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Education

<i>Northwestern University</i>	Materials Science and Engineering	Ph.D., 2015
<i>Indian Institute of Technology</i>	Metallurgical Engineering	B.Tech., 2010

Appointments

- Assistant Professor **2018-present**
 Electrical and Systems Engineering
 University of Pennsylvania, Philadelphia, PA, USA

Professional Preparation

- Resnick Sustainability Prize Fellow in Applied Physics and Materials Science **2015-2017**
Caltech, Pasadena, CA, USA with **H. A. Atwater**
- Graduate Research Assistant in Materials Science and Engineering **2010-2015**
Northwestern University, Evanston, IL, USA with **M. C. Hersam** and **T. J. Marks**
- Visiting Summer Student in Materials Science and Nanoengineering **2008 & 2009**
Rice University, Houston, TX, USA with **P. M. Ajayan**

Selected Awards/Honors/Fellowships

- Frontiers of Materials Award, The Metals Minerals and Materials Society (TMS) **2021**
- Distinguished Alumnus Award, IIT-BHU Global Alumni Association **2019**
- National Academy of Engineering US Frontiers of Engineering (NAE-FOE) Invitee **2019**
- Army Research Office Young Investigator Program (ARO-YIP) Award **2019**
- Nanomaterials Young Investigator Award **2018**
- ACS *Nano Letters* Early Career Editorial Advisory Board **2018-21**
- Forbes, 30 Under 30 in Science **2018**
- Elected to Sigma Xi, The Scientific Research Honor Society as Full Member **2017**
- American Vacuum Society (AVS) Nanometer Scale Science and Technology Division Early Career Award **2017**
- Richard L. Greene Award in Experimental Materials Physics, American Physical Society **2017**
- Young Scientist Award, 43rd Conference on Physics and Chemistry of Surfaces and Interfaces **2016**
- AVS Named Hilliard Speaker, John E. Hilliard Symposium **2015**
- Resnick Prize Postdoctoral Fellowship, California Institute of Technology **2015-17**
- Materials Research Society (MRS) Graduate Student Award **2015**
- IEEE Dielectric & Electrical Insulation Society Graduate Fellowship **2015**
- Russell and Sigurd Varian Award, AVS **2014**
- Johannes E. and Julia R. Weertman Doctoral Fellowship, Northwestern University **2014**
- AVS Nanometer Scale Science and Technology Division Student Award **2014**
- ASM Chicago Regional Chapter Graduate Award **2014**
- Outstanding Researcher Award, International Institute of Nanotechnology **2014**
- SPIE Optics & Photonics Education Scholarship **2014-15**

Peer-Reviewed Journal and Conference Publications

[h-index: 36, Total citations > 11000. [Google Scholar](#) . #corresponding author.]

Under preparation/revisions/submitted:

1. Kumar, P.; Figueroa, K.S.; Foucher, A.; Jo, K.; Acero, N. A.; Stach, E. A.; **Jariwala, D.**,# Efficacy of Boron Nitride Encapsulation against Plasma-Processing in van der Waals Heterostructures. (submitted)
2. Song, B.; Hou, J.; Wang, H.; Sidhik, S.; Miao, J.; Honggang, G.; Zhang, H.; Liu, S.; Fakhraai, Z.; Even, J.; Blancon, J-C.; Mohite, A. D.; **Jariwala, D.**,# Determination of Dielectric Function of Two-Dimensional Hybrid Perovskites. (submitted)
3. Moore, D.; Jo, K.; Nguyen, C.; Lou, J.; Muratore, C.; **Jariwala, D.**; Glavin, N.R., Uncovering Topographically Hidden Features in 2D MoSe₂ with Correlated Potential and Optical Nanoprobes. (submitted)
4. Serra-Maia, R.; Kumar, P.; Meng, A. C.; Foucher, A.; Kang, Y.; **Jariwala, D.**; Stach, E. A.; Development of a systematic method to obtain high signal electron energy loss spectroscopy and high-resolution imaging in liquid cell microscopy. (submitted)
5. Wong, J.W.; Davoyan, A.; Liao, B.; Jo, K.; Krayev, A.; Rotenberg, E.; Bostwick, A.; Jozwiak, C.; Zewail, A. H.; **Jariwala, D.**; Atwater, H.A.; Spatiotemporal Imaging of Geometry Induced Band-Bending Junctions. (in preparation)
6. Liu, X.; Zheng, J.; Wang, D.; Musavigharavi, P.; Stach, E. A.; Olsson, R. H.; **Jariwala, D.**,# A CMOS Compatible Aluminum Scandium Nitride-based Ferroelectric Tunnel Junction Memristor (submitted)
7. Liu, X.; Katti, K.; Zheng, J.; Wang, D.; Musavigharavi, P.; Miao, J.; Stach, E. A.; Olsson, R. H.; **Jariwala, D.**,# AlScN: An Emerging Post-CMOS Compatible Ferroelectric for Non-Volatile Memory Devices (submitted)

Published/In-Press/Accepted:

8. Gatti, G.; Gosálbez-Martínez, D.; Tsirkin, S. S.; Fanciulli, M.; Puppini, M.; Polishchuk, S.; Moser, S.; Testa, I.; Martino, E.; Roth, S.; Bugnon, Ph.; Moreschini, L.; Bostwick, A.; Jozwiak, C.; Rotenberg, E.; Di Santo, G.; Petaccia, L.; Vobornik, I.; Fujii, J.; Wong, J.; **Jariwala, D.**; Atwater, H. A.; Rønnow, H.; Chergui, M.; Yazyev, O.V.; Grioni, M.; and Crepaldi, A., Radial Spin Texture of the Weyl Fermions in Chiral Tellurium. *Physical Review Letters* (accepted)
9. McCreary, A.; Kazakova, O.; **Jariwala, D.**; Al Balushi, Z., An Outlook into the Flat Land of Beyond Graphene 2D Materials: Synthesis, Properties and Device Applications. *2D Materials* (accepted)
10. Song, B.; Liu, F.; Wang, H.; Miao, J.; Chen, Y.; Zhang, H.; Kumar, P.; Liu, X.; Honggang, G.; Stach, E. A.; Liang, X.; Liu, S.; Fakhraai, Z.; **Jariwala, D.**,# Giant Gate-Tunability of Complex Refractive Index in Semiconducting Carbon Nanotubes. *ACS Photonics* DOI: [10.1021/acsp Photonics.0c01220](https://doi.org/10.1021/acsp Photonics.0c01220)
11. Frey, N.C.; Akinwande, D.; **Jariwala, D.**; Shenoy, V. B., Machine Learning-Enabled Design of Point Defects in 2D Materials for Quantum and Neuromorphic Information Processing. *ACS Nano* DOI: [10.1021/acsnano.0c05267](https://doi.org/10.1021/acsnano.0c05267)
12. Lin, Y-R.; Cheng, W-H.; Richter, M. H.; DuChene, J. S.; Peterson, E. A.; Went, C. M.; Al Balushi, Z. Y.; **Jariwala, D.**; Neaton, J. B.; Chen, L-C.; Atwater, H.A., Tailoring Conduction Band Edges in Molybdenum Sulfide/Selenide Alloys for Enhanced CO₂ Reduction. *Journal of Physical Chemistry C* DOI: [10.1021/acs.jpcc.0c04719](https://doi.org/10.1021/acs.jpcc.0c04719)
13. Maccaferri, N.; Meuret, S.; Kornienko, N.; **Jariwala D.**, Speeding up nanoscience and nanotechnology with ultrafast plasmonics. *Nano Letters*, **2020**, 20, 5593-5596
14. Zhang, H.; Abhiraman, B. A.; Zhang, Q.; Miao, J.; Jo, K.; Roccasacca, S.; Knight, M. W.; Davoyan, A. R.; **Jariwala, D.**,# Hybrid Exciton-Plasmon-Polaritons in van der Waals Semiconductor Gratings. *Nature Communications* **2020**, 11, 3552
15. Darlington, T.; Krayev, A.; Venkatesh, V.; Saxena, R.; Kysar, J.; Borys, N. J.; **Jariwala, D.**; Schuck, P. J., Facile and quantitative estimation of strain in nanobubbles with arbitrary symmetry in 2D semiconductors verified using hyperspectral nano-optical imaging. *Journal of Chemical Physics* **2020**, 153, 024702.
16. Kumar, P.; Horwath, J.P.; Foucher, A.; Price, C.P.; Acero, N. A.; Shenoy, V.B.; Stach, E. A.; **Jariwala, D.**,# Direct Visualization of Out of Equilibrium Structural Transformations in Atomically-Thin Chalcogenides. *npj 2D Materials and Applications* **2020**, 4, 1-10

17. Miao, J.; Liu, X.; Saxena, R.; He, K.; Jo, K.; Zhang, H.; He, J.; Han, M-G.; Hu, W.; **Jariwala, D.**,[#] Gate-Tunable Semiconductor Heterojunctions from 2D/3D van der Waals Interfaces *Nano Letters* **2020**, *20*, 2907-2915
 18. **Jariwala, D.**[#] and Wang, H., 2D Materials Based Emerging Memristive Devices in Roadmap for Emerging Hardware and Technology for Machine Learning. *Nanotechnology*, **2020** DOI: [10.1088/1361-6528/aba70f](https://doi.org/10.1088/1361-6528/aba70f)
 19. Brown, K.A.; Britzman, S.; Maccaferri, N.; **Jariwala, D.**; Celano, U., Machine Learning in Nanoscience: Big-Data at Small Scales. *Nano Letters*, **2020**, *20*, 2-10
 20. Chowdhary, T.; Kim, J.; Sadler, E.C.; Li, C.; Lee, S. W.; Jo, K.; Xu, W.; Gracias, D.H.; Drichko, N.V.; **Jariwala, D.**; Britlinger, T.H.; Mueller, T.; Park, H-G.; Kempa, T.J.; Substrate directed synthesis of MoS₂ nanocrystals with tunable dimensionality and optical properties *Nature Nanotechnology* **2020**, *15*, 29-34
 21. Han, M-G.; Garlow, J.; Liu, Y.; Zhang, H.; DiMarzio, D.; Knight, M. W.; Petrovic, C.; **Jariwala, D.**; Zhu, Y., Topological magnetic-spin textures in exfoliated two-dimensional van der Waals Cr₂Ge₂Te₆ *Nano Letters* **2019**, *19*, 7859-7865
 22. Wu, F.; Li, Q.; Wang, P.; Xia, H.; Wang, Z.; Wang, Y.; Peng, M.; Luo, M.; Chen, L.; Chen, F.; Miao, J.; Shan, C.; Pan, A.; Wu, Xin; Ren, W.; **Jariwala, D.** and Weida Hu. High efficiency and fast van der Waals hetero-photodiodes with a unilateral depletion region *Nature Communications* **2019**, *10*, 4663.
 23. Bando, A.; Frey, N.; **Jariwala, D.**; Shenoy, V.B.; Engineering Magnetic Phases in 2D non-van der Waals Transition Metal Oxides *Nano Letters* **2019**, *19*, 7793-7800.
 24. Krayev, A.; Bailey, C. S.; Jo, K.; Wang, S.; Singh, A.; Darlington, T.; Liu, G-Y.; Gradecak, S.; Schuck, P. J.; Pop, E.; **Jariwala, D.**[#] Dry Transfer of van der Waals Crystals to Noble-Metal Surfaces to Enable Characterization of Buried Interfaces *ACS Applied Materials & Interfaces* **2019**, *11*, 38218-38225
 25. Glachman, N.; Geller, N.; Shea, A.; Verret, V.; Karki, K.; Rodriguez-Manzo, J.; Salmon, N.J.; Alsem, D. H.; **Jariwala, D.**; Stach, E. A., Development of a Method to Characterize Active Sites in Photocatalysis using *operando* Transmission Electron Microscopy. *Microscopy and Microanalysis* **2019**, *25*, S2, 1444-45
 26. **Jariwala, D.**; Hersam, M. C., 2D Materials: Molecular Design and Engineering Perspectives. *Molecular Systems Design and Engineering*, **2019**, *4*, 469-470
 27. Price, C. C.; Frey, N. C.; **Jariwala, D.**; Shenoy, V. B., Engineering Zero-Dimensional Quantum Confinement in Transition Metal Dichalcogenide Heterostructures. *ACS Nano* **2019**, *13*, 8303-8311
 28. Zhang, Q.; Zhen, Z.; Liu, C.; **Jariwala, D.**[#] Cui, X., Hybrid phonon-polaritons at atomically-thin van der Waals heterointerfaces for infrared optical modulation *Optics Express* **2019**, *27*, 18585-18600
 29. Zhang, Q.; Zhen, Z.; Yang, Y.; Gan, G.; **Jariwala, D.**[#] Cui, X., Negative refraction inspired polariton lens in van der Waals lateral heterojunctions *Applied Physics Letters* **2019**, *114*, 221101.
 30. Yang, A.; Blancon, J-C.; Zhang, H.; Wong, J.; Yan, E.; Lin, Y. R.; Crochet, J.; Kanatzidis, M.; **Jariwala, D.**; Mohite, A.; Atwater, H. A., Giant Enhancement of Photoluminescence Emission in WS₂-2D Perovskite Heterostructures, *Nano Letters* **2019**, *19*, 8, 4852-4860.
 31. Zhang, Q.; Zhen, Z.; Liu, C.; **Jariwala, D.**[#] Cui, X., Gate-tunable polariton superlens in 2D/3D heterostructures. *Optics Express* **2019**, *27*, 18628-18641
 32. **Jariwala, D.**; Chhowalla, M., Hyperbolic 3D Architectures with 2D Ceramics. *Science* **2019**, *363*, 694-695.
 33. Sherrott, M. C.; Whitney, W. S.; **Jariwala, D.**; Lin, Biswas, S.; Went, C. M.; Wong, J. W.; Rossman, G. R.; Atwater, H. A., Anisotropic Quantum-Well Electro-Optics in Few Layer Black Phosphorus. *Nano Letters* **2019**, *19*, 269-276
 34. Brar, V. W.; Sherrott, M. C.; **Jariwala, D.**[#] Emerging Photonic Architectures in Two-Dimensional Optoelectronics *Chemical Society Reviews* **2018** *47*, 6824-6844.
 35. Stanford, M. G.; Rack, P. D.; **Jariwala, D.**[#] Emerging Nanofabrication and Quantum Confinement Techniques for 2D Materials beyond Graphene *npj 2D Materials and Applications* **2018**, *2*, 20.
- Before joining U. Penn**
36. **Jariwala, D.**; Davoyan, A. R.; Tagliabue, G.; Sherrott, M. C.; Wong, J.; Atwater, H. A., Near-Unity Absorption in van der Waals Semiconductors for Ultrathin Optoelectronics. *Nano Letters* **2016**, *16*, 5482-5487
 37. Wong, J.W.; **Jariwala, D.**; Davoyan, A.; Tagliabue, G.; Tat, K.; Sherrott, M.C.; Atwater, H. A., High Photovoltaic Quantum Efficiency in Ultrathin van der Waals Heterostructures. *ACS Nano* **2017**, *11*, 7230-7240
 38. **Jariwala, D.**; Davoyan, A. R.; Wong, J.; Atwater, H. A., Van der Waals Materials for Atomically Thin Photovoltaics: Promise and Outlook. *ACS Photonics* **2017**, *4*, 2962-2970 (**Listed among most read articles in 2017-18 in the journal**)
 39. **Jariwala, D.** Tunable Confinement of Charges and Excitations. *Nature Nanotechnology* **2018**, *13*, 99-100

40. Atwater, H. A.; Davoyan, A. R.; Ilic, O.; **Jariwala, D.**; Sherrott, M. C.; Went, C. M.; Whitney, W. S.; Wong, J., Materials Challenges for StarShot Lightsail. *Nature Materials* **2018**, *17*, 861-867
41. **Jariwala, D.**; Krayev, A.; Robinson, A. E.; Sherrott, M. C.; Wang, S.; Liu, G-Y.; Terrones, M.; Atwater, H. A., Correlated Scanning Probe and TERS Imaging of Nanoscale Heterogeneity in Two-Dimensional Semiconductors. *2D Materials* **2018**, *5*, 035003
42. Lin, W. H.; Brar, V. W.; **Jariwala, D.**; Sherrott, M. C.; Tseng, W-S.; Yeh, N-C.; Atwater, H. A., Atomically Precise Synthesis and Characterization of cm-Scale Hexagonal Boron Nitride. *Chemistry of Materials* **2017**, *29*, 4700-4707
43. Whitney, W. S.; Sherrott, M. C.; **Jariwala, D.**; Lin, W. H.; Bechtel, H. A.; Rossman, G. R.; Atwater, H. A., Field-Effect Optoelectronic Modulation of Quantum-Confined Carriers in Black Phosphorus. *Nano Letters* **2017**, *17*, 78-84
44. **Jariwala, D.**; Marks, T. J.; Hersam, M. C., Mixed-Dimensional van der Waals Heterostructures. *Nature Materials* **2017**, *16*, 170-181 (**Featured on issue cover, FOCUS, Currently listed among most read articles in the journal**)
45. **Jariwala, D.**; Sangwan, V.; Wu, C.-C.; Prabhumirashi, P. L.; Geier, M. L.; Marks, T. J.; Lauhon, L. J.; Hersam, M. C., Gate-Tunable Carbon Nanotube-MoS₂ Heterojunction p-n Diode. *Proceedings of the National Academy of Sciences of U.S.A.* **2013**, *110*, 18076–18080 (**Featured in This Week in PNAS, IEEE Spectrum, Science Daily**)
46. **Jariwala, D.**; Howell, S. L., Chen, K. S.; Kang, J.; Sangwan, V. K.; Filippone, S. A.; Turrissi, R.; Marks, T. J.; Lauhon, L. J.; Hersam, M. C., Hybrid, Gate-Tunable, van der Waals p-n Heterojunctions from Pentacene and MoS₂. *Nano Letters* **2016**, *16*, 497-503 (**Featured in ACS Editor's Choice and Nature Nanotechnology Research Highlights; among most read articles in 2016 in the journal**)
47. **Jariwala, D.**; Sangwan, V. K.; Late, D. J.; Johns, J. E.; Dravid, V. P.; Marks, T. J.; Lauhon, L. J.; Hersam, M. C., Band-like Transport in High Mobility Unencapsulated Single-Layer MoS₂ Transistors. *Applied Physics Letters* **2013**, *102*, 173107 (**Listed among most read articles in 2014 in the journal**)
48. **Jariwala, D.**; Sangwan, V. K.; Lauhon, L. J.; Marks, T. J.; Hersam, M. C., Emerging Device Applications for Semiconducting Two-Dimensional Transition Metal Dichalcogenides. *ACS Nano* **2014**, *8*, 1102-1120 (**Listed among most read articles in 2014 in the journal**)
49. **Jariwala, D.**; Sangwan, V. K.; Lauhon, L. J.; Marks, T. J.; Hersam, M. C., Carbon Nanomaterials for Electronics, Optoelectronics, Photovoltaics, and Sensing. *Chemical Society Reviews* **2013**, *42*, 2824-2860 (**Listed among most read articles in 2014 and among most cited articles 2013-2015 in the journal**)
50. **Jariwala, D.**; Sangwan, V. K.; Seo, J. W. T.; Xu, W.; Smith, J.; Kim, C. H.; Lauhon, L. J.; Marks, T. J.; Hersam, M. C. Large-area, Low-operating Voltage, Anti-ambipolar Heterojunctions from Solution-processed Semiconductors. *Nano Letters* **2015**, *15*, 416–421
51. Wu, C.-C.; **Jariwala, D.**; Sangwan, V. K.; Marks, T. J.; Hersam, M. C.; Lauhon, L. J., Elucidating the Photoresponse of Ultrathin MoS₂ Field-Effect Transistors by Scanning Photocurrent Microscopy. *The Journal of Physical Chemistry Letters* **2013**, *4*, 2508–2513
52. Howell, S. L.; **Jariwala, D.**; Wu C.-C.; Sangwan V. K.; Marks, T.J.; Hersam M. C.; Lauhon L. J., Investigation of Band-Offsets at Monolayer-Multilayer MoS₂ Junctions by Scanning Photocurrent Microscopy. *Nano Letters* **2015**, *15*, 2278-2284
53. Kang, J.; **Jariwala, D.**; Ryder, C.; Wells, S.A.; Choi, Y.; Hwang, E.; Cho, J.H.; Marks, T.J.; Hersam, M.C., Probing Out-of-Plane Charge Transport in Black Phosphorus with Graphene-Contacted Vertical Field-Effect Transistors. *Nano Letters* **2016**, *16*, 2580-2585
54. Sangwan, V. K.; **Jariwala, D.**; Kim, I. S.; Chen, K-S.; Marks, T. J.; Lauhon, L. J.; Hersam, M. C., Gate-Tunable Memristive Phenomena Mediated by Grain Boundaries in Single-Layer MoS₂. *Nature Nanotechnology* **2015**, *10*, 403-406 (**Featured in News and Views, IEEE Spectrum, Science Daily**)
55. Sangwan, V. K.; **Jariwala, D.**; Filippone, S. A.; Karmel, H. J.; Johns, J. E.; Alaboson, J. M.; Marks, T. J.; Lauhon, L. J.; Hersam, M. C., Quantitatively Enhanced Reliability and Uniformity of High- κ Dielectrics on Graphene Enabled by Self-Assembled Seeding Layers. *Nano Letters* **2013**, *13*, 1162-1167
56. Sangwan, V. K.; **Jariwala, D.**; Everaerts, K.; McMorrow, J. J. E.; He, J.; Grayson, M.; Lauhon, L. J.; Marks, T. J.; Hersam, M. C., Wafer-scale Solution-derived Molecular Gate Dielectrics for Low-voltage Graphene Electronics. *Applied Physics Letters* **2014**, *104*, 083503

57. Wood, J. D.; Wells, S.; **Jariwala, D.**; Chen, K-S.; Cho, E-K.; Sangwan, V. K.; Liu, X.; Lauhon, L. J.; Marks, T. J.; Hersam, M. C. Effective Passivation of Exfoliated Black Phosphorus Transistors Against Ambient Degradation. *Nano Letters* **2014**, *14*, 6964–6970 (**Featured in Nature Materials Research Highlights**)
58. Sangwan, V. K.; Arnold, H. N.; **Jariwala, D.**; Marks, T. J.; Lauhon, L. J.; Hersam, M. C., Low Frequency Electronic Noise in Single-Layer MoS₂ Transistors. *Nano Letters* **2013**, *13*, 4351–4355
59. Prado, M. C.; **Jariwala, D.**; Marks, T. J.; Hersam, M. C., Optimization of Graphene Dry Etching Conditions via Combined Microscopic and Spectroscopic Analysis. *Applied Physics Letters* **2013**, *102*, 193111
60. Kim, I. S.; Sangwan, V. K.; **Jariwala, D.**; Wood, J. D.; Park, S.; Chen, K-S.; Shi, F.; Ruiz-Zepeda, F.; Arturo, P.; Jose-Yacaman, M.; Dravid, V. P.; Marks, T. J.; Hersam, M. C.; Lauhon, L. J. Influence of Stoichiometry on the Optical and Electrical Properties of Chemical Vapor Deposition Derived MoS₂. *ACS Nano* **2014**, *8*, 10551–10558
61. Everaerts, K.; Emery, J. D.; **Jariwala, D.**; Karmel, H. J.; Sangwan, V. K.; Prabhumirashi, P. L.; Geier, M. L.; McMorrow, J. J. E.; Bedzyk, M. J.; Facchetti, A.; Hersam M. C.; Marks, T. J., Ambient-Processable High-Capacitance Hafnia-Organic Self-Assembled Nanodielectrics. *Journal of the American Chemical Society* **2013**, *135*, 8926–8939
62. Tselev, A.; Sangwan, V. K.; **Jariwala, D.**; Marks, T. J.; Lauhon, L. J.; Hersam, M. C.; Kalinin, S. V. Near-Field Microwave Microscopy of High-K Oxides Grown on Graphene with an Organic Seeding Layer. *Applied Physics Letters* **2013**, *103*, 243105.
63. Zhu, J.; Kang, J.; Kang, J.; **Jariwala, D.**; Wood, J. D.; Seo, J. W. T.; Chen, K. S.; Marks, T. J.; Hersam, M. C. Thickness-Sorted Hexagonal Boron Nitride Nanosheets Patchworked by Assembly for High Performance Dielectrics *Nano Letters* **2015**, *15*, 7029–7036
64. Zhu, J.; Liu, X.; Geier, M. L.; McMorrow, J. J. E.; **Jariwala, D.**; Beck, M. E.; Huang, W.; Marks, T. J.; Hersam, M. C. Layer-by-Layer Assembled Two-Dimensional Montmorillonite Dielectrics for Solution-Processed Electronics *Advanced Materials* **2016**, *28*, 63-68 (**cover article**)
65. Everaerts, K.; Zeng, L.; Hennek, J. W.; Camacho, D. I.; **Jariwala, D.**; Bedzyk, M. J.; Hersam, M. C.; Marks, T. J. Printed Indium Gallium Zinc Oxide Transistors. Self-Assembled Nanodielectric Effects on Low-Temperature Combustion Growth and Carrier Mobility. *ACS Applied Materials & Interfaces* **2013**, *5*, 11884-11893
66. Behnam, A.; Sangwan, V. K.; Zhong, X.; Lian, F.; Estrada, D.; **Jariwala, D.**; Hoag, A. J.; Lauhon, L. J.; Marks, T. J.; Hersam, M. C., Pop, E. High-Field Transport and Thermal Reliability of Sorted Carbon Nanotube Network Devices. *ACS Nano* **2012**, *7*, 482-490
67. McMorrow, J. J. E.; Walker, A. R.; Sangwan, V. K.; **Jariwala, D.**; Hoffman, E.; Everaerts, K.; Facchetti, A.; Hersam, M. C.; Marks, T. J., Solution-Processed Nanodielectrics on Template-Stripped Metal Substrates *ACS Applied Materials & Interfaces* **2015**, *7*, 26360–26366
68. Ryder, C.; Wood, J.D.; Wells, S. A.; Yang, Y.; **Jariwala, D.**; Marks, T. J.; Schatz, G.; Hersam, M. C., Covalent Functionalization and Passivation of Exfoliated Black Phosphorus via Aryl Diazonium Chemistry. *Nature Chemistry* **2016**, *8*, 597-602
69. Choi, Y.; Kang, J.; **Jariwala, D.**; Kang, M. S.; Marks, T.J.; Hersam, M. C.; Cho, J. H., Low-Voltage, Complementary Electronics from Ion-gel Gated van der Waals Heterostructures *Advanced Materials* **2016**, *28*, 3742-3748
70. McMorrow, J. J. E.; Cress, C. D.; Arnold, H. N.; Sangwan, V. K.; **Jariwala, D.**; Schmucker, S. W.; Marks, T. J., Hersam, M. C. Vacuum Ultraviolet Radiation Effects on Two-Dimensional MoS₂ Field-Effect Transistors. *Applied Physics Letters* **2017**, *110*, 073102
71. Choi, Y.; Kang, J.; **Jariwala, D.**; Wells, S. A.; Kang, M. S.; Marks, T.J.; Hersam, M. C.; Cho, J. H., Low-Voltage 2D-Material Field Effect Transistors Enabled by Ion-Gel Capacitive Coupling *Chemistry of Materials* **2017**, *29*, 4008-4013
72. Ci, L.; Song, L.; Jin, C.; **Jariwala, D.**; Wu, D.; Li, Y.; Srivastava, A.; Wang, Z.; Storr, K.; Balicas, L., Atomic Layers of Hybridized Boron Nitride and Graphene Domains. *Nature Materials* **2010**, *9*, 430-435 (**Featured on cover, in News and Views and Science Daily**)
73. Ci, L.; Song, L.; **Jariwala, D.**; Elías, A. L.; Gao, W.; Terrones, M.; Ajayan, P. M., Graphene Shape Control by Multistage Cutting and Transfer. *Advanced Materials* **2009**, *21*, 4487-4491
74. **Jariwala, D.**; Srivastava, A.; Ajayan, P. M., Graphene Synthesis and Band-Gap Opening. *Journal of Nanoscience and Nanotechnology* **2011**, *11*, 6621-6641

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77. Srivastava, A.; Galande, C.; Ci, L.; Song, L.; Rai, C.; **Jariwala, D.;** Kelly, K. F.; Ajayan, P. M., Novel Liquid Precursor-based Facile Synthesis of Large-area Continuous, Single, and Few-Layer Graphene Films. *Chemistry of Materials* **2010**, 22, 3457-3461
78. Song, L.; Balicas, L.; Mowbray, D. J.; Capaz, R. B.; Storr, K.; Ci, L.; **Jariwala, D.;** Kurth, S.; Louie, S. G.; Rubio, A.; Ajayan, P. M., Anomalous Insulator Metal Transition in Boron Nitride-Graphene Hybrid Atomic Layers. *Physical Review B* **2012**, 86, 075429
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Patents

1. **Jariwala, D.;** Hersam, M. C.; Sangwan V. K., Gate-Tunable P-N Heterojunction Diode and Fabrication Method and Application of the same. U.S. Patent number: US 9472686
2. Sangwan, V. K.; **Jariwala, D.;** Kim, I. S.; Hersam, M. C.; Marks, T. J.; Lauhon, L. J., Gate-Tunable Atomically-Thin Memristors and Methods for Preparing Same and Applications of Same U.S. Patent application number 62118687 U.S. Patent number: US 9515257
3. **Jariwala, D.;** Hersam, M. C.; Marks, T. J.; Sangwan, V. K.; Xu, W.; Kim, H., System and Method for Anti-ambipolar Heterojunctions from Solution-Processed Semiconductors. U.S. Patent number: US 62101676

Invited Seminars, Webinars, Talks & Presentations (* Award presentations)

^c Cancelled due to COVID19, ^w Delivered by web

1. Recent Progress in Graphene and 2D Materials, Seoul, Korea, September 2021
2. Sharp meets Bright Workshop, UC Irvine, July 2021
3. Graphene 2021, June 2021
4. MRS Fall and Spring Meeting, Boston, USA, November 2020 (x2)^w
5. Materials Science and Technology, Pittsburgh, USA, November 2020^w
6. SPIE Annual meeting, San Diego, USA, August 2020 (x3)^w
7. IEEE RAPID, Miramar Beach, USA, August 2020^w
8. National Institute of Technology, Durgapur, India^w
9. Drexel U. IEEE's Research Symposium, April 2020^c
10. Pennsylvania State University, ESM Dept. State College, USA, March 2020^w
11. Pennsylvania State University, 2D Crystal Consortium. State College, USA, March 2020^w
12. Photonics West, San Francisco, USA, February 2020
13. 6th Int. Conf. on Adv. Nanomaterials and Nanotechnology, Guwahati, India, December 2019 (x2)
14. Low-Dimensional Materials for Optoelectronics, Shenzhen, China, December 2019
15. Ulsan National Institute of Science and Technology, Ulsan, Korea, December 2019
16. Int. Conf. on Advanced Materials and Devices (ICAMD), Jeju, South Korea, December 2019
17. Materials Research Society Fall Meeting, November 2019
18. Rowan University, Department of Physics, November 2019
19. Northrop Grumman Tech Fest, Anaheim, USA, October 2019
20. AVS Annual International Symposium, Dayton, USA, October 2019
21. NAE Frontiers of Engineering Symposium, Charleston, USA, September 2019
22. International Materials Research Congress, Cancun, Mexico, August 2019
23. SPIE Annual meeting, San Diego, USA, August 2019
24. Optical Society of America, Advanced Photonics Congress, San Francisco, July 2019 (x2)

25. Indian Institute of Science Education and Research, Pune, India, July 2019
26. Int. Workshop on Adv. in 2D Mater., Trivandrum, India, July 2019
27. Compound Semiconductor Week, Nara, Japan, May 2019
28. Materials Research Society Spring Meeting, Phoenix, U.S.A., April 2019
29. Morgan State University, Baltimore, U.S.A., April 2019
30. Air Force Research Laboratory, Dayton, U.S.A., March 2019
31. International Center for Diffraction Data, Newtown Square, U.S.A., March 2019
32. Materials Science and Engineering, Drexel University, Philadelphia, U.S.A., February, 2019
33. Materials Research Society Fall Meeting, Boston, U.S.A., November, 2018
34. Shanghai Institute for Technical Physics, Shanghai, China, October 2018
35. Low-Dimensional Materials for Optoelectronics Conference, Shenzhen University, China, October 2018
36. Center for Functional Nanomaterials, Brookhaven National Laboratory, June 2018
37. Sharp Meets Bright Workshop, North Carolina Central University, April 2018
38. Rutgers University, New Brunswick, NJ, U.S.A., February 2018
39. Indian Institute of Technology, Varanasi, India, December 2017
40. Indian Institute of Science Education and Research, Trivandrum, India, December 2017
41. Tata Institute of Fundamental Research, Mumbai, India, December 2017
42. Materials Science and Engineering, U. Pennsylvania, PA, U.S.A., November 2017
43. Workshop on Innovative Nanoscale Devices and Systems (WINDS), Kohala Coast, HI, U.S.A, November 2017
44. Department of Electrical Engineering, University of Southern California, October 2017
45. SPIE Nanoscience + Engineering, San Diego, CA, U.S.A, August 2017
46. European Materials Research Society (E-MRS), Spring Meeting, Strasbourg, France, May 2017
47. Materials Science and Engineering, U. Michigan-Ann Arbor, MI, U.S.A, April 2017
48. American Physical Society (APS) Annual Meeting, New Orleans, LA, U.S.A., March 2017*
49. Electrical and Systems Engineering, U. Pennsylvania, PA, U.S.A., March 2017
50. Materials Science and Engineering, U. Illinois Urbana-Champaign, IL, U.S.A., January 2017
51. Northrop Grumman Aerospace Systems, Redondo Beach, CA, U.S.A., September 2016
52. International Helmholtz Research School for Nanoelectronics, Prague, Czech Republic, September 2016
53. Helmholtz Zentrum Dresden-Rossendorf (HZDR), Dresden, Germany, September 2016
54. John E. Hilliard Symposium, Northwestern University, IL, U.S.A., May 2015. *
55. Indian Institute of Technology, Varanasi, India, December 2014
56. Los Alamos National Laboratory, NM, U.S.A., October 2014

Teaching and Mentoring

- **Graduate Courses:** Nanoelectronics (ESE 621) **Since Spring 2018**
- **Undergraduate Courses:** Electronic, Photonic and Electromechanical Devices (ESE 218) **Since Fall 2018**
- **Currently mentoring (18): Postdoctoral Scholars:** *Pawan Kumar, Surendra Babu, Simrjit Singh* **PhD Students:** *Kiyoung Jo, Huiqin Zhang, Xiwen Liu, Chavez Lawrence, Kwan-Ho Kim, Chloe Le Blanc, Adam Alfieri* **Masters Students:** *Jason Lynch.* **Visiting Students:** *Baokun Song* **Undergraduates:** *Natalia Acero, Bhaskar Abhiraman, Francisco Barrera, Keshava Katti, Kevin Xu, Hyong-Min Kim*
- **Past mentees: Masters Students:** *Vishal Venkatesh (Penn), Akshaya Venkatakrishnan (Micron), Ravindra Saxena (Rice), Kang He (Purdue)* **Undergraduates:** *Suyash Tripathi (U. Toronto), Noah Glachman (U. Chicago), Stefano Roccasecca (UCLA), Justin Qian (Northwestern), Nidhi Kapate (Stanford), Joseph Orr, Kelotchi Figueroa, Sebastian Naranjo (Boston University), Jonathan Jenkins.* **Postdoctoral Scholars:** *Jinshui Miao (SITP, China)*

Outreach and Professional Service

- Symposium Organizer on topic of 2D and Quantum Materials, MRS Fall Meeting 2018, 2019, Spring Meeting 2019, 2020, 2021
- Guest Editor: Special issue on 2D Materials in RSC *Molecular Systems Design and Engineering*
- Guest Editor: Special issue on Atomic Scale Materials for Devices in MDPI *Micromachines*
- Serving on Editorial Board of MDPI *Electronics, Micromachines*
- Serving on Materials Research Society (MRS) Meetings Assessment Sub-Committee (2018-)
- Serving on IEEE EDS Opto-electronics Committee and Chairing EDS Philadelphia Chapter
- Served on Optical Society of America (OSA) Optics for Energy Committee (2018-20)
- Member of AVS, APS, MRS, ACS, SPIE, ASM International, OSA and IEEE.
- Served as Peer reviewer for NSF (ENG-CMMI, ENG-ECCS, DMR-EPM and MPS-CMP), Swiss National Science Foundation, Icelandic Research Fund, Israel Science Foundation and DOE BES proposals, FONDECYT Chile, FWF Austrian Science Fund, NWO Dutch Research Council
- **Active Peer reviewer for journals listed below having peer reviewed 150+ manuscripts in total:**
 - Nature Group and Partner Journals:** *Nature, Nature Materials, Nature Nanotechnology, Nature Electronics, Nature Communications, Scientific Reports, 2D materials and Applications, Communications Physics, Journal of Materials Science, Communications Materials, Light: Science and Applications, Microsystems and Nanoengineering*
 - AAAS Journals:** *Science, Science Advances*
 - American Chemical Society (ACS) Journals:** *ACS Nano, ACS Photonics, ACS Applied Materials and Interfaces, ACS Applied Electronic Materials, ACS Applied Nano Materials, Chemistry of Materials, Journal of the American Chemical Society, Journal of Medicinal Chemistry, Nano Letters, ACS Materials Letters*
 - American Physical Society (APS) Journals:** *Physical Review Letters, Physical Review B, Physical Review Applied, Physical Review Materials*
 - Wiley Group Journals:** *Advanced Materials, Advanced Functional Materials, Advanced Electronic Materials, Advanced Energy Materials, Advanced Science, Advanced Optical Materials, Annalen der Physik, Small, Small Methods, Physica Status Solidi a and b*
 - Royal Society of Chemistry (RSC) Journals:** *Chemical Society Reviews, Nanoscale, RSC Advances, Physical Chemistry Chemical Physics.*
 - Institute of Physics (IOP) Publishing:** *2D Materials, Nanotechnology, Applied Physics Express, Journal of Physics: Condensed Matter, Materials Research Express*
 - American Institute of Physics (AIP) Journals:** *Journal of Applied Physics, Applied Physics Letters*
 - IEEE Journals:** *Journal of Quantum Electronics, Electron Device Letters, Transactions on Nanotechnology, Transactions on Electron Devices*
 - Elsevier:** *Organic Electronics, Cell Press-Matter, Carbon, Thin-Solid Films, Applied Surface Science, Physics Letters A, Chemical Physics Letters*
 - Other publishers:** *Applied Sciences, Electronics, Catalyst, Nanomaterials, Micromachines, Optics Express, Optics Materials Express, Optica*

References: Available upon request.