

Xi Wang

210 DuPont Hall
University of Delaware
Newark, DE 19716
Phone: (302) 831-3369
Email: wangxi@udel.edu

Research Interests

Nanophotonics; Dynamically tunable photonic devices; Semiconductor plasmonics; Metamaterials; Metasurfaces; Phase transition materials; 2D materials.

Education

Postdoc	University of California, Berkeley Department of Materials Science and Engineering <i>Advisor:</i> Prof. Jie Yao	2014-2018
Ph.D.	State University of New York at Buffalo Department of Electrical Engineering <i>Dissertation:</i> Metamaterials on fibers: nanofabrication for optical applications <i>Advisor:</i> Prof. Alexander N. Cartwright	2014
MS	State University of New York at Buffalo Department of Electrical Engineering <i>Advisor:</i> Prof. Gottfried Strasser	2009
BS	Tsinghua University Department of Microelectronics	2007

Research Experience

Postdoctoral research

University of California Berkeley

- *Advisor:* Prof. Jie Yao (Apr. 2014 – Aug. 2018)
 - Department of Materials Science and Engineering
 - *Research focus:*
 - Dynamically tunable nanophotonics
 - Gradient permittivity materials
 - Micro-electro-opto-mechanical modulator
 - Photoluminescence modulation by active substrates

Doctoral research

State University of New York at Buffalo

- *Advisor:* Prof. Alexander N. Cartwright (June 2010 – Mar. 2014)
 - Department of Electrical Engineering

- *Research focus:*
 - Nano-optical structures
 - Nanofabrications
 - Fiber metamaterials

MS research

State University of New York at Buffalo

- *Advisor:* Prof. Gottfried Strasser (Apr. 2008 – June 2010)
 - Department of Electrical Engineering
 - *Research focus:*
 - MBE growth
 - Quantum cascade lasers

Teaching and Mentoring Experience

Postdoctoral period, University of California, Berkeley

- Mentored/mentoring 4 doctoral, and 2 undergraduate students

Doctoral period, State University of New York at Buffalo

- Teaching Assistant for Circuit Analysis Fall 2008, Spring 2009, Spring 2010
- Teaching Assistant for Electronic Devices and Circuits Fall 2009

Professional Service

Reviewer for

- Nano Research
- Scientific Reports
- Optics Communications
- Journal of Optics – **Outstanding Reviewer Awards 2016**
- Nanomaterials
- Optics Express
- Advanced Sustainable Systems
- Journal of Physics D: Applied Physics
- Journal of Photonics for Energy
- IEEE Photonics
- Journal of the Optical Society of America B
- MRS Communications
- Materials
- Optical Materials Express
- Materials Research Express
- Applied Sciences

Publications

Journal Publications

- [1] Yang Deng*, **Xi Wang***, Zilun Gong*, Kaichen Dong, Shuai Lou, Nicolas Pégard, Kyle B. Tom, Fuyi Yang, Zheng You, Laura Waller, and Jie Yao, All-silicon broadband ultraviolet metasurfaces, **Advanced Materials**, In Press (*equal contribution).
- [2] Shuren Lin, Alexandra Carvalho, Shancheng Yan, Roger Li, Sujung Kim, Aleksandr Rodin, Lídia Carvalho, Emory M. Chan, **Xi Wang**, Antonio H. Castro Neto, and Jie Yao, Accessing valley degree of freedom in bulk Tin (II) sulfide at room temperature, **Nature communications** 9, 1455 (2018).
- [3] Kaichen Dong, Yang Deng, **Xi Wang**, Kyle Tom, Zheng You, Junqiao Wu, and Jie Yao, Subwavelength light confinement and enhancement enabled by dissipative dielectric nanostructures, **Optics Letters** 43, 1826-1829 (2018).
- [4] **Xi Wang***, Kaichen Dong*, Hwan Sung Choe, Huili Liu, Shuai Lou, Kyle B. Tom, Hans A. Bechtel, Zheng You, Junqiao Wu, and Jie Yao, Multifunctional Microelectro-Opto-mechanical Platform Based on Phase-Transition Materials, **Nano Letters** 18, 1637-1643 (2018) (* equal contribution).
- [5] Kaichen Dong, Hwan Sung Choe, **Xi Wang**, Huili Liu, Bivas Saha, Changhyun Ko, Yang Deng, Kyle B. Tom, Shuai Lou, Letian Wang, Costas P. Grigoropoulos, Zheng You, Jie Yao, and Junqiao Wu, A 0.2 V Micro-Electromechanical Switch Enabled by a Phase Transition, **Small** 14, 1703621 (2018).
- [6] Shuai Lou, Yin Liu, Fuyi Yang, Shuren Lin, Ruopeng Zhang, Michael Wang, Kyle B. Tom, Fei Zhou, Hong Ding, Karen Bustillo, **Xi Wang**, Shancheng Yan, Mary Scott, Andrew Minor, and Jie Yao, Three-dimensional Architecture Enabled by Strained Two-dimensional Material Heterojunction, **Nano Letters** 18, 1819-1825 (2018).
- [7] Kaichen Dong, Sukjoon Hong, Yang Deng, He Ma, Jiachen Li, **Xi Wang**, Junyeob Yeo, Letian Wang, Shuai Lou, Kyle B. Tom, Kai Liu, Zheng You, Yang Wei, Costas P. Grigoropoulos, Jie Yao, and Junqiao Wu, A Lithography-Free and Field-Programmable Photonic Metacanvas, **Advanced Materials** 30, 1703878 (2018).
- [8] **Xi Wang**, Yang Deng, Qi-Tong Li, Yijing Huang, Zilun Gong, Kyle Tom and Jie Yao, Excitation and propagation of surface plasmon polaritons on a non-structured surface with gradient permittivity, **Light: Science & Applications (Nature Publishing Group)** 5, e16179 (2016).
- [9] **Xi Wang**, Zilun Gong, Kaichen Dong, Shuai Lou, Jonathan Slack, Andre Anders, and Jie Yao, Tunable Bragg filters with a phase transition material defect layer, **Optics Express** 24, 20365-20372 (2016).
- [10] Jiwei Hou*, **Xi Wang***, Deyi Fu, Changhyun Ko, Yabin Chen, Yufei Sun, Sangwook Lee, Kevin X. Wang, Kaichen Dong, Yinghui Sun, Sefaattin Tongay, Liying Jiao, Jie Yao, Kai Liu, and Junqiao Wu, Modulating Photoluminescence of Monolayer Molybdenum Disulfide by Metal-Insulator Phase Transition in Active Substrates, **Small** 12, 3976-3984 (2016) (* equal contribution).
- [11] Zuhuang Chen, **Xi Wang***, Yajun Qi*, Sui Yang, Julio A. N. T. Soares, Brent A. Apgar, Ran Gao, Ruijuan Xu, Yeonbae Lee, Xiang Zhang, Jie Yao and Lane W. Martin, Self-Assembled, Tunable

Metamaterials via Spinodal Decomposition, **ACS Nano** 10, 10237-10244 (2016) (* equal contribution).

- [12] Yanping Liu, Kyle Tom, **Xi Wang**, Chunming Huang, Hongtao Yuan, Hong Ding, Changhyun Ko, Joonki Suh, Lawrence Pan, Kristin A. Persson, and Jie Yao, Dynamic Control of Optical Response in Layered Metal Chalcogenide Nanoplates, **Nano Letters** 16, 488-496 (2016).
- [13] Jingbo Sun, **Xi Wang**, Tianboyu Xu, Zhaxylyk Kudyshev, Alexander N. Cartwright, and Natalia M. Litchinitser, Spinning Light on the Nanoscale, **Nano letters** 14, 2726-2729 (2014).
- [14] Jingbo Sun, Jinwei Zeng, **Xi Wang**, Alexander N. Cartwright, and Natalia M. Litchinitser, Concealing with Structured Light, **Scientific Reports (Nature Publishing Group)** 4, 4093 (2014).
- [15] Brian J. Schultz, Robert V. Dennis, Jeffrey P. Aldinger, Chernoy Jaye, **Xi Wang**, Daniel A. Fischer, Alexander N. Cartwright, and Sarbajit Banerjee, X-ray Absorption Spectroscopy Studies of Electronic Structure Recovery and Nitrogen Local Structure upon Thermal Reduction of Graphene Oxide in an Ammonia Environment, **RSC Advances** 4, 634-644 (2014).
- [16] Jinwei Zeng, **Xi Wang**, Jingbo Sun, Apra Pandey, Alexander N. Cartwright, and Natalia M. Litchinitser, Manipulating Complex Light with Metamaterials, **Scientific Reports (Nature Publishing Group)** 3, 2826 (2013).
- [17] Robert V. Dennis, Brian J. Schultz, Chernoy Jaye, **Xi Wang**, Daniel A. Fischer, Alexander N. Cartwright, and Sarbajit Banerjee, Near-edge x-ray absorption fine structure spectroscopy study of nitrogen incorporation in chemically reduced graphene oxide, **Journal of Vacuum Science & Technology B** 31, 041204 (2013).
- [18] Vincent Lee, Robert V. Dennis, Chernoy Jaye, **Xi Wang**, Daniel A. Fischer, Alexander N. Cartwright, and Sarbajit Banerjee, In situ near-edge x-ray absorption fine structure spectroscopy investigation of the thermal defunctionalization of graphene oxide, **Journal of Vacuum Science & Technology B** 30, 061206 (2012).
- [19] **Xi Wang**, Gayatri Venugopal, Jinwei Zeng, Yinnan Chen, Dong Ho Lee, Natalia M. Litchinitser, and Alexander N. Cartwright, Optical fiber metamagnetics, **Optics Express** 19, 19813 (2011).

Conference Presentations

- [1] **Xi Wang**, Kaichen Dong, Hwan Sung Choe, Huili Liu, Shuai Lou, Kyle B Tom, Hans A Bechtel, Zheng You, Junqiao Wu, and Jie Yao, A multifunctional micro-electro-opto-mechanical (MEOM) platform based on phase-transition materials, **CLEO 2018**.
- [2] Kaichen Dong, Sukjoon Hong, Yang Deng, He Ma, Jiachen Li, **Xi Wang**, Junyeob Yeo, Letian Wang, Shuai Lou, Kyle B Tom, Kai Liu, Zheng You, Yang Wei, Costas P Grigoropoulos, Jie Yao, and Junqiao Wu, A Reprogrammable Photonic Meta-platform, **CLEO 2018**.
- [3] **Xi Wang**, Zilun Gong, Kaichen Dong, Shuai Lou, Jonathan Slack, Andre Anders, and Jie Yao, All-solid-state tunable Bragg filters based on a phase transition material, **CLEO 2017**.

- [4] **Xi Wang**, Yang Deng, Qitong Li, Yijing Huang, Zilun Gong, Kyle Tom, and Jie Yao, Excitation and propagation of surface plasmon polaritons on non-structured surface with gradient permittivity, **CLEO 2016**.
- [5] **Xi Wang**, Jinwei Zeng, Jingbo Sun, Vahid F Nezhad, Alexander N. Cartwright, and Natalia M. Litchinitser, Metasurface-on-fiber enabled orbital angular momentum modes in conventional optical fibers, **CLEO 2014**.
- [6] Jingbo Sun, **Xi Wang**, Tianboyu Xu, Zhaxylyk Kudyshev, Alexander N. Cartwright, and Natalia M. Litchinitser, Twisting light using nano-waveguide arrays, **CLEO 2014**
- [7] Jingbo Sun, **Xi Wang**, Tianboyu Xu, Zhaxylyk Kudyshev, Alexander N. Cartwright, and Natalia M. Litchinitser, Twisting Light with Metamaterials, **Photonics Society Summer Topical Meeting Series, IEEE 2014**.
- [8] Apra Pandey, Jinwei Zeng, **Xi Wang**, Alexander N. Cartwright, and Natalia M. Litchinitser, Interaction of Structured Light with Metamaterials, **Frontiers in Optics/Laser Science XXVIII (FIO/LS) meeting, 2012**
- [9] Natalia M. Litchinitser, Apra Pandey, Gayatri Venugopal, **Xi Wang**, Jinwei Zeng, and Alexander N. Cartwright, Nonlinear metamaterial waveguides and cavities, **META'12**, Paris, France, April 2012 (invited)
- [10] Natalia M. Litchinitser, Apra Pandey, Jinwei Zeng, **Xi Wang**, Steven Shipsey, and Alexander N. Cartwright, Unconventional light in unconventional materials, **SPIE optics + photonics 2012** (invited)
- [11] Ke Liu, Huina Xu, **Xi Wang**, Haifeng Hu, Qiaoqiang Gan, and Alexander N. Cartwright, Rainbow-colored photonic bandgap structure fabricated by holographic lithography, **SPIE optics + photonics 2012**
- [12] Jinwei Zeng, Apra Pandey, **Xi Wang**, Steven Shipsey, Alexander N. Cartwright, and Natalia M. Litchinitser, Optical vortices in metamaterials, **SPIE optics + photonics 2012**
- [13] **Xi Wang**, Gayatri Venugopal, Jinwei Zeng, DungHo Lee, Natalia M. Litchinitser, and Alexander N. Cartwright, Bridging fiber optics with metamagnetics, **SPIE optics + photonics 2011**

Book chapters

Jinwei Zeng, **Xi Wang**, Mikhail I Shalaev, Alexander N Cartwright, Natalia M Litchinitser, "Tailoring Nonlinear Interactions in Metamaterials", *Nonlinear, Tunable and Active Metamaterials*, 217-235, Springer International Publishing (2015)