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Professional Preparation

Yale University, New Haven CT	Physics	B.S.	1990
University of California, Berkeley	Physics	Ph.D.	1998
University of Pennsylvania, Philadelphia PA	Physics	Postdoctoral	2000
California Institute of Technology, Pasadena CA	Physics	Postdoctoral	2002

Appointments

2015-	Wang Fong-Jen Professor of Mechanical Engineering, Columbia University, New York NY
2012-2014	Professor of Mechanical Engineering, Columbia University, New York NY
2007- 2012	Associate Professor of Mechanical Engineering, Columbia University, New York NY
2003-2007	Assistant Professor of Mechanical Engineering, Columbia University, New York, NY
2000-2002	Millikan Fellow in Experimental Condensed Matter Physics, California Institute of Technology, Pasadena CA
1990-1992	High School Teacher, New York Public High Schools, New York, NY

Awards: Millikan Fellowship in Experimental Condensed Matter Physics, Caltech (2000); Society of Columbia Graduates Great Teacher Award (2014); Distinguished Faculty Teaching Award, Columbia Engineering Alumni Association (2015).

Graduate and Postdoctoral Advisor

A. Zettl (UC Berkeley); A.T. Johnson (U. Penn); Michael Roukes (Caltech)

Graduate Advisees:

Lei Wang (Cornell); Yuanda Gao (Intel); Daniel Chenet (Intel); Changyao Chen (Argonne Nat. Lab); Xian Zhang (Trinity College); Yuyao Shan; Nicholas Petrone (Neovel Inc); Adam Hurst (Kulite Semiconductor); Zhengyi Zhang (Sandisk); Shuaimin Liu; Anurag Mathur (UC Berkeley); Robert Caldwell (Intel); Justin Abramson (Pall Corp.); Mingyuan Huang (Xian Jiaotong Univ.); Bhupesh Chandra (IBM).

Postdoctoral advisees:

Cory Dean (Columbia); Arend van der Zande (UIUC); Alexander Gondarenko; Gwan-Hyoung Lee (Yonsei Univ, Korea); Changgu Lee (SKKU, Korea); Vikram Deshpande (Univ. Utah); Matteo Palma (St. Mary's College, London UK); Seokwoo Jeon (KAIST, Korea); Sami Rosenblatt (IBM); Seong Chan Jun (Yonsei Univ., Korea)

Selected Publications: Full list of publications and citation metrics available here:

<https://scholar.google.com/citations?user=mQcg8HoAAAAJ&hl=en>

1. Wolfenson, H., et al., "Tropomyosin controls sarcomere-like contractions for rigidity sensing and suppressing growth on soft matrices", *Nature Cell Biology* **18**, 33-37 (2016).
2. Woessner, A., et al., "Near-field photocurrent nanoscopy on bare and encapsulated graphene", *Nature Communications* **7**, 10783 (2016).
3. Tsen, A.W., et al., "Nature of the quantum metal in a two-dimensional crystalline superconductor", *Nature Physics* **12**, 208-212 (2016).
4. Ni, G.X., et al., "Ultrafast optical switching of infrared plasmon polaritons in high-mobility graphene", *Nature Photonics* **10**, 244-248 (2016).
5. Li, J.I.A., et al., "Negative Coulomb Drag in Double Bilayer Graphene", *Physical Review Letters* **117**, 046802 (2016).
6. Chen, C.Y., et al., "Modulation of mechanical resonance by chemical potential oscillation in graphene", *Nature Physics* **12**, 240-245 (2016).
7. Woessner, A., et al., "Highly confined low-loss plasmons in graphene-boron nitride heterostructures", *Nature Materials* **14**, 421-425 (2015).
8. Wang, L., et al., "Evidence for a fractional fractal quantum Hall effect in graphene superlattices", *Science* **350**, 1231-1234 (2015).
9. Kim, Y.D., et al., "Bright visible light emission from graphene", *Nature Nanotechnology* **10**, 676-681 (2015).
10. Gao, Y.D., et al., "High-Speed Electro-Optic Modulator Integrated with Graphene-Boron Nitride Heterostructure and Photonic Crystal Nanocavity", *Nano Letters* **15**, 2001-2005 (2015).
11. Cui, X., et al., "Multi-terminal transport measurements of MoS₂ using a van der Waals heterostructure device platform", *Nature Nanotechnology* **10**, 534-540 (2015).
12. Chernikov, A., et al., "Electrical Tuning of Exciton Binding Energies in Monolayer WS₂", *Physical review letters* **115**, 126802 (2015).
13. Zandiatashbar, A., et al., "Effect of defects on the intrinsic strength and stiffness of graphene", *Nature Communications* **5**, 3186 (2014).
14. Wu, W.Z., et al., "Piezoelectricity of single-atomic-layer MoS₂ for energy conversion and piezotronics", *Nature* **514**, 470-474 (2014).
15. van der Zande, A.M., et al., "Tailoring the Electronic Structure in Bilayer Molybdenum Disulfide via Interlayer Twist", *Nano Letters* **14**, 3869-3875 (2014).
16. van der Zande, A.M., et al., "Grains and grain boundaries in highly crystalline monolayer molybdenum disulfide", *Nature Materials* **12**, 554-561 (2013).
17. Rangamani, P., et al., "Decoding Information in Cell Shape", *Cell* **154**, 1356-1369 (2013).
18. Mak, K.F., et al., "Tightly bound trions in monolayer MoS₂", *Nature Materials* **12**, 207-211 (2013).
19. Lee, G.H., et al., "High-Strength Chemical-Vapor Deposited Graphene and Grain Boundaries", *Science* **340**, 1073-1076 (2013).

20. Gan, X.T., et al., "Chip-integrated ultrafast graphene photodetector with high responsivity", *Nature Photonics* **7**, 883-887 (2013).
21. Dean, C.R., et al., "Hofstadter's butterfly and the fractal quantum Hall effect in moire superlattices", *Nature* **497**, 598-602 (2013).
22. Chen, C.Y., et al., "Graphene mechanical oscillators with tunable frequency", *Nature Nanotechnology* **8**, 923-927 (2013).
23. Ghassemi, S., et al., "Cells test substrate rigidity by local contractions on submicrometer pillars", *Proceedings of the National Academy of Sciences of the United States of America* **109**, 5328-5333 (2012).
24. Mak, K.F., et al., "Atomically Thin MoS(2): A New Direct-Gap Semiconductor", *Physical Review Letters* **105**, 136805 (2010).
25. Lee, C., et al., "Frictional Characteristics of Atomically Thin Sheets", *Science* **328**, 76-80 (2010).
26. Dean, C.R., et al., "Boron nitride substrates for high-quality graphene electronics", *Nature Nanotechnology* **5**, 722-726 (2010).
27. Chen, C., et al., "Performance of monolayer graphene nanomechanical resonators with electrical readout", *Nature Nanotechnology* **4**, 861-867 (2009).
28. Lee, C., et al., "Measurement of the elastic properties and intrinsic strength of monolayer graphene", *Science* **321**, 385-388 (2008).
29. Bolotin, K.I., et al., "Temperature-dependent transport in suspended graphene", *Physical Review Letters* **101**, 096802 (2008).
30. Hone, J., et al., "Quantized phonon spectrum of single-wall carbon nanotubes", *Science* **289**, 1730-1733 (2000).