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ARKA MAJUMDAR

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Electrical and Computer Engineering and Physics  
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EDUCATIONAL HISTORY

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Stanford University, Stanford, CA

*PhD, Electrical Engineering (GPA: 4/4)*

September, 2012

Thesis: Solid State Cavity Quantum Electrodynamics with Quantum Dots Coupled to Photonic Crystal Cavities.

Stanford University, Stanford, CA

*MS, Electrical Engineering (GPA: 4/4)*

December 2009

Indian Institute of Technology, Kharagpur, India

*B. Tech (Hons.), Electronics and Electrical Communication Engineering (GPA: 9.8/10)*

May 2007

Thesis: Filter-bank Design by Trans-conductor for Sub-band ADC.

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EMPLOYMENT HISTORY

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University of Washington

Electrical and Computer Engineering and Physics Department

Seattle, WA, USA

Washington Research Foundation Distinguished Investigator, 01/2019-present

Assistant Professor, 08/2014-present

Tunoptix Inc.

Seattle, WA

Building low-power tunable optical elements for imaging and display

Co-founder, 07/2017-present

Meta Company

Redwood City, CA, USA

Optics consultant for nanophotonic design for augmented reality glasses

08/2014-03/2016

University of Washington, Electrical Engineering Department

Seattle, WA, USA

Affiliate Assistant Professor, 09/2013-06/2014

Intel Labs

Santa Clara, CA, USA

Postdoctoral research scientist, 08/2013-08/2014

University of California, Berkeley, Physics Department

Berkeley, CA, USA

Postdoctoral scholar, 10/2012-07/2013

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AWARDS AND HONORS

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ECE Department Outstanding Research Advisor Award, 2019, UW-ECE  
UW College of Engineering (CoE) Junior Faculty Award, 2019, UW-CoE  
NSF CAREER Award, 2019, National Science Foundation  
Alfred P. Sloan Research Fellow in Physics, 2018, Sloan Foundation  
Nominated for Packard Fellowship by UW, 2017, UW  
Amazon Catalyst Fellow, 2016, Amazon  
Early Career Faculty Award, 2015, Intel  
Young Investigator Award, 2015, AFOSR  
Winner of Research Velocity Challenge, Intel Labs, Q2, 2014  
President's (of India) Gold Medal, 2007, IIT-Kharagpur (for being Institute topper)  
Silver Medal, 2007, IIT-Kharagpur (for being the department topper)  
Stanford Graduate Fellowship (Texas Instruments fellow), 2007, Stanford University  
Jagadish Chandra Bose National Science Talent Search Scholarship, 2003, JBNSTS  
Topper in Higher Secondary (12<sup>th</sup> grade) examination in the state of West Bengal, 2003  
Swami Lokeswarananda Gold Medal for best student in 11<sup>th</sup> and 12<sup>th</sup> standard, 2003  
11<sup>th</sup> place in Secondary examination in the state of West Bengal, 2001  
National Talent Search Examination Scholarship, 2001  
Swami Lokeswarananda Gold Medal for best student in 5<sup>th</sup> - 10<sup>th</sup> standard, 2001

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AFFILIATIONS AND OTHER APPOINTMENTS

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Affiliate Professor, Clean Energy Institute (CEI), University of Washington  
Affiliate Professor, Nano-Engineered Systems (Nano-ES), University of Washington  
Affiliate Professor, Molecular Engineering and Sciences (MOLES), University of Washington  
Affiliate Professor, UW Reality Center, University of Washington

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PUBLICATIONS

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**Refereed archival journal publications (Citations: 3840; h-index: 32 from Google Scholar)**  
**My graduate students are bold faced, my postdocs are italicized, \*my undergraduate student**

1. Ultra-broadband and compact sub-wavelength grating polarization beam splitter for silicon-on-insulator platform, Fang Zhang, **Jiajiu Zheng**, Yipeng Song, Weixi Liu, Peipeng Xu, Arka Majumdar, in press, OSA Continuum, 2020.
2. High-precision local transfer of van der Waals materials on nanophotonic structures, **David Rosser**, **Taylor Fryett**, **Abhi Saxena**, *Albert Ryou*, and Arka Majumdar, Opt. Mater. Express 10(2), 645-652 (2020).
3. Image amplification and fidelity in a miniature self-imaging optical resonator, *Albert Ryou*, **Shane Colburn**, Arka Majumdar, Phys. Rev. A 101, 013824, 2020.
4. Design and Optimization of Ellipsoid Scatterer-based Metasurfaces via the Inverse T-Matrix Method, **Maksym V. Zhelyeznyakov**, **Alan Zhan**, Arka Majumdar, OSA Continuum, Vol. 3, Issue 1, pp. 89-103, 2020.
5. Simultaneous focal length control and achromatic computational imaging using quartic metasurfaces, **Shane Colburn**, Arka Majumdar, ACS Photonics, 7, 1, 120-127, 2020.
6. Improving indistinguishability of single photons from colloidal quantum dots using nanocavities, **Abhi Saxena**, **Yueyang Chen**, *Albert Ryou*, Carlos G. Sevilla\*, Peipeng Xu, Arka Majumdar, ACS

- Photonics 6, 12, 3166-3173, 2019.
7. Coupling of Photonic Crystal Cavity and Interlayer Exciton in 2D Heterobilayer, Pasqual Rivera, **Taylor K. Fryett, Yueyang Chen, Chang-Hua Liu**, Essance Ray, Fariba Hatami, Jiaqiang Yan, David Mandrus, Wang Yao, Arka Majumdar, Xiaodong Xu, 2D Materials 7 (2020) 015027.
  8. Ultra-low mode volume on-substrate silicon nanobeam cavity, Jun Zhou, **Jiajiu Zheng, Zhuoran Fang**, Peipeng Xu, Arka Majumdar, Optics Express, Vol. 27, Issue 21, pp. 30692-30699 (2019).
  9. Controlling three-dimensional optical fields via inverse Mie scattering, **Alan Zhan**, Ricky Gibson, **James Whitehead**, Evan Smith, Josh Hendrickson, Arka Majumdar, Science Advances, Vol. 5, no. 10, eaax4769, 2019.
  10. Ultra-Compact Subwavelength-grating-assisted Polarization-Independent Directional Coupler, Heng Xie, **Jiajiu Zheng**, Peipeng Xu, Jianting Yao, **James Whitehead**, Arka Majumdar, IEEE Photonics Technology Letters, Volume: 31, Issue: 18, pp. 1538 – 1541 (2019).
  11. Nonvolatile Rewritable Photomemory Arrays Based on Reversible Phase-Change Perovskite for Optical Information Storage, Chen Zou, **Jiajiu Zheng**, Cheng Chang, Arka Majumdar, Lih Y. Lin, Advanced Optical Materials, 1900558, 2019.
  12. Large thermal tuning of polymer-embedded silicon nitride nanobeam cavity, **Yueyang Chen, James Whitehead, Taylor Fryett**, Peipeng xu, **Jiajiu Zheng**, *Albert Ryou*, Arka Majumdar, Optics Letters, Vol. 44, Issue 12, pp. 3058-3061 (2019).
  13. Silicon nitride nanobeam enhanced emission from all-inorganic perovskite nanocrystals, Chee Fai Fong, Yin Yin, **Yueyang Chen, David Rosser**, Jun Xing, Arka Majumdar and Qihua Xiong, Optics Express, Vol. 27, Issue 13, pp. 18673-18682 (2019).
  14. Optical Frontend for a Convolutional Neural Network, **Shane Colburn**, Yi Chu, Eli Shlizerman, Arka Majumdar, Applied Optics, Vol. 58, Issue 12, pp. 3179-3186 (2019).
  15. Multi-slot photonic crystal cavities for high-sensitivity refractive index sensing, Peipeng Xu, **Jiajiu Zheng**, Jun Zhou, **Yueyang Chen**, Chen Zou, Arka Majumdar, Optics Express, Vol. 27, Issue 3, pp. 3609-3616, 2019.
  16. Role of refractive indices on the meta-lens performance, **Elyas Bayati, Alan Zhan, Shane Colburn**, Arka Majumdar, Applied Optics, Vol. 58, Issue 6, pp. 1460-1466 (2019).
  17. Van der Waals materials integrated nanophotonic devices, *Chang-Hua Liu*, **Jiajiu Zheng, Yueyang Chen, Taylor Fryett**, Arka Majumdar, Optical Material Express, Vol. 9, Issue 2, pp. 384-399 (2019).
  18. Low-loss and broadband non-volatile phase-change directional coupler switches, **Jiajiu Zheng**, Peipeng Xu, Jonathan Doyle, Arka Majumdar, ACS Photonics, 2019, 6 (2), pp 553–557.
  19. 400%/W second harmonic conversion efficiency in 14 $\mu$ m-diameter gallium phosphide-on-oxide resonators, Alan D. Logan, Michael Gould, Emma R. Schmidgall, Karine Hestroffer, Zin Lin, Weiliang Jin, Arka Majumdar, Fariba Hatami, Alejandro W. Rodriguez, Kai-Mei C. Fu, Optics Express, Vol. 26, Issue 26, pp. 33687-33699 (2018).
  20. Ultrathin metalenses using van der Waals materials, Chang-Hua Liu, **Jiajiu Zheng, Shane Colburn, Taylor K. Fryett, Yueyang Chen**, Xiaodong Xu, Arka Majumdar, Nano Letters, 2018, 18 (11), pp 6961–6966.
  21. Deterministic positioning of colloidal quantum dots on silicon nitride nanobeam cavities, **Yueyang Chen**, *Albert Ryou*, Max Friedfeld, **Taylor Fryett, James Whitehead**, Brandi Cossairt, Arka Majumdar, Nano Letters, 2018, 18 (10), pp 6404–6410.
  22. Broadband transparent and CMOS-compatible flat optics with silicon nitride metasurfaces, **Shane Colburn, Alan Zhan, Elyas Bayati, James Whitehead**, *Albert Ryou*, **Luocheng Huang**, Arka Majumdar, Optical Materials Express 8(8), 2330-2344 (2018).
  23. Varifocal zoom imaging with large area focal length adjustable metalenses, **Shane Colburn, Alan Zhan**, Arka Majumdar, Optica, Vol. 5, Issue 7, pp. 825-831 (2018).
  24. Strong photon antibunching in weakly nonlinear two-dimensional exciton-polaritons, *Albert Ryou*, **David Rosser, Abhi Saxena, Taylor Fryett**, Arka Majumdar, Physical Review B 97, 235307, (2018).
  25. GST-on-silicon hybrid nanophotonic integrated circuits: a non-volatile quasi-continuously reprogrammable platform, **Jiajiu Zheng**, Amey Khanolkar, Peipeng Xu, **Shane Colburn**, Sanchit

- Deshmukh, Jason Meyers, Jesse Frantz, Eric Pop, Joshua Hendrickson, Jonathan Doylend, Nicholas Boechler, [Arka Majumdar](#), *Optical Materials Express*, Vol. 8, Issue 6, pp. 1551-1561 (2018).
26. Encapsulated silicon nitride nanobeam cavity for hybrid nanophotonics, **Taylor Fryett, Yueyang Chen, James Whitehead**, Zane Matthew Peycke\*, Xiaodong Xu, [Arka Majumdar](#), *ACS Photonics*, 5 (6), pp 2176–2181 2018.
  27. Inverse design of optical elements based on arrays of dielectric spheres, **Alan Zhan, Taylor Fryett, Shane Colburn**, [Arka Majumdar](#), *Applied Optics*, Vol. 57, Issue 6, pp. 1437-1446 (2018).
  28. Metasurface Optics for Full-color Computational Imaging, **Shane Colburn, Alan Zhan, Arka Majumdar**, *Science Advances*, Vol. 4, no. 2, eaar2114, 2018.
  29. Charging a Smartphone Across a Room Using Lasers, Vikram Iyer, **Elyas Bayati**, Rajalakshmi Nandakumar, [Arka Majumdar](#), Shyamnath Gollakota, *Proceedings of the ACM on Interactive, Multimedia, Wearable and Ubiquitous Technologies (PACM IMWUT)*, Volume 1 Issue 4, December 2017, Article No. 143.
  30. Flat metaform near-eye visor, **Chuchuan Hong, Shane Colburn, Arka Majumdar**, *Applied Optics*, Vol. 56, Issue 31, pp. 8822-8827 (2017).
  31. Cavity nonlinear optics with layered materials, **Taylor Fryett, Alan Zhan, Arka Majumdar**, *Nanophotonics (De Gruyter Journal)*, Volume 7, Issue 2, Pages 355–370, ISSN (Online) 2192-8614, (2017).
  32. Quantum many-body simulation using monolayer exciton-polaritons in coupled-cavities, HaiXiao Wang, **Alan Zhan**, YaDong Xu, HuanYang Chen, Wen-Long You, [Arka Majumdar](#), Jian-Hua Jiang, *Journal of Physics: Condensed Matter*, Volume 29, 445703, (2017).
  33. Phase matched nonlinear optics via patterning layered materials, **Taylor Fryett, Alan Zhan, Arka Majumdar**, *Optics Letters*, Vol. 42, Issue 18, pp. 3586-3589 (2017).
  34. A Forming-Free Bipolar Resistive Switching Behavior Based On ITO/V2O5/ITO Structure, Zhenni Wan, Robert B. Darling, [Arka Majumdar](#) and M. P. Anantram, *Appl. Phys. Lett.* 111, 041601 (2017).
  35. Metasurface Freeform Nanophotonics, **Alan Zhan, Shane Colburn, Christopher M. Dodson, Arka Majumdar**, *Scientific Reports* 7, Article number: 1673 (2017).
  36. Tunable metasurfaces via subwavelength phase shifters with uniform amplitude, **Shane Colburn, Alan Zhan, Arka Majumdar**, *Scientific Reports* 7, Article number: 40174 (2017).
  37. Hybrid metal-dielectric nanocavity for enhanced light-matter interactions, Yousif A. Kelaita, Kevin A. Fischer, Thomas M. Babinec, Konstantinos G. Lagoudakis, Tomas Sarmiento, Armand Rundquist, [Arka Majumdar](#) and Jelena Vuckovic, *Optical Materials Express* 7(1), 231-239 (2017).
  38. Fundamental Scaling Laws in Nanophotonics, Ke Liu, Shuai Sun, [Arka Majumdar](#), Volker J. Sorger, *Scientific Reports* 6, Article number: 37419, (2016).
  39. Nano-cavity integrated van der Waals heterostructure light-emitting device, *Chang-Hua Liu*, Genevieve Clark, **Taylor Fryett**, Sanfeng Wu, **Jiajiu Zheng**, Fariba Hatami, Xiaodong Xu, [Arka Majumdar](#), *Nano Letters*, 17 (1), pp 200–205, 2016.
  40. Silicon photonic crystal cavity enhanced second-harmonic generation from monolayer WSe<sub>2</sub>, **Taylor Fryett**, Kyle L. Seyler, **Jiajiu Zheng**, *Chang-Hua Liu*, Xiaodong Xu, [Arka Majumdar](#), *2D materials*, Volume 4, Number 1, 015031, 2016.
  41. Cavity enhanced second-order nonlinear quantum photonic logic circuits, Rahul Trivedi\*, Uday K Khankhoje and [Arka Majumdar](#), *Physical Review Applied*, 5, 054001, (2016).
  42. Low Contrast Dielectric Metasurface Optics, **Alan Zhan, Shane Colburn, Rahul Trivedi\*, Taylor Fryett, Christopher Dodson, Arka Majumdar**, *ACS Photonics*, 3 (2), pp 209–214, (2016).
  43. Hybrid 2D material nano-photonics: a scalable platform for low-power nonlinear and quantum optics, [Arka Majumdar, Christopher M. Dodson, Taylor Fryett, Alan Zhan](#), Dario Gerace. *ACS Photonics*, 2 (8), pp 1160–1166, 2015.
  44. Cavity Enhanced Nonlinear Optics for Few Photon Optical Bistability, **Taylor Fryett, Christopher M. Dodson, Arka Majumdar**, *Optics Express*, 23(12), 16246-16255, 2015.
  45. Tunable dark modes in one-dimensional “diatomic” dielectric gratings, Bo Zeng, [Arka Majumdar](#) and Feng Wang, *Optics Express*, Vol. 23, Issue 10, pp. 12478-12487, (2015).

46. Monolayer semiconductor nanocavity lasers with ultralow thresholds, Sanfeng Wu, Sonia Buckley, John R. Schaibley, Liefeng Feng, Jiaqiang Yan, David G. Mandrus, Fariba Hatami, Wang Yao, Jelena Vuckovic, [Arka Majumdar](#) and Xiaodong Xu, *Nature*, 529, 69-72, (2015).
47. Electro-optical switching at 1550 nm using a two-state GeSe phase-change layer, Richard Soref, Joshua Hendrickson, Xun Li, Haibo Liang, [Arka Majumdar](#), Jianwei Mu, Wei-Ping Huang, *Optics Express*, Vol. 23, Issue 2, pp. 1536-1546 (2015).
48. Simulations of Silicon-on-insulator Channel-waveguide Electro-optical  $2 \times 2$  Switches and  $1 \times 1$  Modulators Using a  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  Self-holding Layer, Haibo Liang, Richard Soref, Jianwei Mu, [Arka Majumdar](#), Xun Li, Wei-Ping Huang, *IEEE Journal of Lightwave Technology*, Volume 33, Issue 9, (2015).
49. Electro-optical  $1 \times 2$ ,  $1 \times N$  and  $N \times N$  fiber-optic and free-space switching over 1.55 to 3.0 micron using a  $\text{Ge-Ge}_2\text{Sb}_2\text{Te}_5\text{-Ge}$  prism structure, Joshua Hendrickson, Richard Soref, Julian Sweet, and [Arka Majumdar](#), *Optics Express*, Vol. 23, Iss. 1, pp. 72-85 (2015).
50. Nonclassical higher-order photon correlations with a quantum dot strongly coupled to a photonic-crystal nanocavity, Michal Bajcsy, Armand Rundquist, [Arka Majumdar](#), Tomas Sarmiento, Kevin Fischer, Konstantinos G. Lagoudakis, Sonia Buckley, Jelena Vuckovic, *Physical Review A*, 90, 023846, (2014).
51. Cavity-Enabled Self-Electro-Optic Bistability in Silicon Photonics, [Arka Majumdar](#) and Armand Rundquist, *Optics Letters*, Vol. 39, Issue 13, pp. 3864-3867 (2014).
52. A direct measurement of the electronic structure of Si nanocrystals and its effect on optoelectronic properties, Waqas Mustafeez, [Arka Majumdar](#), Jelena Vuckovic and Alberto Salleo, *Journal of Applied Physics*, J. Appl. Phys. 115, 103515, (2014).
53. Control of Two-Dimensional Excitonic Light Emission via Photonic Crystal, Sanfeng Wu, Sonia Buckley, Aaron M. Jones, Jason S. Ross, Nirmal J. Ghimire, Jiaqiang Yan, David G. Mandrus, Wang Yao, Fariba Hatami, Jelena Vučković, [Arka Majumdar](#), Xiaodong Xu, *2D-Materials*, 1, 011001, (2014).
54. Graphene for Tunable Nanophotonic Resonators, [Arka Majumdar](#), Jonghwan Kim, Jelena Vuckovic, Feng Wang, *IEEE Journal of Selected Topics in Quantum Electronics* Vol. 20, 1, 4600204 (2014).
55. Deterministically Charged Quantum Dots in Photonic Crystal Nanoresonators for Efficient Spin-Photon Interfaces, Konstantinos G. Lagoudakis, Kevin Fischer, Tomas Sarmiento, [Arka Majumdar](#), Armand Rundquist, Jesse Lu, Michal Bajcsy, Jelena Vučković, *New Journal of Physics*, 15, 113056, (2013).
56. Proposed Coupling of an Electron Spin in a Semiconductor Quantum Dot to a Nanosize Optical Cavity, [Arka Majumdar](#), Per Kaer, Michal Bajcsy, Erik D. Kim, Konstantinos G. Lagoudakis, Armand Rundquist, Jelena Vuckovic, *Physical Review Letters*, 111, 027402 (2013).
57. Single-photon blockade in doubly resonant nanocavities with second-order nonlinearity, [Arka Majumdar](#) and Dario Gerace, *Physical Review B*, 87, 235319, (2013).
58. Photon blockade with a four-level quantum emitter coupled to a photonic-crystal nanocavity, Michal Bajcsy, [Arka Majumdar](#), Armand Rundquist, Jelena Vuckovic, *New Journal of Physics*, 15, 025014, (2013).
59. Electrical Control of Silicon Photonic Crystal Cavity by Graphene, [Arka Majumdar](#), Jonghwan Kim, Jelena Vuckovic, Feng Wang, 13 (2), pp 515–518, *Nano Letters*, (2013).
60. Design and analysis of photonic crystal coupled cavity arrays for quantum simulation, [Arka Majumdar](#), Armand Rundquist, Michal Bajcsy, Vaishno D. Dasika, Seth R. Bank, Jelena Vuckovic, *Physical Review B*, 86, 195312 (2012).
61. Cavity Quantum Electrodynamics with a Single Quantum Dot Coupled to a Photonic Molecule, [Arka Majumdar](#), Armand Rundquist, Michal Bajcsy, Jelena Vuckovic, *Physical Review B*, 86, 045315, (2012).
62. Electrically driven photonic crystal nano-cavity devices, Gary Shambat, Bryan Ellis, Jan Petykiewicz, Marie A. Mayer, [Arka Majumdar](#), Tomas Sarmiento, James Harris, Eugene E. Haller, Jelena

- Vuckovic, IEEE Journal of selected topics on quantum electronics, Volume 18, Issue 6, 1700 – 1710, (2012).
63. All Optical Switching with a Single Quantum Dot Strongly Coupled to a Photonic Crystal Cavity, Arka Majumdar, Michal Bajcsy, Dirk Englund, Jelena Vuckovic, IEEE Journal of selected topics on quantum electronics, Volume 18, Issue 6, 1812 – 1817, (2012).
  64. Probing the ladder of dressed states and nonclassical light generation in quantum dot-cavity QED, Arka Majumdar, Michal Bajcsy, Jelena Vuckovic, Physical Review A, Rapid communication, 84, 041801(R), (2012).
  65. Phonon-mediated coupling between quantum dots through an off-resonant microcavity, Arka Majumdar, Michal Bajcsy, Armand Rundquist, Erik Kim, Jelena Vuckovic, Physical Review B, 85, 195301 (2012).
  66. Loss-enabled sub-Poissonian light generation in a bimodal nano-cavity, Arka Majumdar, Michal Bajcsy, Armand Rundquist, Jelena Vuckovic, Physical Review Letters, 108, 183601 (2012).
  67. Nonlinear Temporal Dynamics of Strongly Coupled Quantum Dot-Cavity System, Arka Majumdar, Dirk Englund, Michal Bajcsy, Jelena Vuckovic, Physical Review A, 85, 033802, (2012).
  68. Ultrafast photon-photon interaction in a strongly coupled quantum dot-cavity system, Dirk Englund, Arka Majumdar, Michal Bajcsy, Andrei Faraon, Pierre Petroff, Jelena Vuckovic, Physical Review Letters, 108, 093604, (2012).
  69. Bichromatic driving of a solid-state cavity quantum electrodynamics system, Alexander Papageorge, Arka Majumdar, Erik D. Kim, Jelena Vuckovic, New Journal of Physics, 14 013028, (2012).
  70. Off-resonant coupling between a single quantum dot and a nanobeam photonic crystal cavity, Armand Rundquist, Arka Majumdar, Jelena Vuckovic, Applied Physics Letters, 99, 251907, (2011).
  71. 10 GHz direct modulation of a single mode photonic crystal nanocavity light-emitting diode, Gary Shambat, Bryan Ellis, Arka Majumdar, Jan Petykiewicz, Marie Mayer, Tomas Sarmiento, James Harris, Eugene E. Haller and Jelena Vuckovic, Nature Communications, vol. 2, no. 539, 2011.
  72. The effect of photo-generated carriers on the spectral diffusion of a quantum dot coupled to a photonic crystal cavity, Arka majumdar, Erik D. Kim, Jelena Vuckovic, Physical Review B, 84, 195304, 2011.
  73. Integrated quantum optical networks based on quantum dots and photonic crystals, Andrei Faraon, Arka Majumdar, Dirk Englund, Erik Kim, Michal Bajcsy and Jelena Vučković, New Journal of Physics, 13, 055025, 2011.
  74. Fast quantum dot single photon source triggered at telecommunications wavelength, Kelley Rivoire, Sonia Buckley, Arka Majumdar, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Applied Physics Letters, 98, 083105 (2011).
  75. Ultra-low power fiber-coupled gallium arsenide photonic crystal cavity electro-optic modulator, Gary Shambat, Bryan Ellis, Marie A. Mayer, Arka Majumdar, Eugene E. Haller, and Jelena Vuckovic, Optics Express, Vol. 19, Issue 8, pp. 7530-7536 (2011).
  76. Low Power Resonant Optical Excitation of an Optomechanical Cavity, Yiyang Gong, Armand Rundquist, Arka Majumdar, Jelena Vuckovic, Optics Express, Vol. 19, Issue 2, pp. 1429-1440, (2011).
  77. Probing of single quantum dot dressed states via an off-resonant cavity, Arka Majumdar, Alexander Papageorge, Erik D. Kim, Michal Bajcsy, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Physical Review B, 84, 085310, (2011).
  78. Phonon mediated off-resonant quantum dot-cavity coupling under resonant excitation of the quantum dot, Arka Majumdar, Erik D. Kim, Yiyang Gong, Michal Bajcsy, Jelena Vuckovic, Physical Review B, 84, 085309, (2011).
  79. Alignment and Performance Considerations for Capacitive, Inductive and Optical Proximity Communication, Arka Majumdar, J. Cunningham, A. Krishnamoorthy, IEEE Transaction of Advanced Packaging, 33, 3, 690-701, (2010).
  80. Proposal for high-speed and high-fidelity electron-spin initialization in a negatively charged quantum dot coupled to a microcavity in a weak external magnetic field, Arka Majumdar, Ziliang Lin, Andrei Faraon, Jelena Vuckovic, Physical Review A, 82, 022301 (2010).

81. Differential Reflection Spectroscopy of a Single Quantum Dot Strongly Coupled to a Photonic Crystal Cavity, Erik Kim, Arka Majumdar, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Applied Physics Letters, 97, 053111 (2010).
82. Linewidth broadening of a quantum dot coupled to an off-resonant cavity, Arka Majumdar, Andrei Faraon, Erik Kim, Dirk Englund, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Physical Review B, 82, 045306, (2010).
83. Generation of nonclassical states of light via photon blockade in optical nanocavities, Andrei Faraon, Arka Majumdar, Jelena Vuckovic, Physical Review A, Vol 81, 033838 (2010).
84. Resonant excitation of a quantum dot strongly coupled to a photonic crystal nanocavity, Dirk Englund, Arka Majumdar, Andrei Faraon, Mitsuru Toishi, Nick Stoltz, Pierre Petroff, Jelena Vuckovic, Physical Review Letters, 104, 073904 (2010).
85. Theory of Electro-optic Modulation via a Quantum Dot Coupled to a Nano-resonator, Arka Majumdar, Nicolas Manquest, Andrei Faraon and Jelena Vuvckovic, Optics Express Vol. 18, Iss. 5, pp. 3974--3984 (2010).
86. Fast Electrical Control of a Quantum Dot Strongly Coupled to a Nano-resonator, Andrei Faraon, Arka Majumdar, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Physical Review Letters, 104, 047402, January 2010.
87. An optical modulator based on a single strongly coupled quantum dot - cavity system in a p-i-n junction, Dirk Englund, Andrei Faraon, Arka Majumdar, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Optics Express, vol 17, no. 21, 2009.
88. Study of the potential of alternative crops by integration of multisource data using a neuro-fuzzy technique, International Journal of Remote Sensing, A. Sarkar, Arka Majumdar, S. Chatterjee, D. Chatterjee, S. S. Ray, B. Kartikeyan, Volume 29, Issue 19, Pages 5479-5493, June 2008.

#### **Other non-refereed journal papers**

89. Dielectric metasurface-based freeform optics, Arka Majumdar, **Alan Zhan**, **Shane Colburn**, SPIE Newsroom, 20 January, (2017).
90. Quantum optics: Arithmetic with photons (News and Views), Michal Bajcsy and Arka Majumdar, Nature Photonics 10, 4-6 (2016).

#### **Journal papers under review**

91. Inverse designed metalenses with extended depth of focus, **Elyas Bayati**, Raphael Pestourie, **Shane Colburn**, Zin Lin, Steven G. Johnson, Arka Majumdar, Under Review in ACS Photonics.
92. Single-shot three-dimensional imaging with a metasurface depth camera, **Shane Colburn**, Arka Majumdar, Under Review.
93. Nonvolatile electrically reconfigurable integrated photonic switch, **Jiajiu Zheng**, **Zhuoran Fang**, Changming Wu, Shifeng Zhu, Peipeng Xu, Jonathan K. Doylend, Sanchit Deshmukh, Eric Pop, Scott Dunham, Mo Li and Arka Majumdar.
94. Active tuning of hybridized modes in a heterogeneous photonic molecule, Kevin C. Smith, **Yueyang Chen**, Arka Majumdar, and David J. Masiello.
95. MEMS-actuated Metasurface Alvarez Lens, Zheyi Han, **Shane Colburn**, Arka Majumdar, Karl Böhringer.
96. Modeling Electrical Switching of Nonvolatile Phase-Change Integrated Nanophotonic Structures with Graphene Heaters, **Jiajiu Zheng**, Shifeng Zhu, Peipeng Xu, Scott Dunham, Arka Majumdar.
97. Black phosphorus van der Waals heterostructures light emitting diodes for mid-infrared silicon photonics, Tian-Yun Chang, **Yueyang Chen**, De-In Luo, Jia-Xin Li, Po-Liang Chen, Seokjyeong Lee, **Zhuoran Fang**, Wei-Qing Li, Ya-Yun Zhang, Mo Li, Arka Majumdar, Chang-Hua Liu.
98. Exciton-polaritons in WSe<sub>2</sub> monolayer strongly coupled to two-dimensional photonics crystals, **Yueyang Chen**, Shengnan Miao, Tianmeng Wang, Ding Zhong, Colin Chow, **James Whitehead**,

- Xiaodong Xu, Sufei Shi, [Arka Majumdar](#).
99. Analysis of Extended Depth of Focus Metalenses for Achromatic Computational Imaging, **Luocheng Huang, James Whitehead, Shane Colburn, Arka Majumdar**.
  100. Exciton-phonon interactions in cavity-integrated transition metal dichalcogenides, **David Rosser, Taylor Fryett, Albert Ryou, Abhi Saxena, and Arka Majumdar**.

### Conference proceedings

1. Zheyi Han, **Shane Colburn, Arka Majumdar**, Karl F. Böhringer, MEMS-integrated metasurface lens with tunable focus, SPIE Photonics West, 2020.
2. Peipeng Xu, **Jiajiu Zheng**, Jonathan Doylend, [Arka Majumdar](#), Non-volatile quasi-continuously programmable silicon photonics using phase-change materials, SPIE/ COS Photonics Asia, 2019.
3. Jun Zhou, **Jiajiu Zheng, Zhuoran Fang**, Peipeng Xu, and [Arka Majumdar](#), Low mode volume Bowtie Shaped Photonic Crystal Nanobeam Cavity in Silicon, Asia Communications and Photonics Conference, China, 2019.
4. Peipeng Xu, **Jiajiu Zheng**, Jonathan Doylend, and [Arka Majumdar](#), Non-volatile Integrated Silicon Photonic Switches Using Phase-change Materials, Asia Communications and Photonics Conference, China, 2019.
5. Jun Zhou, **Jiajiu Zheng, Zhuoran Fang**, Peipeng Xu, and [Arka Majumdar](#), High Q-factor and Low Mode Volume Bowtie Photonic Crystal Nanobeam Cavity in Silicon, PIERS, Xiamen, China, 2019.
6. Peipeng Xu, **Jiajiu Zheng**, Jonathan Doylend, and [Arka Majumdar](#), Non-volatile Integrated Silicon Photonic Switches Using Phase-change Materials, PIERS, Xiamen, China, 2019.
7. **Jiajiu Zheng, Zhuoran Fang**, Shifeng Zhu, Peipeng Xu, Jonathan Doylend, Sanchit Deshmukh, Eric Pop, Scott Dunham, [Arka Majumdar](#), Nonvolatile Electrically Reconfigurable Silicon Photonic Switches Using Phase-Change Materials, FIO 2019.
8. Alan Logan, Michael Gould, Emma Schmidgall, Karine Hestroffer, Zin Lin, Weiliang Jin, [Arka Majumdar](#), Fariba Hatami, Alejandro Rodriguez, Kai-Mei Fu, High Efficiency Second Harmonic Generation in Gallium Phosphide Ring Resonators on Oxide, CLEO 2019.
9. *Albert Ryou, Shane Colburn, Alan Zhan, Arka Majumdar*, Scaling of Mode Degeneracy and Image Fidelity in a Self-Imaging Optical Resonator, CLEO 2019.
10. **Jiajiu Zheng**, Peipeng Xu, Jonathan Doylend, [Arka Majumdar](#), Broadband Low-loss Non-volatile Photonic Switches Using Phase-Change Materials, CLEO 2019.
11. **Yueyang Chen, Albert Ryou**, Max Friedfeld, **Taylor Fryett, James Whitehead**, Brandi Cossairt, [Arka Majumdar](#), Deterministic positioning of colloidal quantum dots on silicon nitride nanobeam cavities, CLEO 2019.
12. **Elyas Bayati, Shane Colburn, Arka Majumdar**, Metasurface Optics for Ultra-Compact Augmented Reality (AR) Visors, CLEO 2019.
13. **Maksym V. Zhelyeznyakov, Shane Colburn, Elyas Bayati, Arka Majumdar**, Metasurface Computational Imaging (Invited Paper), SPIE Photonics West, 2019.
14. **Shane Colburn, Alan Zhan, Arka Majumdar**, Focal length adjustable metalenses for zoom imaging, SPIE Photonics West, 2019.
15. **Alan Zhan**, Ricky Gibson, **James Whitehead**, Evan Smith, Joshua Hendrickson, [Arka Majumdar](#), Large scale three-dimensional inverse design of discrete scatterer optics, High Contrast Metastructures VIII, SPIE Photonics West, 2019.
16. **Jiajiu Zheng**, Amey Khanolkar, Peipeng Xu, **Shane Colburn**, Sanchit Deshmukh, Jason Myers, Jesse Frantz, Eric Pop, Joshua Hendrickson, Jonathan Doylend, Nicholas Boechler, [Arka Majumdar](#), Non-volatile quasi-continuously programmable silicon photonics using phase-change materials, SPIE Photonics West, 2019.
17. *Chang-Hua Liu, Jiajiu Zheng, Shane Colburn*, Genevieve Clark, **Taylor Fryett, Yueyang Chen, Xiaodong Xu, Arka Majumdar**, Developing ultrathin light emitters and metalenses based on van der Waals materials (Invited Paper), SPIE Photonics West, 2019.



18. **Shane Colburn**, Arka Majumdar, Mitigating metalens aberrations via computational imaging, OSA Imaging and Applied Optics Congress, 2018.
19. **Jiajiu Zheng**, Amey Khanolkar, Peipeng Xu, **Shane Colburn**, Sanchit Deshmukh, Jason Myers, Jesse Frantz, Eric Pop, Nicholas Boechler, Jonathan Doylend, Arka Majumdar, Non-volatile all-optical quasi-continuous switching in GST-on-silicon microring resonators, CLEO, 2018.
20. **Shane Colburn**, **Alan Zhan**, Arka Majumdar, Large Area Tunable Alvarez Metalens via Stepper Lithography, CLEO 2018.
21. **Taylor K. Fryett**, **Yueyang Chen**, **James Whitehead**, Zane Matthew Peycke\*, Xiaodong Xu, Arka Majumdar, Encapsulated Silicon Nitride Nanobeam Cavity for Nanophotonics using Layered Materials, CLEO 2018.
22. Yang Liu, Zheng Wang, **James Whitehead**, Arka Majumdar, Asif Khan, Jayakanth Ravichandran, Electro-optic and ferroelectric properties of epitaxial 0.5 (Ba 0.7 Ca 0.3) TiO 3-0.5 Ba (Ti 0.8 Zr 0.2) O 3 thin films grown by pulsed laser deposition, APS March Meeting 2018.
23. **Shane Colburn**, **Alan Zhan**, and Arka Majumdar, Full-color imaging with PSF-engineered metasurfaces and computational reconstruction, FIO, 2017.
24. Ke Liu, Shuai Sun, Arka Majumdar, and Volker J. Sorger, Physical Scaling Laws of Nanophotonics, Advanced Photonics Congress, 2017.
25. **Shane Colburn**, **Alan Zhan**, Arka Majumdar, Sanchit Deshmukh, Eric Pop, Jason Myers, Jesse Frantz, Active metasurfaces based on phase-change memory material digital metamolecules, IEEE-NANO, 2017.
26. *Chang-Hua Liu*, Genevieve Clark, **Taylor Fryett**, Sanfeng Wu, **Jiajiu Zheng**, Xiaodong Xu, Arka Majumdar, Cavity-enhanced light emission from an electrically driven van der Waals heterostructures, CLEO, 2017.
27. **Taylor Fryett**, Kyle Seyler, **Jiajiu Zheng**, Xiaodong Xu, Arka Majumdar, Silicon photonic crystal cavity enhanced second-harmonic generation from monolayer WSe<sub>2</sub>, CLEO, 2017.
28. **Jiajiu Zheng**, **Dan Guo**, Arka Majumdar, Self-electro-optic bistability in hybrid silicon photonic microring resonators, CLEO, 2017.
29. **Shane Colburn**, **Alan Zhan**, Sanchit Deshmukh, Jason Myers, Jesse Frantz, Eric Pop, Arka Majumdar, Metasurfaces Based on Nano-Patterned Phase-Change Memory Materials, CLEO, 2017.
30. Ke Liu, Shuai Sun, Arka Majumdar, and Volker J. Sorger, Physical Scaling Laws of Nanophotonics, FIO, 2016.
31. Michael Kopreski\*, **Alan Zhan**, Arka Majumdar, Metasurface-based spin-selective optical cavity, FIO, 2016.
32. Ke Liu, Arka Majumdar, Volker Sorger, Physical Scaling Laws of Nanophotonics, META, 2016.
33. Arka Majumdar, **Taylor Fryett**, *Chang-hua Liu*, **Jiajiu Zheng**, Sanfeng Wu, Pasqual Rivera, Kyle Syler, Genevieve Clark, Xiaodong Xu, Two-dimensional materials for integrated optoelectronic information technology, Photonics Society Summer Topical Meeting Series (SUM), 2016 IEEE.
34. Arka Majumdar, Cavity Enhanced Nonlinear Optics with 2D Material, IPR, 2016.
35. Arka Majumdar, **Taylor Fryett**, *Chang-hua Liu*, **Jiajiu Zheng**, Sanfeng Wu, Pasqual Rivera, Kyle Syler, Genevieve Clark and Xiaodong Xu, Two-dimensional Materials for Integrated Optoelectronic Information Technology, IEEE summer topicals, 2016.
36. **Alan Zhan**, **Shane Colburn**, Rahul Trivedi\*, **Taylor Fryett**, *Chris Dodson*, and Arka Majumdar, Low Contrast Dielectric Metasurface Optics, CLEO, 2016.
37. **Shane Colburn**, **Alan Zhan**, Arka Majumdar, Metasurface-based freeform optics for biosensing and augmented reality systems, CLEO, 2016.
38. Arka Majumdar, Sanfeng Wu, Sonia Buckley, Aaron M Jones, Jason S Ross, Nirmal J Ghimire, Jiaqiang Yan, David J Mundras, Wang Yao, Fariba Hatami, Jelena Vuckovic, Xiaodong Xu, 2D-material Based Nano-photonics, CLEO, 2014.
39. Kevin Fischer, Thomas Babinec, Yousif Kelaita, Konstantinos Lagoudakis, Tomas Sarmiento, Armand Rundquist, Arka Majumdar, Jelena Vuckovic, Ultrafast Light-Matter Interaction in a Metaphotonic Cavity Containing a Single Quantum Dot, CLEO, 2014.

40. Kevin Fischer, Thomas Babinec, Yousif Kelaita, Konstantinos Lagoudakis, Tomas Sarmiento, Armand Rundquist, [Arka Majumdar](#), Jelena Vuckovic, Hybrid metal-dielectric nanocavity for ultrafast quantum dot optical field interaction, APS March Meeting, 2014.
41. Armand Rundquist, [Arka Majumdar](#), Michal Bajcsy, Vaishno Dasika, Seth Bank, Jelena Vuckovic, Photonic Crystal Coupled Cavity Arrays for Quantum Simulation, CLEO, San Jose, 2013.
42. Konstantinos Lagoudakis, Kevin Fischer, [Arka Majumdar](#), Armand Rundquist, Michal Bajcsy, Jesse Lu, Tomas Sarmiento, Jelena Vuckovic, Zeeman splitting of deterministically charged quantum dots coupled to photonic crystal nanoresonators, CLEO, 2013.
43. Michal Bajcsy, Armand Rundquist, [Arka Majumdar](#), Tomas Sarmiento, Konstantinos Lagoudakis, and Jelena Vuckovic, Third-order photon correlations from a quantum dot coupled to a photonic-crystal nanocavity, CLEO, San Jose, 2013.
44. [Arka Majumdar](#), Jonghwan Kim, Jelena Vuckovic, Feng Wang, Electrical Control of Photonic Crystal Cavity by Graphene, CLEO, San Jose, 2013.
45. [Arka Majumdar](#), Armand Rundquist, Michal Bajcsy and Jelena Vuckovic, Correlated photons in quantum dot-cavity quantum electrodynamics: beyond the single cavity, CLEO, San Jose, 2013.
46. Michal Bajcsy, [Arka Majumdar](#), Armand Rundquist and Jelena Vuckovic, Coupling a single quantum dot to a photonic molecule, FIO, Rochester, 2012.
47. Jelena Vučković, Gary Shambat, Jan Petykiewicz, Bryan Ellis, [Arka Majumdar](#), Tomas Sarmiento, Marie Mayer, James Harris, and Eugene Haller, Photonic Crystal Nanocavity Lasers and Modulators, IEEE Photonics Conference, Burlingame, California, 2012.
48. Gary Shambat, Bryan Ellis, [Arka Majumdar](#), Jan Petykiewicz, Marie Mayer, Tomas Sarmiento, James Harris, Eugene Haller, and Jelena Vuckovic, Ultrafast Direct Modulation of a Single-Mode Photonic Crystal Nanocavity Light-Emitting Diode, CLEO, 2012.
49. Jelena Vuckovic, Bryan Ellis, Gary Shambat, Jan Petykiewicz, [Arka Majumdar](#), Tomas Sarmiento, Marie Mayer, James Harris, and Eugene Haller, Ultra-Low Threshold and High Speed Electrically Driven Photonic Crystal Nanocavity Lasers and LEDs, CLEO 2012.
50. Armand Rundquist, [Arka Majumdar](#), Jelena Vuckovic, Off-resonant Coupling Between a Single Quantum Dot and a Nanobeam Photonic Crystal Cavity, CLEO, 2012.
51. [Arka Majumdar](#), Dirk Englund, Michal Bajcsy, Jelena Vuckovic, Ultrafast Nonlinear Dynamics in Strongly Coupled Quantum Dot-Cavity system, San Jose, CLEO, 2012.
52. [Arka Majumdar](#), Armand Rundquist, Michal Bajcsy, Alexander Papageorge, Erik D. Kim, Jelena Vuckovic, Phonon Mediated Off-resonant Quantum Dot - Cavity Interaction, QD2012.
53. Michal Bajcsy, [Arka Majumdar](#) and Jelena Vuckovic, Photon blockade with a four-level atom coupled to a microcavity, DAMOP, 2012.
54. [Arka Majumdar](#), Erik D. Kim, Michal Bajcsy, Armand Rundquist and Jelena Vuckovic, Phonon Mediated Off-resonant Quantum Dot - Cavity Interaction, APS March Meeting, 2012.
55. [Arka Majumdar](#), Alexander Papageorge, Erik Kim, Michal Bajcsy and Jelena Vuckovic, Quantum Dot Dressing Observed via Off-resonant Cavity, Frontiers in Optics, San Jose, 2011.
56. Michal Bajcsy, [Arka Majumdar](#) and Jelena Vuckovic, Multi-photon State Generation from Strongly Coupled Quantum Dot-Cavity System, Frontiers in Optics, San Jose, 2011.
57. Gary Shambat, Bryan Ellis, [Arka Majumdar](#), Jelena Vuckovic, Ultra-low power fiber-coupled GaAs photonic crystal cavity electro-optic modulator, CLEO, 2011.
58. Kelley Rivoire, Sonia Buckley, [Arka Majumdar](#), Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Fast quantum dot single photon source triggered at telecommunications wavelength, CLEO, 2011.
59. Alexander Papageorge, [Arka Majumdar](#), Michal Bajcsy, Erik D. Kim, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Coherent Optical Spectroscopy of a Single Quantum Dot Via an Off Resonant Cavity, CLEO, 2011.
60. Michal Bajcsy, Andrei Faraon, Kelley Rivoire, [Arka Majumdar](#), Jelena Vuckovic, Atoms and Photonics Crystal Cavities, DAMOP, 2011.
61. Armand Rundquist, Yiyang Gong, [Arka Majumdar](#), Jelena Vuckovic, Low Power Resonant Optical Excitation of an Optomechanical Cavity, CLEO, 2011.

62. Arka Majumdar, Erik Kim, Yiyang Gong, Andrei Faraon, Dirk Englund, Jelena Vuckovic, Off-resonant quantum dot-cavity interaction, CLEO, 2011.
63. Erik D. Kim, Arka Majumdar, Jelena Vuckovic, Hyochul Kim, Pierre Petroff, Differential Reflection Spectroscopy of Photonic Crystal Cavities Containing Coupled InAs Quantum Dots, FIO, 2010.
64. Ivan Shubin, John E. Cunningham, Darko Popovic, Hiren Thacker, Xuezhe Zheng, Ying Luo, Jim Mitchell, Kannan Raj, Ashok V. Krishnamoorthy, Steve Zamek, Winnie Chen, and Arka Majumdar Ferro-Electrically-Enhanced proximity communication, International Symposium on Microelectronics: FALL 2010, Vol. 2010, No. 1, pp. 000084-000092.
65. Arka Majumdar, Andrei Faraon, Nicolas Manquest, Hyochul Kim, Pierre Petroff, and Jelena Vuckovic, Electro-optic modulation with a single quantum dot strongly coupled to a nanocavity, Photonics in Switching, Monterey, California, 2010.
66. Arka Majumdar, Andrei Faraon, Dirk Englund, Nicolas Manquest, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Optical manipulation of quantum dot excitons strongly coupled to photonic crystal cavities, SPIE Photonic West 2010, San Francisco.
67. Andrei Faraon, Arka Majumdar, Dirk Englund, Ziliang Lin, Jelena Vuckovic, Integrated photonic crystal networks with coupled quantum dots, SPIE Photonic West 2010, San Francisco.
68. Arka Majumdar, Andrei Faraon, Jelena Vuckovic, Optimal pulse to generate non-classical photon states via photon blockade, SPIE Photonic West 2010, San Francisco.
69. Arka Majumdar, Dirk Englund, Andrei Faraon, Jelena Vuckovic, Single Quantum Dot Spectroscopy via Non-resonant Dot-Cavity Coupling, FIO/Laser Science Conference 2009, San Jose.
70. Andrei Faraon, Arka Majumdar, Hyochul Kim, Pierre Petroff, Jelena Vuckovic, Electrically Driven Optical Modulator with a Strongly Coupled Quantum Dot, FIO/Laser Science Conference 2009, San Jose.
71. Arka Majumdar, Fast, Single Quantum Dot Photonic Crystal Electro-Optic Modulator with Ultra-Low Control Energies, SPRC Symposium, 2009.
72. Dirk Englund, Andrei Faraon, Arka Majumdar, Ilya Fushman, Jelena Vuckovic, Ultrafast all-optical switching with a single quantum dot, CLEO 2009, Baltimore.
73. Andrei Faraon, Arka Majumdar, Jelena Vuckovic, Electrically controlled single quantum dot switching in photonic crystal resonators, CLEO 2009, Baltimore.
74. Arka Majumdar, Andrei Faraon, Jelena Vuckovic, Engineering Anti-bunching via Photon Blockade in Photonic Crystal Cavity-Quantum Dot Systems, CLEO 2009, Baltimore.
75. Arka Majumdar, Andrei Faraon, Dirk Englund, Ilya Fushman, Jelena Vuckovic, Quantum Dots in Photonic Crystals: From Single photon sources to single photon nonlinear optics, Proceedings of SPIE, 2009.
76. Arka Majumdar, Information from zero-crossing in G.S. Sanyal School of Telecommunications IIT-Kharagpur in August 2007.
77. Arka Majumdar, Bulk Growth of Silicon Carbide Crystal, Jamshedpur, India, in Indo-German Winter Academy, 2005.
78. Sandipan Kundu, Arka Majumdar, Kaushik Dasgupta, Rajkumar Singha, Characterization of (Si-SiGe-Si) Interband Tunnel Diode and Its Applications, International Conference on MEMS and Semiconductor Nanotechnology, IIT-Kharagpur, 20 - 22 December 2005.

#### **Patents submitted and/or awarded**

1. Nonvolatile electrically reconfigurable integrated photonic switch, **Jiajiu Zheng, Zhuoran Fang, Changming Wu, Shifeng Zhu, Peipeng Xu, Jonathan K. Doylend, Sanchit Deshmukh, Eric Pop, Scott Dunham, Mo Li and Arka Majumdar**, ROI filed (2019).
2. Simultaneous focal length control and achromatic computational imaging with quartic metasurfaces, **Shane Colburn, Arka Majumdar**, Provisional filed (2019).
3. MEMS-integrated Metasurface Lens with Tunable Focus, Zheyi Han, **Shane Colburn, Arka Majumdar**, Karl Bohringer, Patent filed (2019).

4. Systems and Methods for Wireless Power Transmission, Shyamnath Gollakota, Vikram Subramaniam Iyer, Arka Majumdar, **Elyas Bayati**, Rajalakshmi Nandakumar, Patent Filed (2019).
5. Deterministic positioning of colloidal quantum dots on silicon nitride nanobeam cavities, **Yueyang Chen**, *Albert Ryou*, Max Friedfeld, **Taylor Fryett**, **James Whitehead**, Brandi Cossairt, Arka Majumdar, Provisional Filed (2019).
6. Varifocal zoom imaging with large area focal length adjustable metalenses, **Shane Colburn**, **Alan Zhan**, Arka Majumdar, ROI filed (2018).
7. Metasurface Optics for Full-color Computational Imaging, Arka Majumdar, **Alan Zhan**, **Shane Colburn**, Patent Filed (2018).
8. Low-Contrast Silicon Nitride-Based Metasurfaces, Arka Majumdar, **Alan Zhan**, **Shane Colburn**, Patent Issued, 2019.
9. 2D Material Based Nanoscale Laser, Xiaodong Xu, Arka Majumdar, Sanfeng Wu, Provisional Filed (2015).

### Parts of books (chapters in edited books)

1. Andrei Faraon, Amir Arbabi, Seyedeh Mahsa Kamali, Ehsan Arbabi, Arka Majumdar, Applications of wavefront control using nano-post based dielectric metasurfaces, In: Dielectric Metamaterials, Woodhead Publishing Series in Electronic and Optical Materials 2020.
2. Arka Majumdar, Michal Bajcsy, Kelly Rivoire, Sonia Buckley, Andrei Faraon, Erik D. Kim, Dirk Englund, Jelena Vuckovic, (2012), Quantum optics with single quantum dots in photonic crystal cavities, pp. 46-77, In: Quantum Optics with Semiconductor Nanostructures, Editor: Frank Jahnke, Woodhead Publishing Series in Electronic and Optical Materials PA, USA, 2012.
3. Andrei Faraon, Dirk Englund, Ilya Fushman, Arka Majumdar, Jelena Vuckovic, (2012), Quantum dots in photonic crystal cavities, pp. 153-168, In: Quantum Dots: Optics, Electron Transport and Future Applications, Editor: Alexander Tartakovskii, Cambridge University Press, New York, USA.

### Journal issues edited

- Guest Editor: Optical Material Express, special issue on Materials and Devices for quantum photonics (2019)
- Associate Editor: Journal of Nanophotonics (SPIE); 2015-present
- Guest Editor: Nanophotonics Journal for special issue on quantum photonics (2015)

### Other significant research dissemination (web sites, software, Wikis, etc.)

- *Air News Paper*, Contemporary Metasurface Design Can Regulate Optical Fields In Three Dimensions, October 2019.
- *Scitechdaily*, *Nanowerk*, *Phys. Org.*, *Science Daily*, New metasurface design can control optical fields in three dimensions, October 2019.
- *Techexplorist*, Manipulating light with nanoscale precision, October 2019.
- *Photonics Media*, Inverse, Mie Scattering Techniques Advance 3D Metamaterial Design, October 2019.
- *SPIE Newsroom*, Augmenting Reality Poses Challenges for Optics (by Neil Savage), January 2019.
- *Lifeinism*, Is it the End of the Road for Glasses? December 2018
- *Ceramic Tech Today*, Goodbye glass—optical lenses go 2D, November 2018.
- *Opli*, *Phys Org*, *Nanowerk*, *TechExplorist*, *Science Daily*, Scientists engineer a functional optical lens out of 2D materials, November 2018.
- *Wired*, The phone charger of the future will go pew pew, February 2018.
- *Forbes*, These Researchers Used A Laser to Wirelessly Charge A Smartphone, February 2018.

- *Digital Trends*, New wireless charging tech juices your phone from across the room using lasers, February 2018.
- *Phys. Org., Opli*, Using a laser to wirelessly charge a smartphone safely across a room, February 2018.
- *GeekWire*, Charging your smartphone with lasers? Engineers say it's not as scary as it sounds, February 2018.
- *Phys. Org., Opli, UW Today*, Hybrid optics bring color imaging using ultrathin metalenses into focus, February 2018.
- *GeekWire*, Researchers use computing power to raise the bar for ultrathin metasurface cameras, February 2018.
- *UW-EE News*, Researchers deliver the future in optical display through freeform optics, May 2017.
- *EurekAlert, Phys. Org., Nanowerk, ecnmag, azonano*, Nanocavity and atomically thin materials advance the technology for chip-scale light sources, January 2017
- *OSA News, Yahoo Finance, Opli, Benzinga*, Ultra-Small Nano-cavity Advances Technology for Quantum-Based Data Encryption, January 2017
- *GeekWire*, 'Like Star Trek, but with information': UW researchers get \$2M grant to study quantum communications, September 2016
- *EE Times*, Nanolaser Enables On-Chip Photonics, February 2015
- *Phys. Org.*, Scientists build a nanolaser using a single atomic sheet, February 2015
- *Laser Focus World*, EO switch based on GeSe phase change has two stable, self-sustaining states, February 2015
- *Science Codex*, Stanford engineers use nanophotonics to reshape computer data transmission, 2011
- *Phys. Org.*, Using nanophotonics to reshape on-chip computer data transmission, 2011
- *Laser Focus World*, Single mode nanocavity LED sends data at just 0.25 fJ per data bit, 2011
- *Forbes*, Stanford Engineers Unveil an Optical Breakthrough, 2011
- *Wired*, Stanford Forges New Chip with Nanoscale Holiday Lights, 2011
- *San Francisco Chronicle*, Stanford develops super-fast computer device, 2011
- *Laser Focus World*, Quantum-dot modulator drives power requirements even lower, 2010

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OTHER SCHOLARLY ACTIVITY

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**Invited lectures and seminars**

1. DARPA-MEC Analog Feature Extraction and Intelligent Data Representation for Realtime Edge Inference Workshop, *Metaphotonic Computational Image Sensor*, San Jose, February 2020.
2. Photonics West, San Francisco, CA, *Phase change material integrated silicon photonics: GST and beyond*, February 2020.
3. Photonics West, San Francisco, CA, *Metaform Optics for Ultra-Compact Augmented Reality Visor*, February 2020.
4. Toyota Research Institute of North America (TRINA), *Challenges and Opportunities for Optical Neural Network*, Ann Arbor, MI, January 2020.
5. University of Washington Institute for Neuro-engineering (UWIN), *Extreme miniaturization of optics using metasurface and computational imaging*, UW, January 2020.
6. University of Pennsylvania ESE Colloquium, *Metasurface Computational Imaging*, Philadelphia, PA
7. UW Physics Colloquium, *cQED with broad quantum emitters: towards photonic quantum simulation*, Seattle, WA, September 2019.
8. SPIE Optics and Photonics, San Diego, CA, *GST integrated silicon photonics*, August 2019.
9. Novel Optical Materials and Applications Conference, OSA Advanced Photonics Congress, *GST integrated silicon photonics*, San Francisco, CA, July 2019.

10. Nano-ES Seminar Series, UW, Seattle, WA, *Cavity Quantum Electrodynamics with Broad Emitters*, June 2019.
11. UW ECE Colloquium, Seattle, WA, *Dielectric metasurfaces: A new frontier in imaging and display technology*, May 2019.
12. MRS Spring Meeting, Phoenix, AZ, *GST integrated silicon photonics*, April 2019.
13. Google-X, Mountain View, CA, *Metasurface Computational Imaging*, March 2019.
14. University of Maryland, ECE Seminar, *Metasurface Computational Imaging*, March 2019.
15. Attojoule Optoelectronics Workshop, Stanford University, Stanford, CA, *Nanophotonics and emerging materials for low-power optoelectronics*, March 2019.
16. Nano-ES Seminar Series, UW, *Metasurface Computational Imaging*, February 2019.
17. Caltech, Pasadena, CA, *Metasurface Computational Imaging*, February 2019.
18. Photonics West, San Francisco, CA, *Metasurface Computational Imaging*, February 2019.
19. Photonics West, San Francisco, CA, *Towards single-photon nonlinear nanophotonics with broad emitters*, February 2019.
20. Analog Devices, Camas, WA, *Metasurface Optics: Computational Imaging and Tunability*, January 2019.
21. PQE, Snowbird, Utah, *Metasurface Computational Imaging*, January 2019.
22. NAMIS International Autumn School, UW, *Metasurface Computational Imaging*, September 2018.
23. International Nano-Optoelectronic Workshop (iNOW), Tsinghua-Berkeley Shenzhen Institute, Berkeley, CA, *Metasurface Computational Imaging*, July 2018.
24. Argonne National Labs, QIS workshop in APS user meeting, *Towards single photon nonlinear nanophotonics*, May 2018.
25. Nanolytica, Simon Fraser University, *Metasurface Computational Imaging*, May 2018.
26. Art Institute of Seattle, Spring Lecture Series, *Metasurface computational imaging: a new frontier in optical sensing*, April 2018.
27. SPIE DCS, *Cavity integrated layered material devices*, April 2018.
28. SPMS Seminar, NTU, *Cavity integrated layered material devices*, November 2017.
29. PIERS, *Cavity integrated layered material devices*, November 2017.
30. 64th Annual AVS International Symposium and Exhibition (AVS 64), *Dielectric Free Form Metasurfaces for Optical Sensing*, November 2017.
31. Samsung Advanced Institute of Technology, *Metasurface freeform nanophotonics*, October 2017.
32. Intel Labs, *Hybrid Nanophotonics for Optical Information Science and Sensing*, Santa Clara, October 2017.
33. University of California, Berkeley, Condensed Matter Physics Seminar, *Cavity integrated layered material devices*, October 2017.
34. Stanford University Optics & Photonics Seminar (AP-483), *Metasurface freeform nanophotonics*, October 2017.
35. University of Wisconsin Madison, Material Science Colloquium, *Cavity integrated layered material devices*, October 2017.
36. University of Southern California, MHI Nano Science & Technology Seminar, *Metasurface freeform nanophotonics*, September 2017.
37. FOPS (Fundamentals of Optical Processes in Semiconductors), *Cavity integrated layered material devices*, Stevenson, WA, August 2017.
38. Novel Optical Materials and Applications Conference, OSA Advanced Photonics Congress, *Dielectric Resonator Integrated 2D Material Structures*, New Orleans, LA, July 2017.
39. Oculus Research, *Metasurface freeform nanophotonics: a new frontier for imaging and display*, July 2017.
40. Intel Labs, *Metasurface freeform nanophotonics: a new frontier for imaging and display*, June 2017.
41. SPIE Defense and Commercial Sensing (DCS), *Progress in 2D semiconductor optoelectronics*, Anaheim, April 2017.

42. SPIE Photonics West, San Francisco, CA, *Cavity nonlinear optics with monolayer materials*, January 2017.
43. SPIE Photonics West, San Francisco, CA, *Dielectric metasurface-based freeform optics*, January 2017.
44. Google, *Dielectric metasurface based freeform optics*, July 2016
45. Integrated Photonics Research, *Cavity Enhanced Nonlinear Optics with 2D Material*, July 2016.
46. SPIE Photonics West, *2D material nanophotonics for optical information science*, February 2016.
47. PQE, Snowbird, Utah, *2D material nanophotonics for optical information science*, January 2016.
48. OSA-Webinar, *2D material nanophotonics for optical information science*, October 2015.
49. Harvard University, *2D material nanophotonics for optical information science*, June 2015.
50. GWU, *2D material nanophotonics for optical information science*, June 2015.
51. SiWEDS, Spring Meeting, *Optoelectronics with 2D Materials for More than Moore*, April 2015.
52. UW, Seattle, MSE seminar, *2D material nanophotonics for optical information science*, April 2015.
53. FIO, Tucson, AZ, *Towards few-photon optoelectronics with photonic crystal devices*, October 2014.
54. UW, Physics seminar, *Strongly correlated photons in semiconductor cQED*, October 2013.
55. SPIE Optics and Photonics, San Diego, CA, *Nonclassical light sources based on quantum dots in optical nanocavities*, August 2013.
56. UW, Physics seminar, *Strong photon-photon and photon-phonon interaction in solid state nano-cavity QED*, April 2013.
57. UW, EE-seminar, *Light Matter Interaction at the Nano-scale: Towards Attojoule Optoelectronics*, February 2013.
58. USC, EE-Electro-physics seminar, *Light Matter Interaction at the Nano-scale: Towards Attojoule Optoelectronics*, February 2013.
59. Caltech, IQI Seminar, *Strong photon-photon and photon-phonon interaction in quantum dot CQED*, July 2012.
60. QD2012, Santa Fe, NM, USA, *Quantum dots in optical nano-cavities: from cQED to device applications*, May 2012.
61. IQC, Physics seminar, Waterloo, Canada, *Solid State cQED with QDs Coupled to PhC Cavities*, February 2012.
62. EFRC special seminar, Columbia University, *Solid State cQED with QDs Coupled to PhC Cavities*, February 2012.
63. IPRM 2010, Takamatsu, Japan, *Quantum and Classical Information Processing with a Single Quantum Dot in Photonic Crystal Cavity*, June 2010.
64. QD 2010, Nottingham, UK, *Quantum and Classical Information Processing with a Single Quantum Dot in Photonic Crystal Cavity*, April 2010.
65. IIT Kharagpur, Physics Seminar, *Solid State cQED with QDs Coupled to PhC Cavities*, August 2010.
66. IIT Kharagpur and IACS, *Quantum dot embedded in photonic crystal cavity for solid-state cavity QED: a path to quantum information processing*, September 2009.

### **Professional society memberships**

AAAS, 2018-current  
SPIE, 2016-current  
APS, 2012-current  
IEEE, 2008-current  
OSA, 2008-current

### **Journal Reviewers (Total 224 papers reviewed)**

- Nature publishing groups: Nature, Nature Photonics, Nature Materials, Nature Scientific Reports, Lights: Science and Applications, Nature Nanotechnology, Nature Communication, Nature-2D

Materials & Applications, Microsystems & Nano-engineering, Communications Physics, Nature Electronics

- AAAS paper: Science, Science Advances
- APS Journals: Physical Review Letter, Physical Review Applied, Physical Review A, Physical Review B, Physical Review X
- ACS Journals: Nano Letters, ACS Photonics, ACS Nano, ACS Omega, ACS Applied Materials & Interfaces, The Journal of Physical Chemistry Letters
- OSA Journals: Optics Express, Optics Letter, JOSA-B, Photonics Research, Optica, Applied Optics, Optical Material Express, OSA-Continuum
- IEEE Journals: IEEE Journal of Lightwave Technology, IEEE Journal of Quantum Electronics, IEEE Journal of Solid-state circuits, IEEE Journal of Selected Topics in Quantum Electronics, IEEE Computer Magazine, IEEE Photonics Journal
- AIP Journals: Applied Physics Letter, APL-Photonics, Journal of Applied Physics
- IOP Journals: New Journal of Physics, Nanotechnology, Journal of Physics D: Applied Physics, Journal of Physics: Condensed Matter, Journal of Physics B: Atomic, Molecular & Optical Physics, Journal of Optics, Chinese Optics Letters
- Elsevier Journals: Optics Communications, Optical Materials, Journal of Computational Physics, Science Bulletin
- Wiley Journals: Advanced Optical Materials, Small, Lasers and Photonics Review, Advanced Theory and Simulations, Advanced Intelligent Systems
- Proceedings of the National Academy of Sciences
- MRS Communications
- De Gruyter Journals: Nanophotonics
- Springer Journals: Frontiers in Physics, Indian Journal of Physics

### **Conference Reviewers**

- IEEE Rapid, 2018 – current
- Advance Photonics Congress (OSA), 2017 – current
- IEEE Nano, 2017 – current

### **Reviewer Recognition**

- Recognized OSA reviewer (2018)

### **Funding Reviewers**

- Reviewer for Science Foundation Ireland
- Reviewer for Engineering and Physical Sciences Research Council (EPSRC).
- Reviewer for US federal agencies: AFOSR, AFRL, ARO, and NSF (Physics, EPM, GRFP).
- Reviewer for UW Royalty Research Fund.
- Reviewer for Netherlands Organization for Scientific Research (NWO).
- Reviewer for Israeli Ministry of Science, Technology and Space.
- Reviewer for The National Academies of Sciences, Engineering, and Medicine.

### **Conference Session Chair**

- Presided in NOMA, 2017-2019
- Presided in Integrated photonics research, 2016



- Presided in SPIE-photonics west, 2016-2019
- Presided in CLEO, 2014

**Conference Chair**

- Track chair for Integrated Photonics and Optical Devices for IEEE-RAPID, 2018-current.
- Conference chair of 2D photonics materials and devices in SPIE Photonics West, 2018-current.

**Conference Organizer and Committee Member**

- Technical program committee member for the NOMA (Novel Optical Materials and Applications) in OSA Advanced Photonics Congress, 2017-current.
- Technical program committee member for Photonic and Phononic Properties of Engineered Nanostructures VIII in SPIE Photonics West, 2017-current.
- Technical program committee member for High Contrast Metastructures in SPIE Photonics West, 2017-current.
- PRACQSYS: Principles and Applications of Control in Quantum Systems, 2017, Seattle.

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RESEARCH ACTIVITIES

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- Total fund raised (as a team): \$26.5 Million
- Funding amount to my group: \$4.76 Million

**Funded Research**

<b>Funding Agency</b>	<b>Title</b>	<b>Your role</b>	<b>Your Amount Total Amount</b>	<b>Dates</b>
DARPA-STTR	<i>Aberration free imaging with large area composite metasurfaces and computational imaging</i>	PI (Sub-contract TunOptix)	My amount: \$123K Total: \$123K	02/2020-08/2020
Tunoptix-SEED	<i>MEMS-tunable metasurface for machine vision</i>	PI	My amount: \$100K Total: \$200K	10/2019-09/2020
NSF	<i>QII-TAQS: Strongly Interacting Photons in Coupled Cavity Arrays: A Platform for Quantum Many-Body Simulation</i>	PI	My amount: \$500K Total: \$2M	09/2019-08/2014
Boeing	<i>Custom Notch Filter</i>	PI	My amount: \$20K Total: \$20K	09/2019-12/2019
NSF	<i>QLCI-CG: Institute for Hybrid Quantum Systems</i>	Co-PI: PI: Fu	Total: \$147K	09/2019-08/2020
ONR-STTR	<i>Phase I – Compact and Low-cost spectrometer module based on Integrated Photonics Technology</i>	Sub-contract (UIITech)	My amount: \$72K Total: \$72K	07/2019-06/2020
UW Reality Lab	<i>Compact and full-color depth cameras using double-helix metasurfaces</i>	PI	My Amount: \$50K Total: \$50K	06/2019-06/2021
WRF	<i>Implantable, cell-size integrated nanophotonic microscope for brain imaging</i>	PI	My Amount: \$150K Total: \$150K	06/2019-05/2021

NSF	<i>CAREER: Van der Waals material integrated ultra-low-power silicon nitride nanophotonics</i>	PI	My Amount: \$500K Total: \$500K	06/2019-05/2024
NSF	<i>EAGER: Colloidal QD-cavity based quantum simulation</i>	PI	My Amount: \$150K Total: \$300K	09/2018-09/2020
NSF-SNM	<i>Printable photonics for metasurfaces</i>	Co-PI PI: Mckenzie	My amount: \$140K Total: \$450K	09/2018-09/2021
UW Reality Lab	<i>Metaform optics for ultra-compact augmented reality visor</i>	PI	My Amount: \$50K Total: \$50K	06/2018-06/2020
Sloan Foundation	<i>Many body simulation with interacting photons</i>	PI	My Amount: \$65K Total: \$65K	05/2018-05/2020
AFOSR	<i>2D material integrated nanophotonics</i>	PI	My Amount: \$250K Total: \$750K	01/2018-12/2018
Tunoptix-GRUB	<i>MEMS-tunable metasurface for augmented reality</i>	PI	My Amount: \$110K Total: \$220K	11/2017-10/2018
NSF-MRSEC	<i>Material science center</i>	Co-PI PI: Gamelin	My amount: \$109K Total: \$15.6M	09/2017-current
Samsung	<i>Fast, Sub-Wavelength Spatial Light Modulator using Emerging Materials and Metasurfaces</i>	PI	My amount: \$300K Total: \$300K	10/2017-09/2019
NSF	<i>OP: Solid-State cQED with Single Emitters in Monolayer Material</i>	PI	My amount: \$183K Total: \$358K	09/2017-08/2020
UW-RRF	<i>Fast, sub-wavelength SLM via phase-change metasurfaces</i>	PI	My amount: \$36K Total: \$36K	01/2018-12/2018
Intel/SRC	<i>Complex dielectrics for low-power silicon photonic phase control</i>	PI	My amount: \$100K Total: \$100K	07/2017-06/2018
ARO	<i>PRACQSYS: conference support</i>	PI	My amount: \$15K Total: \$15K	07/2017-09/2017
AFOSR-SBIR	<i>Phase-II: Design automation software for Integrated Nanophotonics</i>	Sub-contract (CFDRC)	My amount: \$250K Total: \$250K	08/2017 – 07/2019
Amazon Catalyst	<i>Vision Corrective Eyewear using metasurface freeform optics</i>	PI	My Amount: \$90K Total: \$90K	2016-2017
UW-SRI	<i>CIPriS: Center for Integrated Printed Systems</i>	Co-PI PI: Mckenzie	Total: \$100K	2016-2017
NSF	<i>MRI: Acquisition of a Nanoscribe 3D laser lithography system</i>	Co-PI PI: Boechler	Total: 436K	09/16 - 08/19
NSF	<i>EFRI-ACQUIRE: Nanophotonic Quantum Transmitter</i>	Co-PI; PI: Fu	My amount: \$509K Total: \$2M	09/2016 – 07/2020
NIH	<i>High resolution PET detectors for oncology</i>	Consultant, PI: Lewellen	Unfunded collaborator	1/2015 – 12/2020
Intel	<i>Early Career Faculty Award</i>	PI	My amount: \$25K Total: \$25K	NA
AFOSR	<i>YIP: Hybrid Silicon/Silica Photonics Platform for Low-Power Digital Optoelectronic Switching and Logic Devices</i>	PI	My amount: \$365K Total: \$365K	4/2015-3/2018

NSF	<i>EFRI-2-DARE: Spin-Valley Coupling for Photonic and Spintronic Devices</i>	Co-PI; PI: Cobden	My amount: \$248K Total: \$1.5M	8/2014 - 7/2018
AFOSR-SBIR	<i>Phase-I: Design Automation Software for Integrated Nanophotonics</i>	Sub-contract (CFDRC)	My amount: \$32K Total: \$32K	8/2014- 11/2014

### Research Fellowships by Postdoctoral Students: (Total Amount: \$220K)

- IC postdoctoral fellowship: Albert Ryou (\$200K)
- Mistletoe Research Fellowship: Shreyas Shah (\$10K)
- Mistletoe Research Fellowship: Albert Ryou (\$10K)

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### GRADUATE STUDENTS

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### Chaired Doctoral Degrees

*Taylor Fryett*, Advisor, (2014-2019), Currently engineer at Fluke Corporation  
*Alan Zhan*, Advisor, (2014-2019), Currently consultant in startup TunOptix

### Current Doctoral Students

*Luocheng Huang*, Advisor, Pre-Qualifications, (2019-present)  
*Chris Munley*, Advisor, Post- Qualifications, (2018-present)  
*Abhi Saxena*, Advisor, Post-Qualifications, (2018-present)  
*Maksym Zhelyeznyakov*, Advisor, Post-Qualifications, (2018-present)  
*Zhuoran Fang*, Advisor, Pre-Qualifications, (2018-present)  
*David Rosser*, Advisor, Post- Qualifications, (2017-present)  
*James Whitehead*, Advisor, Post-Qualifications, (2017-present)  
*Elyas Bayati*, Advisor, Post-Qualifications, (2017-present)  
*Yueyang Chen*, Advisor, Post- Qualifications, (2016-present)  
*Shane Colburn*, Advisor, Post-Generals, (2015-present)  
*Jiajiu Zheng*, Advisor, Post-Generals, (2015-present)

### Chaired Masters degrees

- *Luocheng Huang*, Advisor, Project topic: Extended depth of focus lens with rotationally symmetric point spread function (2017-2019); Currently graduate student (PhD) at University of Washington.
- *Chuchuan Hong*, Advisor, Thesis topic: Metasurface enabled near eye visors (2015-17); Currently graduate student (PhD) at Vanderbilt University.
- *Dan Guo*, Advisor, Thesis topic: Phase change material based optical limiter (2015-17); Currently NXE GSC Engineer at ASML.
- *Shane Colburn*, Advisor, Thesis topic: Low contrast dielectric metasurface optics (2015-16); Currently graduate student (PhD) at University of Washington.

### Current Masters Students

*Andrew Wolfram*, Advisor, (2018-present)

### Other significant student supervision

### Postdoctoral Scholars

*Albert Ryou*, (2017-present)

- *Shreyas Shah*, (2018-2019), Currently Silicon Photonics Engineer at Rockley Photonics, Pasadena, CA
- *Chang-hua Liu*, (2015-2017), Currently Assistant Professor at National Tsing-Hua University, Taiwan
- *Christopher Dodson*, (2014-2015), Currently Optical Engineer in Apple

### Committee members

*Seth Michael Hirsh*, General Examination (2019)  
*Alaina M Green*, PhD Thesis defense (2019)  
*Tun Sheng Tan*, General Examination (2019)  
*Kevin Smith*, General Examination (2019)  
*Jun Hui See Toh*, General Examination (2019)  
*Anupam Pant*, General Examination (2019)  
*Xiaojie Fu*, PhD Thesis defense (2019)  
*Qiyu Liu*, General Examination (2019)  
*Anissa Dadkhah*, MS Thesis Defense (2019)  
*Gaurav Mahamuni*, General Examination (2019); PhD Thesis Defense (2019)  
*Zheyi Han*, General Examination (2018)  
*Chen Zou*, General Examination (2018)  
*Harrison J Goldwyn*, General Examination (2018)  
*Jake Busche*, General Examination (2018)  
*Sandamali Devadithya*, MS Thesis Defense (2017)  
*Conner Ballew*, MS Thesis Defense (2016)  
*Shane Colburn*, MS Thesis Defense (2016)  
*Erin Sanehira*, General Examination (2016); PhD Thesis Defense (2017)  
*Jenny Wan*, General Examination (2016); PhD Thesis Defense (2017)  
*Jason Ross*, PhD Thesis defense (2016)  
*Xu Xu*, General Examination (2016)  
*Peifeng Jing*, General Examination (2016); PhD Thesis Defense (2017)  
*Jingda Wu*, General Examination (2015); PhD Thesis Defense (2016)  
*Yunqi Zhao*, General Examination (2015); PhD Thesis Defense (2016)  
*Mike Gould*, General Examination (2015); PhD Thesis Defense (2016)  
*Niket Thakkar*, General Examination (2015); PhD Thesis Defense (2017)  
*Nicole Thomas*, PhD Thesis Defense (2014)

### Current Undergraduate research supervisor

*Yifan Liu* (2019-current)

### Previous Undergraduate students

*Yotam Ofek* (2018-2019), PhD student in UCLA  
*Laura Owens* (REU, 2018), Working in Energetiq Technology Incorporated  
*Michael Kopeski* (REU, 2017), MS-Physics student at University of Cambridge  
*Zane Matthew Peycke* (2016-2019), MS-EE student at Columbia University  
*Yuxuan Chen* (2017-2019), MS-EE at UCLA  
*Michael Choquer* (2016-2018), PhD student at UCSB  
*Jacob Dean Waelder* (2016-2018), Intern at LBNL; PhD student at U. Michigan

*James Whitehead* (2015-2017), PhD student at U. Washington  
*Shana Odem* (2014-2015), Process Engineer at Micron Technology  
*Jun Park* (2014-2015), Graduate Student at U. Michigan  
*William Li* (2014-2015), Engineer at Apple

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DOCUMENTATION OF TEACHING EFFECTIVENESS

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**Courses Taught & Student Evaluations**

Course	Title	Quarter	Credit	Enrollment	Evaluations Response	Item 1	Item 3	Item 4	Overall Median
Ph-123	Waves	Fall, 2019	5	158	Yes, 74/158	3.6	4.1	4.0	3.8
		Fall, 2018	5	131	Yes, 50/131	4.1	4.0	3.8	4.0
EE-361	Applied Electromagnetics	Winter, 2020	5						
		Winter, 2019	5	35	Yes, 27/35	4.1	4.6	4.1	4.2
		Winter, 2018	5	13	Yes, 11/13	4.0	4.5	4.5	4.2
Ph-122	Electromagnetics	Fall, 2016	5	166	Yes, 78/166	3.1	3.0	2.2	3.0
EE-299	Intro to Nanotech.	Spring, 2018	3	28	Yes, 20/28	4.4	4.5	4.3	4.5
		Spring, 2017	3	10	Yes, 8/10	4.1	4.5	4.1	4.3
		Spring, 2016	3	22	Yes, 13/15	2.6	3.6	3.1	3.2
Ph-431	Modern Physics Lab	Winter, 2016	3	29	Yes, 8/12	3.5	3.3	3.1	3.5
					Yes, 15/17	4.0	3.1	3.2	3.4
Ph-495	Seminar of current problems	Winter, 2015	1	23	Yes, 9/23	3.4	3.7	3.0	3.5
EE-539/ Ph-576	Applied Nanophotonics	Spring, 2019	4	19	Yes, 16/19	4.3	4.8	4.4	4.5
		Winter, 2017	4	8	Yes, 6/8	4.1	4.6	4.1	4.3
		Fall, 2015	3	16	Yes, 13/16	3.3	3.9	3.2	3.4
		Fall, 2014	3	8	Yes, 7/8	4.1	4.6	4.1	4.2

**Supervision of independent study (design projects and research)**

Course	Title or Student Name	Quarter	# of Students (Total Credit Hrs)
Phys 800A	Alan Zhan	Spring 2019	1 (10)

Phys 600A	David Rosser, Christopher Munley	Spring 2019	2 (18)
Phys 499A	Zane Peycke, Stephen Lee	Spring 2019	2 (3)
EE 800A	Taylor Fryett, Jiajiu Zheng, Shane Colburn	Spring 2019	3 (28)
EE 600A	Yueyang Chen, Elyas Bayati, James Whitehead	Spring 2019	3 (30)
EE 599A	Abhi Saxena, Zhuoran Fang, Andrew Wolfram, Maksym Zhelyeznyakov, Tristan Tan, Shane Colburn	Spring 2019	6 (15)
Phys 800A	Alan Zhan	Winter 2019	1 (10)
Phys 600A	David Rosser	Winter 2019	1 (10)
Phys 499A	David Yu, Abhijay Khatri, Nikhar Arora, Zane Peycke, Stephen Lee	Winter 2019	5 (10)
EE 800A	Taylor Fryett, Jiajiu Zheng	Winter 2019	2 (20)
EE 600A	Yueyang Chen, Elyas Bayati, Shane Colburn	Winter 2019	3 (24)
EE 599A	Abhi Saxena, Zhuoran Fang, Andrew Wolfram, Maksym Zhelyeznyakov, James Whitehead	Winter 2019	5 (9)
Phys 600A	David Rosser	Fall 2018	1 (7)
Phys 499A	David Yu, Abhijay Khatri, Nikhar Arora, Zane Peycke	Fall 2018	4 (9)
Phys 401C	Yotam Ofek	Fall 2018	1 (6)
EE 800A	Taylor Fryett	Fall 2018	1 (10)
EE 600A	Jiajiu Zheng, Yueyang Chen, Elyas Bayati, Shane Colburn, Zhuoran Fang	Fall 2018	5 (36)
EE 599A	Abhi Saxena, Tristan Tan, Andrew Wolfram, Maksym Zhelyeznyakov, James Whitehead	Fall 2018	5 (10)
EE 499A	Yuxuan Chen, Geyu Yan, Mitchell Szeto	Fall 2018	3 (8)
Phys 600A	David Rosser, Alan Zhan	Sum, 2018	2 (4)
Phys 499A	David Yu, Abhijay Khatri, Nikhar Arora	Sum, 2018	3 (4)
EE600A	Jiajiu Zheng, Yueyang Chen, Elyas Bayati	Sum, 2018	3 (6)
EE599A	James Whitehead	Sum, 2018	1 (2)
EE 499A	Natalie Salazar	Sum, 2018	1 (2)
Phys 800A	Alan Zhan	Spring 2018	1 (10)
Phys 600A	David Rosser	Spring 2018	1 (1)
Phys 499A	Zane Matthew Peycke, Jacob Waelder, Koichi Mito, Nicolas Makoto Leitmann-Niimi, David Yu, Luke Commins	Spring 2018	6 (9)
EE 700A	Taylor Fryett	Spring 2018	1 (10)
EE 600A	Jiajiu Zheng, Shane Colburn, Yueyang Chen, Elyas Bayati	Spring 2018	4 (37)
EE599A	James Whitehead	Spring 2018	1 (3)
EE 490A	Elizabeth Lin	Spring 2018	1 (1)
Phys 600A	Alan Zhan, David Rosser	Winter 2018	2 (11)
Phys 499A	Zane Matthew Peycke, Jacob Waelder, Koichi Mito, Nicolas Makoto Leitmann-Niimi, Jayla Danielle Deisler	Winter 2018	5 (6)
EE 600A	Jiajiu Zheng, Taylor Fryett, Shane Colburn, Yueyang Chen, Elyas Bayati	Winter 2018	5 (47)
EE 599A	James Whitehead	Winter 2018	1 (2)
Phys 600A	Alan Zhan	Fall 2017	1 (10)
Phys 499A	Zane Matthew Peycke, Jacob Waelder, Koichi Mito	Fall 2017	3 (4)

EE 600A	Jiajiu Zheng, Taylor Fryett, Shane Colburn, Yueyang Chen, Elyas Bayati, James Whitehead	Fall 2017	6 (46)
EE 499A	Michael Choquer	Fall, 2017	1 (3)
Phys 600A	Alan Zhan	Sum, 2017	1 (2)
Phys 499A	Zane Matthew Peycke	Sum, 2017	1 (1)
EE 600 A	Jiajiu Zheng, Taylor Fryett, Shane Colburn, Yueyang Chen	Sum, 2017	4(8)
Phys 600A	Alan Zhan	Spring, 2017	1(7)
Phys 499A	Jacob Waelder, Zane Matthew Peycke	Spring, 2017	2(2)
EE700A	Dan Guo, Chuchuan Hong	Spring, 2017	2(4)
EE600A	Jiajiu Zheng, Taylor Fryett, Shane Colburn	Spring, 2017	3(26)
EE599A	Yueyang Chen	Spring, 2017	1(2)
EE499B	Michael Choquer	Spring, 2017	1(1)
Phys 600A	Tun Sheng Tan, Alan Zhan	Winter, 2017	2(7)
Phys 499A	Jacob Waelder	Winter, 2017	1(1)
EE700A	Dan Guo, Chuchuan Hong	Winter, 2017	2(16)
EE600A	Jiajiu Zheng, Taylor Fryett, Shane Colburn, Yueyang Chen	Winter, 2017	4(33)
EE499B	Michael Choquer	Winter, 2017	1(2)
Phys 600A	Alan Zhan	Fall, 2016	1(4)
Phys 499A	Jacob Waelder	Fall, 2016	1(1)
EE600A	Jiajiu Zheng, Taylor Fryett, Shane Colburn	Fall, 2016	3(30)
EE599A	Dan Guo, Chuchuan Hong, Yueyang Chen	Fall, 2016	3(10)
EE499H	Michael Choquer	Fall, 2016	1(2)
Phys 499A	Dylan Austin, Jacob Waelder, Jiasheng Xie	Sum, 2016	3(5)
Phys 600A	Alan Zhan	Sum, 2016	1(2)
EE600A	Jiajiu Zheng, Taylor Fryett, Shane Colburn	Sum, 2016	3(6)
EE600A	Jiajiu Zheng	Spring, 2016	1(5)
EE499A	Shana Odem and Bradley Marquez	Spring, 2016	2(5)
EE490A	Shana Odem	Spring, 2016	1(2)
Phys 600A	Alan Zhan	Winter, 2016	1(7)
EE700A	Shane Colburn	Winter, 2016	1(7)
EE600A	Taylor Fryett, Jiajiu Zheng	Winter, 2016	2(13)
EE599A	Shane Colburn	Winter, 2016	1(2)
EE499A	Bradley Joshua Marquez; William Liaw Li; Shana Lawanda Odem; Jun Seok Park	Winter, 2016	4(16)
Phys 600A	Alan Zhan	Fall, 2015	1(7)
EE600A	Taylor Fryett	Fall, 2015	1(10)
EE599A	Shane Colburn, Nicholas Becker	Fall, 2015	2(8)
EE499A	William Liaw Li; Shana Lawanda Odem; Jun Seok Park	Fall, 2015	3(11)
Phys 600A	Alan Zhan	Sum, 2015	1(4)
EE599A	Taylor Fryett	Sum, 2015	1(3)
Phys 600A	Alan Zhan	Spring, 2015	1(3)
Phys 499A	Morgan Michael Bayer	Spring, 2015	1(1)
EE599B	Nathan Allen Olds	Spring, 2015	1(1)
EE599A	Taylor Fryett	Spring, 2015	1(5)
EE499A	Jun-min Lee, Anh-Tuan Ngo and Yuanchao Xu	Spring, 2015	3(7)
EE499A	Derek Tokutake Hsu	Winter, 2015	1 (1)

EE600A	Alan Zhan	Winter, 2015	1 (1)
EE599A	Taylor Fryett	Winter, 2015	1 (5)
EE599A	Taylor Fryett	Fall, 2014	1 (2)

### List of other teaching contributions

*Phys 576, Atomic Physics*, Guest Lecture, Spring, 2019  
*Photonics Capstone Course*, Advisor, Winter-Spring, 2019  
*ECE Capstone Course*, Advisor, Spring 2018  
*ABC Physics Seminar*, Guest Speaker, Winter 2018  
*Physics graduate career panel*, Guest Speaker, Winter 2018  
*EE504*, Guest Lecture, Fall, 2017  
*Phys294*, Guest Lecture, Winter, 2017  
*NME421*, Guest Lecture, Spring, 2016-18  
*EE502*, Guest Lecture, Fall, 2015  
*Phys528*, Guest Lecture, Fall, 2015-19  
*NME498A*, Guest Lecture, Spring, 2015  
*EE529*, Guest Lecture, Spring, 2015-16  
*ME599*, Guest Lecture, Spring, 2015  
*EE539: Quantum Optics*, Guest Lecture, Spring, 2015  
*EE592*, Guest Lecture, Fall, 2014-16

### Teaching Evaluations

Course/ Quarter	ET&L Teaching Review	Peer Review
EE-539/ Spring 2019	Yes, Ken Yasuhara	Yes, Azadeh Yazdan
EE-361/ Winter 2019	Yes, Ken Yasuhara	Yes, Rich Christie
Ph-123/ Fall 2018	No	Yes, Paula Heron
EE-299/ Spring 2018	Yes, Ken Yasuhara	Yes, Lih Lin
EE-361/ Winter 2018	Yes, Jim L. Borgford-Parnell	Yes, Yasuo Kuga
EE-299/ Spring 2017	Yes, Jim L. Borgford-Parnell	Yes, Kai-Mei Fu
EE-539/ Winter 2017	Yes, Jim L. Borgford-Parnell	Yes, Lih Lin
Ph-122/ Fall 2016	No	No
EE-299/ Spring 2016	Yes, Jim L. Borgford-Parnell	Yes, Karl Bohringer
Ph-431/ Winter 2016	No	No
EE-539/ Fall 2015	Yes, Jim L. Borgford-Parnell	Yes, M. P. (Anant) Anantram
Ph-495/ Winter 2015	No	No
EE-539/ Fall 2014	No	Yes, Lih Lin

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### SERVICE

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### Departmental service

- Physics graduate admission committee (2014-current)
- EE graduate fellowship committee (2015-19)
- EE undergraduate admission committee (2015-current)
- EE Computing support (2015-2018)
- EE department faculty search committee (2014-16)



### **College service**

- Reviewed for College of Engineering Awards (2019)

### **University service**

- Member of the Scientific Advisory Committee (SAC) for the Nano-engineered Systems Institute, 2017-current.

### **Professional society and other service**

- Chair of the technical group on Quantum Optical Science and Technology, OSA (2014-2016)

### **Community service**

- Has mentored high-school students over summer through SPARK program (2016-current)
- Part of UW-STARS program and mentored one student (2017-current)
- Took part in UW discovery days (2016-current)

### **International, national or governmental service**

NA

### **All other services**

NA