

James T. Teherani

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Updated April 2019

Field of specialization

semiconductor device physics;
modeling, simulation, and nanoscale fabrication of electronic devices built from 2D materials

Education

Massachusetts Institute of Technology	GPA 5.0/5.0	
PhD Electrical Engineering and Computer Science		2015
Thesis: <i>Fundamental Limits of the Switching Abruptness of Tunneling Transistors</i>		
Advisors: Prof. Judy Hoyt and Prof. Dimitri Antoniadis		
S.M. Electrical Engineering and Computer Science		2010
Thesis: <i>Band-to-band Tunneling in Silicon Diodes and Tunnel Transistors</i>		
Advisors: Prof. Judy Hoyt and Prof. Dimitri Antoniadis		
The University of Texas at Austin	GPA 4.0/4.0	
B.S. Electrical and Computer Engineering, Highest Honors		2008

Professional Experience

Columbia University		2015 – present
<i>Assistant Professor in the Department of Electrical Engineering</i>		
MIT Department of Electrical Engineering and Computer Science		2015
<i>Postdoctoral associate. Advisor: Prof. Antoniadis</i>		
MIT Department of Electrical Engineering and Computer Science		2008 – 2015
<i>Semiconductor device physics graduate researcher. Advisors: Prof. Hoyt and Prof. Antoniadis</i>		
IBM Research, T. J. Watson Research Center, Yorktown Heights, New York		2009
<i>Device physics intern. Advisor: Dr. Paul Solomon</i>		
DRS Infrared Technologies, Dallas, Texas		2005, 2007
<i>Engineering intern. Advisor: Jeffrey Beck</i>		

Courses Taught

<i>ELEN E3106: Solid-state Devices and Materials</i>		Fall 2018
37 students; student evaluations: course 3.95/5, instructor 4.05/5		
<i>ELEN E6333: Semiconductor Device Physics</i>		Fall 2018
12 students; student evaluations: course 4.63/5, instructor 4.63/5		

<i>ELEN E6333: Semiconductor Device Physics</i>	Fall 2017
12 students; student evaluations: course 4.93/5, instructor 5.00/5	
<i>ELEN E9301: TPC: Theory and Practice of Device Scaling (co-taught with Prof. Theis)</i>	Spring 2017
25 students; student evaluations: course 4.94/5, instructor 4.92/5	
<i>ELEN E4301: Introduction to Semiconductor Devices</i>	Fall 2016
44 students; student evaluations: course 4.69/5, instructor 4.85/5	
<i>Electrical Engineering Lab for ENGI E1102: The Art of Engineering</i>	Spring 2016
~30 students; student evaluations: course 4.08/5, instructor 4.67/5	
<i>ELEN E4301: Introduction to Semiconductor Devices</i>	Fall 2015
16 students; student evaluations: course 4.94/5, instructor 4.75/5	
<i>ELEN E3106: Solid-state Devices and Materials (co-taught with Prof. Kymissis)</i>	Fall 2015
24 students; student evaluations: course 4.13/5, instructor 4.50/5	
<i>Electrical Engineering Lab for ENGI E1102: The Art of Engineering</i>	Fall 2015
~30 students; student evaluations unavailable	

Supervised Research

MS/PhD

Abhinandan Borah, <i>Modeling Charge in Low DOS Systems</i>	2016 – present
Ankur Nipane, <i>Electrostatics of Low Dimensional Junctions</i>	2016 – present
Xinyi Xu (co-advised with P. J. Schuck, <i>Mechanical Engineering</i>)	2018 – present
Anjaly Thekkevilayil Rajendran (co-advised with J. Hone, <i>Mechanical Engineering</i>)	2019 – present

Postdoctoral Associates

Minsup Choi (co-advised with Prof. Hone)	2017 – present
Younghun Jung (co-advised with Prof. Hone)	2016 – 2019

MS

Jiazhang Wang	2018 – 2019
Punnu Jose Sebastian, <i>Fabrication of Encapsulated van der Waals Structures</i>	2017 – 2018
Sirisha Jayanti, <i>Calculation of Potential Across Non-ideal PN Junctions</i>	2017
Tian Sun, <i>Large Field Electromagnet for Electronic Test Set</i>	2017

Undergraduate

Adina Bechhofer, junior, Columbia Electrical Engineering	2018 – present
Alice Wu, junior, Columbia Electrical Engineering	2018 – present
Zhenguo Wu, junior, Columbia Electrical Engineering	2018 – present
Andrew Murphy, senior, Columbia Physics	2018 – present
Jakub Ostrowski, junior, Columbia Electrical Engineering	2018
Joshua Polanco Calderon, sophomore, Columbia SEAS	2018
Leslie Ortiz, junior, Barnard Physics	2018
Rebecca Murray, <i>Numerical Modeling of Auger Generation</i>	2016

Visiting students

Myeongjun Lee, visiting PhD student from SKKU, Korea	2019 – present
Marco Fratus, MS student from KTH Sweden/Politecnico di Milano	2016 – 2018
Yefei Zhang, MS/PhD student from Xi'an Jiaotong University	2016 – 2018
Jiayue Li, MS student from Nanjing University	2016 – 2017
Rui Ding, undergraduate from University of Science and Technology of China	2016

Thesis Committees

Committee member

Changjian Julia Zhang, PhD in Mechanical Engineering	2018
Charishma Puliyaanda Subbaiah, PhD in Electrical Engineering	2018
Hyungsik Kim, PhD in Electrical Engineering <i>Unconventional CVD Graphene and α-MoO₃ Electronics for Very Large Scale Integration (VLSI)</i>	2017
Scott Trocchia, PhD in Electrical Engineering <i>Single-molecule Carbon Nanotube Field-effect Transistors for Genomic Applications</i>	2017
Amrita Masurkar, PhD in Electrical Engineering <i>Charge Injection and Transport in Pentacene Field-Effect Transistors</i>	2016
Tarun Chari, PhD in Electrical Engineering <i>Optimization Studies in Graphene Electronics</i>	2016
Daniel Chenet, PhD in Mechanical Engineering <i>2D Materials: Synthesis, Characterization, and Applications</i> , joined Intel	2016

Publications

(by convention, PI is typically listed last)

J. T. Teherani, "(Invited) Orientation Dependence of the Hole Ballistic Velocity in Si, SiGe, and Ge Thin-Body Structures with Uniaxial Compressive Strain," *ECS Fall Meeting*, Cancun, Mexico, 2018, vol. MA2018-02, pp. 1017–1017. <http://ma.ecsdl.org/content/MA2018-02/31/1017>

J. T. Teherani, "The Auger FET: a Novel Device Concept for Subthermal Switching," *IEEE 2nd Electron Devices Technology and Manufacturing Conference (EDTM)*, 2018, pp. 208–210. <https://doi.org/10.1109/EDTM.2018.8421442>

A. Nipane, Y. Zhang, and J. T. Teherani, "Role of out-of-plane dielectric thickness in the electrostatic simulation of atomically thin lateral junctions," *Journal of Applied Physics*, vol. 123, no. 21, p. 214302, Jun. 2018. <https://doi.org/10.1063/1.5027520>

A. Nipane, S. Jayanti, A. Borah, and J. T. Teherani, "Erratum: 'Electrostatics of lateral p-n junctions in atomically thin materials,'" *Journal of Applied Physics*, vol. 124, no. 13, p. 139902, Oct. 2018.

<https://doi.org/10.1063/1.5051548>

Y. Jung, M. S. Choi, A. Borah, A. Nipane, W. J. Yoo, J. Hone, and J. T. Teherani, "Reliable High-Quality Metal-Embedded h-BN Contacts to p-type WSe₂," *76th Device Research Conference (DRC)*, 2018, pp. 1–2.

<https://doi.org/10.1109/DRC.2018.8442181>

M. S. Choi, Y. Jung, D. Rhodes, B. Kim, J. T. Teherani, J. Hone, and W. J. Yoo, "Study of Contact Properties for Semiconducting TMDCs Using Via Contacts Embedded in h-BN," *Bulletin of the American Physical Society*, Los Angeles, California, 2018. <http://meetings.aps.org/Meeting/MAR18/Session/T60.169>

A. Borah, P. J. Sebastian, A. Nipane, and J. T. Teherani, "An Intuitive Equivalent Circuit Model for Multilayer Van Der Waals Heterostructures," *IEEE Transactions on Electron Devices*, vol. 65, no. 10, pp. 4209–4215, Oct. 2018.

<https://doi.org/10.1109/TED.2018.2851920>

J. T. Teherani, "A Comprehensive Theoretical Analysis of Hole Ballistic Velocity in Si, SiGe, and Ge: Effect of Uniaxial Strain, Crystallographic Orientation, Body Thickness, and Gate Architecture," *IEEE Transactions on Electron Devices*, vol. 64, no. 8, pp. 3316–3323, Aug. 2017. <https://doi.org/10.1109/TED.2017.2708691>

A. Nipane, S. Jayanti, A. Borah, and J. T. Teherani, "Electrostatics of lateral p-n junctions in atomically thin materials," *Journal of Applied Physics*, vol. 122, no. 19, p. 194501, Nov. 2017.

<https://doi.org/10.1063/1.4994047>

A. Kerelsky, A. Nipane, D. Edelberg, D. Wang, X. Zhou, A. Motmaendadgar, H. Gao, S. Xie, K. Kang, J. Park, J. T. Teherani, and A. Pasupathy, "Absence of a Band Gap at the Interface of a Metal and Highly Doped Monolayer MoS₂," *Nano Lett.*, Sep. 2017. <https://doi.org/10.1021/acs.nanolett.7b01986>

A. Kerelsky, A. Nipane, D. Edelberg, D. Wang, M. Cheng, A. Dadgar, H. Gao, K. Kang, J. Park, J. T. Teherani, and A. Pasupathy, "Band Structure Evolution in Vertically Contacted MoS₂ Probed Using Scanning Tunneling Spectroscopy," *Bulletin of the American Physical Society*, New Orleans, Louisiana, 2017, vol. Volume 62, Number 4. <http://meetings.aps.org/Meeting/MAR17/Session/L32.12>

A. Borah and J. T. Teherani, "Electrostatic Properties Simulation of Layered 2D Material Devices," *nanohub.org*, 2017. <https://doi.org/10.21981/D3C24QQ39>

J. T. Teherani, S. Agarwal, W. Chern, P. M. Solomon, E. Yablonovitch, and D. A. Antoniadis, "Auger generation as an intrinsic limit to tunneling field-effect transistor performance," *Journal of Applied Physics*, vol. 120, no. 8, p. 084507, Aug. 2016. <https://doi.org/10.1063/1.4960571>

J. T. Teherani, "(Talk) Auger Generation as an Intrinsic Limit to Tunneling Field-Effect Transistor Performance," *nanohub.org*, 2016. <https://nanohub.org/resources/24982>

J. T. Teherani, "Fundamental limits of the switching abruptness of tunneling transistors," Thesis, Massachusetts Institute of Technology, 2015. <https://doi.org/1721.1/99853>

J. T. Teherani, W. Chern, S. Agarwal, J. L. Hoyt, and D. A. Antoniadis, "A framework for generation and recombination in tunneling field-effect transistors," *Fourth Berkeley Symposium on Energy Efficient Electronic Systems (E3S)*, 2015, pp. 1–3. <https://doi.org/10.1109/E3S.2015.7336797>

T. Yu, J. T. Teherani, D. A. Antoniadis, and J. L. Hoyt, "Effects of substrate leakage and drain-side thermal barriers in In_{0.53}Ga_{0.47}As/GaAs_{0.5}Sb_{0.5} quantum-well tunneling field-effect transistors," *Appl. Phys. Express*, vol. 7, no. 9, p. 094201, Sep. 2014. <https://doi.org/10.7567/APEX.7.094201>

J. T. Teherani, W. Chern, D. A. Antoniadis, and J. L. Hoyt, "Ultra-Thin, High Quality HfO₂ on Strained-Ge MOS Capacitors with Low Leakage Current," *ECS Trans.*, vol. 64, no. 6, pp. 267–271, Aug. 2014. <https://doi.org/10.1149/06406.0267ecst>

J. T. Teherani, "Uniaxial and Biaxial Stress/Strain Calculator for Semiconductors," *nanohub.org*, 2014. <https://doi.org/10.4231/D33F4KN4J>

W. Chern, P. Hashemi, J. T. Teherani, D. A. Antoniadis, and J. L. Hoyt, "Record Hole Mobility at High Vertical Fields in Planar Strained Germanium on Insulator With Asymmetric Strain," *IEEE Electron Device Letters*, vol. 35, no. 3, pp. 309–311, Mar. 2014. <https://doi.org/10.1109/LED.2014.2300197>

S. Agarwal, J. T. Teherani, J. L. Hoyt, D. A. Antoniadis, and E. Yablonovitch, "Engineering the Electron-Hole Bilayer Tunneling Field-Effect Transistor," *IEEE Transactions on Electron Devices*, vol. 61, no. 5, pp. 1599–1606, May 2014. <https://doi.org/10.1109/TED.2014.2312939>

T. Yu, J. T. Teherani, D. A. Antoniadis, and J. L. Hoyt, "InGaAs/GaAsSb Quantum-Well Tunnel-FETs With Tunable Backward Diode Characteristics," *IEEE Electron Device Letters*, vol. 34, no. 12, pp. 1503–1505, 2013. <https://doi.org/10.1109/LED.2013.2287237>

J. T. Teherani, T. Yu, D. A. Antoniadis, and J. L. Hoyt, "Electrostatic design of vertical tunneling field-effect transistors," *Third Berkeley Symposium on Energy Efficient Electronic Systems (E3S)*, 2013, pp. 1–2. <https://doi.org/10.1109/E3S.2013.6705872>

J. T. Teherani and J. L. Hoyt, "A Physically-Intuitive Method for Calculation of the Local Lattice Constant from a High-Resolution Transmission Electron Microscopy Image by Fourier Analysis," *arXiv*, Sep. 2013. <http://arxiv.org/abs/1309.3155>

J. T. Teherani, W. Chern, D. A. Antoniadis, and J. L. Hoyt, "Simulation of enhanced hole ballistic velocity in asymmetrically strained Germanium nanowire trigate p-MOSFETs," *IEEE International Electron Devices Meeting (IEDM)*, 2013, pp. 32.4.1-32.4.4. <https://doi.org/10.1109/IEDM.2013.6724737>

J. T. Teherani, S. Agarwal, E. Yablonovitch, J. L. Hoyt, and D. A. Antoniadis, "Impact of Quantization Energy and Gate Leakage in Bilayer Tunneling Transistors," *IEEE Electron Device Letters*, vol. 34, no. 2, pp. 298–300, Feb. 2013. <https://doi.org/10.1109/LED.2012.2229458>

J. T. Teherani, "TEM Lattice Calculator," *nanohub.org*, 2013. <https://doi.org/10.4231/D3VQ2S96B>

- S. Agarwal, J. T. Teherani, J. L. Hoyt, D. A. Antoniadis, and E. Yablonovitch, "Optimization of the electron hole bilayer tunneling field effect transistor," *71st Device Research Conference (DRC)*, 2013, pp. 109–110. <https://doi.org/10.1109/DRC.2013.6633817>
- J. T. Teherani, W. Chern, D. A. Antoniadis, J. L. Hoyt, L. Ruiz, C. D. Poweleit, and J. Menéndez, "Extraction of large valence-band energy offsets and comparison to theoretical values for strained-Si/strained-Ge type-II heterostructures on relaxed SiGe substrates," *Phys. Rev. B*, vol. 85, no. 20, p. 205308, May 2012. <https://doi.org/10.1103/PhysRevB.85.205308>
- P. Hashemi, W. Chern, H. Lee, J. T. Teherani, Y. Zhu, J. Gonsalvez, G. G. Shahidi, and J. L. Hoyt, "Ultrathin Strained-Ge Channel P-MOSFETs With High-K/Metal Gate and Sub-1-nm Equivalent Oxide Thickness," *IEEE Electron Device Letters*, vol. 33, no. 7, pp. 943–945, Jul. 2012. <https://doi.org/10.1109/LED.2012.2195631>
- W. Chern, P. Hashemi, J. T. Teherani, T. Yu, Y. Dong, G. Xia, D. A. Antoniadis, and J. L. Hoyt, "High mobility high-K-all-around asymmetrically-strained Germanium nanowire trigate p-MOSFETs," *IEEE International Electron Devices Meeting (IEDM)*, 2012, pp. 16.5.1-16.5.4. <https://doi.org/10.1109/IEDM.2012.6479055>
- P. M. Solomon, I. Lauer, A. Majumdar, J. T. Teherani, M. Luisier, J. Cai, and S. J. Koester, "Effect of Uniaxial Strain on the Drain Current of a Heterojunction Tunneling Field-Effect Transistor," *Electron Device Letters, IEEE*, vol. 32, no. 4, pp. 464–466, 2011. <https://doi.org/10.1109/LED.2011.2108993>
- J. T. Teherani, "Band-to-band tunneling in silicon diodes and tunnel transistors," Thesis, MIT, Cambridge, MA, USA, 2010. <https://doi.org/1721.1/60215>
- P. Hashemi, J. T. Teherani, and J. L. Hoyt, "Investigation of hole mobility in gate-all-around Si nanowire p-MOSFETs with high-K/metal-gate: Effects of hydrogen thermal annealing and nanowire shape," *IEEE International Electron Devices Meeting (IEDM)*, 2010, pp. 34.5.1-34.5.4. <https://doi.org/10.1109/IEDM.2010.5703477>
- J. Beck, R. Scritchfield, B. Sullivan, J. T. Teherani, C.-F. Wan, M. Kinch, M. Ohlson, M. Skokan, L. Wood, P. Mitra, M. Goodwin, and J. Robinson, "Performance and modeling of the MWIR HgCdTe electron avalanche photodiode," *Proceedings of the SPIE*, 2009, vol. 7298, pp. 729838-729838–17. <https://doi.org/10.1117/12.819045>
- J. Beck, R. Scritchfield, B. Sullivan, J. T. Teherani, C.-F. Wan, M. Kinch, M. Ohlson, M. Skokan, L. Wood, P. Mitra, M. Goodwin, and J. Robinson, "Performance and Modeling of the MWIR HgCdTe Electron Avalanche Photodiode," *Journal of Elec Materi*, vol. 38, no. 8, pp. 1579–1592, Aug. 2009. <https://doi.org/10.1007/s11664-009-0684-8>
- H. F. Schaake, M. A. Kinch, D. Chandra, F. Aqariden, P. K. Liao, D. F. Weirauch, C.-F. Wan, R. E. Scritchfield, W. W. Sullivan, J. T. Teherani, and H. D. Shih, "High-Operating-Temperature MWIR Detector Diodes," *Journal of Elec Materi*, vol. 37, no. 9, pp. 1401–1405, Sep. 2008. <https://doi.org/10.1007/s11664-008-0423-6>

Grants

Current

Sponsor: National Science Foundation

Title: CAREER: Exploiting Many-Particle Physics for Low-Energy Nanoelectronics

Lead PI: J. Teherani

Total Amount: \$500,000

Award Period: 2/15/2018 – 1/31/2023

Location: Columbia University

Sponsor: National Science Foundation

Title: Collaborative Research: REU Site: Nano-NY

Lead PI: I. Kymissis (Columbia University)

Total Amount: \$372,997

Award Period: 4/1/2018 – 3/31/2020

Location: Columbia University

Awards and Honors

Edward and Carole Kim Faculty Involvement Award — for excellent teaching and service to students	2018
National Science Foundation CAREER Award	2018
National Science Foundation Graduate Fellowship	2010 – 2015
George E. Smith Award (best paper in IEEE Electron Device Letters journal)	2014
NSF Center for Energy Efficient Electronics Science Leadership Award	2014
National Defense Science and Engineering Graduate Fellowship (NDSEG)	2010 – 2013
National Nanotechnology Infrastructure Network (NNIN) International Winter School Fellow	2011
Purdue University, Network for Computation Nanotechnology Summer School Scholarship	2011
University of Texas, Engineering Foundation Undergraduate Endowed Presidential Scholarship	2007
University of Texas, B. N. Gafford Scholarship in Electrical and Computer Engineering	2006
DRS Technologies Academic Scholarship	2006

Invited Talks

The 7th SKKU Workshop on Materials Frontier Research (Topics on Atomically Engineered Materials and Processing) <i>Transferred via contacts as a device platform for ideal 2D transistors</i>	2019
IEEE 2nd Electron Devices Technology and Manufacturing Conference (EDTM) <i>The Auger FET: a Novel Device Concept for Subthermal Switching</i>	2018
The Electrochemical Society Fall Meeting <i>Orientation Dependence of the Hole Ballistic Velocity in Si, SiGe, and Ge Thin-Body Structures with Uniaxial Compressive Strain</i>	2018
IEEE S3S (SOI-3D-Subthreshold) Microelectronics Technology Unified Conference <i>Optimization of Intrinsic Auger-Assisted Tunneling of TFETs with Steep Subthreshold Slopes</i>	2018

USC Department of Electrical Engineering <i>Auger Generation as an Intrinsic Mechanism Limiting Tunneling Field-Effect Transistor Performance</i>	2018
The 27 th Connecticut Symposium on Microelectronics & Optoelectronics (CMOC) <i>The Unique Electrostatics of Vertical Junctions to 2D Materials</i>	April 2018
2018 IEEE Electron Devices Technology and Manufacturing (EDTM) Conference <i>The Auger FET: a Novel Device Concept for Subthermal Switching</i>	March 2018
University of Texas at Austin <i>Auger generation as an intrinsic limit to tunneling field-effect transistor performance</i>	Feb. 2017
Massachusetts Institute of Technology, Microsystems Tech. Annual Research Conference <i>Opportunities after Graduate School</i>	Jan. 2017
Steep Slope Workshop at École Polytechnique Fédérale de Lausanne <i>Auger generation as an intrinsic limit to tunneling field-effect transistor performance</i>	Sept. 2016
IBM T. J. Watson Research Center <i>Auger generation as an intrinsic limit to tunneling field-effect transistor performance</i>	Aug. 2016
DRS Infrared Technologies <i>Auger generation as an intrinsic limit to tunneling field-effect transistor performance</i>	July 2016
Purdue University <i>Auger generation as an intrinsic limit to tunneling field-effect transistor performance</i>	June 2016
University of Notre Dame <i>Auger Generation as a Fundamental Limit to the Off-state of TFETs</i>	Feb. 2016

Service

University Service

Faculty Advisor, Columbia University Society of Hispanic Professional Engineers (SHPE)	2018 – present
Faculty Advisor, Columbia University Amateur Radio Club	2018 – present
Faculty Advisor, Columbia University Society of Women Engineers (SWE)	2016 – present
Department of Electrical Engineering Undergraduate Committee	2015 – present
Department of Electrical Engineering Curriculum/COI Committee	2018 – present
Department of Electrical Engineering Undergraduate Advising Committee Chair	2018 – present
Department of Electrical Engineering ABET Committee	2018 – present
Department of Electrical Engineering PhD Defense Qualifying Exam (DQE) Committee	2018 – present
Department of Electrical Engineering Distinguished Lectures Committee	2018 – present

Service to the Discipline

Nanotechnology Committee Member, IEEE Electron Device Society (EDS)	2017 – present
Technical Program Committee Member, Device Research Conference	2018 – present
Editor, IEEE Transactions on Electron Devices, Special Issue on 2D Materials for Electronic, Optoelectronic and Sensor Devices	2017 – 2018
Review Panelist, Department of Defense National Defense Science and Engineering Graduate (NDSEG) Fellowship	2017, 2018, 2019

Public Outreach

Educational Outreach Video, Building at the Nanoscale: Part 01 , 2D and 3D materials	2019
Educational Outreach Video, Building at the Nanoscale: Part 02 , how to build structures from atomically thin 2D materials	2019
Outreach talk on graduate school opportunities to the Society of Hispanic Engineers	2019
Lab tour and outreach seminar to 50 students from Corpus Christi school (7th and 8th graders)	2019
Seminar on “Graduate Education and Careers” to annual EngAGE program, which targets prospective graduate students from underrepresented backgrounds	2019
Girl Scouts lab tour and outreach seminar through the Society of Women Engineers (middle school)	2018
Summer@SEAS seminar on life beyond undergraduate education	2018
MRSEC REU Seminar, “What is Grad School All About?”	2018
STEM workshop for students from the Bronx Center for Science and Mathematics	2018
Columbia Engineering Outreach Programs, Inside Engineering	
<i>Central Park East II, Manhattan, New York</i>	2018
<i>Mott Hall II Middle School, Manhattan, New York</i>	2018
<i>John Ericsson Middle School, Brooklyn, New York</i>	2018
<i>Mott Hall II Middle School, Manhattan, New York</i>	2017
<i>Mott Hall II Middle School, Manhattan, New York (second visit)</i>	2017
<i>Scholars' Academy, Queens, New York</i>	2016
<i>Lower East Side Preparatory High School, Manhattan, New York</i>	2016
<i>Mott Hall II Middle School, Manhattan, New York</i>	2016
<i>Bayside High School, Bronx, New York</i>	2016
MakeCU Hardware Hackathon, Faculty Judge	2018
SAT Physics Workshop for Students from <i>Bronx Center for Science and Mathematics</i>	2018
Columbia Engineering Achievers in Graduate Education (EngAGE), diversity recruitment <i>Lecture on Graduate Education and Research</i>	2017, 2018
Society of Women Engineers, Faculty Panel on Research and Career Opportunities	2017
Educational Outreach Video, Is Moore’s Law Ending?	2017
Society of Women Engineers, Engineering Exploration Experience, <i>Electricity from our Bare Hands</i>	2017
GOALS (Greater Opportunities Advancing Leadership and Science) for Girls	2016
Society of Women Engineers, Engineering Exploration Experience, <i>How Computer Chips Work</i>	2016
MakeCU Hardware Hackathon, <i>How to Hack Like An Engineer</i>	2016
Science & Engineering Expo at the School at Columbia, <i>How to Make Computer Chips</i>	2016
Society of Women Engineering, Panel on Undergraduate Research	2015
MIT+K12 Videos, What is a Semiconductor?	2015
<i>Video creator and actor</i> , Engaging, entertaining, and educational STEM video with 300,000 views	

- MIT+K12 Videos, [How Computers Compute](#) 2014
Video creator and actor, Engaging, entertaining, and educational STEM video with **30,000 views**
- MIT Online Science, Technology, and Engineering Community (MOSTEC) 2013, 2014
Guest lecturer, STEM enrichment lecture to inspire underserved high school seniors
- MIT Educational Studies Program, Spark 2013
Teacher, taught Saturday classes to ~100 students middle school students on computer chip fabrication
- MIT Minority Introduction to Engineering and Science (MITES) 2012
Guest lecturer, STEM program serving under-represented high school juniors
- MIT+K12 and Khan Academy, [Series and Parallel Circuits: A Water Analogy](#) 2012
Video and experiment creator and actor, demonstration of different types of circuits with **14,000 views**
- Cambridge Science Festival IDEAS Competition 2012
Mentor, advised team in local green technologies competition
- MIT Society of Women Engineers, Women in Science & Engineering Program (WiSE) 2012
Guest lecturer, STEM outreach to inspire young women
- MIT Society of Women Engineers, Keys to Empowering Youth 2010
Guest lecturer, engineering outreach to middle school girls
- University of Texas, UTeach Outreach 2006 – 2007
Teacher, taught a weekly hands-on science unit to four local elementary school classrooms
- University of Texas, Student Engineers Educating Kids (SEEK) 2006
Mentor, academic weekly mentor to students from disadvantaged middle schools