Center Publications

Updated February 6, 2019

1a. Publications

1ai. Peer Reviewed

Journal Articles Published *(chronological)*

1. T. Stewart, A. Nagesetti, R. Guduru, E. Stimphil, A. Hadjikhani, L. Salgueiro, P. Liang, J. Horstmyer, A. Schally, and **S. Khizroev**, "Magnetoelectric nanoparticles to deliver and release anti-tumor peptide into glioblastoma cells across blood-brain barrier via external application of d.c. and a.c. magnetic fields," *Nanomedicine (London)*, vol. 13, pp. 423-438, Feb 2018.
2. B. Osoba, B. Saha, S. F. Almeida, J. Patil, L. E. Brandt, M. E. D. Roots, E. Acosta, **J. Wu** and **T.-J. K. Liu**, "Variability study for low-voltage micro-electro-mechanical relay operation," *IEEE Transactions on Electron Devices*, Vol. 65, No. 4, pp. 1529 - 1534, Feb 2018.
3. Y. Chen, S. Huang, X. Ji, K. Adepalli , K. Yin, X. Ling, X. Wang , J. Xue, M. Dresselhaus, **J. Kong** and B. Yildiz, "Tuning Electronic Structure of Single Layer MoS2 through Defect and Interface Engineering", *ACS Nano*, vol. 12, pp. 2569–2579, Feb 2018.
4. J. Hong, M. Stone, B. Navarette, K. Luongo, Z. Yuan, K. Xia, N. Xu, **J. Bokor**, L. You and **S. Khizroev**, "3D multilevel spin transfer toque devices," *Appl. Phys. Lett.*, vol. 112, pp. 112402, Mar 2018.
5. R. Lo Conte, Z. Xiao, C. Chen, C. V. Stan, J. Gorchon, A. El-Ghazaly, M. E. Nowakowski, H. Sohn, A. Pattabi, A. Scholl, N. Tamura, A. Sepulveda, G. P. Carman, R. N. Candler and **J. Bokor**, "Influence of Nonuniform Micron-Scale Strain Distributions on the Electrical Reorientation of Magnetic Microstructures in a Composite Multiferroic Heterostructure," *Nano Lett.*, vol. 18, pp. 1952-1961, Mar 2018.
6. X. Zhao, A. Vardi and **J. A. del Alamo**, "Excess Off-State Current In InGaAs FinFETs." *IEEE Electron Device Letters*, Vol. 39, No. 4, pp. 476-479, Apr 2018.
7. B. V. Senkovskiy, D. U. Usachov, A. V. Fedorov, D. Haberer, N. Ehlen, **F. R. Fischer** and A. Grüneis, "Finding the Hidden Valence Band of N = 7 Armchair Graphene Nanoribbons with Angle-Resolved Photoemission Spectroscopy," *2D Mater.*, vol. *5*, pp. 035007, Apr 2018.
8. K. Dong, H. S. Choe, X. Wang, H. Liu, B. Saha, C. Ko, Y. Deng, K. Tom, S. Lou, Z. You, J. Yao and **J. Wu**, "0.2-Volt microelectromechanical switch enabled by a phase transition," *Small*, vol. 14, pp. 1703621, Apr 2018.
9. Z. Pedramrazi, C. Chen, F. Zhao, T. Cao, G. Nguyen, A. Omrani, H.-Z. Tsai, R. Cloke, T. Marangoni, D. Rizzo, T. Joshi, C. Bronner, W. Choi, **F. R. Fischer**, **S. G. Louie** and M. F. Crommie, "Concentration Dependence of Dopant Electronic Structure in Bottom-Up Graphene Nanoribbons," *Nano Lett.*, vol. 18, pp. 3550-3556, May 2018.
10. Y. Gao, A. J. Goodman, P.-C. Shen, **J. Kong** and W. A. Tisdale, "Phase-Modulated Degenerate Parametric Amplification Microscopy," *Nano Lett.*, vol. 18, pp. 5001-5006, Jun 2018.
11. B. V. Senkovskiy, D. Y. Usachov, A. V. Fedorov, T. Marangoni, D. Haberer, C. Tresca, G. Profeta, V. Caciuc, S. Tsukamoto, N. Atodiresei, N. Ehlen, C. Chen, J. Avila, M. C. Asensio, A. Varykhalov, A. Nefedov, C. Wöll, T. K. Kim, M. Hoesch, **F. R. Fischer** and A. Grüneis, "Boron-Doped Graphene Nanoribbons: Electronic Structure and Raman Fingerprint," *ACS Nano*, vol. 12, pp. 7571–7582, Jul 2018.
12. K. Yin, S. Huang, X. Chen, X. Wang, **J. Kong**, Y. Chen, J. Xue "Generating Sub-nanometer Pores in Single-Layer MoS2 by Heavy-Ion Bombardment for Gas Separation: A Theoretical Perspective," *ACS Appl. Mater. Interfaces*, vol. 10, pp. 28909-28917, Jul 2018.

13. M. S. Eggleston, S. B. Desai, K. Messer, S. A. Fortuna, S. Madhvapathy, J. Xiao, X. Zhang, **E. Yablonovitch**, **A. Javey** and **M. C. Wu**, "Ultrafast Spontaneous Emission from a Slot-Antenna Coupled WSe2 Monolayer," *ACS Photonics*, vol. 5, no. 7, pp. 2701–2705, Jul 2018.
14. D. J. Rizzo, G. Veber, T. Cao, C. Bronner, T. Chen, F. Zhao, H. Rodriguez, **S. G. Louie**, M. F. Crommie and **F. R. Fischer**, "Topological band engineering of graphene nanoribbons," *Nature*, vol. 560, pp. 204-208, Aug 2018.
15. R. Guduru, P. Liang, M. Yousef, J. Horstmyer, and **S. Khizroev**, "Electric field mapping of the brain with magnetoelectric nanoparticles," *Bioelectr. Med.*, vol. 4, pp.10, Aug 2018.
16. J. Hong, K. Dong, **J. Bokor**, and L. You, "Self-assembled single-digit nanometer memory cells," *Appl. Phys. Lett.*, vol. 113, p. 062404, Aug 2018.
17. Z. Gao, Q. Ji, P.-C. Shen, Y. Han, W. S. Leong, N. Mao, L. Zhou, C. Su, J. Niu, X. Ji, M. M. Goulamaly, D. A. Muller, Y. Li and **J. Kong**, "In-situ Generated Volatile Precursor for CVD Growth of a Semimetallic 2D Dichalcogenide," *ACS Appl. Mater. Interfaces*, vol. 10, pp. 34401–34408, Sep 2018.
18. W. S. Leong, Q. Ji, N. Mao, Y. Han, H. Wang, A. J. Goodman, C. Su, Y. Guo, P.-C. Shen, Z. Gao, D. A. Muller, W. A. Tisdale and **J. Kong**, "Synthetic Lateral Metal-Semiconductor Heterostructures of Transition Metal Disulfides," *J. Am. Chem. Soc.*, vol. 140, pp. 12354–12358, Sep 2018.
19. X. Zhao, C. Heidelberger, **E. A. Fitzgerald**, W. Lu, A. Vardi and **J. A. del Alamo**, "Sub-10-nm-Diameter InGaAs Vertical Nanowire MOSFETs: Ni Versus Mo Contacts," *IEEE Transactions in Electron Devices*, vol. 65, pp. 3762-3768, Sep 2018.
20. N. Sato, F. Xue, R. M. White, C. Bi and **S. X. Wang**, "Two-terminal spin–orbit torque magnetoresistive random access memory," *Nature Electronics*, vol. 1, pp. 508–511, Sep 2018.
21. Y. -L. Lee, F. Zhao, T. Cao, J. Ihm and **S. G. Louie**, "Topological phases in cove-edged and chevron graphene nanoribbons: Geometric structures, Z2 invariants, and junction states," *Nano Lett.*, vol. 18, pp. 7247-7253, Sep 2018.
22. **S. Khizroev**, "Technobiology's Enabler: The Magnetoelectric Nanoparticle," *Cold Spring Harb. Perspect. Med.*, doi: 10.1101/cshperspect.a034207, published online, Oct 2018.
23. P.-C. Shen, Y. Lin, H. Wang, J.-H. Park, W. S. Leong, A.-Y. Lu, T. Palacios and **J. Kong**, "CVD Technology for 2D Materials," *IEEE Transaction on Electronic Devices*, vol. 65, pp. 4040-4052, Oct 2018.
24. J. Lin, X. Zhao, I. Manglano Clavero, D. A. Antoniadis and **J. A. del Alamo**, "A Scaling Study of Excess OFF-State Current in InGaAs Quantum-Well MOSFETs," *IEEE Transactions in Electron Devices*, Jan 2019. (Published Online) DOI: 10.1109/TED.2019.2891751
25. X. Zhang, J. Grajal, U. Radhakrishna, X. Wang, W. Chern, L. Zhou, Y. Lin, P.-C. Shen, X. Ji, X. Ling, A. Zubair, Y. Zhang, H. Wang, M. Dubey, **J. Kong**, M. S. Dresselhaus and T. Palacios, "Two-dimensional MoS2-enabled Rectenna for Ubiquitous Energy Harvesting in the Wi-Fi Band," *Nature*, Jan 2019. (Published Online) DOI: 10.1038/s41586-019-0892-1
26. W. S. Leong, H. Wang, J. Yeo, F. J. Martin-Martinez, A. Zubair, P.-C. Shen, Y. Mao, T. Palacios, M. J. Buehler, J.-Y. Hong and **J. Kong**, "Paraffin-Enabled Graphene Transfer," *Nature Communications*, Jan 2019. (Accepted)

Under Review/Submitted *(alphabetical by 1st author)*

1. Y. Lin, Q. Ma, P.-C. Shen, Y. Bie, A. Liao, B. Han, N. Mao, X. Zhang, X. Ji, Y. Zhang, J. Yin, S. Huang, M. Dresselhaus, P. Jarillo-Herrero, X. Ling, **J. Kong** and T. Palacios, "Asymmetric Hot-Carrier Thermalization and Broadband Photoresponse in Graphene-2D Semiconductor Lateral Heterojunctions," 2018. (Submitted)

2. M. Stone, B. Navarette, K. Luongo, A. Hadjikhani, P. Wang, J. Hong, **J. Bokor** and **S. Khizroev**, "Anomalous magnetoresistance oscillations in magnetic tunneling junctions with embedded magnetic metal nanoparticles," *Appl. Phys. Lett*., 2018. (Submitted)
3. S. K. Vadlamani, S. Agarwal, D. T. Limmer and **E. Yablonovitch**, "Tunnel-FET Switching is Governed by Non-Lorentzian Spectral Line-Shape," *Proceedings of the IEEE*, 2018. (Submitted)
4. A. Vidaña, **D. Zubia**, M. Martinez, E. Acosta, J. Mireles Jr., **T.-J. K. Liu**, S. Almeida, "Conductivity modulation in strained transition-metal-dichalcogenides via micro-electro-mechanical actuation," *Semiconductor Science and Technology*, 2018. (Submitted)
5. J. Hong, T. Yang, A. N'Diaye, **J. Bokor** and L. You, "Effects of interface induced natural strains on magnetic properties of FeRh," *Nanomaterials*, 2019. (Submitted)
6. M. Stone, B. Navarette, R. Guduru, K. Luongo, A. Hadjikhani, D. Toledo, Y. Emirov, B. Arkook, P. Liang, J. Hong, **J. Bokor** and **S. Khizroev**, "Nanomagnetic Particle-based Information Processing," *Transactions on Nanotechnology*, 2018. (Submitted)
7. J. Hong, H.-N. Hwang, A. T. N'Diaye, J. Liang, G. Chen, Y. Park, L. T. Singh, Y. G. Jung, J.-H. Yang, J.-I. Jeong, A. K. Schmid, E. Arenholz, H. Yang, **J. Bokor**, C.-C. Hwang and L. You, "The interfacial spin modulation of graphene on Fe(111)," *Proc. Nat. Acad. Sci.*, 2019. (Submitted)
8. A. El-Ghazaly, B. Tran, A. Ceballos, C.-H. Lambert, A. Pattabi, **S. Salahuddin**, F. Hellman and **J. Bokor**, "Ultrafast Magnetization Switching in Nanoscale Magnetic Dots," *Appl. Phys. Lett.*, 2019 (Submitted)
9. X. Zhao, A. Vardi and **J. A. del Alamo**, "Fin-Width Scaling of Highly-Doped InGaAs Fins," *IEEE Transactions on Electron Devices*, 2019. (Submitted)
10. X. Zhao, A. Vardi and **J. A. del Alamo**, "Excess OFF-State Current in InGaAs FinFETs: Physics of the Parasitic Bipolar Effect," *IEEE Transactions on Electron Devices*, 2019. (Submitted)
11. K. Han, G. H. Ahn, J. Cho, D.-H. Lien, M. Amani, S. B. Desai, G. Zhang, H. Kim, N. Gupta, **A. Javey** and **M. C. Wu**, "Bright electroluminescence in ambient conditions from WSe2 p-n diodes using pulsed injection," *Science Advances*, 2019. (Submitted)

Conference Proceedings: Major Conferences *(chronological)*

1. S. Kim, P. Zheng, K. Kato, L. Rubin, **T.-J. K. Liu**, "Cost-Efficient Sub-lithographic Patterning with Tilted-Ion Implantation (TII)," *International Symposium on VLSI Technology, Systems, and Applications (2018 VLSI-TSA)*, Hsinchu, Taiwan, Apr 2018.
2. A. El-Ghazaly, C. H. Lambert, B. Tran, A. Pattabi, J. Gorchon, **S. Salahuddin**, **H.-S. P. Wong** and **J. Bokor**, "Scaling of All-Optical Switching to Nanometer Dimensions," *IEEE International Magnetics Conference (Intermag)*, Singapore, Apr 2018.
3. J. Hong, O. Lee, K. Dong, **S. Khizroev**, L. You, and **J. Bokor**, "Probe-based Spin Torque Transfer Device for Writing Hard Disks," *IEEE International Magnetic Conference (Intermag)*, Singapore, Apr 2018.
4. K. Han, S. Fortuna, M. Amani, S. Desai, D.-H. Lien, G. H. Ahn, **E. Yablonovitch**, **A. Javey** and **M. C. Wu**, "Bright Electroluminescence from Back-Gated WSe2 P-N Junctions Using Pulsed Injection," *CLEO*, May 2018.
5. N. M. Andrade, S. Hooten, S. A. Fortuna, K. Han, **E. Yablonovitch** and **M. C. Wu**, "Inverse Design for Single-Mode Waveguide Coupling of Electrically Injected Optical Antenna Based NanoLED," *CLEO*, May 2018.
6. S. Hooten, N. Andrade, S. A. Fortuna, K. Han, **M. C. Wu** and **E. Yablonovitch**, "Hybrid Metallo-Dielectric Structure for Spontaneous Emission Enhancement," *CLEO*, May 2018.

7. N. M. Andrade, K. T. Settaluri, S. Fortuna, S. Hooten, K. Han, **E. Yablonovitch**, **V. Stojanović**, **M. C. Wu**, "Optical Antenna NanoLED Based Interconnect Design," *IEEE Photonics Conference*, Reston, VA, Oct 2018.
8. Z. A. Ye, S. Almeida, M. Rusch, A. Perlas, W. Zhang, U. Sikder, J. Jeon, V**. Stojanović** and **T.-J. K. Liu**, "Demonstration of Sub-50 mV digital integrated circuits with microelectromechnical relays," *IEEE International Electron Devices Meeting*, San Francisco, CA, Dec 2018.
9. C. Bi, X. Li and **S. X. Wang**, "Interfacial control of W/CoFeB/MgO multilayers for high-density SOT-MRAM", *IEEE International Electron Devices Meeting*, San Francisco, CA, Dec 2018.
10. F. Niroui, J. Han, M. Saravanapavanantham, **J. H. Lang** and **V. Bulović**, "From nanostructured building blocks to active devices," *IEEE MEMS Workshop*, 2019.

Conference Proceedings: Other Conferences *(chronological)*

1. **J. A. del Alamo**, X. Cai, W. Lu, A. Vardi and X. Zhao, "III-V CMOS: Quo Vadis?" Invited Talk at *Joint International EUROSOI Workshop and International Conference on Ultimate Integration on Silicon (EUROSOI-ULIS 2018)*, Granada, Spain, March 19-21, 2018.
2. **J. A. del Alamo**, X. Cai, W. Lu, A. Vardi and X. Zhao, "III-V CMOS: Quo Vadis?" Invited Talk at *Compound Semiconductor Week (CSW 2018)*, Cambridge, Massachusetts (U.S.), May 29-June 1, 2018.
3. A. Vardi and **J. A. del Alamo**, "Fin-Width Scaling of Highly-Doped InGaAs Fins," *Compound Semiconductor Week (CSW 2018)*, Cambridge, Massachusetts (U.S.), May 29-June 1, 2018.
4. X. Zhao, A. Vardi and **J. A. del Alamo**, "Modeling the Parasitic Bipolar Effect in InGaAs FinFETs," *Compound Semiconductor Week (CSW 2018)*, Cambridge, Massachusetts (U.S.), May 29-June 1, 2018.
5. **L. K. Marlor** and **C. T. Amelink**, "The Development of a Context-based Summer Research Program for Community College Faculty in Science and Engineering," *2018 American Society for Engineering Education Annual Conference & Exposition*, Salt Lake City, UT, June 2018.
6. S. Hooten, N. M. Andrade, S. A. Fortuna, K. Han, **M. C. Wu**, and **E. Yablonovitch**, "Metal-Dielectric Structure for Spontaneous Emission Enhancement of Point Radiation Sources," in *International Nano-Optoelectronics Workshop (iNOW)*, Berkeley, July 2018.
7. K. Han, S. Fortuna, M. Amani, S. Desai, D.-H. Lien, G.H. Ahn, **E. Yablonovitch**, **A. Javey**, **M. C. Wu**, "Pulsed injection of monolayer WSe2 light-emitting diodes," in *International Nano-Optoelectronics Workshop (iNOW)*, Berkeley, July 2018.
8. S. A. Fortuna, C. Heidelberger, N. Andrade, K. Han, S. Hooten, **E. Yablonovitch**, **E. A. Fitzgerald**, **M. C. Wu**, "Fast Spontaneous Emission in a III-V Antenna-LED", *International Nano-Optoelectronics Workshop (iNOW)*, Berkeley, July 2018.
9. C. Bi, N. Sato, R. Cheaito, R. M. White, M. Asheghi, K. E. Goodson and **S. X. Wang**, "Ultrafast 3-Terminal and 2-Terminal MRAM enabled by Spin-Orbit Torque or Thermally Assisted Switching," *2018 IEEE Magnetic Recording Conference (TMRC)*, Western Digital Milpitas Campus. August 9, 2018.
10. S. A. Fortuna, C. Heidelberger, **E. Yablonovitch**, **E. A. Fitzgerald**, **M. C. Wu**, "Nanoscale III-V light emitting diode with antenna-enhanced 250 picosecond spontaneous emission lifetime", *International Semiconductor Laser Conference*, Sante Fe, NM, September, 2018.

11. **J. A. del Alamo**, X. Zhao, W. Lu, A. Vardi and X. Cai, "Nanoscale III-V Electronics: InGaAs FinFETs and Vertical Nanowire MOSFETs," Invited Plenary Talk at *IEEE Nanotechnology Materials and Devices Conference (NMDC)*, Portland, OR, October 14-17, 2018.

1aii. Books and Book Chapters (alphabetized by first author)

1. C. Bi, N. Sato, and **S. X. Wang**, "Spin-orbit torque magnetoresistive random-access memory (SOT-MRAM)," in *Advances in Non-volatile Memory and Storage Technology*, Editors: Y. Nishi and B. Magyari-Köpe, Elsevier, 2018 (in revision).
2. R. O. Tapaloglu and H.-S. P. Wong (eds), "Beyond-CMOS Technologies for Next Generation Computer Design," Springer, 2018.
3. The nanomechanics chapter of E3S e-book has been finished in this period and will be published on nanoHUB.org shortly.

1aiii. Other Non-Peer Reviewed Publications (alphabetized by first author)

1. X. Zhao, W. Lu, A. Vardi and **J. A. del Alamo**, "Shrinking the vertical nanowire MOSFET," *Compound Semiconductor Magazine*, vol. 24 (4), pp. 52-56, June 2018.

1b. Conference Presentations (in alphabetical order)

Talks: *(excluded are period 10 talks that have published proceedings;)*

1. P.-C. Shen, Y. Lin, T. Palacios, and J. Kong, "Unraveling the Effect of Multiple Defect States in Synthetic Monolayer MoS2 Through Electronic and Optical Probes," *APS March Meeting*, Los Angeles, March 5-9, 2018.
2. T. Cao, "Unifying Optical Selection Rules for Excitons in Two Dimensions: Band Topology and Winding Numbers," *2018 American Physical Society (APS) March Meeting*, Los Angeles, California, March 6, 2018.
3. F. Zhao, "Electric Polarization and End States in Boron Nitride Nanoribbons," *2018 American Physical Society (APS) March Meeting*, Los Angeles, California, March 7, 2018.
4. R. Wilson, Y. Yang, J. Gorchon, C.-H. Lambert, S. Salahuddin, and J. Bokor, "Picosecond electrical excitation of ultrafast magnetization dynamics in ferro-and ferrimagnetic metals." *APS March Meeting*, Los Angeles, CA, March 2018.
5. S. G. Louie, "Topological Effects in Atomically Thin One- and Two-Dimensional Semiconductors," *Symposium on Materials Science and Technology toward Energy-Saving Society (MASTES2018)*, Tokyo, Japan, March 12, 2018.
6. J. Bokor, "Novel Approaches for MRAM Speedup," *Lam Research Technical Symposium*, Beijing, China, March 2018.
7. S. G. Louie, "Interaction and Topological Effects in Atomically Thin Two-dimensional Materials," *32nd International Winterschools on Electronic Properties of Novel Materials (IWEPNM2018)*, Kirchberg, Austria, March 22, 2018.
8. J. Wu, "Phase transition materials for microactuation", *MRS Spring Meeting*, Phoenix, AZ, April 2018.

9. T.-J. K. Liu, "Innovation: Key to the Future of Moore's Law," *National Academy of Inventors 2018 Annual Conference*, Washington DC, April 4, 2018.
10. S. G. Louie, "The Fascinating Quantum World of Two-dimensional Materials: Symmetry, Interaction and Topological Effects," *2018 Brazilian Physical Society Meeting*, Foz do Iguacu, Brazil. May 9, 2018.
11. W. Hwang, W. Wan, S. Mitra, and H.-S. P. Wong "Coming Up N3XT, After 2D Scaling of Si CMOS," *IEEE International Symposium on Circuits and Systems (ISCAS)*, Florence, Italy, May 27-30, 2018.
12. V. Stojanovic "Creating Intelligence at the Edge with new materials and device technologies," *AMAT ET Conference*, Las Vegas, NV, June 2018.
13. S. G. Louie, "Interaction and Topological Effects in Atomically Thin 1D and 2D Semiconductors," *Symposium on Practical Quantum Mechanics for Electronic Materials*, Austin, Texas, June 2, 2018.
14. F. Fischer, "Band Engineering and Quantum Confinement Effects in Graphene Nanoribbons" *2nd From Carbon-Rich Molecules to Carbon-Based Materials Conference*, Nassau Bahamas, June 8, 2018.
15. S. G. Louie, "Ab initio quantum studies of excited state phenomena in materials: Interaction and Topological effects," *Symposium on Materials Genome Towards Exascale*, Spetses, Greece, June 12, 2018.
16. H.-S. P. Wong, "The End of the Road for 2D Scaling of Silicon CMOS and the Future of Device Technology," *Device Research Conference (DRC)*, Santa Barbara, CA, June 24-27, 2018.
17. S. G. Louie, "Topological and Interaction Effects in Atomically Thin 1D and 2D Materials," *International Conference on Novel 2D Materials Explored via Scanning Probe Microscopy and Spectroscopy (2DSPM)*, San Sebastian, Spain, June 25, 2018.
18. J. Kong, "Defects in 2D materials," *NT18 Conference*, Beijing, China, July 2018.
19. S. G. Louie, "Symmetry, Interaction and Topological Effects in Atomically Thin 1D and 2D Materials," *20th National Conference on Condensed Matter Theory and Statistical Physics of China*, Chengdu, China, July 15, 2018.
20. S. G. Louie, "Topological and Interaction Effects in Atomically Thin 1D and 2D Materials" *20th International Conference on Superlattices, Nanostructures and Nanodevices (ICSNN2018)*, Madrid, Spain, July 23, 2018.
21. D. Zubia, A. Vidaña, M. Martinez, E. Acosta, S. Almeida, T.-J. King Liu, J. Mireles, "Conductivity Modulation in Strained 2D Materials via MEMS," *International Materials Research Congress*, Cancun, Mexico, August 22, 2018.
22. S. G. Louie, "Topological and Interaction Effects in Atomically Thin 1D & 2D Materials," *Condensed Matter Physics Conference in Honor of Stephen Fahy's Sixtieth Birthday (SFSB 2018)*, Cork, Ireland, August 30, 2018.
23. J. Bokor, "Ultrafast Spintronics Technology," *Joint European Magnetics Symposium*, Mainz, Germany, Sep 2018.
24. F. Fischer, "There's plenty of space at the bottom…just no room for error" *Packard Fellows Meeting*, San Diego, September 8, 2018.
25. S. Khizroev, "Tunability using multilefforics" *AFOSR Workshop on Origami Antennas*, Miami, FL, September 13, 2018.
26. F. Fischer, "There's plenty of space at the bottom…just no room for error" *Frontiers of Molecular Engineering RSC*, September 28, 2018.

27. J. Bokor, “Picosecond Magnetic Switching by Pure Charge Current Pulses,” *Magnetic Single Nano-Object Workshop & School*, Nancy, France, Sep 2018.
28. J. Bokor, “Picosecond Magnetic Switching By Pure Charge Current Pulses,” *Ultrafast Spintronics Workshop*, Mainz, Germany, Oct 2018.
29. S. G. Louie, “New Ab Initio Many-body Approaches to Excited-State Phenomena for Quantum Energy,” *8th International Workshop on Quantum Energy*, Kunming, China, October 17, 2018.
30. T.-J. K. Liu, “The Future of Microelectronics: Beyond Transistor Scaling,” plenary talk, *Department of Energy Basic Research Needs in Microelectronics Workshop*, Bethesda, Maryland, October 23, 2018.
31. S. G. Louie, “Topological and Interaction Effects in Atomically Thin 1D & 2D Materials,” *21st Asian Workshop on First-Principles Electronic Structure Calculations*, Daejon, Republic of Korea, October 29, 2018.

Posters

1. N. C. Rodriguez, A. Vidana, S. Almeida, and D. Zubia, "CHF3/Ar Plasma Reactive Ion Etching of LTO Mask to Transfer 2D TMD onto MEMS Device," *2018 Emerging Researchers National (ERN) Conference in STEM*, Washington, DC, February 22-24, 2018.
2. S.A. Fortuna, K. Han, N. Andrade, and M.C. Wu, "High-speed nanoLED with Antenna Enhanced Light Emission," *Berkeley Sensor & Actuator Center*, Berkeley, CA. Mar 2018.
3. K. Han, S.A. Fortuna, S. Desai, M. Amani, A. Javey, E. Yablonovitch, and M.C. Wu, "Optical Antenna Based NanoLED," *Berkeley Sensor & Actuator Center*. Berkeley, CA, Mar 2018.
4. N. M. Andrade, S. A. Fortuna, K. Han, and M. C. Wu, “Efficient Waveguide-Coupling of Electrically Injected Optical Antenna Based nanoLED,” *Berkeley Sensor & Actuator Center*, Berkeley, Mar. 2018.
5. P.-C. Shen, Q. Ji, Y. Guo, J.-H. Park, Y. C. Lin, and J. Kong, “Diverse CVD Transition Metal Dichalcogenides and Their Applications”, *The Future of Nanoscale Electronics Symposium*, MIT, April 2018
6. Zhao, A. Vardi and J. A. del Alamo, “Modeling the Parasitic Bipolar Effect in InGaAs FinFETs.” *Compound Semiconductor Week (CSW 2018)*, Cambridge, MA, May 29-June 1, 2018.
7. S. G. Louie, “Novel and Unifying Optical Selection Rules for Excitons in 2D Materials: Band Topology and Winding Numbers,” *34th International Conference on the Physics of Semiconductors (ICPS2018)*, Montpellier, France, July 31, 2018.
8. R. Zubia, M. Martinez, A. Vidaña, E. Acosta, D. Zubia, and J. Mireles, “Design and Simulation of Nanoscale Electro-Mechanical Device for Information Processing,” *Summer Research Symposia*, El Paso, TX, August 2018.
9. K. Han, S.A. Fortuna, S. Desai, M. Amani, A. Javey, E. Yablonovitch, and M.C. Wu, "Optical Antenna Based NanoLED," *Berkeley Sensor & Actuator Center*, Berkeley, CA, Sep 2018.
10. N. M. Andrade, S. A. Fortuna, K. Han, and M. C. Wu, “Efficient Waveguide-Coupling of Electrically Injected Optical Antenna Based nanoLED,” *Berkeley Sensor & Actuator Center*, Berkeley, Sept. 2018.
11. K. Han, S.A. Fortuna, S. Desai, M. Amani, A. Javey, E. Yablonovitch, and M.C. Wu, "TMDC Based nanoLEDs for High-Speed Energy-Efficient Optical Interconnects," *Berkeley Emerging Technologies Research (BETR) Center Workshop*, Berkeley, CA, Sep 2018.

12. S.A. Fortuna, K. Han, N. Andrade, and M.C. Wu, "High-speed nanoLED with Antenna Enhanced Light Emission," *Berkeley Sensor & Actuator Center*, Berkeley, CA. Sep 2018.
13. K. Han, S.A. Fortuna, S. Desai, M. Amani, A. Javey, E. Yablonovitch, and M.C. Wu, "Optical Antenna Based NanoLED," *IDTechEx Show 2018*, Santa Clara, CA, Nov 2018.

1c. Other Dissemination Activities (in chronological order)

1. F. Fischer, "There's plenty of space at the bottom…just no room for error" University of Nevada Reno, Department of Chemistry Seminar, February 23, 2018.
2. S. G. Louie, "Ab initio Theory and Computation of Multiple-Particle Correlated Excitations in Materials: Trions and Biexcitons" 2018 Materials Genome Initiative (MGI) PI Meeting, University of Maryland, College Park, Maryland, March 26, 2018.
3. J. Wu, "Materials Demo Station," Cal Day, Berkeley, CA, April 2018.
4. J. Bokor, "Ultrafast Spintronics," UC Santa Cruz, ECE Department Seminar, April 2018
5. F. Fischer, "There's plenty of space at the bottom…just no room for error" University of Michigan, Department of Chemistry Seminar, April 4, 2018.
6. S. G. Louie, "The Fascinating Quantum World of Two-dimensional Materials: Symmetry, Interaction and Topological Effects," Gail and Jeffrey Kodosky Lecture, Rensselaer Polytechnic Institute, Troy, New York, April 11, 2018.
7. F. Fischer, "There's plenty of space at the bottom…just no room for error" University of California Los Angeles, Department of Chemistry Seminar, April 12, 2018.
8. J. A. del Alamo, "III-V CMOS: Quo Vadis." National University of Singapore, Singapore, April 18, 2018.
9. D. Zubia, "NanoMaterials Integration Lab: Capability and Research," Texas Instruments, Dallas Texas, April 24, 2018.
10. S. G. Louie, "The Fascinating Quantum World of Two-dimensional Materials: Symmetry, Interaction and Topological Effects," Physics Colloquium, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil, May 4, 2018.
11. T.-J. K. Liu, "Innovation: Key to the Future of Moore's Law," Xidian University, Xi'an, Shaanxi Province, China, May 7, 2018.
12. T.-J. K. Liu, "Innovation: Key to the Future of Moore's Law," Tsinghua University, Beijing, China, May 9, 2018.
13. D. Zubia, "NanoMaterials Integration Lab: Capability and Research," Instituto Politecnico Metropolitano, Medellin, Colombia, May 16, 2018.
14. S. G. Louie, "Symmetry, Interaction and Topological Effects in Atomically Thin 1D and 2D Materials," Physics Colloquium, University of Science and Technology of China, Hefei, China, July 15, 2018.
15. S. G. Louie, "Ab initio Theory and Computation of Excited-State Phenomena at C2SEPEM: Trions, Biexcitons, and Shifted Currents," Department of Energy's 2018 Theoretical Condensed Matter Physics PIs Meeting, Gaithersburg, MD, August 14, 2018.
16. T.-J. K. Liu, "There's Plenty of Room at the Top," Nano seminar, UC Berkeley, Berkeley, CA, August 24, 2018.
17. J. A. del Alamo, "Nanoscale III-V Electronics: InGaAs FinFETs and Vertical Nanowire MOSFETs." SMIC, Shanghai, China, Sept. 10, 2018.

18. J. A. del Alamo, “Nanoscale III-V Electronics: InGaAs FinFETs and Vertical Nanowire MOSFETs.” Zhejian University, Hangzhou, China, Sept. 11, 2018.
19. J. A. del Alamo, “Nanoscale III-V Electronics: InGaAs FinFETs and Vertical nanowire MOSFETs.” Lam Research Technical Symposium, Beijing, China, September 12-13, 2018.
20. J. A. del Alamo, “III-V Vertical Nanowire MOSFETs.” Semiconductor Research Corporation GRC Technology Transfer e-Workshop, Oct. 10, 2018.
21. J. Kong, “Chemical vapor deposition synthesis and transfer of two dimensional materials”, MIT Graphene Center Review, November 2, 2018.