite, and Jeremy N. Munday, "Demonstration of Resonance Coupling in Scalable Dielectric Microresonator Coatings for Photovoltaics," *ACS Applied Materials & Interfaces* (**Cover**) **8**, 24536-24542 (2016)

48 **Tao Gong, Lisa Krayer**, and Jeremy N. Munday, "Design concepts for hot carrier-based detectors and energy converters in the near ultraviolet and infrared," *J. of Photonics for Energy* **6**, 042510-042510 (2016)

47 **Joseph L Garrett** and Jeremy N. Munday, "Fast, high-resolution surface potential measurements in air with heterodyne Kelvin probe force microscopy," *Nanotechnology* (**Cover**), **27**, 245705 (2016)

46 Ryan J Suess, Edward Leong, **Joseph L Garrett**, Tong Zhou, Reza Salem, Jeremy N Munday, Thomas E Murphy, and Martin Mittendorff, "Mid-infrared time-resolved photoconduction in black phosphorus," *2D Materials*, **3**, 041006 (2016)

45 **Daniel A. Goldman, Joseph Murray** and Jeremy N. Munday, "Nanophotonic resonators for InP solar cells," *Opt. Express* **24**, A925-A934 (2016)

44 **Joseph Murray** and Jeremy N. Munday, "Experimental demonstration and modeling of the internal light scattering profile within solar cells due to random dielectric scatterers," *J. Appl. Phys.* **119**, 023104 (2016)

43 Elizabeth M. Tennyson, **Joe L. Garrett**, Jesse A. Frantz, Jason D. Myers, Robel Y. Bekele, Jasbinder S. Sanghera, Jeremy N. Munday, Marina S. Leite, "Nanoimaging of Open-Circuit Voltage in Photovoltaic Devices," *Adv. Energy Mater.* (**Cover**), **5**, 1501142 (2015)

42 Chen Gong, Dmitry Ruzmetov, Alexander Pearse, **Dakang Ma**, Jeremy N. Munday, Gary Rubloff, A. Alec Talin, and Marina S. Leite, "Surface/Interface Effects on High-Performance Thin-Film All-Solid-State Li-Ion Batteries," *ACS Applied Materials & Interfaces* (**Cover**), **7**, 26007-26011 (2015)

41 **Tao Gong** and Jeremy N. Munday "Invited: Materials for hot carrier plasmonics," *Opt. Materials Express* **5**, 2501-2512 (2015)

40 **Yunlu Xu, Tao Gong** and Jeremy N. Munday, "The generalized Shockley-Queisser limit for nanostructured solar cells," *Scientific Reports* **5**, 13536 (2015)

39 **Taqiyyah S. Safi**[*] and Jeremy N. Munday "Improving photovoltaic performance through radiative cooling in both terrestrial and extraterrestrial environments," *Opt. Express* **23**, A1120-A1128 (2015)

38 **David Somers** and Jeremy N. Munday, "Rotation of a liquid crystal by the Casimir torque," *Phys. Rev. A* **91**, 032520 (2015)

37 **Dakang Ma**, **Joe L. Garrett**, Jeremy N. Munday, "Quantitative measurement of radiation pressure on a microcantilever in ambient environment," *Appl. Phys. Lett.* **106**, 091107 (2015)

36 **Dongheon Ha**, **Joseph Murray,** Zhiqiang Fang, Liangbing Hu, and Jeremy N. Munday, "Advanced broadband antireflection coatings based on cellulose micro-fiber paper," *IEEE J. of PV*, 5, 577-583 (2015)

35 **Joseph Garrett**, **David Somers**, and Jeremy N. Munday, "The effect of patch potentials in Casimir force measurements determined by heterodyne Kelvin probe force microscopy," *J. Phys.: Condens. Matter* (**Cover**) **27**, 214012 (2015)

34 **Tao Gong** and Jeremy N. Munday, "Angle-independent hot carrier generation and collection using transparent conducting oxides," *Nano Lett.*, **15**, 147–152 (2015)

33 **Dongheon Ha**, Zhiqiang Fang, Liangbing Hu, and Jeremy N. Munday, "Paper-based antireflection coatings for photovoltaics," *Advanced Energy Materials,* **4,** 1301804 (2014)

32 Wenzhong Bao, Jiayu Wan, Xiaogang Han, Xinghan Cai, Hongli Zhu, Dohun Kim, **Dakang Ma**, **Yunlu Xu**, Jeremy N. Munday, H. Dennis Drew, Michael S. Fuhrer, Liangbing Hu, "Approaching the limits of transparency and conductivity in graphitic materials through lithium intercalation," *Nature Comm.* **5**, 4224 (2014)

31 **Yunlu Xu** and Jeremy N. Munday, "Quantum dot enhanced polymer solar cell," *Opt. Exp*., **22**, A259-A267 (2014)

30 **Yunlu Xu** and Jeremy N. Munday, "Designing Photonic Materials for Effective Bandgap Modification and Optical Concentration in Photovoltaics," *IEEE Journal of Photovoltaics*, **4**, 233-236 (2014)

29 Zhiqiang Fang, Hongli Zhu, **Dongheon Ha**, Qingxia Chen, Colin Preston, Steven Lacey, Yuanyuan Li, Seongwoo Lee, Gang Chen, Xinsheng Chai, Jeremy Munday, Liangbing Hu, "Novel Nanostructured Paper with Ultrahigh Transparency and Ultrahigh Haze for Solar Cells," *Nano Lett.*, **14**, 765–773 (2014)

28 Colin Preston, Zhiqiang Fang, **Joseph Murray**, Hongli Zhu, Jiaqi Dai, Jeremy Munday, Liangbing Hu, "Silver nanowire transparent conducting paper-based electrode with high optical haze," *J. Mater. Chem. C*, **2**, 1248-1254 (2014)

27 Colin Preston, **Yunlu Xu**, Xiaogang Han, Jeremy N. Munday, Liangbing Hu, "Optical haze of transparent and conductive silver nanowire films," *Nano Res.*, **6,** 461-468 (2013)

26 Marina S. Leite, Robyn L. Woo, Jeremy N. Munday, William D. Hong, Shoghig Mesropian, Daniel C. Law, and Harry A. Atwater, "Towards an optimized all lattice-matched InAlAs/InGaAsP/InGaAs multijunction solar cell with efficiency >50%," *Appl. Phys. Lett.* **(Cover) 102**, 033901 (2013)

25 Chia-Ying Chiang, Jillian Epstein, Adam Brown, Jeremy Munday, James Culver, Sheryl Ehrman, "Biological Templates for Anti Reflective Current Collectors for Photoelectrochemical Cell Applications," *Nano Lett.* **12**, 6005–6011 (2012)

24 J. N. Munday, "The effect of photonic bandgap materials on the Shockley-Queisser limit" *J. of Appl. Phys.* **(Cover) 112**, 064501 (2012)

23 J. N. Munday, D. M. Callahan and H. A. Atwater, "Light trapping beyond the $4n^2$ limit in thin waveguides," *Appl. Phys. Lett.* **100**, 121121 (2012)

22 J. Grandidier, D. M. Callahan, J. N. Munday and H. A. Atwater, "Gallium arsenide solar cell absorption enhancement using whispering gallery modes of dielectric nanospheres," *IEEE Journal of Photovoltaics*, **2**, 123-128 (2012)

21 D. M. Callahan, J. N. Munday and H. A. Atwater, "Solar Cell Light Trapping beyond the Ray Optic Limit," *Nano Lett.* **12**, 214-218 (2012)

20 J. N. Munday and Harry A. Atwater, "Large integrated absorption enhancement in plasmonic solar cells by combining metallic gratings and antireflection coatings," *Nano Lett.* **(Cover)** 11, 2195–2201 (2011)

19 J. Grandidier, D. M. Callahan, J. N. Munday and Harry A. Atwater, "Light absorption enhancement in thin film solar cells using whispering gallery modes in dielectric nanospheres," *Adv. Mat.* **(Cover)** 23, 1272-1276 (2011)

18 Vivian E. Ferry, J. N. Munday, and Harry A. Atwater, "Design Considerations for Plasmonic Photovoltaics," *Adv. Mat.* 22, 4794–4808 (2010)

17 J. N. Munday and Federico Capasso, "Repulsive Casimir and van der Waals forces: from measurements to future technologies," *Inter. J. of Mod. Phys. A* 25, 2252 (2010)

16 Peter N. Saeta, Vivian E. Ferry, Domenico Pacifici, Jeremy N. Munday, and Harry A. Atwater, "How much can guided modes enhance absorption in thin solar cells?" *Opt. Express* 17, 20975 (2009)

15 J. N. Munday, Federico Capasso, and V. Adrian Parsegian, "Measured long-range repulsive Casimir-Lifshitz forces," *Nature* **(Cover)** 457, 170-173 (2009)

14 Alejandro W. Rodriguez, J. N. Munday, J. D. Joannopoulos, Federico Capasso, Diego A. R. Dalvit, and Steven G. Johnson "Stable Suspension and Dispersion-Induced Transitions from Repulsive Casimir Forces Between Fluid-Separated Eccentric Cylinders," *Phys. Rev. Lett.* 101, 190404 (2008)

13 J. N. Munday, Federico Capasso, V. Adrian Parsegian, and Sergey M. Bezrukov,"Measurements of the Casimir-Lifshitz force in fluids: The effect of electrostatic forces and Debye screening," *Phys. Rev. A* 78, 032109 (2008)

12 J. N. Munday and Federico Capasso, Reply to "Comment on 'Precision measurement of the Casimir-Lifshitz force in a fluid,'" *Phys. Rev. A* 77, 036103 (2008)
11 J. N. Munday and Federico Capasso, "Precision measurement of the Casimir-Lifshitz force in a fluid," *Phys. Rev. A (Rapid Comm.)* 75, 60102 (2007)
10 Federico Capasso, Jeremy N. Munday, Davide Iannuzzi and H. B. Chan, "Casimir Forces and Quantum Electrodynamical Torques: Physics and Nanomechanics," *IEEE Journal of Selected Topics in Quantum Electronic*s, 13, 400 (2007)
9 J. N. Munday and W. M. Robertson, "Observation of negative group delays within a coaxial photonic crystal using an impulse response method," *Optics Comm.* 273, 32 (2007)
8 Jeremy N. Munday, Davide Iannuzzi, and Federico Capasso "Quantum electrodynamical torques in the presence of Brownian motion," *New Journal of Physics* 8, 244 (2006)
7 Davide Iannuzzi, Mariangela Lisanti, Jeremy N. Munday, and Federico Capasso "Quantum fluctuations in the presence of thin metallic films and anisotropic materials," *Journal of Physics A: Mathematical and General* 39, 6445 (2006)
6 Davide Iannuzzi, Mariangela Lisanti, Jeremy N. Munday, and Federico Capasso "The design of long range quantum electrodynamical forces and torques between macroscopic bodies," *Solid State Comm.* 135, 618 (2005)
5 Jeremy N. Munday, Davide Iannuzzi, Yuri Barash, and Federico Capasso "Torque on birefringent plates induced by quantum fluctuations," *Phys. Rev. A* 71, 042102 (2005)
4 J. N. Munday and R. H. Henderson, "Superluminal time advance of a complex audio signal," *Appl. Phys. Lett.* 85, 503 (2004)
3 J. N. Munday and W. M. Robertson, "Slow electromagnetic pulse propagation through a narrow transmission band in a coaxial photonic crystal," *Appl. Phys. Lett.* 83, 1053 (2003)
2 J. N. Munday and W. M. Robertson, "Negative group velocity pulse tunneling through a coaxial photonic crystal." *Appl. Phys. Lett.* 81, 2127 (2002)
1 J. N. Munday, C. Brad Bennett, and W. M. Robertson, "Band gaps and defect modes in periodically structured waveguides," *J. Acoust. Soc. Am*. 112, 1353 (2002)

CONFERENCE PROCEEDINGS

7 **Tao Gong, Lisa Krayer**, and Jeremy N. Munday, "Hot electron detectors and energy conversion in the UV and IR," SPIE Optical Engineering + Applications, 96081C-96081C-9, San Diego, CA 9-13 August 2015
6 **Yunlu Xu,** Edo Waks, and Jeremy N. Munday, "Improved Voltage Response in III-V Solar Cells Based on Engineered Spontaneous Emission," Photovoltaic Specialists Conference (PVSC), New Orleans, LA, 42nd IEEE, 14-19 June 2015
5 Elizabeth Tenysson, **Joe Garrett**, Chen Gong, Jesse Frantz, Jason Myers, Robel Bekele, Jas Sanghera, Jeremy N. Munday, Marina Leite, "Assessing Local Voltage in CIGS Solar Cells by Nanoscale Resolved Kelvin Probe Force Microscopy and Sub-Micron Photoluminescence," Photovoltaic Specialists Conference (PVSC), Denver, CO, 40th IEEE, 8-13 June 2014
4 J. N. Munday, "Designing photonic materials for effective bandgap modification and optical concentration in photovoltaics," Photovoltaic Specialists Conference (PVSC), Austin, TX, 38th IEEE, 3-8 June 2012
3 Li Tian, J. Amirloo, J. Murray, K. A. Sablon, J. Little, P. Uppal, J. Munday, M. Dagenais, "A comparison of bulk and quantum dot GaAs solar cells," Photonics Conference (IPC), 2012 IEEE , vol., no., pp.194,195, 23-27 Sept. 2012 (doi: 10.1109/IPCon.2012.6358557)
2 J. Grandidier, D. M. Callahan, J. N. Munday, Harry A. Atwater, "Photocurrent enhancement in GaAs solar cells using whispering gallery modes of dielectric nanospheres," Photovoltaic Specialists Conference (PVSC), 2011 37th IEEE, vol., no., pp.003631,003631, 19-24 June 2011 (doi: 10.1109/PVSC.2011.6185935)
1 J. N. Munday, D. M. Callahan, C. Chen, Harry A. Atwater, "Three efficiency benefits from thin film plasmonic solar cells," Photovoltaic Specialists Conference (PVSC), 2011 37th IEEE, pp.000907-000910, 19-24 June 2011 (doi: 10.1109/PVSC.2011.6186099)

INVITED CONFERENCE & PLENARY TALKS

52 Jeremy Munday, "TBD." Materials Research Society Meeting, Boston, MA (scheduled for Nov 2019).
51 Jeremy Munday, "Recent measurements of Casimir forces and torques." SPIE Optics + Photonics, San Diego, CA (scheduled for Aug 2019)
50 Jeremy Munday, "Active photonic elements using metal hydrides." SPIE Optics + Photonics, San Diego, CA (scheduled for Aug 2019)
49 Jeremy Munday, "Recent measurements of Casimir forces and torques." PIERS 2019 (Progress In Electromagnetics Research Symposium), Rome, Italy (scheduled for June 2019).
48 Jeremy Munday, "Enhanced Hot Carrier Effects in Ultra-thin Metallic Films on Index Near-Zero

Substrates." Materials Research Society Meeting, Phoenix, AZ (scheduled for April 2019).

47 Jeremy Munday, "New optoelectronic device functionality based on light trapping." SPIE Defense & Commercial Sensing, Baltimore, Maryland (Scheduled for April 2019)

46 Jeremy Munday, "The Future of Green Power Generation." Invited tutorial for the GERA Energy Workshop at the March APS Meeting, Boston, MA (March 2019)

45 Jeremy Munday, "Improved solar energy conversion devices using photon recycling and hot carrier extraction." SPIE Photonics West, San Francisco, CA (February 2019)

44 Jeremy Munday, "Effect of Surface and Bulk Defects on Hot Carrier Transport in Ultra-thin Metallic Films." Materials Research Society Meeting, Boston, MA (Nov 2018).

43 Jeremy Munday, "Radiation pressure on microcantilevers and for solar sail applications." SPIE Optics + Photonics, San Diego, CA (Aug 2018)

42 Jeremy Munday, "Measurements of the Casimir force between two spheres." SPIE Optics + Photonics, San Diego, CA (Aug 2018)

41 Jeremy Munday, "Casimir Force Measurements between Two Spheres." PIERS 2018 (Progress In Electromagnetics Research Symposium), Toyama, Japan (Aug 2018).

40 Jeremy Munday, "Optical-to-electrical Energy Conversion Using Hot Carriers and Photon Recycling." PIERS 2018 (Progress In Electromagnetics Research Symposium), Toyama, Japan (Aug 2018).

39 Jeremy Munday, Joseph Garrett, and David Somers, "Tailoring Casimir forces and torques." Autumn Meeting of the Brazilian Physical Society, Foz do Iguaçu, Brazil (May 2018).

38 Jeremy Munday, "Optoelectronic devices based on hot carriers in ultrathin metallic films." PIERS 2017 (Progress In Electromagnetics Research Symposium), Singapore (Nov 2017).

37 Jeremy Munday, "Switchable optical materials for space propulsion and attitude control." SPIE Optics + Photonics, San Diego, CA (Aug 2017).

36 Jeremy Munday, "Optoelectronic metasurfaces." META'17 (The 8th International Conference on Metamaterials, Photonic Crystals and Plasmonics), Incheon, Korea (July 2017).

35 Jeremy Munday, "Casimir force and torque experiments beyond the sphere-plate configuration." Workshop on the Casimir force and optical tweezers at the Jussieu site of Laboratoire Kastler-Brossel, Paris, France (July 2017).

34 Jeremy Munday, "Hot carrier optoelectronic devices based on ultra-thin metallic films." PQE-2017 (Physics of Quantum Electronics), Snowbird, UT (Jan 2017).

33 Jeremy Munday, "Tunable photonic elements for solar energy." Materials Research Society Meeting, Boston, MA (Dec 2016).

32 Jeremy Munday, "Hot Carrier Photodetectors." International Semiconductor Device Research Symposium (ISDRS), Bethesda, MD (Dec 2016).

31 Jeremy Munday, "Solar energy generation and photon detection using hot carriers in metals." ACS (American Chemical Society) Southwest Regional Meeting, Galveston, TX (Nov 2016).

30 Jeremy Munday, "Green Solutions for Next Generation Photovoltaics: Using Wood, Glass, and Aluminum." PRiME-ECS (Electrochemical Society) meeting, Honolulu, HI (Oct 2016).

29 Jeremy Munday, "Using Simulations to Guide Experiments." PIERS 2016 (Progress In Electromagnetics Research Symposium), Shanghai, China (Aug 2016).

28 Jeremy Munday, "Plasmonic materials for hot carrier devices." META'16 (The 7th International Conference on Metamaterials, Photonic Crystals and Plasmonics), Malaga, Spain (July 2016).

27 Jeremy Munday, "Casimir forces and torques: recent experimental progress and the effect of patch potentials." IAS Focused Program on Casimir and van der Waals Physics: Progress and Prospects, Hong Kong (April 2016).

26 Jeremy Munday, "Hot carrier effects in nanostructured metals for solar-energy conversion." SPIE Photonics West, San Francisco, CA (Feb 2016).

25 Jeremy Munday, "Solar Power Conversion Efficiency >30% Using Novel Optical and Plasmonic Structures." EMN, Las Vegas, NV (Nov 2015).

24 Jeremy Munday, "Hot electron detectors and energy conversion in the UV and IR." SPIE, San Diego, CA, (Aug 2015).

23 Jeremy Munday, "Anti-reflection coatings based on cellulose paper." Photonics North, Ottawa, CA (June 2015).

22 Jeremy Munday, "Energy Conversion Using Resonant and Non-Resonant Optical Structures." Materials Research Society Spring Meeting, San Francisco, CA, (March 2015).

21 Jeremy Munday, "All-metal solar energy conversion devices based on hot electrons." TMS 2015 144th Annual Meeting and Exhibition, Orlando, FL, (March 2015).

20 Jeremy Munday, "Micro- and nano-scale optics for solar cells." EMN Meeting on Photovoltaics, Orlando, FL, (Jan 2015).

19 Jeremy Munday, "Nanoscale Optics and the Shockley-Queisser Limit." OSA Incubator on the Fundamental Limits of Optical Energy Conversion, Washington DC, USA, (Nov 2014).

18 Jeremy Munday, "Photonic Architectures for Beating Light Trapping and Efficiency Limits in Solar Cells." Progress In Electromagnetics Research Symposium (PIERS), Guangzhou, China, (Aug 2014).
17 Jeremy Munday, "The Detailed Balance Efficiency Limit for Nanowire Solar Cells." Materials Research Society Fall Meeting, Boston, MA, (Dec 2013).
16 Jeremy Munday, "New Opportunities for PV Optics Using Quantum Dots, Nanowires, and Photonic Crystals." OSA's Optics and Photonics Congress on Renewable Energy and the Environment, Tucson, Arizona, (Nov 2013).
15 Jeremy Munday, "Light Trapping Principles and Limits for Photovoltaics." OSA's Optics and Photonics Congress on Renewable Energy and the Environment, Tucson, Arizona, (Nov 2013).
14 Jeremy Munday, "Solar innovations for a *bright* future." ASEI convention on "Innovative technologies: An engine for economic growth," College Park, MD, (Sept 2013).
13 Jeremy Munday, "Photonics and plasmonics for solar energy." Emerging Information and Technology Association – Young Investigators Conference (EITA-YIC), Cambridge, MA (Aug 2013).
12 Jeremy Munday, "Radiation pressure on nanostructured optical materials." International Conference on Computational & Experimental Engineering and Sciences, Seattle, WA (May 2013).
11 Jeremy Munday, "Photonic and plasmonic solar energy conversion." SPIE Defense, Security, and Sensing Conference, Baltimore, MD (April 2013).
10 Jeremy Munday, "Making waves." American Association of Physics Teachers Meeting (Tennessee Section), Murfreesboro, TN (March 2013).
9 Jeremy Munday, "Design and fabrication of ultrathin plasmonic solar cells." Gordon-Kenan Research Seminar (GRS), Waterville, ME (2010).
8 Jeremy Munday, "Measurement of Attractive and Repulsive Casimir Forces and Applications to Nanomechanics." Optical Society of America's Frontiers in Optics, San Jose, CA (2009).
7 Jeremy Munday, "Engineering the Casimir-Lifshitz force for levitation, ultra-low static friction devices, self-sorting, and QED torques AFM measurement of long-range quantum forces." New Frontiers in Casimir Force Control, Santa Fe, NM (2009).
6 Jeremy Munday, "Engineering the Casimir-Lifshitz force for levitation, ultra-low static friction devices, self-sorting, and QED torques." QFEXT09: Quantum Field Theory Under the Influence of External Conditions, Norman, OK (2009).
5 Jeremy Munday, "AFM measurement of long-range quantum forces." SPIE Optics and Photonics, San Diego, CA (2009).
4 Jeremy Munday, "Measurements of the Casimir force with application to nanotechnology." KITP Program: The Theory and Practice of Fluctuation-Induced Interactions, Santa Barbara, CA (2008).
3 Jeremy Munday, "Casimir-Lifshitz forces and QED torques." KITP Program: The Theory and Practice of Fluctuation-Induced Interactions, Santa Barbara, CA (2008).
2 J. N. Munday, "Measurements of the Casimir force in fluids: from attraction to repulsion." 38th Winter Colloquium on the Physics of Quantum Electonics, Snowbird, Utah (2008).
1 J. N. Munday, Federico Capasso, and Davide Iannuzzi, "Experiments for the detection of quantum electrodynamical torques and repulsive forces." Dispersion Forces and Nano-Electro-Mechanical Systems Conference at the Lorentz Center in Leiden, NL (2006).

SEMINARS & COLLOQUIA

49 **Ottawa University**, Quantum Photonics Seminar, Ottawa, Canada (scheduled for May 2019).
48 **University of New Mexico**, Department of Physics and Astronomy Colloquium, Albuquerque, NM (March 2019).
47 **University of Pennsylvania**, ESE Colloquium, Philadelphia, PA (Feb 2019).
46 **City University of New York, ASRC**, Photonics Seminar, New York City, NY (2018).
45 **University of California Davis**, ECE Seminar, Davis, CA (2018).
44 **University of Pennsylvania**, ESE Colloquium, Philadelphia, PA (2018).
43 **University of British Columbia**, Vancouver, Canada (2018).
42 **University of Southern California**, Los Angeles, CA (2018).
41 **Caltech**, Pasadena, CA (2017).
40 **UCLA**, Los Angeles, CA (2017).
39 **Columbia University**, New York City, NY (2017).
38 **Laboratory for Physical Sciences**, College Park, MD (2017).
37 **UC Irvine.** CaSTL (Center for Chemistry at the Space-Time Limit) Seminar, Irvine, CA (2016).
36 **Univ. of Maryland, Baltimore County.** Physics Colloquium, Baltimore, MD (2016).
35 **Rutgers University.** Laboratory for Surface Modification (LSM) Seminar, Newark, NJ (2016).
34 **NASA Marshall Space Flight Center**, Huntsville, AL (2016)
33 **Univ. of Maryland**, CNAM Colloquium, College Park, MD (2016)

32 **NASA Langley Research Center**, Hampton, VA (2015)
31 **Univ. of Maryland**, NSF TREND seminar, College Park, MD (2015)
30 **The Clark School Engineering Sustainability Workshop**: Engineering Grid Resiliency for a Changing Climate, College Park, MD (2015)
29 **Ottawa University**, Ottawa, Canada (2015)
28 **McGill University**, Montreal, Canada (2015)
27 **Hong Kong University of Science and Technology**, Hong Kong, China (2014)
26 **NASA Marshall Space Flight Center**, Huntsville, AL (2014)
25 **NASA Goddard**, Greenbelt, MD (2014)
24 **Rutgers University.** Nanotechnology for Clean Energy IGERT Seminar, Newark, NJ (2013).
23 **San Diego State University.** Department of Physics, San Diego, CA (2013).
22 **Sandia National Laboratory.** Nanoelectronics & Nanophotonics Group, Livermore, CA (2013).
21 **Santa Clara University.** Department of Mechanical Engineering, Santa Clara, CA (2013).
20 **UC San Diego.** Department of Electrical and Computer Engineering, San Diego, CA (2013).
19 **Univ. of Miami.** Department of Electrical and Computer Engineering, Miami, FL (2013).
18 **Univ. of Maryland.** Department of Material Science and Engineering, College Park, MD (2012).
17 **Univ. of Maryland.** Department of Chemistry and Biochemistry, College Park, MD (2012).
16 **The Clark School Engineering Sustainability Workshop**: Focus on Solar Energy, College Park, MD (2012).
15 **Joint Quantum Institute.** College Park, MD (2012).
14 **U.S. Naval Research Laboratory**, Washington, DC (2012).
13 **DC-Chapter IEEE Photonics Society**: Plenary Session on Forefront applications and developments in plasmonics, College Park, MD (2011).
12 **Laboratory for Physical Sciences**, College Park, MD (2011).
11 **UCLA.** IEEE Photonics Society LA Chapter, Los Angeles, CA (2011).
10 **UC Santa Barbara.** Department of Electrical and Computer Engineering, Santa Barbara, CA (2011).
9 **Boston College.** Department of Physics, Chestnut Hill, MA (2011).
8 **Univ. of Maryland.** Department of Electrical and Computer Engineering, College Park, MD (2011).
7 **Arizona State University.** Department of Physics, Tempe, AZ (2011).
6 **Univ. of Delaware.** Department of Physics, Newark, DE (2011).
5 **Universidade Federal de Pernambuco.** Department of Physics, Recife, Brasil (2010).
4 **Defense Science Research Council**: Physics and Applications of "Black" Materials Special Topic Workshop (2010).
3 **UC Irvine**. Physics Seminar, Irvine, CA (2009).
2 **Yale University**. Atomic Physics Seminar, New Haven, CT (2008).
1 **Harvard University**. Squishy Physics Seminar, Cambridge, MA (2007).

OTHER TALKS

40 Jeremy N. Munday, "Measuring the Casimir torque," APS March Meeting, Boston, MA (2019).
39 Jeremy N. Munday, "Using optics to affect the electrical response of solar cells," MRS Fall Meeting SYMPOSIUM ET11.16: Rump Session: Wavelength Selective Photonic Structures Applications to Solar Cells, Boston, MA (2018).
38 Jeremy N. Munday, "Tailoring Casimir forces and torques through geometry and optical response," APS March Meeting, Los Angeles, CA (2018).
37 Jeremy N. Munday, "Self-Powering, Electrically Switchable Windows," MRS Fall Meeting, Boston, MA (2017).
36 Tao Gong, Lisa Krayer, and Jeremy N. Munday, "Novel metallic absorbers for hot carrier generation," SPIE Photonics West, San Francisco, CA (2017).
35 Tao Gong, Lisa Krayer, and Jeremy N. Munday, "Material opportunities and device applications for hot carrier plasmonics," MRS Fall Meeting, Boston, MA (2016).
34 Yunlu Xu, Taqiyyah Safi, and Jeremy N. Munday, "Modifying the optoelectronic response of photovoltaic materials through nanophotonics," SPIE Optics and Photonics, San Diego, CA (2016).
33 Dakang Ma, Joe Murray, and Jeremy N. Munday, "Using switchable optical materials to control spacecraft through radiation pressure," SPIE Optics and Photonics, San Diego, CA (2016).
32 Taqiyyah Safi and Jeremy N. Munday, "Radiative Cooling of a GaAs Solar Cell To Improve Power Conversion Efficiency," Photovoltaics Specialists Conference (PVSC), Portland, OR (2016).
31 Yunlu Xu, Taqiyyah Safi, and Jeremy N. Munday, "Using photonic nanostructures to modify the optoelectronic response of photovoltaic materials," MRS Fall Meeting, Boston, MA (2015).
30 Tao Gong and Jeremy N. Munday, "Hot electron plasmonics for energy conversion and detection in the UV and IR," MRS Fall Meeting, Boston, MA (2015).

29 Jeremy N. Munday and Yunlu Xu, " Photonic Crystal Devices for Energy Applications," OSA Frontiers in Optics, San Jose, CA (2015).
28 Dakang Ma and Jeremy N. Munday, "Measurement of radiation pressure in an ambient environment," SPIE, San Diego, CA (2015).
27 Jeremy N. Munday, "Advanced Anti-Reflection Coatings Based on Nano- and Micro-Structures," OSA Optics and Photonics Congress on Renewable Energy and the Environment, Canberra, Australia (2014).
26 D. Ha, Z. Fang, L. Hu, and Jeremy N. Munday, "Improved electrical response of photovoltaic devices by photonic structuring," IEEE Photovoltaics Specialists Conference (PVSC), Denver, Co (2014).
25 Jeremy Munday, "The Limiting Efficiency of Photonic Crystal and Nanowire Solar Cells," Spring Materials Research Society Meeting, San Francisco, CA (2014).
24 Jeremy Munday, "Improved electrical response of photovoltaic devices by photonic structuring," American Physical Society March Meeting, Baltimore, MD (2013).
23 Jeremy Munday, "Photonic crystal based solar cells for improved open circuit voltages," Fall Materials Research Society Meeting, Boston, MA (2012).
22 Jeremy Munday, "The effect of photonic bandgap materials on the Shockley-Queisser limit," Photovoltaic Specialist Conference, Austin, TX (2012).
21 Jeremy N. Munday, Dennis Callahan, and Harry A. Atwater, "Exceeding the ergodic light-trapping limit in solar cells." SPIE Optics + Photonics, San Diego, CA (2011).
20 Jeremy N. Munday, Dennis Callahan, and Harry A. Atwater, "Development of Photonic and Plasmonic Designs to Surpass the $4n^2$ Light Trapping Limit." Fall Materials Research Society Meeting, Boston, MA (2011).
19 Dennis Callahan, Jeremy N. Munday, and Harry A. Atwater, "Exceeding the Ergodic Light Trapping Limit Using Photonic and Plasmonic Materials." Fall Materials Research Society Meeting, Boston, MA (2011).
18 Jonathan Grandidier, Dennis M. Callahan, Augustin Mihi, Jeremy N. Munday, Michael G. Deceglie, Paul V. Braun and Harry A. Atwater, "Light Absorption Enhancement in Ultra-thin Film Solar Cells Using Whispering Gallery Modes in Dielectric Nanosphere Arrays." Fall Materials Research Society Meeting, Boston, MA (2011).
17 Jeremy N. Munday, Dennis Callahan, Clare Chen, and Harry A. Atwater, "Three efficiency benefits from thin film plasmonics solar cells." Photovoltaics Specialists Conferences, Seattle, WA (2011).
16 Jeremy N. Munday, Dennis Callahan, and Harry A. Atwater, "Design criteria for surpassing the classical light-trapping limit in thin film solar cells." Spring Materials Research Society Meeting, San Francisco, CA (2011).
15 Dennis Callahan, Jeremy N. Munday, and Harry A. Atwater, "Exceeding the Ergodic Light Trapping Limit Using Photonic and Plasmonic Materials." Spring Materials Research Society Meeting, San Francisco, CA (2011).
14 Jeremy N. Munday, Dennis Callahan, and Harry A. Atwater, "Surpassing the classical light-trapping limit in thin film solar cells." American Physical Society March Meeting, Dallas, TX (2011).
13 Jeremy N. Munday and Harry A. Atwater, "Beating Traditional Photovoltaic Designs through Optical Concentration via Plasmonic Grating and Antenna Structures." Fall Materials Research Society Meeting, Boston, MA (2010).
12 Jeremy N. Munday, Dennis Callahan, and Harry A. Atwater, "Optoelectronic design concepts for GaAs plasmonic solar cells." Spring Materials Research Society Meeting, San Francisco, CA (2010).
11 Jeremy N. Munday, Dennis Callahan, and Harry A. Atwater, "Optoelectronic design concepts for high efficiency ultrathin GaAs plasmonic solar cells." SPIE Optics and Photonics, San Diego, CA (2010).
10 Jeremy N. Munday, Vivian E. Ferry, and Harry A. Atwater, "Using plasmonic scatterers in ultrathin-film solar cells to approach the absorption limit of bulk materials." Fall Materials Research Society Meeting, Boston MA (2009).
9 J. N. Munday and Federico Capasso, "Measurements of the Casimir-Lifshitz force between a metal and a dielectric in fluid." American Physical Society March Meeting (2008).
8 J. N. Munday and Federico Capasso, "Measurements of the Casimir force in fluids." American Physical Society March Meeting (2007).
7 Limor Spector, Jeremy Munday, Federico Capasso, Nicholas Geisse, Kevin Kit Parker, "The Casimir force on transparent conductors." American Physical Society March Meeting (2007).
6 Mark B. Romanowsky, Jeremy N. Munday, Richard Schalek, Federico Capasso, Qiang Li, Genda Gu**, "**Casimir force measurements between metal and high T_c superconductor surfaces.**"** American Physical Society March Meeting (2007).
5 J. N. Munday, Davide Iannuzzi, Federico Capasso, Yuri Barash, "Mechanical Torque on Birefringent Plates Induced by Quantum Fluctuations." American Physical Society March Meeting (2005).
4 Ron Henderson, Jeremy Munday, **"**Negative Group Delays without Distortion in an Electronic Filter,**"** American Physical Society March Meeting (2005).

3 W. M. Robertson, J. N. Munday, and C. Brad Bennett, "Group Velocity Manipulations in Coaxial Photonic Crystals." PIERS (2003).

2 J. N. Munday and W. M. Robertson, "Slow and fast electromagnetic pulse propagation within a coaxial crystal." American Physical Society March Meeting (2003).

1 J. N. Munday, C. Brad Bennett, and W. M. Robertson, "Acoustic band gaps and defect modes in periodically-structured wave guides." American Physical Society March Meeting (2002).

CONFERENCE TALKS BY STUDENTS

16 **David A. T. Somers** and Jeremy N. Munday, "An experimental apparatus for Casimir torque measurements," American Physical Society March Meeting, Baltimore, MD (2016).

15 **Dakang Ma**, **Joseph Garrett**, **Joseph Murray**, "Measurement and Applications of Radiation Pressure," American Physical Society March Meeting, Baltimore, MD (2016).

14 Elizabeth Tennyson, **Joseph Garrett**, Jeremy Munday, and Marina Leite, "Resolving local voltage variations in opto-electronic devices with Kelvin probe force microscopy," American Physical Society March Meeting, Baltimore, MD (2016).

13 **Daniel Goldman**, **Joseph Murray**, and Jeremy Munday, "High Efficiency InP Solar Cells Through Nanostructuring," American Physical Society March Meeting, Baltimore, MD (2016).

12 **Taqiyyah Safi*** and Jeremy Munday, "Enhancing photovoltaic efficiency through radiative cooling of solar cells below ambient temperature," American Physical Society March Meeting, Baltimore, MD (2016).

11 **Yunlu Xu** and Jeremy Munday, "The Upper Bound on Solar Power Conversion Efficiency Through Photonic Engineering," American Physical Society March Meeting, Baltimore, MD (2016).

10 **Joseph Murray**, **Dakang Ma**, and Jeremy Munday, "Switchable Solar Window Devices Based on Polymer Dispersed Liquid Crystals," American Physical Society March Meeting, Baltimore, MD (2016).

9 **Tao Gong** and Jeremy Munday, "Semiconductor-free hot carrier devices for energy harvesting and photodetection," American Physical Society March Meeting, Baltimore, MD (2016).

8 **Lisa Krayer** and Jeremy N. Munday, "Hot carrier metamaterial detectors and energy converters," American Physical Society March Meeting, Baltimore, MD (2016).

7 **Joseph L Garrett** and Jeremy N. Munday, "Measurement and control of electrostatic patch potentials," American Physical Society March Meeting, Baltimore, MD (2016).

6 **Dongheon Ha**, Chen Gong, Marina S. Leite, and Jeremy N. Munday, "Dielectric micro-resonator arrays for optical coupling to solar cells," American Physical Society March Meeting, Baltimore, MD (2016).

5 **Sean Gillen***, **David A.T. Somers**, and Jeremy N. Munday, "Simulation of weak anchoring effects on nematic liquid crystal hemispheres," American Physical Society March Meeting, Baltimore, MD (2016).

4 **Dakang Ma**, **Joseph Garrett**, and Jeremy N. Munday, "Radiation Pressure Measurement under Ambient Conditions Using a Microcantilever," OSA Frontiers in Optics, San Jose, CA (2015).

3 **David Somers** and Jeremy N. Munday, "Distortion of a liquid crystal bulk by the Casimir torque," American Physical Society March Meeting, San Antonio, TX (2015).

2 **Joseph Garrett**, **David Somers**, and Jeremy N. Munday, "Electrostatic patch potentials in Casimir force measurements," American Physical Society March Meeting, San Antonio, TX (2015).

1 **Dakang Ma**, **Joseph Garrett**, and Jeremy N. Munday, "Measurement of radiation pressure in an ambient environment," American Physical Society March Meeting, San Antonio, TX (2015).

POSTERS

8 Jeremy N. Munday**,** Dennis Callahan, and Harry A. Atwater, "Ultrathin plasmonic solar cells: enhanced light trapping and optoelectronic performance." Gordon Research Conference (GRC), Waterville, ME (2010).

7 Dennis Callahan, Jeremy N. Munday**,** and Harry A. Atwater, "Multifunctional nanoparticle networks as transparent conductive electrodes for solar cells." Spring Materials Research Society Meeting, San Francisco, CA (2010).

6 Jeremy N. Munday**,** Dennis Callahan, Vivian E. Ferry, and Harry A. Atwater, "The effect of plasmonic scattering in photovoltaics: a comparison between metallic nanoparticle scatterers and antireflection coatings." Fall Materials Research Society Meeting, Boston, MA (2009).

5 Jeremy N. Munday and Federico Capasso, "The Casimir force: from attraction to repulsion." Gordon Conference on Mechanical Systems in the Quantum Regime, Ventura, CA (2008).

4 Jeremy N. Munday and Federico Capasso, "QED torques and forces induced by electromagnetic zero-point fluctuations." Synergy Between Experiment and Computation in Nanoscale Science Conference at Harvard University (2006).

3 J. N. Munday and W. M. Robertson, "Superluminal and Super-Slowed Electromagnetic Pulse Propagation Within a Coaxial Photonic Crystal." 1st place award in the 8th Annual Undergraduate Research Symposium at MTSU (2003).

2 J. N. Munday, C. Brad Bennett, and W. M. Robertson, "Acoustic band gaps and defect modes in periodically-structured wave guides." Chemistry and Communication Conference in Strasbourg, France (2002).

1 J. Ash, J. N. Munday, C. Brad Bennett, and W. M. Robertson, "Acoustic pulse experiments as analogs of short optical pulse experiments." 5th Annual Southeast Ultrafast Laser Conference (2001).

GRANTS AND CONTRACTS

15 Title: Controlling the Casimir Torque
Sponsor: National Science Foundation
Date: September 2018 – September 2021
Amount: **$240,00**
Role: **PI**

14 Title: Engineering the Quantum Vacuum
Sponsor: DARPA Young Faculty Award
Date: June 2018 – June 2020
Amount: **$500,000**
Role: **PI**

13 Title: Project Terrapin (supplement)
Sponsor: Google, Inc
Date: January 2018 – December 2018
Amount: **$250,000**
Role: **PI**

12 Title: A novel approach to solar energy harvesting
Sponsor: UMD, Tier 1: Proof of Concept/Seed Grant Program
Date: July 2017 – June 2018
Amount: **$50,000**
Role: **PI**

11 Title: Novel optoelectronic materials for hot carrier effects
Sponsor: Office of Naval Research Young Investigator Program
Date: June 2016 – May 2019
Amount: **$510,000**
Role: **PI**

10 Title: CAREER: Integrated Research and Education on Hot Carrier Effects in Plasmonics
Sponsor: National Science Foundation
Date: January 2016 – December 2020
Amount: **$500,000**
Role: **PI**

9 Title: Project Terrapin
Sponsor: Google, Inc
Date: January 2016 – December 2017
Amount: **$941,687**
Role: **PI**

8 Title: Propellantless attitude control of solar sail technology utilizing reflective control devices
Sponsor: NASA
Date: September 2015 – September 2017
Amount: **$200,000**
Role: **PI**

7 Title: Vacuum fluctuation induced torque on liquid crystal molecules
Sponsor: National Science Foundation
Date: September 2015 – September 2018
Amount: **$279,307**
Role: **PI**

6 Title: Graduate School Research and Scholarship Award
Sponsor: University of Maryland
Date: June 2015 – Aug 2015
Amount: **$9,000**
Role: **PI**

5 Title: High efficiency photovoltaics through engineering spontaneous emission
Sponsor: National Science Foundation
Date: August 2013 – July 2016
Amount: **$300,180**
Role: **PI**, with co-PI Edo Waks

4 Title: Team QUANTUM SEA Sustainability Project
Sponsor: University of Maryland Sustainability Fund
Date: April 2013 – September 2014
Amount: **$5,000**
Role: **Faculty Mentor** (Undergraduate Gemstone Team)

3 Title: QUANTUM SEA: Quantum dot Usage As a New Technique to Unleash Maximum Solar Energy Absorption
Sponsor: ACCIAC Fellows in Innovation and Creativity (ACCIAC)
Date: June 2013 – September 2013
Amount: **$3,500**
Role: **Faculty Mentor** (Undergraduate Gemstone Team)

2 Title: Radiation pressure on tunable optical metamaterials for propulsion and steering without moving parts
Sponsor: NASA Space Technology Research Opportunities for Early Career Faculty (STRO-ECF)
Date: September 2012 – September 2015
Amount: **$600,000**
Role: **PI**

1 Title: Development of lightweight, high efficiency photovoltaics for solar powered aircrafts
Sponsor: Minta Martin
Date: May 2012 – April 2013
Amount: **$75,000**
Role: **PI**

TEACHING EXPERIENCE

Course evaluations are provided below for each course taught (with enrollment ≥5), normalized from 0-4, with 4 being the highest rating. For comparison, the college-wide averages for each semester are also provided. Details: "Effective Instructor Evaluation" is obtained from students' response to the statement, "Overall, this instructor was an effective teacher." "Overall Course Evaluation" is the "Average of five administrator agree/disagree questions."

Fall 2017	ENEE498I-Solar Energy Conversation Enrollment: 20	**Effective Instructor Evaluation: 3.57** College Level Ave: 3.12 **Overall Course Evaluation: 3.66** College Level Ave: 3.28
Fall 2017	ENEE789C-Solar Energy Conversation Enrollment: 6	**Effective Instructor Evaluation: 3.00** College Level Ave: 3.09 **Overall Course Evaluation: 3.12** College Level Ave: 3.28
Fall 2016	ENEE498I-Solar Energy Conversation Enrollment: 13	**Effective Instructor Evaluation: 3.82** College Level Ave: 3.13 **Overall Course Evaluation: 3.64** College Level Ave: 3.22

Spring 2016	ENEE380-101 Electromagnetic Theory Enrollment: 25	**Effective Instructor Evaluation: 3.52** College Level Ave: 3.06 **Overall Course Evaluation: 3.60** College Level Ave: 3.22
	ENEE380-102 Electromagnetic Theory Enrollment: 25	**Effective Instructor Evaluation: 3.32** College Level Ave: 3.06 **Overall Course Evaluation: 3.45** College Level Ave: 3.22
	ENEE380-103 Electromagnetic Theory Enrollment: 25	**Effective Instructor Evaluation: 3.39** College Level Ave: 3.06 **Overall Course Evaluation: 3.48** College Level Ave: 3.22
Fall 2015	ENEE789C-Solar Energy Conversation Enrollment: 11	**Effective Instructor Evaluation: 3.78** College Level Ave: 3.02 **Overall Course Evaluation: 3.58** College Level Ave: 3.22
Fall 2015	ENEE498I-Solar Energy Conversation Enrollment: 21	**Effective Instructor Evaluation: 3.85** College Level Ave: 3.02 **Overall Course Evaluation: 3.68** College Level Ave: 3.22
Spring 2015	ENEE380 Electromagnetic Theory Enrollment: 60	**Effective Instructor Evaluation: 3.65** College Level Ave: 3.02 **Overall Course Evaluation: 3.64** College Level Ave: 3.22
	GEMS497-Team Thesis Defense Enrollment: 14	**Effective Instructor Evaluation: 3.57** College Level Ave: 3.33 **Overall Course Evaluation: 3.31** College Level Ave: 3.23
Fall 2014	ENEE789C-Solar Energy Conversation Enrollment: 13	**Effective Instructor Evaluation: 3.90** College Level Ave: 3.03 **Overall Course Evaluation: 3.74** College Level Ave: 3.24
	ENEE498I-Solar Energy Conversation Enrollment: 10	**Effective Instructor Evaluation: 3.43** College Level Ave: 3.03 **Overall Course Evaluation: 3.51** College Level Ave: 3.24
	GEMS496-Project Writing Seminar Enrollment: 14	**Effective Instructor Evaluation: 3.38** College Level Ave: 3.39 **Overall Course Evaluation: 3.40** College Level Ave: 3.16
Spring 2014	ENEE380 Electromagnetic Theory Enrollment: 34	**Effective Instructor Evaluation: 3.72** College Level Ave: 2.99 **Overall Course Evaluation: 3.63** College Level Ave: 3.22
	GEMS397-Team Project Seminar IV Enrollment: 14	**Effective Instructor Evaluation: 3.36** College Level Ave: 3.43 **Overall Course Evaluation: 3.52** College Level Ave: 3.37

Fall 2013	ENEE789C-Solar Energy Conversation Enrollment: 19	**Effective Instructor Evaluation: 3.38** College Level Ave: 3.07 **Overall Course Evaluation: 3.29** College Level Ave: 3.26
	ENEE498I-Solar Energy Conversation Enrollment: 20	**Effective Instructor Evaluation: 3.38** College Level Ave: 3.07 **Overall Course Evaluation: 3.29** College Level Ave: 3.26
	GEMS396-Project Project Seminar III Enrollment: 14	**Effective Instructor Evaluation: 3.38** College Level Ave: 3.07 **Overall Course Evaluation: 3.29** College Level Ave: 3.26
Spring 2013	ENEE380 Electromagnetic Theory Enrollment: 17	**Effective Instructor Evaluation: 3.33** College Level Ave: 2.70 **Overall Course Evaluation: 3.63** College Level Ave: 3.06
Spring 2013	GEMS297-Team Project Seminar II Enrollment: 14	**Effective Instructor Evaluation: 3.29** College Level Ave: 3.31 **Overall Course Evaluation: 3.19** College Level Ave: 3.24
Fall 2012	ENEE380H Electromagnetic Theory (Honors) Enrollment: 5	**Effective Instructor Evaluation: 3.67** College Level Ave: 2.72 **Overall Course Evaluation: 3.8** College Level Ave: 3.13
	GEMS296-Team Project Seminar I Enrollment: 14	**Effective Instructor Evaluation: 3.27** College Level Ave: 3.33 **Overall Course Evaluation: 3.13** College Level Ave: 3.30
Fall 2011	ENEE789C-Solar Energy Conversation Enrollment: 4	**Effective Instructor Evaluation: N/A** College Level Ave: -- **Overall Course Evaluation: N/A** College Level Ave: --

Below are brief descriptions of the courses listed.

University of Maryland **College Park, MD**

ENEE789C/ENEE489I Advanced Topics in Electrophysics: Solar Energy Conversion **Fall 2014, 2015, 2016, 2017**

- This course provides a fundamental understanding of energy conversion processes from solar illumination covering thermodynamic limits, device physics, and the optics and photonics of such devices as well as future generation techniques, including multijunction and multi-exciton generation, and more speculative conversion processes, such as rectifying antennas.

GEMS496 Team Project Seminar V **Fall 2014**

- This is the fifth of six seminars during which Gemstone students carry out multidisciplinary research under the general guidance of a faculty mentor. The teams develop their working relationship, start their literature search, define their research question, and set short & long-term goals.

GEMS397 Team Project Seminar IV **Spring 2014**

- This is the fourth of six seminars during which Gemstone students carry out multidisciplinary research under the general guidance of a faculty mentor. The teams develop their working relationship, start their literature search, define their research question, and set short & long-term goals.

ENEE380 Electromagnetic Theory **Spring 2014, 2015, 2016**

- This course provides an introduction to electromagnetic fields. Coulomb's law, Gauss's law, electrical potential, dielectric materials capacitance, boundary value problems, Biot-Savart law, Ampere's law, Lorentz force equation, magnetic materials, magnetic circuits, inductance, time varying fields and Maxwell's equation.

GEMS396 Team Project Seminar III **Fall 2013**

- This is the third of six seminars during which Gemstone students carry out multidisciplinary research under the general guidance of a faculty mentor. The teams develop their working relationship, start their literature search, define their research question, and set short & long-term goals.

ENEE789C/ENEE489I Advanced Topics in Electrophysics: **Fall 2013**
Solar Energy Conversion

- This course provides a fundamental understanding of energy conversion processes from solar illumination covering thermodynamic limits, device physics, and the optics and photonics of such devices as well as future generation techniques, including multijunction and multi-exciton generation, and more speculative conversion processes, such as rectifying antennas.

GEMS297 Team Project Seminar II **Spring 2013**

- This is the second of six seminars during which Gemstone students carry out multidisciplinary research under the general guidance of a faculty mentor. The teams develop their working relationship, start their literature search, define their research question, and set short & long-term goals.

ENEE380 Electromagnetic Theory **Spring 2013**

- This course provides an introduction to electromagnetic fields. Coulomb's law, Gauss's law, electrical potential, dielectric materials capacitance, boundary value problems, Biot-Savart law, Ampere's law, Lorentz force equation, magnetic materials, magnetic circuits, inductance, time varying fields and Maxwell's equation.

GEMS296 Team Project Seminar I **Fall 2012**

- This is the first of six seminars during which Gemstone students carry out multidisciplinary research under the general guidance of a faculty mentor. The teams develop their working relationship, start their literature search, define their research question, and set short & long-term goals.

ENEE380H Honors Electromagnetic Theory **Fall 2012**

- This course provides an introduction to electromagnetic fields. Coulomb's law, Gauss's law, electrical potential, dielectric materials capacitance, boundary value problems, Biot-Savart law, Ampere's law, Lorentz force equation, magnetic materials, magnetic circuits, inductance, time varying fields and Maxwell's equation.

ENEE789C Advanced Topics in Electrophysics: **Fall 2011**
Solar Energy Conversion

- This course provides a fundamental understanding of energy conversion processes from solar illumination covering thermodynamic limits, device physics, and the optics and photonics of such devices as well as future generation techniques, including multijunction and multi-exciton generation, and more speculative conversion processes, such as rectifying antennas.

California Institute of Technology **Pasadena, CA**
Co-Lecturer for Applied Physics 183c: **Spring 2010**
Physics of Semiconductors and Semiconductor Devices

- Presented 2 1.5-hour lectures for the graduate semiconductor devices course. Course topics included Fermi energy, band-bending, carrier generation and recombination mechanisms, quasi-Fermi levels, carrier drift and diffusion transport, *p-n* junctions, metal-semiconductor contacts, MOS field effect devices, quantum transport, etc.

Co-Lecturer for Applied Physics 114b: Solid State Physics **Winter 2010**

- Presented 6 1-hour lectures for the graduate solid-state physics coarse. Topics included models for energy bandstructure, standard and low dimensional transport and scattering mechanisms, semiconductor devices, optical and electronic properties of solids, excitons, etc.

Harvard University **Cambridge, MA**
Astronomy 302: Scientists Teaching Science **Spring 2008**

- Course taken with Dr. Philip M. Sadler addressing principles for lecturing well, leading discussions, connecting to real-world applications, and creating tests in scientific disciplines while focusing on relevant educational research, case studies, and engaging in practical classroom activities

Teaching Fellow, Head Section Leader **September 2006 – January 2007**

- Head Section Leader and Teaching Fellow for Science A-49: The Physics of Music and Sound, an undergraduate class for non-science majors
- Gave lectures and demonstrations pertaining to various aspects of acoustics on a level accessible to non-science majors yet rigorous enough to expose students to main concepts of scientific analysis
- Created handouts and assisted in the construction of tests and homework assignments

Middle Tennessee State University **Murfreesboro, TN**
Teaching and Lab Assistant, Tutor **June 2000 – May 2003**

- Assisted students in both Calculus and Non-Calculus based introductory physics classes and labs (Phys 2010, 2011, 2020, 2021, 2110, 2111, 2120, 2121)
- Constructed handouts, supervised experiments and graded homework assignments
- Provided tutoring on an individual basis for classes within the department

Physics Curriculum Development Assistant **May 2000 – September 2000**

- Creation of visual aids and assisted in the general development of a non-calculus based physics course under the direction of Dr. Victor J. Montemayor (http://www.mtsu.edu/~phys2020/)

RESEARCH ADVISING AND MENTORING

Graduated Ph.D. Students
Dongheon Ha (Ph.D. in ECE awarded 5/2016)
Currently: Postdoc at NIST (National Institute of Standards and Technology)
Joe Murray (Ph.D. in ECE awarded 5/2016)
Currently: Postdoc at Univ. of Maryland
Yunlu Xu (Ph.D. in ECE awarded 8/2016)
Currently: Software system engineer at TE Subcom
Tao Gong (Ph.D. in ECE awarded 9/2016)
Currently: Associate Software Engineer at MathWorks
Dakang Ma (Ph.D. in ECE awarded 12/2016)
Currently: Postdoc at NIST (National Institute of Standards and Technology)
Joe Garrett (Ph.D. in Physics awarded 8/2017)
Currently: Postdoc at UMD

Graduated MS Students
Dan Goldman (M.S. in ECE awarded 5/2016)

Graduate Students
David Somers (UMD, Physics: 2013-present)
Lisa Krayer (UMD, ECE: 2014-present)
Kevin Palm (UMD, Physics: 2016-present)
Sarvenaz Memarzadeh (UMD, ECE: 2016-present)
Tristan Deppe (UMD, ECE: 2017-present)

Undergraduate Students
Taqiyyah Safi (UMD: 2015-2016): graduate school at MIT
Paul La Rosa (UMD: 2014-2015): Lockheed Martin
Bartosz Tararuj (UMD: 2014-2015)
Patrick Giggins (UMD: 2014-2015)
Nicole Greene (UMD: 2013-2014)
Carlos Biaou (UMD: 2013-2014): graduate school at UC Berkeley
Adam Maraschky (Saint Johns College: summer 2012)

Pedro Pena (UMD: 2012-present): graduate school at UMD
Mylene Motsebo (UMD: Summer 2012)
Clare Chen (Caltech, Summer Undergraduate Research Fellowship: 2010)
Reggie Wilcox (Caltech, Summer Undergraduate Research Fellowship: 2010)
Limor Spector (Harvard University: 2006-2007)
Rachel Hillmer (UIUC, NSF REU at Harvard University: summer 2005)

UMD Gemstone Project (2012-present)
This is a multi-year, interdisciplinary undergraduate research program for selected honors students. I am the mentor for team "QUANTUM SEA: Quantum dot Usage As a New Technique to Unleash Maximum Solar Energy Absorption." The team consists of 14 undergraduate students from a variety of disciplines. This team received two grants in 2013 to pursue solar research: (i) University Sustainability Fund grant for $5,000 and (ii) ACCIAC Fellows in Innovation and Creativity (ACCIAC) for $3,500.

High School Students
Brian Murray (Eleanor Roosevelt High School 2014-2015): UMD undergraduate
Sonia Zhang (Eleanor Roosevelt High School: 2012-2013): MIT undergraduate
Akshay Sreekumar (River Hill High School: summer 2012)

Graduate Thesis Committees
[PhD]: Filiz Yesilkoy (PhD, ECE 2012), Ryan Domenick Artuso (PhD, Physics 2012), Tamin Tai (PhD, ECE 2013), Paul Iven Jaffe (PhD, ECE 2013), Michael Sanders (PhD, Aerospace 2014), Justin Wilson (PhD, Physics 2015), Dev Ettisserry (PhD, ECE 2015), Li-Chiang Kuo (PhD, ECE 2015), Kangmook Lim (PhD, ECE 2015), Ryan Suess (PhD, ECE 2016), Daimeng Zhang (PhD, ECE 2016), Chensheng Wu (PhD, ECE 2016), Shou Sun (PhD, ECE 2016), Mehdi Jadidi (PhD, ECE 2016), Christopher Petoukhoff (PhD, Mat. Sci. & Eng. at Rutgers Univ. 2016), Yi Zhang (PhD, School of Photovoltaic & Renewable Energy Eng at UNSW 2016), Navin Lingaraju (MS, ECE 2017), Pablo Solano (PhD, Physics 2017), Shangjie Yu (PhD, ECE 2018), Aisha Alobaid (PhD, Chem Eng 2019), Lance Boyer (PhD, Physics 2019)

Student Awards
Lisa Krayer: Ann G. Wylie Dissertation Fellowship (2018)
Sarvenaz Memarzadeh: Harry K. Wells Graduate Fellowship (2018)
Lisa Krayer: UMD ECE Graduate Student Service Award (2017)
Dongheon Ha: Poster award nomination at the Fall Materials Research Society Conference (2015)
Lisa Krayer: NSF Graduate Student Fellowship (2015)
Lisa Krayer: NDSEG Graduate Student Fellowship – declined (2015)
Dongheon Ha: Graduate Dean's Dissertation Fellowship (2015)
Dongheon Ha: Ann G. Wylie Dissertation Fellowship (2015)
Dongheon Ha: Korean Graduate Student Association (KGSA) best presentation award (2015)
Joseph Garrett: Thomas Mason Interdisciplinary Scholarship (2015)
Joseph Garrett: APS FGSA Travel Award for Excellence in Graduate Research (2015)
7 students receive Goldhaber Travel Award (2015)
Dongheon Ha: Future Faculty Programs Fellow (2015)
Dan Goldman: ECE Distinguished Teaching Assistant (2014-2015)
David Somers: Best Graduate Student Speaker Award from the IREAP student seminar series (Spring 2014)
Carlos Biaou: Jack Kent Cooke Foundation Graduate Scholarship (2014)
Yunlu Xu: Honorable Mention at UMD Optics Society poster competition (2014)
Dongheon Ha: Distinguished Teaching Assistant (2012-2013)
Dongheon Ha: International Teaching Fellow (2012-2013)
Joseph Garrett: 1st place presentation in 'Pushing the Boundaries of Science' at the UMD Graduate Research Interaction Day (2013)