JON A. SCHULLER

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EDUCATION

Stanford University 2003-2009
Ph.D. in Applied Physics, January 2010
- Dissertation Title: "Dielectric Optical Antenna Emitters and Metamaterials"

University of California at Santa Barbara 1999-2003
B.S. in Physics with High Honors
- Senior Honors Thesis: "Structural Engineering of Ferromagnetism in III-V Digital Ferromagnetic Heterostructures"

ACADEMIC POSITIONS

UC Santa Barbara
Assistant Professor, Electrical and Computer Engineering. 2012-2018
Associate Professor, Electrical and Computer Engineering 2018-

Columbia University 2010-2012
Fellow, Energy Frontier Research Center.

HONORS AND AWARDS

National Science Foundation CAREER Award	2015
Hellman Faculty Fellowship	2014
Air Force Office of Scientific Research Young Investigator Award	2013
UC Santa Barbara Regents Junior Faculty Award	2013
National Academy of Engineering's Frontiers of Engineering Participant	2013
Stanford University Humanities and Sciences Diversity Fellowship Award	2003

RESEARCH INTERESTS AND SCIENTIFIC HIGHLIGHTS

- **Magnetic dipole (MD) light emission in 2D hybrid organic/inorganic perovskites.** Quantified optical constants and explained the origins of large optical anisotropies (ACS nano 2019). Discovered extraordinarily bright magnetic dipole (MD) light emission—the only known case in an extended material (Science Advances 2020). Identified self-trapped excitons as the source of MD emission (ACS Nano 2020). Demonstrated only known example of a material with non-unity optical frequency magnetic permeability (submitted, preprint available).

- **Light-Emitting metasurfaces.** Demonstrated first example of directed light emission from a phased-array metasurface (Nature Photonics 2020). Demonstrated focused and beamed light emission from metasurface lenses and axicons respectively (Nature Communications 2021).

- **Reconfigurable semiconductor metasurfaces.** Identified generalized principles of reconfigurable metasurfaces (ACS Photonics 2015). Proposed (Advanced Optical Materials 2016), then demonstrated (ACS Photonics 2019) semiconductor hetero-junction device implementation. Demonstrated broadband electrically tunable infrared devices based on metal-insulator transitions (ACS Photonics 2018).

- **Ultrawide tuning of infrared nanophotonic elements.** Demonstrated ultrawide tuning of metaresonators using free-carrier refraction (Nano Letters 2015) and extreme thermo-optic effects (Nano Letters 2017). Discovered new "thermal free-carrier effect" (Nature Communications 2017). Demonstrated thermo-optic tuning of metasurface lenses (Physical Review Applied 2018) and filters (Nanophotonics 2019).

- **Momentum-resolved spectroscopies.** Pioneered use of energy-momentum spectroscopy to investigate optical anisotropies and excitons in layered systems (Nature Nanotechnology 2013). Expanded repertoire of momentum-resolved techniques to include photoluminescence excitation (Physical Review B 2016), model-blind refractive index (Optics Express 2017), and surface plasmon dispersion (Nano Letters 2017) measurements.

- **Semiconductor Mie resonator metamaterials and optoelectronics.** First demonstration of optical metamaterial based on high-index Mie resonators (PRL 2007). Subsequent demonstrations of Mie resonator thermal emitters (Nature Photonics 2009), photodetectors (Nature Materials 2009), and solar cells (Nano Letters 2010, Optics Express 2011).

FUNDING

21. **Title:** Broadband Multispectral Mid-Infrared Laser
Source: NASA STTR
Period: 12/2020-12/2022
Award Amount: $750,000. My share = $195,000
Co-PIs: Dr. Alex Spott

20. **Title:** Simulation and Design of Infrared Imaging Systems
Source: Raytheon Vision Systems
Period: 07/2020-12/2020
Award Amount: $100,000
Co-PIs: None

19. **Title:** Nonlinear GaN Metasurfaces
Source: UCSB Academic Senate
Period: 07/2020-06/2021
Award Amount: $13,905
Co-PIs: None

18. **Title:** Forbidden Light: Origins and Implications of Optical Frequency Magnetism in Hybrid Organic/Inorganic Perovskites
Source: National Science Foundation
Period: 07/2020-06/2023
Award Amount: $389,685
Co-PIs: None

17. **Title:** Light Emitting GaN Quantum Well Metasurfaces
Source: Office of Naval Research
Period: 01/2019-01/2022
Award Amount: $450,000
Co-PIs: None

16. **Title:** Quantum Materials for Energy Efficient Neuromorphic Computing
Source: Department of Energy
Period: 09/2018-09/2022
Award Amount: $9,750,000 total. My share = $200,000 plus 4 yrs postdoctoral support
Co-PIs: Center comprises 19 co-PIs total

15. **Title:** Light Emitting GaN Metasurfaces
Source: UCSB Academic Senate
Period: 07/2018-07/2019
Award Amount: $9,500
Co-PIs: None

14. **Title:** Unrestricted Gift
Source: Raytheon Corporation
Period: 11/2017
Award Amount: $30,000
Co-PIs: None

13. **Title:** CAREER: Origins and Applications of Optical Anisotropis in Organic Photonics—*Career-Life Balance Supplement*
Source: National Science Foundation
Period: 01/2017-04/2017
Award Amount: $25,513
Co-PIs: None

12. **Title:** Electrically Reconfigurable Infrared III-V Phased Array Metasurfaces
Source: Air Force Office of Scientific Research
Period: 09/2016-09/2019
Award Amount: $420,000
Co-PIs: None

11. **Title:** Dynamically Tunable Metasurfaces via Electrically and Optically Pumped Semiconductors
Source: UCSB Academic Senate
Period: 07/2016-07/2017
Award Amount: $14,000
Co-PIs: None

10. **Title:** HBCU/MI Acquisition of UV/VIS/Raman Spectroscopy and Imaging Instrumentation of Physics and Engineering Research
Source: Army Research Office
Period: 2016
Award Amount: $500,000 instrumentation grant
Co-PIs: One of several co-PIs on instrumentation grant

9. **Title:** Reconfigurable Photonic and Electronic Materials
Source: California NanoSystems Institute
Period: 07/2016-07/2018
Award Amount: $112,000
Co-PIs: Michael Gordon and Dan Morse

8. **Title:** Unrestricted Gift
   Source: Northrop Grumman Corporation
   Period: 10/2016
   Award Amount: $30,000
   Co-PIs: None

7. **Title:** CAREER: Origins and Applications of Optical Anisotropies in Organic Photonics
   Source: National Science Foundation
   Period: 04/2015-04/2020
   Award Amount: $500,000
   Co-PIs: None

6. **Title:** Tunable Quantum Materials
   Source: University of California Office of the President
   Period: 01/2015-01/2019
   Award Amount: $1,200,000 total. My share = $300,000
   Co-PIs: I.K. Schuller, O. Shpyrko, Y. Takamura

5. **Title:** Light Trapping in Oriented Polymer Thin Films: Rethinking Organic Solar Cells
   Source: Hellman Family Foundation Faculty Fellowship
   Period: 09/2014-09/2015
   Award Amount: $29,100
   Co-PIs: None

4. **Title:** YIP: Infrared Semiconductor Metamaterials
   Source: Air Force Office of Scientific Research
   Period: 07/2013-07/2016
   Award Amount: $375,000
   Co-PIs: None

3. **Title:** Infrared Plasmonics
   Source: Regents' Junior Faculty Award
   Period: 07/2013-08/2013
   Award Amount: $7,500
   Co-PIs: None

2. **Title:** UCSB MRSEC SEED: Multipole Spectroscopy
   Source: National Science Foundation
   Period: 07/2013-07/2015
   Award Amount: $150,000
   Co-PIs: None

1. **Title:** Center for Energy Efficient Materials SEED: Morphology Dependent Optical Properties of Organic Solar Cell Materials
   Source: Department of Energy
   Period: 11/2012-11/2014
   Award Amount: $200,000
   Co-PIs: None

PUBLICATIONS

Google Scholar Webpage: https://scholar.google.com/citations?user=Ff90s74AAAAJ&hl=en&oi=sra

Total Number of Google Scholar Citations: 10470 h-index: 28 (as of 06/10/2021)

53. I.T. Chiu, M.H. Lee, S. Cheng, S. Zhang, L. Heki, Z. Zhang, Y. Mohtashami, P.N. Lapa, M. Feng, P. Shafer, A.T. N'Diaye, A. Mehta, **J.A. Schuller**, G. Galli, S. Ramanathan, Y. Zhu, I.K. Schuller, and Y. Takamura, "Cation and Anion Topotactic Transformations in Cobaltite Thin Films Leading to Ruddlesden-Popper Phases," ***Physical Review Materials***, **in press** (2021).

52. Y. Mohtashami, R.A. DeCrescent, L.K. Heki, P.P. Iyer, N.A. Butakov, M.S. Wong, A. Alhassan, W.J. Mitchell, S. Nakamur, S.P. DenBaars, and **J.A. Schuller**, "Light-Emitting Metalenses and Meta-axicons for Focusing and Beaming of Spontaneous Emission," ***Nature Communications***, **in press** (2021).

51. R.M. Kennard, C.J. Dahlman, R.A. DeCrescent, **J.A. Schuller**, K. Mukherjee, R. Seshadri, and M.L. Chabinyc, "Ferroelastic Hysteresis in Thin Films of Methylammonium Lead Iodide," ***Chemistry of Materials***, **33**, pp. 298 (2021).

50. R.A. DeCrescent, X. Du, R.M. Kennard, N.R. Venkatesan, C.J. Dahlman, M.L. Chabinyc, and **J.A. Schuller**, "Even-Parity Self-Trapped Excitons Lead to Magnetic Dipole Radiation in Two-Dimensional Lead Halide Perovskites," ***ACS Nano***, **14**, pp. 8958-8968 (2020).

49. P.P. Iyer, R.A. DeCrescent, Y. Mohtashami, G., Lheureux, N.A. Butakov, A. Alhassan, C. Weisbuch, S. Nakamura, S.P. DenBaars, and **J.A. Schuller**, "Unidirectional luminescence from InGaN/GaN quantum-well metasurfaces," ***Nature Photonics***, **14**, pp. 543 (2020).

48. G. Lheureaux, M. Monavarian, R. Anderson, J. Bellessa, C. Symonds, **J.A. Schuller**, J.S. Speck, S.P. DenBaars, "Tamm Plasmons in Metal/Nanoporous GaN Distributed Bragg Reflector Cavities for Active and Passive Optoelectronics," ***Optics Express***, **28**, pp. 17934-17943 (2020).

47. H.T. Chorsi, S. Yue, P.P. Iyer, M. Goyal, T. Schumann, S. Stemmer, B. Liao, and **J.A. Schuller**, "Widely Tunable Optical and Thermal Properties of Dirac Semimetal Cd_3As_2," ***Advanced Optical Materials***, **8**, pp. 1901192 (2020).

46. R.A. DeCrescent, N.R. Venkatesan, C.J. Dahlman, R.M. Kennard, X. Zhang, W. Li, X. Du, M.L. Chabinyc, R. Zia, and **J.A. Schuller**. "Bright magnetic dipole radiation from two-dimensional lead-halide perovskites," ***Science Advances***, **6**, p. eaay4900 (2020).

45. L. Mao, S. Teicher, C.Stoumpos, R. Kennard, R. DeCrescent, G. Wu, **J. Schuller**, M. Chabinyc, A. Cheetham, and R. Seshadri. "Chemical and Structural Diversity of Hybrid Layered Double Perovskite Halides," ***Journal of the American Chemical Society***, **141**, pp. 19099-19109 (2019).

44. S. Yue, H.T. Chorsi, M. Goyal, T. Schumann, R. Yang, T. Xu, B. Deng, S. Stemmer, **J.A. Schuller**, and B. Liao. "Soft Phonons and Ultralow Lattice Thermal Conductivity in the Dirac Semimetal Cd_3As_2," ***Physical Review Research***, **1**, pp. 033101 (2019).

43. H. Zhao, R. Zhang, H.T. Chorsi, W. Britton, Y. Chen, P.P. Iyer, **J.A. Schuller**, L. Dal Negro, and J. Klamkin, "Gate-tunable Metafilm Absorber Based on Indium Silicon Oxide," ***Nanophotonics***, **8**, pp. 1803-1810 (2019).

42. R.A. DeCrescent, N.R. Venkatesan, C.J, Dahlman, R.M. Kennard, M.L. Chabinyc, and **J.A. Schuller**, Optical Constants and Effective-Medium Origins of Large Optical Anisotropies in Layered Hybrid Organic/Inorganic Perovskites. ***ACS Nano*, 13**, 10745-10753 (2019).

41. C.J. Dahlman, R.A. DeCrescent, N.R. Venkatesan, R.M. Kennard, G. Wu, M.A. Everest, **J.A. Schuller**, and M.L. Chabinyc, "Controlling Solvate Intermediate Growth for Phase-Pure Organic Lead Iodide Ruddlesden-Popper $(C_4H_9NH_3)(CH_3NH_3)_{n-1}Pb_nI_{3n+1}$ Perovskite Thin Films," ***Chemistry of Materials*** **31**, pp. 5832-5844 (2019).

40. R.M. Kennard, C.J. Dahlman, H. Nakayama, R.A. DeCrescent, **J.A. Schuller**, R. Seshadri, K. Mukherjee, and M. Chabinyc, "Phase Stability and Diffusion in Lateral Heterostructures of Methyl Ammonium Lead Halide Perovskites," ***ACS Applied Material Interfaces*** **11**, 25313 (2019).

39. T.Lewi, N.A. Butakov, H.A. Evans, M.W. Knight, P.P. Iyer, D. Higgs, H.T. Chorsi, J. Trastoy, J.D.V. Grande, I. Valmianski, C. Urban, Y. Kalcheim, P.Y. Wang, P.W.C. Hon, I.K. Schuller, and **J.A. Schuller**, "Thermally Reconfigurable Meta-optics," ***IEEE Photonics Journal*** **11**, 4601016 (2019).

38. P.P. Iyer, M. Pendharkar, C.J. Palmstrom, and **J.A. Schuller**, "III-V Heterojunction Platform for Electrically Reconfigurable Dielectric Metasurfaces," ***ACS Photonics*** **5**, 1345 (2019).

37. Y. Kalcheim, N.A. Butakov, N. Vargas, M.H. Lee, J.D.V. Grande, J. Trastoy, P.Salev, **J.A. Schuller,** and I.K. Schuller, "Robust Coupling between Structural and Electronic Transitions in a Mott Material," ***Phys. Rev. Lett.*** **122**, 057601(2019).

36. T. Lewi, N.A. Butakov, and **J.A. Schuller**, "Thermal Tuning Capabilities of Semiconductor Metasurfaces," ***Nanophotonics***, **8,** 331 (2019).

35. N.R. Venkatesan, R.M. Kenard, R.A. DeCrescent, H. Nakayama, C.J. Dahlman, E.E. Perry, **J.A. Schuller**, and M.L. Chabinyc, "Phase Intergrowth and Structural Defects in Organic Metal Halide Ruddlesden–Popper thin films," ***Chemistry of Materials*** **30**, 8615 (2018).

34. N.A. Butakov, M.W. Knight, T.Lewi, P.P. Iyer, D. Higgs, H.T. Chorsi, J. Trastoy, J.D.V. Grande, I. Valmianski, C. Urban, Y. Kalcheim, P.Y. Wang, P.W.C. Hon, I.K. Schuller, and **J.A. Schuller**, "Broadband Electrically Tunable Dielectric Resonators Using Metal-Insulator Transitions," ***ACS Photonics*** **5,** 4056 (2018).

33**.** P.P. Iyer, R.A. DeCrescent, T. Lewi, N. Antonellis, and **J.A. Schuller**, "Uniform Thermo-Optic Tunability of Dielectric Metalenses" ***Phys. Rev. Appl.*** **10**, 044029 (2018).

32. N.A. Butakov, I. Valmianski, T. Lewi, C. Urban, Z. Ren, A.A. Mikhailovsky, S.D. Wilson, I.K. Schuller, and **J.A. Schuller**, "Switchable Plasmonic-Dielectric Resonators with Metal-Insulator Transitions," ***ACS Photonics*** **5**, 371 (2018).

31. S.J. Brown, R.A. DeCrescent, D.M. Nakazono, S.H. Willenson, N.A. Ran, X. Liu, G.C. Bazan, T.Q. Nguyen, and **J.A. Schuller**, "Enhancing Organic Semiconductor-Surface Plasmon Polariton Coupling with Molecular Orientation," ***Nano Lett.*** **17**, 6151 (2017).

30. P.P. Iyer, M. Pendharkar, C.J. Palmstrom, and **J.A. Schuller**, "Ultrawide Thermal Free-Carrier Tuning of Dielectric Antennas Coupled to Epsilon-Near-Zero Substrates," ***Nature Comm.*** **8**, 472 (2017).

29. T. Lewi, H. Evans, N.A Butakov, and **J.A. Schuller,** "Ultrawide Thermo-Optic Tuning of PbTe Meta-atoms," ***Nano Lett.*** **17**, 3940 (2017).

28. T. Das, and **J.A. Schuller,** "Dark Modes and Field Enhancements in Dielectric Dimers Illuminated by Cylindrical Vector Beams,"***Phys. Rev. B*** **95**, 201111 (2017). PRB Editors' Suggestion.

27. N.A. Butakov, and **J.A. Schuller,** "Designing Multipolar Resonances in Dielectric Metamaterials," ***Sci. Reports*** **6,** 38487 (2016).

26. R.A. DeCrescent, S.J. Brown, R.A. Schlitz, M.L. Chabinyc, and **J.A. Schuller,** "Model-Blind Characterization of Thin-film Optical Constants with Momentum-Resolved Reflectometry" ***Opt. Express*** **24,** 28842 (2016).

25. S.J. Brown, R.A. Schlitz, M.L. Chabinyc, **J.A. Schuller,** "Morphology Dependent Optical Anisotropies in the N-type Polymer P(NDI2OD-T2)," ***Phys. Rev. B*** **94**, 165105 (2016)

24. P.P. Iyer, M. Pendharkar, and **J.A. Schuller,** ."Electrically Reconfigurable Metasurfaces Using Heterojunction Resonators," ***Adv. Opt. Mater.*** **4,** 1582 (2016). Advanced Optical Materials' "Best of 2016".

23. G.R. Bhimanapati et al., "Recent Advances in Two-Dimensional Materials Beyond Graphene" ***ACS Nano*** **9**, 11509 (2015). Invited review

22. T. Das, P.P. Iyer, and **J.A. Schulle**r, "Beam Engineering for Selective and Enhanced Coupling to Multipolar Resonances," ***Phys. Rev. B*** **92,** 241110 (2015). PRB Editors' Suggestion

21. T. Lewi, P.P. Iyer, N.A. Butakov, A.A. Mikhailovsky and **J.A. Schulle**r, "Widely Tunable Infrared Antennas Using Free Carrier Refraction," ***Nano Lett.*** **15,** 8188 (2015). Nature Photonics Highlight of the Recent Literature.

20. N.A. Butakov, and **J.A. Schulle**r, "Hybrid Optical Antennas with Photonic Resistors," ***Opt. Express*** **23,** 29698 (2015).

19. P.P. Iyer, N.A. Butakov, and **J.A. Schulle**r, "Reconfigurable Semiconductor Phased Array Metasurfaces," ***ACS Photonics*** **2**, 1077 (2015). ACS Editors' Choice Selection

18. R.R. Grote, S.J. Brown, J.B. Driscoll, R.M. Osgood, and **J.A. Schuller**, "Morphology-Dependent Light Trapping in Thin-Film Organic Solar Cells," ***Opt. Express*** **21**, A847 (2013).

17. **J.A. Schuller**, S. Karaveli, T. Schiros, H. Keliang, S. Yang, I. Kymissis, J. Shan, and R. Zia, "Orientation of Luminescent Excitons in Layered Nanomaterials," ***Nature Nanotech***. **8**, 271 (2013).

16. **J.A. Schuller,** "Wiring Up Displacement Currents" ***Physics*** **5**, 52 (2012). Invited Viewpoint.

15. A.P. Vasudev, **J.A. Schuller**, and M.L. Brongersma, "Nanophotonic Light Trapping with Patterned Transparent Conductive Oxides," ***Opt. Express*** **20**, A385 (2012).

14. S.A. Mann, R.R. Grote, R.M. Osgood Jr., and **J.A. Schuller,** "Dielectric Particle and Void Resonators for Solar Cell Textures," ***Opt. Express*** **19**, 25729 (2011).

13. L. Cao, P. Fan, A. Vasudev, J.S. White, Z. Yu, W. Cai, **J.A. Schuller**, S. Fan, and M.L. Brongersma, "Semiconductor Nanowire Optical Antenna Solar Absorbers," ***Nano Lett.* 10**, 439 (2010).

12. **J.A. Schuller**, W. Cai, Y.C. Jun, E.S. Barnard, J.S. White, and M.L. Brongersma, "Plasmonics for Extreme Light Concentration and Manipulation" ***Nature Mater.* 9**, 193 (2010).

11. **J.A. Schuller** and M.L. Brongersma, "General Properties of Dielectric Optical Antennas," ***Opt. Express* 17**, 24084 (2009).

10. **J.A. Schuller**, T. Taubner, and M.L. Brongersma, "Optical Antenna Thermal Emitters," ***Nature Photon.* 3**, 658 (2009).

9. L. Cao, J.S. White, J.S. Park, **J.A. Schuller**, B.M. Clemens and M.L. Brongersma, "Engineering Light Absorption in Semiconductor Nanowire Devices," ***Nature Mater.* 8**, 643 (2009).

8. J. Provine, C. Roper, **J.A. Schuller**, M.L. Brongersma, R. Maboudian, R. Howe, "The dependence of poly-crystalline SiC mid-infrared optical properties on deposition conditions" ***2008 IEEE/LEOS Optical Mems & Nanophotonics***, 182 (2008).

7. **J.A. Schuller**, R. Zia, T. Taubner, and M.L. Brongersma, "Dielectric Metamaterials Based on Electric and Magnetic Resonances of SiC Particles," ***Phys. Rev. Lett.* 99**, 107401 (2007). PRL Editor's Selection.

6. M.L. Brongersma, R. Zia, **J.A. Schuller**, "Plasmonics – The Missing Link Between Nanoelectronics and Microphotonics," ***Appl. Phys. A* 89**, 221 (2007).

5. L. Rontzch, K.H. Heinig, **J.A. Schuller**, and M.L. Brongersma, "Thin Film Patterning by Surface Plasmon Induced Thermocapillarity," ***Appl. Phys. Lett.* 90**, 044105 (2007). Nature Photonics Highlight of the Recent Literature.

4. R. Zia, **J. A. Schuller** and M. L. Brongersma, "Near Field Characterization of Guided Polariton Propagation and Cutoff in Surface Plasmon Waveguides," ***Phys. Rev. B.* 72** 165415 (2006).

3. R. Zia, **J.A. Schuller**, A. Chandran, M.L. Brongersma, "Plasmonics," ***Materials Today*, 9**, 20 (2006). Invited review and cover story.

2. **J.A. Schuller**, E. Johnston-Halperin, C.S. Gallinat, H. Knotz, A.C. Gossard, and D.D. Awschalom, "Structural Engineering of Ferromagnetism in III-V Digital Ferromagnetic Heterostructures," ***J. Appl. Phys.* 95**, 4922 (2004).

1. E. Johnston-Halperin, **J.A. Schuller**, C.S. Gallinat, T.C. Kreutz, R.C. Myers, R.K. Kawakami, H. Knotz, A.C. Gossard, and D.D. Awschalom, "Independent Electronic and Magnetic Doping in (Ga,Mn)As Based Digital Ferromagnetic Heterostructures," ***Phys. Rev. B.* 68**, 165328 (2003).

OUTREACH PUBLICATIONS

"Las Nuevas Fronteras de la Física de la Materia Condensada" (invited)
J.A. Schuller, S.A. Hevia, and I.K. Schuller, *Rev. Acad. Colomb. Cienc.* **37**, 463 (2013).

"Negative Spaces for the Transmission of Light Waves" (invited)
J.A. Schuller, and J.Avins, *Afterzine.* **1**, 16 (2010).

"La Fisica y Sus Maravillas" (invited)
J.A. Schuller, S.A. Hevia, and I.K. Schuller, *Revista Franco-Chilena de Oftalmologia.* **2**, 28 (2010).

INVITED TALKS AT INTERNATIONAL CONFERENCES

"Anisotropic and Magnetic Dipole Light Emission from 2D Perovskites"
nanoGE Spring Meeting, March 2021

"Directed and Focused Light Emission from High-Contrast GaN Quantum Well Metasurfaces"
SPIE Photonics West, March 2021

"VO_2 Enabled Reconfigurable Infrared Nanophotonics"
SPIE Optics and Photonics, August 2020

"Directional Light Emission from GaN Metasurfaces and Molecular Scale Magnetic Dipoles"
International Conference on Advanced Materials and Devices, December 2019

"Multipole and Metasurface Quantum Well Emitters"
IEEE Rapid Conference, August 2019

"GaN Light Emitting Quantum Well Metasurfaces"
International Conference for Advanced Materials and Technologies, June 2019

"Resolving Multipolar Transitions and Directional Metasurface Light Emission with Momentum-Resolved Spectroscopy"
Frontiers in Optics, September 2018

"Widely Tunable Infrared MetaResonators for Reconfigurable Metasurfaces"
SPIE Photonics West, January 2018

"Widely Tunable Semiconductor Antennas for Reconfigurable Metasurfaces"
SPIE Nanoscience and Technology Conference, August 2017

"Widely Tunable Semiconductor Antennas for Reconfigurable Metasurfaces"
Meta: International Conference on Metamaterials, Photonic Crystals, and Plasmonics, July 2017

"Widely Tunable Optical Antennas for Reconfigurable Metasurfaces"
International Conference on Materials for Advanced Technologies, June 2017

"Widely Tunable Optical Antennas for Reconfigurable Metasurfaces"
Meta: International Conference on Metamateirals, Photonic Crystals, and Plasmonics, August 2016

"Reconfigurable Infrared Phased-Array Metamaterials"
Physics of Quantum Electronics Conference, January 2016

"Optical Anisotropies in Layered Nanomaterials"
IEEE Photonics Society Summer Topical Meeting: Functional 2D Materials, July 2015

"Reconfigurable Infrared Phased-Array Semiconductor Metamaterials"
International Conference on Materials for Advanced Technologies, June 2015

"Optical Anisotropies in Layered Nanomaterials"
American Vacuum Society 61st International Symposium, November 2014

"Semiconductor and Molecular Optical Antennas: Measuring and Manipulating Radiation Patterns"
2014 Materials Research Society Spring Meeting, April 2014

"Engineering the Spectra, Radiation Patterns, and Phase of Optical Antenna Emitters"
Metamaterials 2013, September 2013

"The Impact of Morphology on Absorption and Luminescence Processes in Organic Semiconductors"
SPIE Nanoscience and Technology Conference, August 2013

"The Orientation of Luminescent Excitons in Layered Nanomaterials"
Low Energy Electrodynamics in Solids, July 2012

"The Impact of Morphology on Absorption and Luminescence Processes in Organic Semiconductors"
Gordon Conference on Plasmonics, June 2012

"Dielectric Optical Antenna Transmitters and Receivers"
SPIE Optics and Photonics Conference, August 2010

"Dielectric Optical Antenna Emitters and Metamaterials"
March Meeting of the American Physical Society, March 2009

"Electromagnetic Modes of Silicon Carbide Structures and Their Relevance to Metamaterial Design"
SPIE Optics and Photonics Conference, August 2007

INVITED TALKS AT RESEARCH INSTITUTIONS

"Multipolar and Metasurface Quantum Well Emitters"
UCSB Graduate Physics Seminar, April 2018

"Neuromorphic Computing with Hybrid Organic/Inorganic Perovskites"
Q-MEEN-C Seminar, October 2020

"Multipole and Metasurface Quantum Well Emitters"
Columbia University Nanophotonics Seminar, August 2019

"Engineering and Spectroscopy of Photon Momentum"
North Carolina State Materials Science and Engineering Seminar, December 2018

"Widely Tunable MetaResonators for Reconfigurable Infrared Metasurfaces"
Los Alamos National Labs Workshop on Hybrid Photonic-Plasmonic Materials, February 2018

"Engineering and Spectroscopy of Photon Momentum"
UC Santa Cruz Electrical Engineering Seminar, December 2017

"Engineering and Spectroscopy of Photon Momentum"

Vanderbilt Institute of Nanoscale Science and Engineering Colloquium, November 2017

"Widely Tunable Semiconductor Mie Resonators for Reconfigurable Metasurfaces"
US-Israel Metamaterials Workshop at Technion University, June 2017

"Reconfigurable and Forbidden Meta-atom Physics and Devices"
Australia National University School of Physics and Engineering Seminar, February 2017

"Widely Tunable Meta-atoms for Reconfigurable Infrared Metasurfaces"
CUDOS Workshop, February 2017

"Reconfigurable Infrared Semiconductor Metasurfaces"
AFOSR Reconfigurable Electronics Workshop, May 2016

"Plasmonic and Dielectric Nanostructures for Optical Sensing"
U.S. National Academy of Sciences Arab-American Frontiers of Science Symposium, December 2015

"Semiconductor and Molecular Optical Antennas"
Joint UCSB/Tokyo Tech Research Seminar, August 2015

"Optical Anisotropies in Layered Nanomaterials"
Penn State Graphene and Beyond Annual Workshop, May 2015

"Semiconductor and Molecular Optical Antennas: Measuring and Manipulating Multipolar Radiation Patterns"
University of Washington, Seattle Electrical Engineering Colloquium, May 2015

"Semiconductor and Molecular Optical Antennas for Energy Sciences"
Sandia National Laboratory Seminar, January 2014

"Dielectric and Molecular Optical Antennas: Transmitters, Receivers, and Artificial Electromagnetic Materials"
UC Riverside Materials Science and Engineering Colloquium, January 2013

"Dielectric and Molecular Optical Antennas: Transmitters, Receivers, and Artificial Electromagnetic Materials"
College of Optics and Photonics at the University of Central Florida, March 2012

"Dielectric and Molecular Optical Antennas: Transmitters, Receivers, and Artificial Electromagnetic Materials"
Harvard University School of Engineering and Applied Sciences Seminar, February 2012

"Dielectric and Molecular Optical Antennas: Transmitters, Receivers, and Artificial Electromagnetic Materials"
UC Santa Barbara Electrical and Computer Engineering Seminar, February 2012

"Dielectric and Molecular Optical Antennas: Transmitters, Receivers, and Artificial Electromagnetic Materials"
Yale University Solid State Physics and Optics Seminar, February 2012

"Dielectric and Molecular Optical Antennas: Transmitters, Receivers, and Artificial Electromagnetic Materials"
University of Pennsylvania Condensed Matter Physics Seminar, January 2012

"Dielectric Optical Antennas: Transmitters, Receivers, and Artificial Electromagnetic Materials"
City College of New York Physics Seminar, May 2011

"Dielectric Optical Antennas: Transmitters, Receivers, and Artificial Electromagnetic Materials"
University of California at San Diego Condensed Matter Physics Seminar, April 2011

"Dielectric Optical Antennas: Building Blocks for Optical Frequency Communications and Artificial Electromagnetic Materials"
University of Arizona College of Optical Sciences Colloquium, January 2011.

"Infrared Antenna Sensors and Light Emitters"
Thermo Electron Corporation Research Symposium, April 2010.

"Dielectric Optical Antennas: Building Blocks for Optical Frequency Communications and Artificial Electromagnetic Materials"
Massachusetts Institute of Technology Electrical Engineering Seminar, March 2010.

"Dielectric Optical Antenna Photodetectors, Solar Cells, Emitters, and Metamaterials"
Darpa Nanoantennas Workshop, October 2009.

"Dielectric Optical Antenna Emitters and Metamaterials"
University of South Florida Energy Sciences Seminar, April 2009.

"Dielectric Optical Antenna Emitters and Metamaterials"
West Virginia University Nano Initiative Colloquium, March 2009.

"Infrared Resonant Structures for Sensing, Metamaterials, and Engineered Thermal Emission"
Thermo Electron Corporation Research Symposium, February 2008.

"Dielectric Metamaterials Based on Electric and Magnetic Resonance in Silicon Carbide Particles"
Brown University Electrical Sciences and Computer Engineering Seminar, November 2007.

TEACHING

Winter 2021, ECE 211A, Engineering Quantum Mechanics
Fall 2020, ECE 162A, Quantum Description of Electronic Materials
Spring 2020, ECE 261, Introduction to Nanophotonics
Winter 2020, ECE 211A, Engineering Quantum Mechanics
Fall 2019, ECE 162A, Quantum Description of Electronic Materials
Spring 2019, ECE 261, Introduction to Nanophotonics
Fall 2018, ECE 162A, Quantum Description of Electronic Materials
Spring 2018, ECE 262, Physics of Solar Cells
Winter 2018, ECE 594U, Nonlinear Optics
Fall 2017, ECE 162A, Quantum Description of Electronic Materials
Spring 2017, ECE 261, Introduction to Nanophotonics

Fall 2016, ECE 162A, Quantum Description of Electronic Materials
Spring 2016, ECE 594Z, Physics of Solar Cells
Winter 2016, ECE 211A, Engineering Quantum Mechanics
Fall 2015, ECE 162A, Quantum Description of Electronic Materials
Spring 2015, ECE 594Z, Introduction to Nanophotnics
Winter 2015, ECE 211A, Engineering Quantum Mechanics
Fall 2014, ECE 162A, Quantum Description of Electronic Materials
Spring 2014, ECE 594Z, Physics of Solar Cells
Winter 2014, ECE 211A, Engineering Quantum Mechanics
Fall 2013, ECE 162A, Quantum Description of Electronic Materials
Winter 2013, ECE 594Z, Introduction to Nanophotonics

MENTORING

Postdocs

Dr. Tomer Lewi	10/2013-04/2018	Asst. Prof. at Bar Ilan University
Dr. Yahya Mohtashami	09/2018-	

PhD Students

Steven Brown	07/2012-06/2017	Intuit Inc.
Tanya Das	05/2013-06/2017	OSA Congressional Fellow
Prasad Iyer	09/2012-04/2018	Holosense Inc.
Nikita Butakov	09/2013-11/2018	Erickson Inc.
Ryan DeCrescent	07/2015-09/2020	NRC Postdoctoral Fellow
Hamid Chorsi	09/2017-07/2020	
Larry Heki	11/2018-	
Sepanta Assadi	07/2020-	

Masters Students

Kyle Arakaki	04/2015-07/2015

Undergraduate Students

Udo Gyene	07/2013-02/2015
Lance Park	10/2013-04/2014
Samuel Willenson	03/2015-07/2016
David Nakazono	06/2015-06/2017
Nicholas Antonellis	07/2017-09/2017

SERVICE TO SCIENTIFIC COMMUNITY

- **Member-at-large**, APS Forum on Outreach and Engaging the Public, 2018-2020
- **Editorial Advisory Panel**, Scientific Reports, 2014-2020
- **Proposal Reviewer,** National Science Foundation Electronic & Photonic Materials Panel (2021), National Science Foundation Photonics Panel (2021), Sinpaore National Research Foundation (2020), Department of Energy: Data, Artifical Intelligence, and Machine Learning (2020), Department of Energy: Energy Frontier Research Center (2020), Department of Energy: Quantum Information Science (2019), Singapore Agency for Science, Technology, and Research (2017), Air Force Office of Scientific Research (2016), National Science Foundation Division of Materials Research (2015), Center for Functional Nanomaterials (2013-2014), Finnish Academy of Sciences (2014), National Science Foundation STTR/SBIR panel on Photonic Materials (2013), Department of Energy Basic Energy Sciences (2013)
- **Program Reviewer,** Office of Naval Research Metamaterials Program (2017)

- **Journal Reviewer**, Advanced Materials, Advanced Optical Materials, ACS Photonics, Applied Physics A, Applied Physics Letters, IEEE Journal of Selected Topic in Quantum Electronics, Nano Letters, Nature Chemistry, Nature Communications, Nature Materials, Nature Photonics, Nature Publishing Group Asia Materials, Optica, Optics Express, Optics Letters, Materials Today, Physical Review B, Physical Review Letters, Physical Review X, PNAS, Science, Scientific Reports
- **Program Committee**, IEEE Research and Applications in Photonics for Defense (RAPID) 2018, 2019
- **Program Committee**, SPIE Photonics West conference on "High Contrast Metastructures." 2017, 2018, 2019, 2020, 2021
- **Program Committee and Local Arrangements Chair**, IEEE Device Research Conference. 2018
- **Conference Co-chair**, SPIE Optics and Photonics conference on "Light Manipulating Organic Materials and Devices." 2014, 2016, 2017
- **Conference Chair,** SPIE Optics and Photonics conference on "Light Manipulating Organic Materials and Devices." 2015
- **Technical Program Subcommittee**. Conference on Lasers and Electro-Optics (CLEO) session on "Micro- and Nano-optics Devices." 2014, 2015, 2016
- **Lead Organizer**. APS March Meeting Focus Topic on Metamaterials. 2014

UNIVERSITY SERVICE

- **Faculty Director,** Art of Science Initiative, 2013-
- **Advisory Board**, Institute for Terahertz Science and Technology, 2013-
- **Academic Senate Faculty Legislature Committee**, 2019-
- **Faculty Advisor**, IEEE Photonics Society UCSB Chapter, 2019-
- **ECE Graduate Admissions Committee**, 2019-
- **ECE Graduate Diversity Officer**, 2021-
- **Graduate Division Central Fellowship Committee**, 2021
- **Elings Hall Building Committee,** 2021
- **ECE Student Awards Committee**, 2014-2018
- **MRL Education and Outreach Advisory Board,** 2016-2018
- **ECE Electronics and Photonics Faculty Recruitment Committee**, 2018
- **ECE Grad Affairs Committee**, 2017
- **Reviewer**, CNSI Challenge Grant Proposals, 2014