

ERIC POP

Pease-Ye Professor of Electrical Engineering and (by courtesy) of Materials Science & Engineering
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Education

Stanford University	Electrical Engineering	Ph.D., 2005
Massachusetts Institute of Technology	Electrical Engineering	M.Eng., 1999
Massachusetts Institute of Technology	Electrical Engineering	B.S., 1999
Massachusetts Institute of Technology	Physics	B.S., 1999

Appointments

Stanford University		
• Pease-Ye Professor in the School of Engineering		2023 – present
• Professor of Electrical Engineering		2019 – present
• Professor of Materials Science & Engineering (by courtesy)		2019 – present
• Affiliate, Precourt Institute for Energy		2013 – present
• Chambers Faculty Scholar in the School of Engineering		2016 – 2020
• Associate Professor of Materials Science & Engineering (by courtesy)		2016 – 2019
• Associate Professor of Electrical Engineering		2013 – 2019
University of Illinois at Urbana-Champaign (UIUC)		
• Adjunct Professor, Electrical and Computer Engineering		2013 – 2015
• Associate Professor, Electrical and Computer Engineering (tenured)		2012 – 2013
• Affiliate and Part-Time Faculty, Beckman Institute		2008 – 2013
• Assistant Professor, Electrical and Computer Engineering		2007 – 2012
Intel Corp., Senior Engineer and visiting researcher at Stanford Univ.		2005 – 2007
Stanford University, Post-Doctoral Researcher, Chemistry & Thermal Sciences		2005
Stanford University, KZSU 90.1 FM radio DJ and General Manager		2000 – 2004

Selected Honors

2023	Pease-Ye Professor in the Stanford School of Engineering
2023	Viskanta Fellowship from Purdue University
2022	APS Fellow
2021	Intel Outstanding Researcher Award
2021	IEEE Fellow
2018	Highly Cited Researcher, Clarivate Analytics (Web of Science)
2017,13-09	Golden Reviewers List, IEEE Electron Device Letters
2016	Most Cited Researchers List in Electrical Engineering by Elsevier
2016-20	Chambers Faculty Scholar, Stanford
2015,11	Golden Reviewers List, IEEE Transactions on Electron Devices
2014	Okawa Foundation Award
2013	Terman Faculty Fellow, Stanford
2013,11,10	Engineering Council Award for Excellence in Advising, UIUC
2012	Campus Distinguished Promotion Award, UIUC
2011	Outstanding Presentation Award, E\PCOS Symposium
2011	Xerox Award for Faculty Research, UIUC
2011	IEEE Senior Member
2011	Center for Advanced Study (CAS) Fellowship, UIUC
2010	PECASE (Presidential) Award from the White House, highest honor given by the US government to early-career scientists and engineers, nominated by ARO and DOD
2010	ONR Young Investigator Program (YIP) Award

2010	NSF CAREER Award
2010	AFOSR Young Investigator Program (YIP) Award
2009	List of Teachers Ranked as Excellent, UIUC
2008	DARPA Young Faculty Award (YFA)
2007	Arnold O. Beckman Research Award, UIUC
2005	Finalist, Stanford E-Challenge Business Plan Competition (top 4 of 80 teams)
2003,02	Best Paper in Session Award, SRC TechCon
2001-04	SRC-IBM Graduate Fellowship
1999	Gerald Pearson Fellowship

Selected Honors with Supervised Students

2022	MRS Gold Graduate Student Award, MRS Fall Meeting (A.I. Khan)
2022	Best Presentation Award, MRS Fall Meeting (A.I. Khan)
2022	Best Presentation Award, SRC TechCon (M. Chen)
2022	Best Presentation Award, SRC TechCon (C. Bailey)
2022	Best Student Paper Award, VLSI Symposium 2022 (A.I. Khan)
2020	Best Paper Award, MRS Fall 2020 (I. Datye)
2018	2018 OMEEx Emerging Researcher Best Paper Prize (S. Deshmukh)
2018	Best Presentation Award, SRC TechCon (C. McClellan)
2018	Best Poster Award, IEEE Device Research Conference (S. Bohaichuk)
2018	Best Presentation Award, MRS Spring Meeting (M. Chen)
2017	Best Paper in Session Award, SRC TechCon (C. McClellan)
2017	Best Paper Award, EDISON'20 (K. Smithe)
2017	Best Conference Paper Award, IEEE NANO (A. Gabourie and S. Suryavanshi)
2016	Best Paper in Session Award, SRC TechCon (N. Wang)
2016	Best Poster Award, IEEE Device Research Conference (I. Datye and A. Gabourie)
2014	Best Paper in Session Award, SRC TechCon (C. English)
2013	Best Paper in Session Award, SRC TechCon (E. Carrion)
2011	Best Paper in Session Award, SRC TechCon (F. Xiong)

Professional Memberships

- APS Fellow, 2022 – present (Member 2011 – 2022)
- IEEE Fellow, 2021 – present (Senior Member, 2011–2021; Member 1999 – 2010)
- AVS Member, 2013 – present
- AAAS Member, 2012 – present
- MRS Member, 2007 – present
- HKN Member; Faculty Advisor for Illinois Alpha Chapter, 2009 – 2011

Conferences Chaired or Organized

- IEEE NVMTS (Nonvolatile Memory Technology Symposium) conference chair, 2022
- IEEE VLSI-TSA (Technology, Systems, Applications) program committee, 2022
- IEEE-IEDM (Intl. Electron Devices Meeting)
 - Emerging Device & Computing Technology (EDT) program committee, 2021-2022
 - Session chair, 2021-2022, San Francisco CA
- IEEE-SISC (Semiconductor Interface Specialists Conference), 2020
- IEEE-VLSI Technology Symposium, 2015–2019
 - Publications Co-Chair, 2019, Kyoto, Japan
 - Session chair, 2018, Honolulu, HI
 - Focus Session Leader, 2018, Honolulu, HI
 - Focus Session Organizer, 2017, Kyoto, Japan

- Publications Co-Chair, 2016, Honolulu, HI
 - Session chair, 2016, Honolulu, HI
 - Session chair, 2015, Kyoto, Japan
- IEEE-DRC (Device Research Conference)*, 2006–present
 - Member of Board of Trustees, 2014–present
 - General Chair, 2015
 - Chair of Technical Program Committee (TPC), 2014
 - Vice-Chair of TPC, 2013
 - Session chair, 2012 and 2006
 - Evening “rump session” organizer, 2011, 2010, 2007
- AVS (American Vacuum Society) Meeting Session Chair, Long Beach, CA 2018
- Stanford-IMEC Resistive Memory Workshop, 2018
- Graphene 2018, Session Chair, Dresden, Germany, 2018
- EDISON’20, Session Chair, Buffalo, NY 2017
- MRS (Materials Research Society) Spring Meeting, 2017, Phoenix, AZ
 - Co-Organizer of “Symposium: Phase-Change Materials and Applications”
- IEEE-IRPS (International Reliability Physics Symposium)
 - XT Committee member, 2017, Monterey, CA
 - XT Committee member, 2016, Pasadena, CA
- ESSDERC (European Solid-State Device Research Conference)
 - North America Publicity Co-Chair, 2017, Leuven, Belgium
 - Session chair, 2016, Lausanne, Switzerland
- IEEE-SNW (Silicon Nanoelectronics Workshop) Session chair, 2016, Honolulu, HI
- E-MRS (European Materials Research Symposium) Session chair, 2016, Lille, France
- MRS (Materials Research Society) Spring Meeting, 2015, San Francisco, CA
 - Co-Organizer of “Symposium: Nanoscale Heat Transport – From Fundamentals to Devices”
- PTES (International Conference on Phononics and Thermal Energy Science), Shanghai, 2013
 - Session chair, 2013
- DATE (Design, Automation, and Test in Europe), 2012
 - Organizer, “The Device-to-System Spectrum – A Tutorial on IC Design with Nanomaterials”
- APS (American Physical Society) March Meeting, 2012
 - Focus session organizer, “Carbon Nanotubes and Related Nanomaterials”
- Nano-DDS (Devices for Defense & Security), 2011
 - Focus session organizer, “Hybrid Molecular & Nanoscale CMOS-Based Architectures”
- IEEE-IEDM (Intl. Electron Devices Meeting)
 - NDT (Nano Device Technology) program committee, 2010–2011
 - Session chair, 2010
- MRS (Materials Research Society) Fall Meeting, Session chair, Boston, 2010
- IEEE-UGIM (University Government Industry Micro/Nano) Symposium, Session chair, Purdue, 2010
- IEEE-ISRDS (Intl. Semiconductor Device Research Symposium), 2009
 - Session chair, ISDRS 2009 and 2007
- ECS (Electrochemical Society) Meeting, Session chair, 2007
- IEEE-GLSVLSI (Great Lakes VLSI) Symposium, Session chair, 2007
- IEEE-SISPAD (Simulation of Semiconductor Processes and Devices), Session chair, 2006

University Committees and Service

At Stanford and SLAC

- EE Faculty Search Committee Chair, 2023 – present

* Longest-running IEEE electron device conference, since 1942.

- Stanford-SLAC Advisor for Nano/Microelectronics, 2022 – present
- EE Distinguished Lecturer Colloquium Series (co-chair), 2022 – 2023
- SNSF Advisory Council, 2022 – present
- Shoucheng Zhang Graduate Fellowship Committee, 2022 – present
- EE Executive Committee (ExCom), 2021 – present
- Ad hoc advisory committee to Dean Jennifer Widom on nanofabrication facilities, 2021 – present
- SystemX, Heterogeneous Integration Focus Area (lead), 2015 – present
- EE Culture, Equity, and Inclusion Committee (CEI) Chair, 2019 – 2022
- EE Academic Affairs Committee (AAC), 2013 – 2021
- MSE Faculty Search Committee, 2019
- Stanford-IMEC Resistive Memory Workshop co-organizer, 2018
- EE Faculty Search Committee, 2017 and 2018
- Rising Stars Committee, 2017
- Stanford Faculty Scholars Committee, 2017
- Stanford Nano Shared Facilities Working Group, 2017
- SNF Shared Nanofabrication Future Plans Committee, 2015 – 2016
- Precourt Institute for Energy, Stanford Interdisciplinary Graduate Fellowship Committee, 2015
- EE21 Committee, 2014 – 2015
- EE Web Site Committee, 2013 – 2015
- SoE Makers Commons Committee, 2013

At UIUC

- ECE Colloquium Committee, 2007 – 2013
- ECE Public Relations Committee, 2009 – 2013
- ECE Nanotechnology Committee, 2009 – 2013
- Beckman Institute Program Advisory Committee, 2009 – 2012
- ECE Graduate Recruitment Committee, 2007 – 2012
- ECE Advisory Committee, 2011 – 2012
- ECE Curriculum Committee, 2010 – 2012
- ECE Graduate Committee, 2009 – 2010
- ECE New Building Committee, 2008 – 2009
- ECE Graduate Admissions Committee, 2007 – 2008
- ECE Fellowship Committee, 2007 – 2008
- MNTL Characterization Lab Committee, 2007 – 2008

Editor and Reviewer Service

- Editorial Board of *2D Materials*
- Editorial Board of *Nano Research*
- Proposal reviewer for:
 - National Science Foundation (NSF) Electronics, Photonics, and Magnetic Devices (EPMD), Thermal Transport Processes (TTP), Division of Materials Research (DMR)
 - Air Force Office of Scientific Research (AFOSR), Army Research Office (ARO)
- Journal reviewer for:
 - Science, Proc. Natl. Academy of Sciences, Nano Research
 - Nature, Nature Nanotechnology, Nature Materials, Nature Communications
 - Nano Letters, ACS Nano, ACS Appl. Materials & Interfaces, 2D Materials
 - IEEE Trans. Nanotechnology, IEEE Trans. Electron Devices, IEEE Electron Device Letters, IEEE Trans. Computer Aided Design, IEEE Trans. Components and Packaging Technologies
 - Physical Review B, X, Letters; Applied Physics Letters, Journal of Applied Physics
 - Nanotechnology, Journal of Physics: Condensed Matter, Solid-State Electronics
 - Journal of Computational Electronics, Journal of Heat Transfer

Teaching and Advising

- EE 101A, “Circuits I,” Winter 2020–present (most recent evaluation: 4.4 out of 5.0)
- EE 323, “Energy in Electronics,” Fall 2014–present (average evaluation: 4.5 out of 5.0)
- EE 116, “Semiconductor Device Physics,” Spring 2014–present (average evaluation: 4.5 out of 5.0)
- EE 216, “Principles & Models of Semiconductor Devices,” Winter 2014–present (average evaluation: 4.5 out of 5.0)
- ECE 340, “Semiconductor Electronics,” 2012–2013 (average evaluation: 4.6 out of 5.0)
- ECE 565, “Energy Dissipation in Electronics,” 2011
- ECE 440, “Solid State Electronics,” 2007–2011 (average evaluation: 4.7 out of 5.0)
- ECE 598EP, “Hot Chips: Atoms to Heat Sinks,” 2008–2010 (average evaluation: 4.7 out of 5.0)
- Undergraduate academic advisees, >100 students total:
 - ~35 at Stanford (2013–present), ~70 at UIUC (2007–2013)
- Classroom instruction, > 700 students total:
 - At Stanford (2013–): ~180 undergrads (EE 101A, 116) and ~140 grad students (EE 216, 323)
 - At UIUC (2007–2013): ~340 undergrads (ECE 340) and ~60 grad students (ECE 565)

Tutorials, Software and Other Educational Initiatives

29. “Fundamental, Thermal, and Energy Limits of PCM and RRAM,” *Tutorial at MRS Fall Meeting*, Boston MA, Nov 2022
28. “Nanoelectronics & Heterogeneous Integration with 2D Materials,” *Short Course at Nano-KISS* (Korean Intl. Summer School on Nanoelectronics), Korea, Feb 2020
27. “(Clarifying) A Few Alternative Facts About 2D Materials,” *Tutorial at 2D Materials: Fundamentals to Spintronics Workshop*, Natal, Brazil, Sep 2019. <https://www.youtube.com/watch?v=9RsgQEIobdI>
26. “What Are Two-Dimensional Materials Good For?” *Tutorial at 2D Materials: Fundamentals to Spintronics Workshop*, Natal, Brazil, Sep 2019. https://www.youtube.com/watch?v=_pCqJkpsxQ
25. “Fundamental, Thermal, and Energy Limits of Phase-Change Memory,” *Tutorial at Eurotherm Nanoscale & Microscale Heat Transfer VI (NMHT)*, Levi, Finland, Dec 2018
24. “Benefits of Heterogeneous Integration: The N3XT 1000x,” *Tutorial at SSDM (Intl. Conference on Solid State Devices & Materials)*, Tokyo Japan, Sep 2018
23. “Fundamental, Thermal, and Energy Limits of PCM and ReRAM,” *Tutorial at IEDM (Intl. Electron Devices Meeting)*, San Francisco, CA, Dec 2017
22. “Fundamentals and Ultimate Scaling Limits of Phase-Change Memory,” *Tutorial at 75th DRC (Device Research Conference)*, Notre Dame, IN, Jun 2017
21. “Energy, Thermal, and Thermoelectric Effects in Nanoscale Devices,” *Short Course at University of Pisa*, Pisa, Italy, Jun 2017
20. “Thermal and Related Properties of 2D Materials and Devices,” *Short Course at 2D Materials Workshop*, Univ. Minnesota, Jun 2016, <http://minic.umn.edu/2d-materials/summer-program-2016>
19. “Thermal Resistance in Electronic Devices,” *Short Course on nanoHUB-U*, May 2016, <https://nanohub.org/courses/tred>
18. “Electrical & Thermal Transport in 2D Materials and Devices,” *Short Course at Nano-KISS* (Korean Intl. Summer School on Nanoelectronics), ETRI, Daejeon Korea, Oct 2015
17. “Device and Thermal Fundamentals and Applications of 2D Materials,” *NanoTechnology for Defense Conference (NT4D)*, Chantilly VA, Nov 2014
16. “Thermoelectrics 101,” *GCEP Symposium*, Stanford CA, Oct 2014. <http://gcep.stanford.edu/learn/energy101.html>
15. S2DS: Stanford 2D Semiconductor simulation tool for monolayer transistors, available at nanohub.org
14. “Energy in Nanoelectronics,” *Tsukuba Summer Lecture Series*, Tsukuba, Japan, Jul-Aug 2014
13. “The Device-to-System Spectrum – A Tutorial on IC Design with Nanomaterials,” *Design, Automation*

& *Test in Europe (DATE)*, Dresden, Germany, Mar 2012

12. Web-Enabled Remote Lab: An interface for measuring electronic devices through the Internet. Devices in the lab can be measured on any web browser (even on an iPhone), anywhere in the world. Developed with undergraduates S. Dutta and S. Prakash. First tested in course ECE 440, Spring 2010. Source code at <http://remotelab.sourceforge.net>. Details published in *IEEE Trans. Educ.* (2011).
11. Graduate Course Online: ECE 598 *Hot Chips: Atoms to Heat Sinks* (Fall 2010) course notes available at <http://poplab.stanford.edu> and audio through <http://nanohub.org>
10. GFETtool: Graphene transistor electro-thermal simulation tool, available at nanoHUB.org
9. nanoJoule: Carbon nanotube electro-thermal simulation tool, available at nanoHUB.org
8. CNTmob: Carbon nanotube mobility simulation tool, available at nanoHUB.org
7. “Carbon Nanoelectronics: Towards Energy-Efficient Computing,” *Design, Automation & Test in Europe (DATE)*, Dresden, Germany, Mar 2010
6. D. Chen, S. Chilstedt, C. Dong, E. Pop, “What Everyone Needs to Know About Carbon-Based Electronics,” *DAC.com Knowledge Center Article*, www.dac.com, Mar 2010
5. “Graphene Thermal Physics,” *IEEE Device Research Conference (DRC)*, State College PA, Jun 2009
4. K-12 Outreach: Series of talks on “*Memory Technology: Putting the nano in your iPod*” presented at University High School, Urbana IL (Spring 2008). Audio and video available at nanoHUB.org
3. Undergraduate Course Online: ECE 440 *Solid-State Electronics* (Fall 2008) course notes available at <http://poplab.stanford.edu> and audio through nanoHUB.org
2. “Electro-Thermal Interaction, Modeling and Measurement in Nanoscale Devices,” *Great Lakes VLSI (GLSVLSI) Conference*, Lago Maggiore, Italy, Mar 2007
1. MONET: Monte Carlo simulation code for transport and heat generation in silicon devices, available at <http://poplab.stanford.edu> along with multimedia and simulation results

Journal Publications (h-index: 95; 34,000+ citations in Google Scholar)

in review: gray; students and post-docs supervised: bold

259. A.P. Saunders, **V. Chen**, J. Wang, A.C. Johnson, A.S. McKeown-Green, H.J. Zeng, T.K. Mac, T. Trinh, T.F. Heinz, E. Pop, F. Liu, “Direct Exfoliation of Nanoribbons from Bulk van der Waals Crystals,” in review, pre-print arXiv:2402.11392 (2024)
258. **Ç. Köroğlu**, A. Daus, **S. Wahid**, E. Pop, “Fringe Current Correction for Unpatterned-Channel Thin Film Transistors Including Contact Resistance and Velocity Saturation Effects,” in review (2024)
257. **K.M. Neilson**, S. Hamtaei, **K. Nassiri Nazif**, J.M. Carr, S. Rahimisheikh, **F.U. Nitta**, G. Brammertz, J.L. Blackburn, J. Hadermann, K.C. Saraswat, O.G. Reid, B. Vermang, A. Daus, E. Pop, “Toward Mass-Production of Transition Metal Dichalcogenide Solar Cells: Scalable Growth of Photovoltaic-Grade Multilayer WSe₂ by Tungsten Selenization,” in review, pre-print arXiv:2402.08534 (2024)
256. S. Vaziri, C. Perez, I.M. Datye, H. Kwon, C.F. Hsu, **M. Chen**, M. Noshin, T.Y. Lee, M. Asheghi, W.Y. Woon, E. Pop, K.E. Goodson, S.S. Liao, X.Y. Bao, “AIN: an engineered thermal material for 3D integrated circuits,” in review (2024)
255. S. Abdollahramezani, O. Hemmatyar, I. Zeimpekis, S. Lepeshov, A. Krasnok, **A.I. Khan**, **K.M. Neilson**, C. Teichrib, T. Brown, E. Pop, D.W. Hewak, M. Wuttig, A. Alù, O.L. Muskens, A. Adibi, “Enhanced Meta-Displays Using Advanced Phase-Change Materials,” in review, pre-print arXiv: 2107.12159 (2023)
254. Z. Fang, R. Chen, J.E. Fröch, Q.A.A. Tanguy, **A.I. Khan**, **X. Wu**, V. Tara, A. Manna, D. Sharp, C. Munley, F. Miller, Y. Zhao, S.J. Geiger, K. Böhringer, M. Reynolds, E. Pop, A. Majumdar, “Non-volatile Phase-only Transmissive Spatial Light Modulator with Electrical Addressability of Individual Pixels,” in revision (2024)
253. **M. Jaikissoon**, **Ç. Köroğlu**, **J.A. Yang**, **K.M. Neilson**, K.C. Saraswat, E. Pop, “CMOS-compatible Strain Engineering of Monolayer Semiconductor Transistors,” in revision (2024)

252. S. Liu, K. Jana, K. Toprasertpong, J. Chen, Z. Liang, Q. Jiang, **S. Wahid**, S. Qin, W.-C. Chen, E. Pop, H.-S.P. Wong, "Design Guidelines for Oxide Semiconductor Gain Cell Memory on Logic Platform," in review (2024)
251. **J.A. Yang, R.K.A. Bennett, L. Hoang**, Z. Zhang, **K.J. Thompson**, A. Michail, J. Parthenios, K. Papagelis, A.J. Mannix, E. Pop, "Biaxial Tensile Strain Enhances Electron Mobility of Monolayer Transition Metal Dichalcogenides," *ACS Nano*, in press, pre-print arXiv:2309.10939 (2023)
250. **X. Wu, A.I. Khan**, H. Lee, C.-F. Hsu, H. Yu, **N. Roy**, I. Takeuchi, X. Bao, H.-S.P. Wong, E. Pop, "Novel Nanocomposite-Superlattices for Low Energy and High Stability Nanoscale Phase-Change Memory," *Nature Comm.* **15**, 13 (2024)
249. S. Kananian, J. Rho, C. Chen, S. Mirjalili, **A. Daus**, M. Kim, S. Niu, E. Pop, H.-S.P. Wong, Z. Bao, A. Mani, A.S.Y. Poon, "A Disposable Reader-Sensor Solution for Wireless Temperature Logging," *Device* **1**, 100183 (2023) (**December Editor's Choice**)
248. **K. Nassiri Nazif**, F.U. Nitta, **A. Daus**, K.C. Saraswat, E. Pop, "Efficiency Limit of Transition Metal Dichalcogenide Solar Cells," *Commun. Physics* **6**, 367 (2023)
247. **A. Daus, L. Hoang**, C. Gilardi, **S. Wahid**, J. Kwon, S. Qin, **J.-S. Ko, M. Islam, A. Kumar, K.M. Neilson**, K.C. Saraswat, S. Mitra, H.-S.P. Wong, E. Pop, "Effect of Back-Gate Dielectric on Indium Tin Oxide (ITO) Transistor Performance and Stability," *IEEE Trans. Electron Devices* **70**, 5685-5689 (2023)
246. C. Perez, A.J. McLeod, **M. Chen**, S. Yi, S. Vaziri, R. Hood, S.T. Ueda, X. Bao, M. Asheghi, W. Park, A.A. Talin, S. Kumar, E. Pop, A.C. Kummel, K.E. Goodson, "High Thermal Conductivity of Sub-Micron Aluminum Nitride Thin Films Sputter-Deposited at Low Temperature," *ACS Nano*, in press (2023)
245. T. Swoboda, X. Gao, C.M.M. Rosário, F. Hui, K. Zhu, Y. Yuan, **S. Deshmukh, Ç. Köroğlu**, E. Pop, M. Lanza, H. Hilgenkamp, M. Muñoz Rojo, "Spatially-Resolved Thermometry of Filamentary Nanoscale Hot Spots in TiO₂ Resistive Random Access Memories to Address Device Variability," *ACS Appl. Electronic Mater.* **5**, 5025-5031 (2023)
244. I.-K. Oh, **A.I. Khan**, S. Qin, Y. Lee, H.-S.P. Wong, E. Pop, S.F. Bent, "Area-Selective Atomic Layer Deposition for Resistive Random-Access Memory Devices," *ACS Appl. Mater. Interfaces.* **15**, 43087-43093 (2023)
243. T.D. Brown, **S.M. Bohaichuk, M. Islam**, S. Kumar, E. Pop, R.S. Williams, "Electro-Thermal Characterization of Dynamical VO₂ Memristors via Local Activity Modeling," *Adv. Materials* **35**, 2205451 (2023)
242. A. Schwarz, H. Alon-Yehezkel, A. Levi, R.K. Yadav, **L. Hoang, C.S. Bailey**, T. Brumme, A.J. Mannix, H. Cohen, E. Yalon, T. Heine, E. Pop, O. Cheshnovsky, D. Naveh, "Thiol-Based Defect Healing of Thin WSe₂," *npj 2D Materials & Applications* **7**, 59 (2023)
241. Q. Li, J. Song, F. Xu, J. van de Groep, J. Hong, **A. Daus**, Y.J. Lee, A. Johnson, E. Pop, F. Liu, M. Brongersma, "A Purcell Enabled Monolayer Semiconductor Free-Space Optical Modulator," *Nature Photonics*, in press (2023)
240. J. Martis, S. Susarla, A. Rayabharam, C. Su, T. Paule, P. Pelz, C. Huff, X. Xu, H.-K. Li, **M. Jaikissoon, V. Chen**, E. Pop, K. Saraswat, A. Zettl, N.R. Aluru, R. Ramesh, P. Ercius, A. Majumdar, "Imaging the Electron Charge Density in Monolayer MoS₂ at the Ångstrom Scale," *Nature Commun.* **14**, 4363 (2023)
239. J. Zhao, **A.I. Khan**, M.Y. Efremov, Z. Ye, **X. Wu**, K. Kim, Z. Lee, H.-S.P. Wong, E. Pop, L.H. Allen, "Probing the Melting Transition in Phase-change Superlattices via Thin Film Nanocalorimetry," *Nano Letters*, **23**, 4587-4594 (2023)
238. **S. Wahid, A. Daus**, J. Kwon, S. Qin, **J.-S. Ko**, H.-S.P. Wong, E. Pop, "Effect of Top-Gate Dielectric Deposition on the Performance of Indium Tin Oxide Transistors," *IEEE Electron Device Lett.* **44**, 951-954 (2023)
237. E. Ber, **R.W. Grady**, E. Pop, E. Yalon, "Uncovering the Different Components of Contact Resistance to Atomically Thin Semiconductors," *Adv. Electron. Mater.* **9**, 2201342 (2023)

236. **V. Chen**, H.R. Lee, **Ç. Köroğlu**, **C.J. McClellan**, **A. Daus**, E. Pop, “Ambipolar Thickness-Dependent Thermoelectric Measurements of WSe_2 ,” *Nano Letters* **23**, 4095-4100 (2023)
235. T. Swoboda, N. Wainstein, **S. Deshmukh**, **Ç. Köroğlu**, X. Gao, M. Lanza, H. Hilgenkamp, E. Pop, E. Yalon, M. Muñoz Rojo, “Nanoscale Temperature Sensing of Electronic Devices with Calibrated Scanning Thermal Microscopy,” *Nanoscale* **15**, 7139-7146 (2023)
234. **S.M. Bohaichuk**, S. Kumar, **M. Islam**, **M. Muñoz Rojo**, R.S. Williams, G. Pitner, J. Jeong, M.G. Samant, S.S.P. Parkin, E. Pop, “Intrinsic and Extrinsic Factors Influencing Dynamics of VO_2 Mott Oscillators,” *Phys. Rev. Applied*, **19**, 044028 (2023) (**Selected as Editor’s Suggestion**)
233. E. Ber, **R.W. Grady**, E. Pop, E. Yalon, “High Number of Transport Modes: A Requirement for Contact Resistance Reduction to Atomically Thin Semiconductors,” *IEEE Trans. Electron Devices* **70**, 1829-1834 (2023)
232. H.-L. Sinn, A. Kumar, E. Pop, A.K.M. Newaz, “Semimetal-Monolayer Transition Metal Dichalcogenide Photodetectors for Wafer-Scale Broadband Photonics,” *Adv. Photonics Res.* **4**, 2300029 (2023)
231. **Ç. Köroğlu**, E. Pop, “High Thermal Conductivity Insulators for Thermal Management in 3D Integrated Circuits,” *IEEE Electron Device Lett.* **44**, 496-499 (2023)
230. **A.I. Khan**, H. Yu, H. Zhang, J.R. Goggin, H. Kwon, **X. Wu**, C. Perez, **K.M. Neilson**, M. Asheghi, K.E. Goodson, P.M. Vora, A. Davydov, I. Takeuchi, E. Pop, “Energy Efficient Neuro-Inspired Phase Change Memory Based on $\text{Ge}_4\text{Sb}_6\text{Te}_7$ as a Novel Epitaxial Nanocomposite,” *Adv. Materials* **35**, 2300107 (2023)
229. **R.K.A. Bennett**, E. Pop, “How do Quantum Effects Influence the Capacitance and Carrier Density of Monolayer MoS_2 Transistors?” *Nano Letters* **23**, 1666-1672 (2023)
228. W. Li, X. Gong, Z. Yu, L. Ma, W. Sun, S. Gao, **Ç. Köroğlu**, W. Wang, L. Liu, T. Li, H. Ning, D. Fan, Y. Xu, X. Tu, T. Xu, L. Sun, W. Wang, J. Lu, Z. Ni, P. Wang, Y. Nie, H. Qiu, Y. Shi, E. Pop, J. Wang, X. Wang, “Approaching the Quantum Limit in Two-Dimensional Semiconductor Contacts,” *Nature* **613**, 274-279 (2023)
227. B. Hoffer, N. Wainstein, **C.M. Neumann**, E. Pop, E. Yalon, S. Kvatinsky, “Stateful Logic using Phase Change Memory,” *IEEE JxCDC* **8**, 77-83 (2022)
226. R. Chen, Z. Fang, J. Zheng, **A.I. Khan**, **K.M. Neilson**, S.J. Geiger, D.M. Callahan, M.G. Moebius, A. Saxena, **M.E. Chen**, C. Rios, J. E. Fröch, P. Xu, J. Hu, E. Pop, A. Majumdar, “Nonvolatile programmable integrated photonics via phase change materials,” *Optics & Photon. News* **33**, 35 (2022)
225. **I.M. Datye**, **A. Daus**, **R.W. Grady**, **K. Brenner**, **S. Vaziri**, E. Pop, “Strain-Enhanced Mobility of Monolayer MoS_2 ,” *Nano Letters* **22**, 8052-8059 (2022)
224. **X. Wu**, **A.I. Khan**, P. Ramesh, C. Perez, K. Kim, Z. Lee, K. Saraswat, K.E. Goodson, H.-S.P. Wong, E. Pop, “Understanding Interface-Controlled Resistance Drift in Superlattice Phase Change Memory,” *IEEE Electron Device Lett.* **43**, 1669-1672 (2022) (**Featured on the Cover**)
223. C. Gilardi, **R.K.A. Bennett**, Y. Yoon, E. Pop, H.-S.P. Wong, S. Mitra, “Extended Scale Length Theory for Low-Dimensional Field-Effect Transistors,” *IEEE Trans. Electron Devices* **69**, 5302-5309 (2022)
222. R. Islam, S. Qin, **S. Deshmukh**, Z. Yu, **Ç. Köroğlu**, **A.I. Khan**, **K. Schauble**, K.C. Saraswat, E. Pop, H.-S.P. Wong, “Improved Gradual Resistive Switching Range and $1000\times$ On/Off Ratio in HfO_x RRAM Achieved with a $\text{Ge}_2\text{Sb}_2\text{Te}_5$ Thermal Barrier,” *Appl. Phys. Lett.* **121**, 082103 (2022)
221. **A. Daus**, **M. Jaikissoon**, **A.I. Khan**, A. Kumar, **R.W. Grady**, K.C. Saraswat, E. Pop, “Fast-Response Flexible Temperature Sensors with Atomically Thin Molybdenum Disulfide,” *Nano Letters* **22**, 6135-6140 (2022)
220. **A.I. Khan**, **X. Wu**, C. Perez, B. Won, K. Kim, P. Ramesh, H. Kwon, M.C. Tung, Z. Lee, I.-K. Oh, K. Saraswat, M. Asheghi, K.E. Goodson, H.-S.P. Wong, E. Pop, “Unveiling the Effect of Superlattice Interfaces and Intermixing on Phase Change Memory Performance,” *Nano Letters* **22**, 6285-6291 (2022)
219. Z. Fang, R. Chen, J. Zheng, **A.I. Khan**, **K.M. Neilson**, S.J. Geiger, D.M. Callahan, M.G. Moebius, A. Saxena, **M.E. Chen**, C. Rios, J. Hu, E. Pop, A. Majumdar, “Ultra-Low-Energy Programmable Non-

- volatile Silicon Photonics Based on Phase Change Materials with Graphene Heaters,” *Nature Nanotech.* **17**, 842-848 (2022)
218. **A.J. Gabourie, Ç. Köroğlu**, E. Pop, “Substrate-Dependence of Monolayer MoS₂ Thermal Conductivity and Thermal Boundary Conductance,” *J. Appl. Phys.* **131**, 195103 (2022) (**Selected as Editor’s Pick**)
217. Z. Cheng, C.-S. Pang, P. Wang, S.T. Le, Y. Wu, D. Shahrjerdi, I. Radu, M.C. Lemme, L.-M. Peng, X. Duan, Z. Chen, J. Appenzeller, S.J. Koester, E. Pop, A.D. Franklin, C.A. Richter, “How to Report and Benchmark Emerging Field-Effect Transistors,” *Nature Electronics* **5**, 416-423 (2022)
216. W. Zheng, **C.J. McClellan**, E. Pop, Y.K. Koh, “Non-Equilibrium Phonon Thermal Resistance at MoS₂/Oxide and Graphene/Oxide Interfaces,” *ACS Appl. Mater. Interfaces.* **14**, 22372–22380 (2022)
215. S. Abdollahramezani, O. Hemmatyar, M. Taghinejad, H. Taghinejad, A. Krasnok, A.A. Eftekhar, C. Teichrib, **S. Deshmukh**, M. El-Sayed, E. Pop, M. Wuttig, A. Alù, W. Cai, A. Adibi, “Electrically Driven Reprogrammable Phase-Change Metasurface Reaching 80% Efficiency,” *Nature Commun.* **13**, 1696 (2022)
214. **S. Deshmukh, M. Muñoz Rojo, E. Yalon, S. Vaziri, Ç. Köroğlu**, R. Islam, R.A. Iglesias, K. Saraswat, E. Pop, “Direct Measurement of Nanoscale Filamentary Hot Spots in Resistive Memory Devices,” *Science Adv.* **8**, eabk1514 (2022)
213. K. Stern, Y. Keller, **C.M. Neumann**, E. Pop, E. Yalon, “Temperature-Dependent Thermal Resistance of Phase Change Memory,” *Appl. Phys. Lett.* **120**, 113501 (2022)
212. **A.I. Khan**, H. Kwon, **M.E. Chen**, M. Asheghi, H.-S.P. Wong, K.E. Goodson, E. Pop, “Electro-Thermal Confinement Enables Improved Superlattice Phase Change Memory,” *IEEE Electron. Dev. Lett.* **43**, 204-207 (2022)
211. **S. Wahid, A. Daus, A.I. Khan, V. Chen, K. Neilson, M. Islam, M.E. Chen**, E. Pop, “Lateral Transport and Field-Effect Characteristics of Sputtered P-Type Chalcogenide Thin Films,” *Appl. Phys. Letters* **119**, 232106 (2021)
210. S. Das, A. Sebastian, E. Pop, **C.J. McClellan**, A.D. Franklin, T. Grasser, T. Knobloch, Y. Illarionov, A.V. Penumatcha, J. Appenzeller, Z. Chen, W. Zhu, I. Asselberghs, L.-J. Li, U.E. Avci, N. Bhat, T.D. Anthopoulos, R. Singh, “2D-Materials Based Transistors for Future Integrated Circuits: Current Status, Challenges, and Prospects,” *Nature Electronics* **4**, 786-799 (2021)
209. **A. Sood**, C. Sievers, **Y.C. Shin, V. Chen**, S. Chen, **K.K.H. Smithe**, S. Chatterjee, D. Donadio, K.E. Goodson, E. Pop, “Engineering Thermal Transport Across Layered Graphene-MoS₂ Superlattices,” *ACS Nano* **15**, 19503-19512 (2021)
208. K. Nassiri Nazif, **A. Daus**, J. Hong, N. Lee, S. Vaziri, A. Kumar, F. Nitta, **M.E. Chen**, S. Kananian, R. Islam, K.-H. Kim, J.-H. Park, A. Poon, M.L. Brongersma, E. Pop, K.C. Saraswat, “High-Specific-Power Flexible Transition Metal Dichalcogenide Solar Cells,” *Nature Commun.* **12**, 7034 (2021)
207. V.Z. Costa, L. Liang, **S. Vaziri**, A. Miller, A. Ichimura, E. Pop, A.K.M. Newaz, “Vibrational Properties of a Naturally Occurring Semiconducting van der Waals Heterostructure,” *J. Phys. Chem. C* **125**, 21607-21613 (2021)
206. **A.I. Khan, A. Daus**, R. Islam, H.R. Lee, **K. Neilson**, H.-S.P. Wong, E. Pop, “Ultralow Switching Current Density Multi-Level Phase Change Memory on a Flexible Substrate,” *Science* **373**, 1243-1247 (2021)
205. **A. Tang**, A. Kumar, **M. Jaikissoon**, K. Saraswat, H.-S.P. Wong, E. Pop, “Toward Low-Temperature Solid-Source Synthesis of Monolayer MoS₂,” *ACS Appl. Mater. Interfaces.* **13**, 41866–41874 (2021)
204. Y. Guo, Y. Sun, A. Tang, C.-H. Wang, Y. Zhao, M. Bai, S. Xu, Z. Xu, T. Tang, S. Wang, C. Qiu, K. Xu, X. Peng, J. Han, E. Pop, Y. Chai, “Field-Effect at Electrical Contacts to Two-Dimensional Materials,” *Nano Research* **14**, 4894-4900 (2021)
203. K. Stern, N. Wainstein, Y. Keller, **C.M. Neumann**, E. Pop, S. Kvatinsky, E. Yalon, “Sub-Nanosecond Pulses Enable Partial Reset for Analog Phase Change Memory,” *IEEE Electron Device Lett.* **42**, 1291-1294 (2021)
202. H. Kwon, **A.I. Khan**, C. Perez, M. Asheghi, E. Pop, K.E. Goodson, “Thermal and Electrical

- Characterization of Sb₂Te₃/GeTe Superlattice Films,” *Nano Letters* **21**, 5984-5990 (2021)
201. U. Schmidt, **C.S. Bailey**, J. Englert, **E. Yalon**, G. Ankonina, E. Pop, O. Hollricher, T. Dieing, “A Comprehensive Study of WSe₂ Crystals Using Correlated Raman, Photoluminescence (PL), Second Harmonic Generation (SHG), and Atomic Force Microscopy (AFM) Imaging,” *Spectroscopy* **36**, 23-30 (2021)
200. **V. Chen**, **Y.C. Shin**, E. Mikheev, Q. Lin, J. Martis, Z. Zhang, S. Chatterjee, A. Majumdar, H.-S.P. Wong, D. Goldhaber-Gordon, E. Pop, “Application-Driven Synthesis and Characterization of Hexagonal Boron Nitride on Metal and Carbon Nanotube Substrates,” *2D Materials* **8**, 045024 (2021)
199. K. Stern, N. Wainstein, Y. Keller, **C.M. Neumann**, E. Pop, S. Kvatinsky, *E. Yalon*, “Uncovering Phase Change Memory Energy Limits by Sub-Nanosecond Probing of Power Dissipation Dynamics,” *Adv. Electron. Mater.* **7**, 2100217 (2021)
198. **A. Daus**, **S. Vaziri**, **V. Chen**, **Ç. Köroğlu**, **R.W. Grady**, **C.S. Bailey**, H.R. Lee, **K. Schauble**, **K. Brenner**, E. Pop, “High-Performance Flexible Nanoscale Field-Effect Transistors Based on Transition Metal Dichalcogenides,” *Nature Electronics* **4**, 495-501 (2021)
197. K. Nassiri Nazif, A. Kumar, J. Hong, R. Islam, **C.J. McClellan**, O. Karni, J. van de Groep, T. Heinz, E. Pop, M.L. Brongersma, K. Saraswat, “High-performance p-n junction transition metal dichalcogenide photovoltaic cells enabled by MoO_x doping and passivation,” *Nano Letters* **21**, 3443-3450 (2021)
196. **M.E. Chen**, **M. Muñoz Rojo**, **F. Lian**, **A. Sood**, S.G. Garrow, J. Koeln, A.G. Alleyne, K.E. Goodson, E. Pop, “Graphene-Based Electromechanical Thermal Switches,” *2D Materials* **8**, 035055 (2021)
195. C.-H. Wang, **V. Chen**, **C.J. McClellan**, A. Tang, **S. Vaziri**, L. Li, **M.E. Chen**, E. Pop, H.-S.P. Wong, “Ultrathin Three-Monolayer Tunneling Memory Selectors,” *ACS Nano* **15**, 8484-8491 (2021)
194. C. Wen, X. Li, T. Zanotti, F.M. Puglisi, Y. Shi, F. Saiz, A. Antidormi, S. Roche, W. Zheng, X. Liang, J. Hu, S. Duhm, J.B. Roldan, T. Wu, **V. Chen**, E. Pop, B. Garrido, K. Zhu, F. Hui, M. Lanza, “Advanced Data Encryption Using 2D Materials,” *Adv. Materials* **33**, 2100185 (2021)
193. **A.J. Gabourie**, Z. Fan, T. Ala-Nissilä, E. Pop, “Spectral Decomposition of Thermal Conductivity: Comparing Velocity Decomposition Methods in Homogeneous Molecular Dynamics Simulations,” *Phys. Rev. B*, **103**, 205421 (2021)
192. H.R. Lee, N. Furukawa, A.J. Ricco, E. Pop, Y. Cui, Y. Nishi, “Carbon Nanotube Thermoelectric Devices by Direct Printing: Towards Wearable Energy Converters,” *Appl. Phys. Lett.* **118**, 173901 (2021)
191. **F. Xiong**, **E. Yalon**, **C.J. McClellan**, J. Zhang, Ö.B. Aslan, **A. Sood**, J. Sun, C. Andolina, W.A. Saidi, K.E. Goodson, T.F. Heinz, Y. Cui, E. Pop, “Tuning Electrical and Thermal Properties of Bilayer MoS₂ via Electrochemical Intercalation,” *Nanotechnology* **32**, 265202 (2021)
190. S. Abdollahramezani, O. Hemmatyar, M. Taghinejad, H. Taghinejad, Y. Kiarashinejad, M. Zandehshahvar, T. Fan, **S. Deshmukh**, A.A. Eftekhar, W. Cai, E. Pop, M. El-Sayed, A. Adibi, “Dynamic Hybrid Metasurfaces,” *Nano Lett.* **21**, 1238-1245 (2021)
189. **C.J. McClellan**, **E. Yalon**, **K.K.H. Smithe**, **S.V. Suryavanshi**, E. Pop, “High Current Density in Monolayer MoS₂ Doped by AlO_x,” *ACS Nano* **15**, 1587-1596 (2021)
188. **A.J. Gabourie**, **S.V. Suryavanshi**, A.B. Farimani, E. Pop, “Thermal Transport in Substrate-Supported and Encased MoS₂,” *2D Materials* **8**, 011001 (2021)
187. **A.I. Khan**, H. Kwon, R. Islam, C. Perez, **M.E. Chen**, M. Asheghi, K.E. Goodson, H.-S.P. Wong, E. Pop, “Two-Fold Reduction of Switching Current Density in Phase Change Memory Using Bi₂Te₃ Thermoelectric Interfacial Layer,” *IEEE Electron Device Lett.* **41**, 1657-1660 (2020)
186. **K. Schauble**, D. Zakhidov, **E. Yalon**, **S. Deshmukh**, **R.W. Grady**, K.A. Cooley, **C.J. McClellan**, *S. Vaziri*, D. Passarello, S.E. Mohny, A.K. Sood, M.F. Toney, A. Salleo, E. Pop, “Uncovering the Effects of Metal Contacts on Monolayer MoS₂,” *ACS Nano* **14**, 14798-14808 (2020)
185. **S. Vaziri**, **V. Chen**, L. Cai, Y. Jiang, **M.E. Chen**, **R.W. Grady**, X. Zheng, E. Pop, “Ultrahigh Doping of Graphene Using Flame-Deposited MoO₃,” *IEEE Electron Device Lett.* **41**, 1592-1595 (2020)
184. D. Somvanshi, E. Ber, **C.S. Bailey**, E. Pop, **E. Yalon**, “Improved Current Density and Contact

- Resistance in Bilayer MoSe₂ by AlO_x Capping,” *ACS Appl. Mater. Interfaces*. **12**, 36355-36361 (2020)
183. J. Zheng, Z. Fang, C. Wu, S. Zhu, P. Xu, J.K. Doylend, **S. Deshmukh**, E. Pop, S. Dunham, M. Li, A. Majumdar, “Nonvolatile Electrically Reconfigurable Integrated Photonic Switch Enabled by a Silicon PIN Diode Heater,” *Adv. Materials* **32**, 2001218 (2020)
182. C. Nyby, **A. Sood**, P. Zalden, **A.J. Gabourie**, P. Muscher, D. Rhodes, E. Mannebach, J. Corbett, A. Mehta, E. Pop, T.F. Heinz, A.M. Lindenberg, “Visualization of energy transport at buried interfaces in layered materials using picosecond x-rays,” *Adv. Fun. Mater.* **30**, 2002282 (2020)
181. **A.I. Khan**, P. Khakbaz, **K.A. Brenner**, **K.K.H. Smithe**, **M.J. Mleczko**, D. Esseni, E. Pop, “Large Temperature Coefficient of Resistance in Atomically Thin Two-Dimensional Materials,” *Appl. Phys. Lett.* **116**, 203105 (2020)
180. **I.M. Datye**, **M. Muñoz Rojo**, **E. Yalon**, **S. Deshmukh**, **M.J. Mleczko**, E. Pop, “Localized Heating and Switching in MoTe₂-Based Resistive Memory Devices,” *Nano Lett.* **20**, 1461-1467 (2020)
179. J. Chen, **C.S. Bailey**, D. Cui, Y. Wang, B. Wang, H. Shi, Z. Cai, E. Pop, C. Zhou, S.B. Cronin, “Stacking Independence and Resonant Interlayer Excitation of Monolayer WSe₂/MoSe₂ Heterostructures for Photocatalytic Energy Conversion,” *ACS Appl. Nano Mater.* **3**, 1175-1181 (2020)
178. **S.M. Bohaichuk**, M.M. Pelella, Y. Sun, Z. Zhang, S. Ramanathan, E. Pop, “VO₂ Switch for Electrostatic Discharge Protection,” *IEEE Electron Device Lett.* **41**, 292-295 (2020)
177. W. Huang, Z. Yang, M.D. Kraman, Q. Wang, Z. Ou, **M.M. Rojo**, A.S. Yalamarthy, **V. Chen**, **F. Lian**, H. Ni, S. Liu, H. Yu, L. Sang, J. Michaels, D.J. Sievers, G. Eden, P. Braun, Q. Chen, S. Gong, D.G. Senesky, E. Pop, X. Li, “Monolithic mTesla Level Magnetic Induction by Self-Rolled-up Membrane Technology,” *Science Adv.* **6**, eaay4508 (2020)
176. J. Nathawat, **K.K.H. Smithe**, **C.D. English**, S. Yin, R. Dixit, M. Randle, N. Arabchigavkani, B. Barut, K. He, E. Pop, J.P. Bird, “Transient Hot-Carrier Dynamics and Intrinsic Velocity Saturation in Monolayer MoS₂,” *Phys. Rev. Mater.* **4**, 014002 (2020)
175. K.A. Patel, **R.W. Grady**, **K.K.H. Smithe**, E. Pop, R. Sordan, “Ultra-Scaled MoS₂ Transistors and Circuits Fabricated without Nanolithography,” *2D Materials* **7**, 015018 (2020)
174. A. Krayev, **C.S. Bailey**, K. Jo, S. Wang, A. Singh, T. Darlington, G.-Y. Liu, S. Gradečak, P.J. Schuck, E. Pop, D. Jariwala, “Dry Transfer of van der Waals Crystals to Noble Metals for Sub-Surface Characterization,” *ACS Appl. Mater. Interfaces* **11**, 38218-38225 (2019)
173. **S.M. Bohaichuk**, S. Kumar, G. Pitner, **C.J. McClellan**, J. Jeong, M. Samant, H.-S.P. Wong, S.S.P. Parkin, R.S. Williams, E. Pop, “Fast Spiking of a Mott VO₂-Carbon Nanotube Composite Device,” *Nano Lett.* **19**, 6751-6755 (2019)
172. **R.L. Xu**, **M. Muñoz Rojo**, S.M. Islam, **A. Sood**, **B. Vareskic**, A. Katre, N. Mingo, K.E. Goodson, H.G. Xing, D. Jena, E. Pop “Thermal Conductivity of Crystalline AlN and the Influence of Atomic-Scale Defects,” *J. Appl. Phys.* **126**, 185105 (2019)
171. **S.M. Bohaichuk**, **M. Muñoz Rojo**, G. Pitner, **C.J. McClellan**, **F. Lian**, J. Li, J. Jeong, M.G. Samant, S.S.P. Parkin, H.-S.P. Wong, E. Pop, “Localized Triggering of the Metal-Insulator Transition in VO₂ using a Single Carbon Nanotube,” *ACS Nano* **13**, 11070-11077 (2019)
170. H. Lee, **S. Deshmukh**, J. Wen, V.Z. Costa, J.S. Schuder, M. Sanchez, A.S. Ichimura, E. Pop, B. Wang, A.K.M. Newaz, “Layer Dependent Interfacial Transport and Optoelectrical Properties of MoS₂ on Ultra-flat Metals,” *ACS Appl. Mater. Interfaces* **11**, 31543-31550 (2019)
169. **S. Deshmukh**, **E. Yalon**, **F. Lian**, **K.E. Schauble**, **F. Xiong**, I.V. Karpov, E. Pop, “Temperature-Dependent Contact Resistance to Non-Volatile Memory Materials,” *IEEE Trans. Electron Devices* **66**, 3816-3821 (2019)
168. **M.J. Mleczko**, **A.C. Yu**, C.M. Smyth, **V. Chen**, **Y.C. Shin**, Y.-C. Tsai, Y. Nishi, R.M. Wallace, E. Pop, “Contact Engineering High Performance *n*-Type MoTe₂ Transistors,” *Nano Lett.*, **19**, 6352-6362 (2019)
167. **S. Vaziri**, **E. Yalon**, **M. Muñoz Rojo**, **S.V. Suryavanshi**, H. Zhang, **C.J. McClellan**, **C.S. Bailey**, **K.K.H. Smithe**, **A.J. Gabourie**, **V. Chen**, **S. Deshmukh**, L. Bendersky, A.V. Davydov, E. Pop,

- “Ultrahigh thermal isolation across heterogeneously layered two-dimensional materials,” *Science Adv.* **5**, eaax1325 (2019)
166. **S.V. Suryavanshi, A.J. Gabourie**, A.B. Farimani, E. Pop, “Thermal Boundary Conductance of Two-Dimensional MoS₂ Interfaces,” *J. Appl. Phys.* **126**, 055107 (2019)
165. A.S. Yalamathy, **M. Muñoz Rojo**, A. Bruefach, D. Boone, K.M. Dowling, **P.F. Satterthwaite**, D. Goldhaber-Gordon, E. Pop, D.G. Senesky, “Significant Phonon Drag Enables High Power Factor in the AlGa_N/Ga_N Two-Dimensional Electron Gas,” *Nano Lett.* **19**, 3770–3776 (2019)
164. K.L. Okabe, **A. Sood, E. Yalon, C.M. Neumann**, M. Asheghi, E. Pop, K.E. Goodson, H.-S.P. Wong, “Understanding the Switching Mechanism of Interfacial Phase Change Memory,” *J. Appl. Phys.* **125**, 184501 (2019)
163. G. Chen, R. Rastak, Y. Wang, H. Yan, V. Feig, Y. Liu, Y. Jiang, S. Chen, **F. Lian**, F. Molina-Lopez, L. Jin, K. Cui, J.W. Chung, E. Pop, C. Linder, Z. Bao, “Strain- and Strain Rate-Invariant Conductance in a Stretchable and Compressible 3D Conducting Polymer Foam,” *Matter* **1**, 1-14 (2019)
162. **A. Sood, F. Xiong**, S. Chen, R. Cheaito, **F. Lian**, M. Asheghi, Y. Cui, D. Donadio, K.E. Goodson, E. Pop, “Quasi-Ballistic Thermal Transport Across MoS₂ Thin Films,” *Nano Lett.* **19**, 2434-2442 (2019)
161. J. Chen, **C.S. Bailey**, Y. Hong, L. Wang, Z. Cai, L. Shen, B. Hou, Y. Wang, H. Shi, J. Sambur, W. Ren, E. Pop, S. Cronin, “Plasmon-Resonant Enhancement of Photocatalysis on Monolayer WSe₂,” *ACS Photonics* **6**, 787-792 (2019)
160. **C.M. Neumann**, K.L. Okabe, **E. Yalon, R.W. Grady**, H.-S.P. Wong, Eric Pop, “Engineering Thermal and Electrical Interface Properties of Phase Change Memory with Monolayer MoS₂,” *Appl. Phys. Lett.* **114**, 082103 (2019)
159. R. Yang, H. Li, **K.K.H. Smithe**, T.R. Kim, K. Okabe, E. Pop, J.A. Fan, H.-S.P. Wong, “Ternary Content-Addressable Memory with MoS₂ Transistors for the Parallel Search of Massive Data,” *Nature Electronics* **2**, 108-114 (2019)
158. S. Chen, **A. Sood**, E. Pop, K.E. Goodson, D. Donadio, “Strongly Tunable Anisotropic Thermal Transport in MoS₂ by Strain and Lithium Intercalation: First-Principles Calculations,” *2D Materials* **6**, 025033 (2019)
157. **E. Yalon, I.M. Datye**, J.-S. Moon, K.-A. Son, K. Lee, E. Pop, “Energy-Efficient Indirectly-Heated Phase Change RF Switch,” *IEEE Electron Device Lett.* **40**, 455-458 (2019)
156. **D. Estrada, Z. Li**, S.N. Dunham, G.-M. Choi, **N. Wang**, Y. Meng, **F. Lian**, J. Lee, J.-M. Zuo, W.P. King, J.A. Rogers, D.G. Cahill, E. Pop, “Thermal Transport in Layer-by-Layer Assembled Polycrystalline Graphene Films,” *npj 2D Materials & Applications* **3**, 10 (2019)
155. M. Lanza, H.-S.P. Wong, E. Pop, D. Ielmini, D. Strukov, B.C. Regan, L. Larcher, M.A. Villena, J.J. Yang, L. Goux, A. Belmonte, Y. Yang, F.M. Puglisi, J. Kang, B. Magyari-Köpe, **E. Yalon**, A. Kenyon, M. Buckwell, A. Mehonic, A. Shluger, H. Li, T.-H. Hou, B. Hudec, D. Akinwande, R. Ge, S. Ambrogio, J.B. Roldan, E. Miranda, J. Suñe, K.L. Pey, X. Wu, N. Raghavan, E. Wu, W.D. Lu, G. Navarro, W. Zhang, H. Wu, R. Li, A. Holleitner, U. Wurstbauer, M. Lemme, M. Liu, S. Long, Q. Liu, H. Lv, A. Padovani, P. Pavan, I. Valov, X. Jing, T. Han, K. Zhu, S. Chen, F. Hui, Y. Shi, “Recommended Methods to Study Resistive Switching Devices,” *Adv. Electron. Mat.* **5**, 1800143 (2019)
154. K. Xu, **A.J. Gabourie**, A. Hashemi, Z. Fan, N. Wei, A.B. Farimani, H.-P. Komsa, A.V. Krasheninnikov, E. Pop, T. Ala-Nissilä, “Thermal Transport in MoS₂ from Molecular Dynamics using Different Empirical Potentials,” *Phys. Rev. B* **99**, 054303 (2019)
153. E. Barré, **J.A.C. Incorvia**, S.H. Kim, **C.J. McClellan**, E. Pop, H.-S.P. Wong, T.F. Heinz, “Spatial Separation of Carrier Spin by the Valley Hall Effect in Monolayer WSe₂ Transistors,” *Nano Lett.* **19**, 770-774 (2019)
152. **M. Muñoz Rojo, Z. Li**, C. Sievers, **A. Bornstein, E. Yalon, S. Deshmukh, S. Vaziri, M.-H. Bae, F. Xiong**, D. Donadio, E. Pop, “Thermal Transport Across Graphene Step Junctions,” *2D Materials* **6**, 011005 (2019)

151. **I.M. Datye, A.J. Gabourie, C.D. English, K.K.H. Smithe, C.J. McClellan, N.C. Wang**, E. Pop, "Reduction of Hysteresis in MoS₂ Transistors Using Pulsed Voltage Measurements," *2D Materials* **6**, 011004 (2019)
150. **A. Sood, F. Xiong**, S. Chen, H. Wang, D. Selli, J. Zhang, **C.J. McClellan**, J. Sun, D. Donadio, Y. Cui, E. Pop, K.E. Goodson, "An Electrochemical Thermal Transistor," *Nature Commun.* **9**, 4510 (2018)
149. Y. Shi, X. Liang, B. Yuan, **V. Chen**, H. Li, F. Hui, Z. Yu, F. Yuan, E. Pop, H.-S.P. Wong, M. Lanza, "Electronic Synapses Made of Layered Two-Dimensional Materials," *Nature Electronics* **1**, 458-465 (2018)
148. Z. Lin, Y. Lei, S. Subramanian, N. Briggs, Y. Wang, C.-L. Lo, **E. Yalon**, D. Lloyd, S. Wu, K. Koski, R. Clark, S. Das, R. Wallace, T. Kuech, J. Bunch, X. Li, Z. Chen, E. Pop, V. Crespi, J. Robinson, M. Terrones, "Recent Progress on 2D Materials Beyond Graphene: From Ripples, Defects, Intercalation, and Valley Dynamics, to Straintronics, and Power Dissipation," *APL Materials* **6**, 080701 (2018)
147. **K.K.H. Smithe, C.D. English, S.V. Suryavanshi**, E. Pop, "High-Field Transport and Velocity Saturation in Synthetic Monolayer MoS₂," *Nano Letters* **18**, 4516-4522 (2018)
146. J. Zheng, A. Khanolkar, P. Xu, S. Colburn, **S. Deshmukh**, J. Myers, J. Frantz, E. Pop, J. Hendrickson, J. Doylend, N. Boechler, A. Majumdar, "GST-on-silicon hybrid nanophotonic integrated circuits: a non-volatile quasicontinuously reprogrammable platform," *Opt. Mater. Express* **8**, 1551-1561 (2018) (**OMEx Emerging Researcher Best Paper Prize**)
145. C.-H. Wang, J.A. Currvan-Incorvia, **C.J. McClellan, A.C. Yu, M.J. Mleczko**, E. Pop, H.-S.P. Wong, "Unipolar N-type Black Phosphorus Transistor with Low Work Function Contacts," *Nano Letters* **18**, 2822-2827 (2018)
144. Ö.B. Aslan, **I.M. Datye, M.J. Mleczko**, K.S. Cheung, S. Krylyuk, A. Bruma, I. Kalish, A.V. Davydov, E. Pop, T.F. Heinz, "Probing the Optical Properties and Strain-Tuning of Ultrathin Mo_{1-x}W_xTe₂," *Nano Letters* **18**, 2485-2491 (2018)
143. **Z.-Y. Ong**, B. Qiu, X. Ruan, E. Pop, "Flexural Resonance Mechanism of Thermal Transport Across Graphene-SiO₂ Interfaces," *J. Appl. Phys.* **123**, 115107 (2018)
142. E.C. Ahn, H.-S.P. Wong, E. Pop, "Carbon Nanomaterials for Non-Volatile Memories," *Nat. Rev. Mater.* **3**, 18009 (2018)
141. A.S. Yalamarthy, H. So, **M. Muñoz Rojo**, A.J. Suria, X. Xu, E. Pop, D. Senesky, "Tuning Electrical and Thermal Transport in AlGaIn/GaN Heterostructures via Buffer Layer Engineering," *Adv. Funct. Mater.* **28**, 1705823 (2018)
140. L. Anzi, A. Mansouri, P. Pedrinazzi, E. Guerriero, M. Fiocco, A. Pesquera, A. Centeno, A. Zurutuza, **A. Behnam, E.A. Carrion**, E. Pop, R. Sordan, "Ultra-Low Contact Resistance in Graphene Devices at the Dirac Point," *2D Materials* **5**, 025014 (2018)
139. L. Jin, A. Chortos, **F. Lian**, E. Pop, C. Linder, Z. Bao, W. Cai, "Microstructural origin of resistance-strain hysteresis in carbon nanotube thin film conductors," *Proc. Natl. Acad. Sci.* **115**, 1986-1991 (2018)
138. **K.K.H. Smithe**, A. Krayev, **C.S. Bailey**, H.R. Lee, **E. Yalon**, Ö.B. Aslan, **M. Muñoz Rojo**, S. Krylyuk, P. Taheri, A.V. Davydov, T.F. Heinz, E. Pop, "Nanoscale Heterogeneities in Monolayer MoSe₂ Revealed by Correlated Scanning Probe Microscopy and Tip-Enhanced Raman Spectroscopy," *ACS Appl. Nano Mater.* **1**, 572-579 (2018)
137. D.A. Rehn, Y. Li, E. Pop, E.J. Reed, "Theoretical potential for low energy consumption phase change memory utilizing electrostatically-induced structural phase transitions in 2D materials," *npj Computational Materials* **2**, 4 (2018)
136. **E. Yalon**, Ö.B. Aslan, **K.K.H. Smithe, C.J. McClellan, S.V. Suryavanshi, F. Xiong**, A. Sood, **C.M. Neumann**, X. Xu, K.E. Goodson, T.F. Heinz, E. Pop, "Temperature-Dependent Thermal Boundary Conductance of Monolayer MoS₂ by Raman Thermometry," *ACS Appl. Mater. Interfaces* **9**, 43013-43020 (2017)
135. C.L. Lo, M. Catalano, **K.K.H. Smithe**, L. Wang, S. Zhang, E. Pop, M.J. Kim, Z. Chen, "Studies of Two-Dimensional h-BN and MoS₂ for Potential Diffusion Barrier Application in Copper Interconnect

- Technology,” *npj 2D Materials & Applications* **1**, 42 (2017)
134. M.T. Barako, S.G. Isaacson, **F. Lian**, E. Pop, R.H. Dauskardt, K.E. Goodson, J. Tice, “Dense Vertically Aligned Copper Nanowire Composites as High Performance Thermal Interface Materials,” *ACS Appl. Mater. Interfaces* **9**, 42067–42074 (2017)
 133. Y.Y. Illarionov, **K.K.H. Smithe**, M. Waihl, T. Knobloch, E. Pop, T. Grasser, “Improved Hysteresis and Reliability of MoS₂ FETs with High-Quality CVD Growth and Al₂O₃ Encapsulation,” *IEEE Electron Device Lett.* **38**, 1763-1766 (2017)
 132. **E. Yalon**, **S. Deshmukh**, **M. Muñoz Rojo**, **F. Lian**, **C.M. Neumann**, **F. Xiong**, E. Pop, “Spatially Resolved Thermometry of Resistive Memory Devices,” *Scientific Reports* **7**, 15360 (2017)
 131. S.W. Fong, **C.M. Neumann**, **E. Yalon**, **M. Muñoz Rojo**, E. Pop, H.-S.P. Wong, “Dual-layer Dielectric Stack for Thermally-Isolated Low-energy Phase-Change Memory,” *IEEE Trans. Electron Devices* **64**, 4496-4502 (2017)
 130. **M.A. Yamoah**, W. Yang, E. Pop, D. Goldhaber-Gordon, “High Velocity Saturation in Graphene Encapsulated by Hexagonal Boron Nitride,” *ACS Nano* **11**, 9914-9919 (2017)
 129. J. Shim, S. Banerjee, H. Qiu, **K.K.H. Smithe**, **D. Estrada**, J. Bello, E. Pop, K. Schulten, R. Bashir, “Detection of Methylation on dsDNA using Nanopores in MoS₂ Membrane,” *Nanoscale* **9**, 14836-14845 (2017)
 128. **M.J. Mleczko**, C. Zhang, H.R. Lee, H.H. Kuo, B. Magyari-Köpe, R.G. Moore, Z.-X. Shen, I.R. Fisher, Y. Nishi, E. Pop, “HfSe₂ and ZrSe₂: Two-Dimensional Semiconductors with Native High-K Oxides,” *Science Adv.* **3**, e1700481 (2017)
 127. A.E. Yore, **K.K.H. Smithe**, S. Jha, K. Ray, E. Pop, A.K.M. Newaz, “Large Array Fabrication of High Performance Monolayer MoS₂ Photodetectors,” *Appl. Phys. Letters*. **111**, 043110 (2017)
 126. **K.K.H. Smithe**, **S.V. Suryavanshi**, **M. Muñoz Rojo**, **A.D. Tedjarati**, E. Pop, “Low Variability in Synthetic Monolayer MoS₂ Devices,” *ACS Nano* **11**, 8456–8463 (2017)
 125. L. Cai, **C.J. McClellan**, A.L. Koh, H. Li, **E. Yalon**, E. Pop, X. Zheng, “Rapid Flame Synthesis of Atomically Thin MoO₃ down to Monolayer Thickness for Effective Hole Doping of WSe₂,” *Nano Letters* **17**, 3854–3861 (2017)
 124. **N.C. Wang**, **E.A. Carrion**, **M.C. Tung**, E. Pop, “Reducing Graphene Device Variability with Yttrium Sacrificial Layers,” *Appl. Phys. Letters* **110**, 223106 (2017)
 123. L. Gao, **E. Yalon**, A.R. Chew, **S. Deshmukh**, A. Salleo, E. Pop, A.A. Demkov, “Effect of oxygen vacancies and strain on the phonon spectrum of HfO₂,” *J. Appl. Phys.* **121**, 224101 (2017)
 122. K. Ray, A.E. Yore, T. Mou, S. Jha, **K.K.H. Smithe**, B. Wang, E. Pop, A.K.M. Newaz, “Photoresponse of Natural van der Waals Heterostructures,” *ACS Nano* **11**, 6024–6030 (2017)
 121. **E. Yalon**, **C.J. McClellan**, **K.K.H. Smithe**, **M. Muñoz Rojo**, **R.L. Xu**, **S.V. Suryavanshi**, **A.J. Gaborie**, **C.M. Neumann**, **F. Xiong**, A.B. Farimani, E. Pop, “Energy Dissipation in Monolayer MoS₂ Electronics,” *Nano Letters* **17**, 3429–3433 (2017)
 120. E. Guerriero, P. Pedrinazzi, A. Mansouri, O. Habibpour, M. Winters, N. Rorsman, **A. Behnam**, **E.A. Carrion**, A. Pesquera, A. Centeno, A. Zurutuza, E. Pop, H. Zirath, R. Sordan “High-Gain Graphene Transistors with a Thin AlO_x Top-Gate Oxide,” *Scientific Reports* **7**, 2419 (2017)
 119. **K.K.H. Smithe**, **C.D. English**, **S.V. Suryavanshi**, E. Pop, “Enhanced Electrical Transport and Performance Projections of Synthetic Monolayer MoS₂ Devices,” *2D Materials* **4**, 011009 (2017)
 118. **S.V. Suryavanshi** and E. Pop, “S2DS: Physics-Based Compact Model for Circuit Simulation of Two-Dimensional Semiconductor Devices Including Non-Idealities,” *J. Appl. Phys.* **120**, 224503 (2016)
 117. Y. An, A. Shekhawat, **A. Behnam**, E. Pop, A. Ural, “Gate tunneling current and quantum capacitance in metal-oxide-semiconductor devices with graphene gate electrodes,” *Appl. Phys. Lett.* **109**, 223104 (2016)
 116. A. Yore, **K.K.H. Smithe**, W. Crumrine, A. Miller, J. Tuck, B. Redd, E. Pop, B. Wang, A.K.M. Newaz, “Visualization of defect-induced excitonic properties of the edges and grain boundaries in synthesized monolayer molybdenum disulfide,” *J. Phys. Chem. C* **120**, 24080-24087 (2016)

115. Y.K. Koh, **A.S. Lyons**, **M.-H. Bae**, B. Huang, **V.E. Dorgan**, D.G. Cahill, E. Pop, "Role of Remote Interfacial Phonon (RIP) Scattering in Heat Transport Across Graphene/SiO₂ Interfaces," *Nano Letters* **16**, 6014-6020 (2016)
114. **M.J. Mleczko**, **R.L. Xu**, K. Okabe, H.-H. Kuo, I.R. Fisher, H.-S.P. Wong, Y. Nishi, E. Pop, "High Current Density and Low Thermal Conductivity of Atomically Thin Semimetallic WTe₂," *ACS Nano* **10**, 7507-7514 (2016)
113. **F. Xiong**, **S. Hong**, **Y. Dai**, **A. Behnam**, **S. Deshmukh**, **F. Lian**, E. Pop, "SANTA: Self-Aligned Nanotrench Ablation via Joule Heating for Probing Sub-20 nm Devices," *Nano Research* **9**, 2950-2959 (2016)
112. S.J. Choi, B.-K. Kim, T.-H. Lee, Y.H. Kim, **Z. Li**, E. Pop, J.-J. Kim, J.H. Song, **M.-H. Bae**, "Electrical and thermoelectric transport by variable range hopping in thin black phosphorus devices," *Nano Lett.* **16**, 3969-3975 (2016)
111. **C.D. English**, G. Shine, **V.E. Dorgan**, K.C. Saraswat, E. Pop, "Improved Contacts to MoS₂ Transistors by Ultra-High Vacuum Metal Deposition," *Nano Lett.* **16**, 3824-3830 (2016)
110. J.C. Koepke, **J.D. Wood**, Y. Chen, S.W. Schmucker, X. Liu, N.N. Chang, L. Nienhaus, J.W. Do, **E.A. Carrion**, **J. Hewaparakrama**, A. Rangarajan, **I. Datye**, R. Mehta, R.T. Haasch, M. Gruebele, G.S. Girolami, E. Pop, J.W. Lyding, "Role of Pressure in the Growth of Hexagonal Boron Nitride Thin Films from Ammonia-Borane," *Chem. Mater.* **28**, 4169-4179 (2016)
109. H. Li, M. Du, **M.J. Mleczko**, A.L. Koh, Y. Nishi, E. Pop, A.J. Bard, X. Zheng, "Kinetic Study of Hydrogen Evolution Reaction over Strained MoS₂ with Sulphur-Vacancies using Scanning Electrochemical Microscopy," *J. Am. Chem. Soc.* **138**, 5123-5129 (2016)
108. **Z. Li**, **V.E. Dorgan**, **A.Y. Serov**, E. Pop, "High-Field and Thermal Transport in Graphene," Chapter 5 in *2D Materials for Nanoelectronics*, CRC Press / Taylor & Francis (2016)
107. **F. Lian**, **J.P. Llinas**, **Z. Li**, **D. Estrada**, E. Pop, "Thermal Conductivity of Chirality-Sorted Carbon Nanotube Networks," *Appl. Phys. Lett.* **108**, 103101 (2016)
106. M.M.S. Aly, M. Gao, G. Hills, C.-S. Lee, G. Pitner, M.M. Shulaker, T.F. Wu, M. Asheghi, J. Bokor, F. Franchetti, K.E. Goodson, C. Kozyrakakis, I. Markov, K. Olukotun, L. Pileggi, E. Pop, J. Rabaey, C. Re, H.-S.P. Wong, S. Mitra, "Energy-Efficient Abundant-Data Computing: The N3XT 1,000X," *IEEE Computer* **48**, 24-33 (2015)
105. Y. An, **A. Behnam**, E. Pop, G. Bosman, A. Ural, "Forward-bias diode parameters, electronic noise, and photoresponse of graphene/silicon Schottky junctions with an interfacial native oxide layer," *J. Appl. Phys.* **118**, 114307 (2015)
104. C. Ahn, S.W. Fong, Y. Kim, S. Lee, A. Sood, **C.M. Neumann**, M. Asheghi, K.E. Goodson, E. Pop, H.-S.P. Wong, "Energy-Efficient Phase-Change Memory with Graphene as Thermal Barrier," *Nano Letters* **15**, 6809-6814 (2015)
103. **F. Xiong**, H. Wang, X. Liu, J. Sun, M. Brongersma, E. Pop, Y. Cui, "Li Intercalation in MoS₂: In-Situ Observation of Its Dynamics and Tuning Optical and Electrical Properties," *Nano Letters* **15**, 6777-6784 (2015)
102. H. Yuan, S. Chang, I. Bargatin, **N.C. Wang**, D.C. Riley, H. Wang, J.W. Schwede, J. Provine, E. Pop, Z.-X. Shen, P.A. Pianetta, N.A. Melosh, R.T. Howe, "Engineering Ultra-Low Work Function of Graphene," *Nano Letters* **15**, 6475-6480 (2015)
101. **A. Behnam**, **F. Xiong**, A. Cappelli, **N.C. Wang**, **E.A. Carrion**, **S. Hong**, **Y. Dai**, **A.S. Lyons**, E.K. Chow, E. Piccinini, C. Jacoboni, E. Pop, "Nanoscale Phase Change Memory with Graphene Ribbon Electrodes," *Appl. Phys. Letters* **107**, 123508 (2015)
100. O. Khatib, **J.D. Wood**, A.S. McLeod, M.D. Goldflam, M. Wagner, G.L. Damhorst, J.C. Koepke, G.P. Doidge, A. Rangarajan, R. Bashir, E. Pop, J.W. Lyding, M.H. Thiemens, F. Keilmann, D.N. Basov, "Graphene-Based Platform for Infrared Near-Field Nano-Spectroscopy of Water and Biological Materials in an Aqueous Environment," *ACS Nano* **9**, 7968-7975 (2015)
99. C.-S. Lee, E. Pop, A.D. Franklin, W. Haensch, H.-S.P. Wong, "A Compact Virtual-Source Model for

- Carbon Nanotube Field-Effect Transistors in the Sub-10-nm Regime – Part II: Extrinsic Elements, Performance Assessment, and Design Optimization,” *IEEE Trans. Electron Devices* **62**, 3070-3078 (2015)
98. C.-S. Lee, E. Pop, A.D. Franklin, W. Haensch, H.-S.P. Wong, “A Compact Virtual-Source Model for Carbon Nanotube Field-Effect Transistors in the Sub-10-nm Regime – Part I: Intrinsic Elements,” *IEEE Trans. Electron Devices* **62**, 3061-3069 (2015)
97. Y.D. Kim, H. Kim, Y. Cho, J.H. Ryoo, C.-H. Park, P. Kim, Y.S. Kim, S. Lee, Y. Li, S.-N. Park, Y.S. Yoo, **V.E. Dorgan**, E. Pop, T.F. Heinz, J. Hone, S.-H. Chun, H. Cheong, S.W. Lee, **M.-H. Bae**, Y.D. Park, “Bright visible-light emission from electrically biased suspended graphene,” *Nature Nanotech.* **10**, 676-681 (2015)
96. M. Bianchi, E. Guerriero, M. Fiocco, R. Alberti, L. Polloni, **A. Behnam**, **E.A. Carrion**, E. Pop, R. Sordan, “Scaling of Graphene Integrated Circuits,” *Nanoscale* **7**, 8076-8083 (2015)
95. J.-W. Do, N.N. Chang, **D. Estrada**, **F. Lian**, H. Cha, X.J. Duan, R.T. Haasch, E. Pop, G.S. Girolami, J.W. Lyding, “Solution-Mediated Selective Nanosoldering of Carbon Nanotube Junctions for Improved Device Performance,” *ACS Nano* **9**, 4806-4813 (2015)
94. **J.D. Wood**, G.P. Doidge, **E.A. Carrion**, J.C. Koepke, J.A. Kaitz, **I. Datye**, **A. Behnam**, **J. Hewaparakrama**, B. Aruin, Y. Chen, H. Dong, R.T. Haasch, J.W. Lyding, E. Pop, “Annealing Free, Clean Graphene Transfer using Alternative Polymer Scaffolds,” *Nanotechnology* **26**, 055302 (2015)
93. **K.L. Grosse**, **V.E. Dorgan**, **D. Estrada**, **J.D. Wood**, I. Vlasiouk, G. Eres, J.W. Lyding, W.P. King, E. Pop, “Direct Observation of Resistive Heating at Graphene Wrinkles and Grain Boundaries,” *Appl. Phys. Lett.*, **105**, 143109 (2014)
92. **K.L. Grosse**, E. Pop, W.P. King, “Heterogeneous Nanometer-Scale Joule and Peltier Effects in Sub-25 nm Thin Phase Change Memory Devices,” *J. Appl. Phys.* **116**, 124508 (2014)
91. **K.L. Grosse**, E. Pop, W.P. King, “Nanometer-Scale Temperature Imaging for Independent Observation of Joule and Peltier Effects in Phase Change Memory Devices,” *Rev. Sci. Instrum.* **85**, 094904 (2014)
90. S. Raoux, **F. Xiong**, M. Wuttig, E. Pop, “Phase Change Materials and Phase Change Memory,” [invited review] *MRS Bulletin* **39**, 703-710 (2014)
89. **Z. Li**, **M.-H. Bae**, E. Pop, “Substrate-Supported Thermometry Platform for Nanomaterials like Graphene, Nanotubes, and Nanowires,” *Appl. Phys. Lett.* **105**, 023107 (2014)
88. M.J. Shu, P. Zalden, F. Chen, B. Weems, I. Chatzakis, **F. Xiong**, R. Jeyasingh, M.C. Hoffman, E. Pop, H.-S.P. Wong, M. Wuttig, A.M. Lindenberg, “Ultrafast Terahertz-Induced Response of GeSbTe Phase-Change Materials,” *Appl. Phys. Lett.* **104**, 251907 (2014)
87. **A. Serov**, **Z.-Y. Ong**, M.V. Fischetti, E. Pop, “Theoretical Analysis of High-Field Transport in Graphene on a Substrate,” *J. Appl. Phys.* **116**, 034507 (2014)
86. Y. Jiang, **F. Xiong**, C.-L. Tsai, T. Ozel, E. Pop, M. Shim, “Self-Aligned Cu Etch Mask for Individually-Addressable Metallic and Semiconducting Carbon Nanotubes,” *ACS Nano* **8**, 6500-6508 (2014)
85. E. Pop, “Monte Carlo Transport and Heat Generation in Semiconductors,” *Annu. Rev. Heat Transfer*, Ch. **11**, pp. 385-423 (2014).
84. M.M. Shulaker, J.V. Rethy, T.F. Wu, L.S. Liyanage, H. Wei, **Z. Li**, E. Pop, G. Gielen, H.-S.P. Wong, S. Mitra, “Carbon Nanotube Circuit Integration up to Sub-20 nm Channel Lengths,” *ACS Nano* **8**, 3434-3443 (2014)
83. **E.A. Carrion**, **A.Y. Serov**, **S. Islam**, **A. Behnam**, **A. Malik**, **F. Xiong**, M. Bianchi, R. Sordan, E. Pop, “Hysteresis-Free Nanosecond Pulsed Electrical Characterization of Top-Gated Graphene Transistors,” *IEEE Trans. Electron Devices* **61**, 1583-1589 (2014)
82. P.K. Mohseni, **A. Behnam**, **J.D. Wood**, X. Zhao, K.J. Yu, J.A. Rogers, J.W. Lyding, E. Pop, X. Li, “Monolithic III-V Nanowire Solar Cells on Graphene via Direct van der Waals Epitaxy,” *Adv. Materials* **26**, 3755-3760 (2014)
81. D.G. Cahill, P.V. Braun, G. Chen, D.R. Clarke, S. Fan, K.E. Goodson, P. Keblinski, W.P. King, G.D. Mahan, A. Majumdar, H.J. Maris, S.R. Phillpot, E. Pop, L. Shi, “Nanoscale Thermal Transport II: 2003-

- 2012,” *Applied Physics Reviews* **1**, 011305 (2014)
80. J-W. Do, **D. Estrada**, X. Xie, N.N. Chang, G.S. Girolami, J.A. Rogers, E. Pop, J.W. Lyding, “Nanosoldering Carbon Nanotube Junctions by Local Chemical Vapor Deposition for Improved Device Performance,” *Nano Letters* **13**, 5844-5850 (2013)
79. B.E. Walling, Z. Kuang, Y. Hao, **D. Estrada**, **J.D. Wood**, **F. Lian**, L.A. Miller, A.B. Shah, J.L. Jeffries, R.T. Haasch, J.W. Lyding, E. Pop, G.W. Lau, “Helical Carbon Nanotubes Enhance the Early Immune Response and Inhibit Macrophage-Mediated Phagocytosis of *Pseudomonas aeruginosa*,” *PLoS ONE* **8**, e80283 (2013)
78. M.P. Gupta, **A. Behnam**, **F. Lian**, **D. Estrada**, E. Pop, S. Kumar, “High Field Characteristics of Carbon Nanotube Thin Film Transistors,” *Nanotechnology* **24**, 405204 (2013)
77. A. Cappelli, E. Piccinini, **F. Xiong**, **A. Behnam**, R. Brunetti, M. Rudan, E. Pop, C. Jacoboni, “Conductive Preferential Paths of Hot Carriers in Amorphous Phase-Change Materials,” *Appl. Phys. Lett.* **103**, 083503 (2013)
76. E. Guerriero, L. Polloni, M. Bianchi, **A. Behnam**, **E.A. Carrion**, L.G. Rizzi, E. Pop, R. Sordan, “Gigahertz Integrated Graphene Ring Oscillators,” *ACS Nano* **7**, 5588-5594 (2013)
75. C.-L. Tsai, **F. Xiong**, E. Pop, M. Shim, “Resistive Random Access Memory Enabled by Carbon Nanotube Crossbar Electrodes,” *ACS Nano* **7**, 5360-5366 (2013)
74. J. Luo, L. Wei, C.-S. Lee, A.D. Franklin, X. Guan, E. Pop, D.A. Antoniadis, H.-S.P. Wong, “A Compact Model for Carbon Nanotube Field-Effect Transistors Including Non-Idealities and Calibrated with Experimental Data Down to 9 nm Gate Length,” *IEEE Trans. Electron Devices* **60**, 1834-1843 (2013)
73. **K.L. Grosse**, **F. Xiong**, **S. Hong**, W.P. King, and E. Pop, “Direct Observation of Nanometer-Scale Joule and Peltier Effects in Phase Change Memory Devices,” *Appl. Phys. Lett.* **102**, 193503 (2013)
72. **Z.-Y. Ong**, M.V. Fischetti, **A.Y. Serov**, E. Pop, “Signatures of Dynamic Screening in Interfacial Thermal Transport of Graphene,” *Phys. Rev. B* **87**, 195404 (2013)
71. B. Kumar, K. Min, M. Bashirzadeh, A. Barati-Farimani, **M.-H. Bae**, **D. Estrada**, Y.D. Kim, P. Yasaei, Y.D. Park, E. Pop, N.R. Aluru, A. Salehi-Khojin, “The Role of External Defects in Chemical Sensing of Graphene Field-Effect Transistors,” *Nano Letters* **13**, 1962-1968 (2013)
70. S.H. Jin, S.N. Dunham, J. Song, X. Xie, J-h. Kim, C. Lu, A. Islam, F. Du, J. Kim, J. Felts, Y. Li, **F. Xiong**, A. Wahad, M. Menon, E. Cho, **K.L. Grosse**, D.J. Lee, H.U. Chung, E. Pop, M.A. Alam, W.P. King, Y. Huang, J.A. Rogers, “Using Nanoscale Thermocapillary Flows to Create Arrays of Purely Semiconducting Single Walled Carbon Nanotubes,” *Nature Nanotechnology* **8**, 347-355 (2013)
69. **M.-H. Bae**, **Z. Li**, Z. Aksamija, **P.N. Martin**, **F. Xiong**, **Z.-Y. Ong**, I. Knezevic, E. Pop, “Ballistic to Diffusive Crossover of Heat Flow in Graphene Ribbons,” *Nature Commun.* **4**, 1734 (2013)
68. P.K. Mohseni, **A. Behnam**, **J.D. Wood**, **C.D. English**, J.W. Lyding, E. Pop, X. Li, “In_xGa_{1-x}As Nanowire Growth on Graphene: van der Waals Epitaxy Induced Phase Segregation,” *Nano Letters* **13**, 1153-1161 (2013)
67. **V.E. Dorgan**, **A. Behnam**, H.J. Conley, K.I. Bolotin, E. Pop, “High-Field Electrical and Thermal Transport in Suspended Graphene,” *Nano Letters*, **13**, 4581-4586 (2013) ([Selected as cover article of Nano Letters, October 2013](#))
66. **F. Xiong**, **M.-H. Bae**, **Y. Dai**, **A.D. Liao**, **A. Behnam**, **E.A. Carrion**, **S. Hong**, D. Ielmini, E. Pop, “Self-Aligned Nanotube-Nanowire Phase-Change Memory,” *Nano Letters* **13**, 464-469 (2013)
65. **S. Islam**, **Z. Li**, **V.E. Dorgan**, **M.-H. Bae**, E. Pop, “Role of Joule Heating on Current Saturation and Transient Behavior of Graphene Transistors,” *IEEE Electron Device Lett.* **34**, 166-168 (2013)
64. **A.Y. Serov**, **Z.-Y. Ong**, E. Pop, “Effect of Grain Boundaries on Thermal Transport in Graphene,” *Appl. Phys. Lett.* **102**, 033104 (2013)
63. S. Banerjee, J. Shim, J. Rivera, X. Jin, **D. Estrada**, V. Solovyeva, X. You, J. Pak, E. Pop, N. Aluru, R. Bashir, “Electrochemistry at Edge of Single Graphene Layer in a Nanopore,” *ACS Nano* **7**, 834-843 (2013)

62. **A. Behnam**, V. Sangwan, **X. Zhong**, **F. Lian**, **D. Estrada**, D. Jariwala, **A.J. Hoag**, L.J. Lauhon, T.J. Marks, M.C. Hersam, E. Pop, "High-Field Transport and Thermal Reliability of Sorted Carbon Nanotube Network Devices," *ACS Nano* **7**, 482-490 (2013)
61. J.C. Koepke, **J.D. Wood**, **D. Estrada**, **Z.-Y. Ong**, K.T. He, E. Pop, J.W. Lyding, "Atomic-Scale Evidence for Potential Barriers and Strong Carrier Scattering at Graphene Grain Boundaries: a Scanning Tunneling Microscopy Study," *ACS Nano* **7**, 75-86 (2013)
60. Y. An, **A. Behnam**, E. Pop, A. Ural, "Metal-Semiconductor-Metal Photodetectors Based on Graphene/*p*-type Silicon Schottky Junctions," *Appl. Phys. Lett.* **102**, 013110 (2013)
59. M.P. Gupta, L. Chen, **D. Estrada**, **A. Behnam**, E. Pop, S. Kumar, "Impact of Thermal Boundary Conductances on Power Dissipation and Electrical Breakdown of Carbon Nanotube Network Transistors," *J. Appl. Phys.* **112**, 124506 (2012)
58. X. Xie, **K.L. Grosse**, J. Song, C. Lu, S. Dunham, F. Du, A.E. Islam, Y. Li, Y. Zhang, E. Pop, Y. Huang, W.P. King, J.A. Rogers, "Quantitative Thermal Imaging of Single Walled Carbon Nanotube Devices by Scanning Joule Expansion Microscopy," *ACS Nano* **6**, 10267-10275 (2012)
57. E. Pop, V. Varshney, A.K. Roy, "Thermal Properties of Graphene: Fundamentals and Applications," *MRS Bulletin* **37**, 1273-1281 (2012)
56. **A. Behnam**, **A.S. Lyons**, **M.-H. Bae**, E.K. Chow, **S. Islam**, **C.M. Neumann**, E. Pop, "Transport in Nanoribbon Interconnects Obtained from Graphene Grown by Chemical Vapor Deposition (CVD)," *Nano Letters* **12**, 4424-4430 (2012)
55. L.G. Rizzi, M. Bianchi, **A. Behnam**, **E. Carrion**, E. Guerriero, L. Polloni, E. Pop, R. Sordan, "Cascading Wafer-Scale Integrated Graphene Complementary Inverters under Ambient Conditions," *Nano Letters* **12**, 3948-3953 (2012)
54. K.T. He, **J.D. Wood**, G.P. Doidge, E. Pop, J.W. Lyding, "Scanning Tunneling Microscopy Study and Nanomanipulation of Graphene-Coated Water on Mica," *Nano Letters* **12**, 2665 (2012)
53. M.Y. Timmermans, **D. Estrada**, A.G. Nasibulin, **J.D. Wood**, **A. Behnam**, D.-M. Sun, Y. Ohno, J.W. Lyding, E. Pop, E.I. Kauppinen, "Effect of Carbon Nanotube Network Morphology on Thin Film Transistor Performance," *Nano Research* **5**, 307-319 (2012)
52. R. Alizadegan, **A.D. Liao**, **F. Xiong**, E. Pop, K.J. Hsia, "Effects of Tip-Nanotube Interactions on Atomic Force Microscopy Imaging of Carbon Nanotubes," *Nano Research* **5**, 235-247 (2012)
51. A. Salehi-Khojin, **D. Estrada**, K.Y. Lin, K. Ran, R.T. Haasch, J.-M. Zuo, E. Pop, R.I. Masel, "Chemical Sensors Based on Randomly Stacked Graphene Flakes," *Appl. Phys. Lett.* **100**, 033111-4 (2012)
50. B.M. Venkatesan, **D. Estrada**, S. Banerjee, X. Jin, **V.E. Dorgan**, **M.-H. Bae**, N.R. Aluru, E. Pop, R. Bashir, "Stacked Graphene-Al₂O₃ Nanopore Sensors for Sensitive Detection of DNA and DNA-Protein Complexes," *ACS Nano* **6**, 441-450 (2012)
49. A. Salehi-Khojin, **D. Estrada**, K.Y. Lin, **M.-H. Bae**, **F. Xiong**, E. Pop, R.I. Masel, "Polycrystalline Graphene Ribbons as Chemiresistors," *Adv. Materials* **24**, 53-57 (2012)
48. W.-P. Hsieh, **A.S. Lyons**, E. Pop, P. Keblinsky, D.G. Cahill, "Pressure Tuning of the Thermal Conductance of Weak Interfaces," *Phys. Rev. B* **84**, 184107-5 (2011)
47. **J.D. Wood**, S.W. Schmucker, **A.S. Lyons**, E. Pop, J.W. Lyding, "Effects of Polycrystalline Cu Substrate on Graphene Growth by Chemical Vapor Deposition," *Nano Letters* **11**, 4547-4554 (2011)
46. **S. Dutta**, **S. Prakash**, **D. Estrada**, E. Pop, "A Web Service and Interface for Electronic Device Characterization," *IEEE Trans. Education* **54**, 646-651 (2011)
45. **M.-H. Bae**, **S. Islam**, **V.E. Dorgan**, E. Pop, "Scaling of High-Field Transport and Localized Heating in Graphene Transistors," *ACS Nano* **5**, 7936-7944 (2011)
44. **Z.-Y. Ong**, E. Pop, J. Shiomi, "Reduction of Phonon Lifetimes and Thermal Conductivity of a Carbon Nanotube on Amorphous Silica," *Phys. Rev. B* **84**, 165418-10 (2011)
43. **T. Tsafack**, E. Piccinini, B.-S. Lee, E. Pop, M. Rudan, "Electronic, Optical and Thermal Properties of the Hexagonal and Rocksalt-Like Ge₂Sb₂Te₅ Chalcogenide from First-Principle Calculations," *J. Appl.*

- Phys.* **110**, 063716-9 (2011)
42. R.-H. Kim, **M.-H. Bae**, D.G. Kim, H. Cheng, B.H. Kim, D.-H. Kim, M. Li, J. Wu, F. Du, H.-S. Kim, S. Kim, **D. Estrada**, S.W. Hong, Y. Huang, E. Pop, J.A. Rogers, "Stretchable, Transparent Graphene Interconnects for Arrays of Microscale Inorganic Light Emitting Diodes on Rubber Substrates," *Nano Letters* **11**, 3881-3886 (2011)
 41. **Z.-Y. Ong** and E. Pop, "Effect of Substrate Modes on Thermal Transport in Supported Graphene," *Phys. Rev. B* **84**, 075471-7 (2011)
 40. C.-L. Tsai, **A. Liao**, E. Pop, M. Shim, "Electrical Power Dissipation in Carbon Nanotubes on Single Crystal Quartz and Amorphous SiO₂," *Appl. Phys. Lett.* **99**, 053120-2 (2011)
 39. **A.D. Liao**, J. Wu, X. Wang, K. Tahy, D. Jena, H. Dai, E. Pop, "Thermally-Limited Current Carrying Ability of Graphene Nanoribbons," *Phys. Rev. Lett.* **106**, 256801-4 (2011)
 38. **K.L. Grosse**, **M.-H. Bae**, **F. Lian**, E. Pop, W.P. King, "Nanoscale Joule Heating, Peltier Cooling and Current Crowding at Graphene-Metal Contacts," *Nature Nanotechnology* **6**, 287-290 (2011)
 37. **F. Xiong**, **A.D. Liao**, **D. Estrada**, E. Pop, "Low Power Switching of Phase Change Materials with Carbon Nanotube Electrodes," *Science* **332**, 568-570 (2011) (**Selected as cover article of Science, April 2011**)
 36. **D. Estrada**, E. Pop, "Imaging Dissipation and Hot Spots in Carbon Nanotube Network Transistors," *Appl. Phys. Letters* **98**, 073120-2 (2011)
 35. Y.K. Koh, **M.-H. Bae**, D.G. Cahill, E. Pop, "Reliably Counting Atomic Planes of Few-Layer Graphene ($n > 4$)," *ACS Nano* **5**, 269-274 (2011)
 34. **M.-H. Bae**, **Z.-Y. Ong**, **D. Estrada**, E. Pop, "Imaging, Simulation, and Electrostatic Control of Power Dissipation in Graphene Devices," *Nano Letters* **10**, 4787-4793 (2010) (**Selected as cover article of Nano Letters, December 2010**)
 33. **Z.-Y. Ong** and E. Pop, "Frequency and Polarization Dependence of Thermal Coupling between Carbon Nanotubes and SiO₂," *J. Appl. Phys.* **108**, 103502-9 (2010)
 32. Y.K. Koh, **M.-H. Bae**, D.G. Cahill, E. Pop, "Heat Conduction across Monolayer and Few-Layer Graphenes," *Nano Letters* **10**, 4363-4368 (2010)
 31. **A. Liao**, R. Alizadegan, **Z.-Y. Ong**, **S. Dutta**, K. J. Hsia, E. Pop, "Thermal Dissipation and Variability in Electrical Breakdown of Carbon Nanotube Devices," *Phys. Rev. B* **82**, 205406-14 (2010)
 30. **V.E. Dorgan**, **M.-H. Bae**, E. Pop, "Mobility and Saturation Velocity in Graphene on SiO₂," *Appl. Phys. Letters* **97**, 082112-4 (2010)
 29. **P.N. Martin**, Z. Aksamija, E. Pop, U. Ravaioli, "Reduced Thermal Conductivity in Nano-Engineered Rough Ge and GaAs Nanowires," *Nano Letters* **10**, 1120-1124 (2010)
 28. E. Landis, K. Klein, **A. Liao**, E. Pop, D. Hensley, A. Melechko, R. Hamers, "Covalent functionalization and electron-transfer properties of vertically aligned carbon nanofibers: The importance of edge-plane sites," *Chemistry of Materials* **22**, 2357-2366 (2010)
 27. **Z.-Y. Ong** and E. Pop, "Molecular Dynamics Simulation of Interfacial Thermal Resistance between Single-Wall Carbon Nanotubes and SiO₂," *Phys. Rev. B* **81**, 155408-14 (2010)
 26. E. Pop, "Energy Dissipation and Transport in Nanoscale Devices," *Nano Research* **3**, 147-169 (2010)
 25. **D. Estrada**, **A. Liao**, **S. Dutta**, E. Pop, "Reduction of Hysteresis for Carbon Nanotube Mobility Measurements Using Pulsed Characterization," *Nanotechnology* **21**, 085702-8 (2010)
 24. Z. Wang, I.-S. Chun, X. Li, **Z.-Y. Ong**, E. Pop, L. Millet, M. Gillete, G. Popescu, "Topography & Refractometry of Nanostructures Using Spatial Light Interference Microscopy (SLIM)," *Optics Letters* **35**, 208-210 (2010)
 23. **F. Xiong**, **A. Liao**, E. Pop, "Inducing Chalcogenide Phase Change with Ultra-Narrow Carbon Nanotube Heaters," *Appl. Phys. Letters* **95**, 243103-5 (2009)
 22. **Y. Zhao**, **A. Liao**, E. Pop, "Multiband Mobility in Semiconducting Carbon Nanotubes," *IEEE Electron Device Lett.* **30**, 1078-1080 (2009)

21. **I.-R. Chen** and E. Pop, "Compact Thermal Model for Segmented Nanowire Phase-Change Memory Cells," *IEEE Trans. Electron Devices* **56**, 1523-1528 (2009)
20. **P. Martin**, Z. Aksamija, E. Pop, U. Ravaioli, "Impact of Phonon-Surface Roughness Scattering on Thermal Conductivity of Thin Si Nanowires," *Phys. Rev. Letters* **102**, 125503-6 (2009)
19. J. Lee, **A. Liao**, E. Pop, W. King, "Electrical and Thermal Coupling to a Single-Wall Carbon Nanotube Device Using an Electro-Thermal Nanoprobe," *Nano Letters* **9**, 1356-1361 (2009)
18. **A. Liao**, **Y. Zhao**, E. Pop, "Avalanche-Induced Current Enhancement in Semiconducting Single-Walled Carbon Nanotubes," *Phys. Rev. Lett.* **101**, 256804-7 (2008)
17. E. Pop, "The Role of Electrical and Thermal Contact Resistance for Joule Breakdown of Single-Wall Carbon Nanotubes," *Nanotechnology* **19**, 295202-6 (2008)
16. M.A. Panzer, G. Zhang, D. Mann, X. Hu, E. Pop, H. Dai, K.E. Goodson, "Thermal Properties of Metal-Coated Vertically-Aligned Single-Wall Nanotube Arrays," *J. Heat Transfer* **130**, 052401-9 (2008)
15. S. Verma, E. Pop, P. Kapur, K. Parat, K.C. Saraswat, "Operational Voltage Reduction of Flash Memory Using High-K Composite Tunnel Barriers," *IEEE Electron Device Letters* **29**, 252-254 (2008)
14. X. Wang, L. Zhang, Y. Lu, Y. Kato, H. Dai, E. Pop, "Electrically-Driven Light Emission from Hot Single-Walled Carbon Nanotubes at Various Temperatures and Ambient Pressures," *Applied Physics Letters* **91**, 261102-4 (2007)
13. J.P. Reifenberg, M.A. Panzer, S. Kim, A.M. Gibby, Y. Zhang, S. Wong, H.-S.P. Wong, E. Pop, K.E. Goodson, "Thickness and Stoichiometry Dependence of the Thermal Conductivity of GeSbTe Films," *Applied Physics Letters* **91**, 111904-6 (2007)
12. E. Pop, D.A. Mann, K.E. Goodson, H. Dai, "Electrical and Thermal Transport in Metallic Single-Wall Carbon Nanotubes on Insulating Substrates," *Journal of Applied Physics* **101**, 093710-20 (2007)
11. D. Mann, Y. Kato, A. Kinkhabwala, E. Pop, J. Cao, X. Wang, L. Zhang, Q. Wang, J. Guo and H. Dai, "Electrically Driven Thermal Light Emission from Individual Single-Wall Carbon Nanotubes," *Nature Nanotechnology* **2**, 33-38 (2007)
10. E. Pop, S. Sinha, K.E. Goodson, "Heat Generation and Transport in Nanometer-Scale Transistors," *Proceedings of IEEE* **94**, 1587-1601 (2006)
9. H. Dai, A. Javey, E. Pop, D. Mann, Y. Lu, "Electrical Transport Properties and Field Effect Transistors of Carbon Nanotubes," *NANO* **1**, 1-13 (2006)
8. S. Sinha, E. Pop, R.W. Dutton, K.E. Goodson, "Non-Equilibrium Phonon Distributions in Sub-100 nm Silicon Transistors," *J. Heat Transfer* **128**, 638-647 (2006)
7. E. Pop and K. Goodson, "Thermal Phenomena in Nanoscale Transistors," *Journal of Electronic Packaging* **128**, 102-108 (2006)
6. T. Kenny, K. Goodson, J. Santiago, E. Wang, J. Koo, L. Jiang, E. Pop, S. Sinha, L. Zhang, D. Fogg, S. Yao, R. Flynn, C. Chang, C. Hidrovo, "Advanced Cooling Technologies for Microprocessors," *Intl. J. High Speed Electronics & Systems* **16**, 301-313 (2006)
5. E. Pop, D. Mann, Q. Wang, K. Goodson, H. Dai, "Thermal Conductance of an Individual Single-Wall Carbon Nanotube above Room Temperature," *Nano Letters* **6**, 96-100 (2006)
4. D. Mann, E. Pop, J. Cao, Q. Wang, K. Goodson, H. Dai, "Thermal and Molecular Stimulated Relaxation of Hot Phonons in Suspended Carbon Nanotubes," *Journal of Physical Chemistry B* **110**, 1502-1505 (2006)
3. E. Pop, D. Mann, J. Cao, Q. Wang, K. Goodson, H. Dai, "Negative Differential Conductance and Hot Phonons in Suspended Nanotube Molecular Wires," *Physical Review Letters* **95**, 155505-8 (2005)
2. E. Pop, R.W. Dutton, K.E. Goodson, "Monte Carlo Simulation of Joule Heating in Bulk and Strained Silicon," *Applied Physics Letters* **86**, 082101-3 (2005)
1. E. Pop, R.W. Dutton, K.E. Goodson, "Analytic Band Monte Carlo Model for Electron Transport in Si Including Acoustic and Optical Phonon Dispersion," *Journal of Applied Physics* **96**, 4998-5005 (2004)

Conference Proceedings and Abstracts (refereed)in review: gray; students and post-docs supervised: **bold**

359. **X. Wu, A.I. Khan**, H. Zhang, H. Yu, A.V. Davydov, I. Takeuchi, H.-S.P. Wong, E. Pop, "Ultrathin $\text{Sb}_2\text{Te}_3/\text{Ge}_4\text{Sb}_6\text{Te}_7$ Superlattices for Low-Power and High-Speed Phase Change Memory," *MRS Spring Meeting*, April 2024, Seattle CA
358. **A.I. Khan**, E.R. Lindgren, A. Ramdas, B. Won, **X. Wu**, H. Kim, H.-S.P. Wong, F. Jornada, I.-K. Oh, Y. Suzuki, E. Pop, "Probing The Low-Resistivity in Sub-5 nm Thin Nanocrystalline NbP and TaP Semimetals," *MRS Spring Meeting*, April 2024, Seattle WA
357. J. Zhao, **A.I. Khan**, M. Efremov, Z. Ye, **X. Wu**, H.-S.P. Wong, E. Pop, L. Allen, "Thin-film Nanocalorimetry study of the Melting Transitions in 2D Phase-Change Superlattices," *MRS Spring Meeting*, April 2024, Seattle WA
356. **R.K.A. Bennett, L. Hoang, C. Cremers**, A.J. Mannix, E. Pop, "A Method for Extracting 2D Semiconductor Mobility in Transistors with Gate-Voltage-Dependent Contact Resistance," *MRS Spring Meeting*, April 2024, Seattle WA
355. **J.A. Yang**, E. Pop, "A Tale from the Queer Resistance: Healing and Activism from with(in) Materials Science," *MRS Spring Meeting*, Apr 2024, Seattle WA
354. **J.A. Yang, L.A. Hoang, T. Peña**, Z. Zhang, A.J. Mannix, E. Pop, "Effects of High- κ Dielectric Encapsulation and Carrier Density on Raman Scattering in Synthetic Monolayer WS_2 ," *MRS Spring Meeting*, April 2024, Seattle WA
353. **C.A. Nattoo, T. Peña, K. Nassiri Nazif**, A.C. Johnson, F. Liu, E. Pop, "Rapid Detection of Defects in Monolayer 2D Semiconductors by Polarized Raman Spectroscopy," *MRS Spring Meeting*, Apr 2024, Seattle WA
352. A.J. Gabourie, C.J. McClellan, C.A. Polanco, D. Donadio, S. Chowdhury, S. Mitra, E. Pop, "Accelerated Multi-Scale Thermal Modeling of Advanced Integrated Circuits (MUSCLE-Therm)," *GOMACTech-24*, Mar 2024, Charleston SC
351. **L. Hoang, M. Jaikissoon**, Z. Zhang, K.C. Saraswat, E. Pop, A.J. Mannix, "Contact-induced Strain for Enhanced Performance in Monolayer WS_2 Transistors," *APS March Meeting*, Mar 2024, Minneapolis MN
350. **M.A. Wang**, E. Pop, "Electro-Thermal Monte Carlo Simulation of Monolayer MoS_2 ," *APS March Meeting*, Mar 2024, Minneapolis MN
349. T. Knobloch, D. Waldhoer, M. Davoudi, A. Karl, P. Khakbaz, M. Matzinger, Y. Zhang, **K. Smithe**, A. Nazir, C. Liu, Y. Illarionov, E. Pop, H. Peng, B. Kaczer, T. Grasser, "Modeling the Performance and Reliability of Two-Dimensional Semiconductor Transistors," *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2023, San Francisco CA
348. **J.A. Yang, R.K.A. Bennett, L.A. Hoang**, Z. Zhang, **K.J. Thompson**, A.J. Mannix, E. Pop, "Mobility Enhancement of Monolayer WS_2 from Biaxial Tensile Strain," *MRS Fall Meeting*, Nov 2023, Boston MA
347. **A.I. Khan**, E.R. Lindgren, **X. Wu**, H. Kim, A. Ramdas, B. Won, F. Jornada, K.E. Goodson, I.-K. Oh, H.-S.P. Wong, Y. Suzuki, E. Pop, "Unconventional Resistivity Scaling in Nanocrystalline NbP and TaP sub-5 nm Thin Film," *MRS Fall Meeting*, Nov 2023, Boston MA
346. **Ç. Köroğlu, A.J. Gabourie**, E. Pop, "Heat Dissipation in 2D Material Transistors: The Role of Interfaces and Contacts," *MRS Fall Meeting*, Nov 2023, Boston MA
345. **M.A. Wang**, E. Pop, "Monte Carlo Simulation of Joule Heating in Monolayer MoS_2 Devices," *MRS Fall Meeting*, Nov 2023, Boston MA
344. **A.I. Khan, X. Wu, A. Daus**, H. Kwon, K.E. Goodson, H.-S.P. Wong, E. Pop, "Novel Chalcogenide Superlattice-Based Energy-Efficient Phase-Change Memory for 3D Heterogeneous Integration," *AVS 69th International Symposium & Exhibition*, Nov 2023, Portland, OR
343. **K. Nassiri Nazif**, F.U. Nitta, **A. Daus**, K.C. Saraswat, E. Pop, "Efficiency Limit of Transition Metal Dichalcogenide Solar Cells," *1st Middle East and North Africa Solar Conference (MENA Solar Conference)*, Nov 2023, Dubai, UAE

342. R. Chen, Z. Fang, J. Fröch, Q. Tanguy, **A.I. Khan, X. Wu**, V. Tara, A. Manna, D. Sharp, C. Munley, Y. Zhao, K. Böhringer, M. Reynolds, E. Pop, A. Majumdar, "Nonvolatile transmissive metasurface with phase-only modulation," *Frontiers in Optics + Laser Science (FiO LS)*, Oct 2023, Tacoma WA
341. Z. Fang, R. Chen, J.E. Fröch, Q. Tanguy, **A.I. Khan, X. Wu**, A. Mana, D. Sharp, C. Munley, M. Reynolds, E. Pop; A. Majumdar, "A Purcell Enabled Monolayer Semiconductor Free-Space Optical Modulator," *IEEE Conf. Lasers & Electro-Optics (CLEO)*, Sep. 2023
340. Q. Li, J.-H. Song, F. Xu, J. van de Groep, J. Hong, **A. Daus**, Y.J. Lee, A.C. Johnson, E. Pop, F. Liu, M.L. Brongersma, "A Purcell Enabled Monolayer Semiconductor Free-Space Optical Modulator," *IEEE Conf. Lasers & Electro-Optics (CLEO)*, Sep. 2023
339. **J.-S. Ko**, Z. Zhang, S. Lee, **M. Jaikissoon, R.K.A. Bennett**, K. Kim, A.C. Kummel, P. Bandaru, E. Pop, K.C. Saraswat, "Ultrathin Gate Dielectric Enabled by Nanofog Aluminum Oxide on Monolayer MoS₂," *ESSDERC (European Solid-State Device Conference)*, Sep 2023, Lisbon Portugal
338. **S. Wahid, L. Hoang, A. Daus**, E. Pop, "Improving Bias Stress Stability of Indium Tin Oxide Transistors Up to 100-Fold," *SRC TECHCON*, Sep 2023, Austin TX
337. **A.I. Khan, X. Wu**, H. Kwon, H. Yu, **A. Daus**, K. Saraswat, I. Takeuchi, K.E. Goodson, H.-S.P. Wong, E. Pop, "Novel Epitaxial Nanocomposite and Superlattices Enabling Energy Efficient Neuro-inspired Phase Change Memory," *SRC TECHCON*, Sep 2023, Austin TX
336. J. Zhao, **A.I. Khan**, M. Efremov, Z. Ye, X. Wu, H.-S.P. Wong, E. Pop, L. Allen, "Preliminary Nanocalorimetry Study of Phase-change Superlattices," *North American Thermal Analysis Society 49th Annual Conf. (NATAS)*, August 2023, Rockville MD
335. **S. Wahid, L. Hoang, A. Daus**, E. Pop, "Up to 100-fold Improvement of Threshold Voltage Stability in ITO Transistors," *IEEE Device Research Conference (DRC)*, Jun 2023, Santa Barbara CA
334. **M. Jaikissoon, J.-S. Ko**, E. Pop, K. Saraswat, "Local Back-Gate Monolayer MoS₂ Transistors with Channel Lengths Down to 50 nm and EOT ~ 1 nm Showing Improved Ion using Post-Metal Anneal," *IEEE Device Research Conference (DRC)*, Jun 2023, Santa Barbara CA
333. **K. Nassiri Nazif**, F.U. Nitta, **A. Daus**, K.C. Saraswat, E. Pop, "Efficiency Limit of Transition Metal Dichalcogenide Solar Cells," *50th IEEE Photovoltaic Specialists Conference (PVSC 50)*, June 2023, San Juan PR
332. K. Toprasertpong, S. Liu, J. Chen, **S. Wahid**, K. Jana, W.-C. Chen, S. Li, E. Pop, H.-S.P. Wong, "Co-designed Capacitive Coupling-Immune Sensing Scheme for Indium-Tin-Oxide (ITO) 2T Gain Cell Operating at Positive Voltage Below 2 V," *IEEE VLSI Tech. Symp.*, Jun 2023, Kyoto Japan
331. I.-K Oh, **A.I. Khan**, S. Qin, H.-S.P. Wong, E. Pop, S.F. Bent, "Dielectric-on-Metal (DoM) of Area-Selective Atomic Layer Deposition for Memory Devices," *7th Area Selective Deposition Workshop (ASD23)*, Apr 2023, Incheon Korea
330. J. Martis, S. Susarla, A. Rayabharam, C. Su, T. Paule, P. Pelz, C. Huff, X. Xu, H.-K. Li, **V. Chen, M. Jaikissoon**, E. Pop, K. Saraswat, A. Zettl, N. Aluru, R. Ramesh, P. Ercius, A. Majumdar, "Imaging the Electron Charge Density in Monolayer MoS₂ at the Ångstrom Scale," *MRS Spring Meeting*, April 2023, San Francisco, CA
329. A. Shearer, **J.-S. Ko**, E. Pop, S. Bent, "Enhancing the Nucleation of Dielectrics on MoS₂ by Atomic Layer Deposition," *MRS Spring Meeting*, April 2023, San Francisco, CA
328. H.-L. Sinn, A. Kumar, E. Pop, A.K.M. Newaz, "Semimetal-Monolayer Transition Metal Dichalcogenides Photodetectors for Wafer-Scale Ultraviolet Photonics," *MRS Spring Meeting*, April 2023, San Francisco, CA
327. **S. Wahid, M. Islam**, C. Perez, T.D. Brown, **M.E. Chen**, M.A. Marcus, H. Ohldag, S. Kumar, E. Pop, "Understanding Oxygen Migration due to Contacts and Gate Bias-Stress in Indium Tin Oxide Transistors," *MRS Spring Meeting*, April 2023, San Francisco, CA
326. J. Zhao, **A.I. Khan**, M. Efremov, Z. Ye, **X. Wu**, H.-S.P. Wong, E. Pop, L. Allen, "Preliminary Study of Phase-change Superlattices via Thin Film Nanocalorimetry," *MRS Spring Meeting*, April 2023, San Francisco, CA

325. **M. Islam, C. Perez**, R. Bhattacharya, **S. Wahid**, T.D. Brown, M.A. Marcus, H. Ohldag, V. Gambin, S. Kumar, E. Pop, "Physics of Resistive Switching in LaCoO_3 revealed by X-ray Absorption Spectromicroscopy," *MRS Spring Meeting*, April 2023, San Francisco, CA
324. Q. Li, J.-H. Song, F. Xu, J. van de Groep, J. Hong, **A. Daus**, Y.J. Lee, A.C. Johnson, E. Pop, F. Liu, M.L. Brongersma, "A Monolayer Semiconductor Free-Space Electro-Optical Modulator," *APS March Meeting*, Mar 2023, Las Vegas NV
323. **K. Neilson**, M. Tie, **J.-K. Ko**, **M. Jaikissoon**, **J.A. Yang**, R. Chen, A. Majumdar, K. Saraswat, T.F. Heinz, E. Pop, "Lithographic Damage to Two Dimensional Materials Probed by Photoluminescence and Raman Spectroscopy," *APS March Meeting*, Mar 2023, Las Vegas NV
322. A.K.M. Newaz, H.-L. Sinn, A. Kumar, E. Pop, "Semimetal-Monolayer Transition Metal Dichalcogenides Photodetectors for Wafer-Scale Ultraviolet Photonics," *APS March Meeting*, Mar 2023, Las Vegas NV
321. C. Perez, **A.I. Khan**, **X. Wu**, E. Fuller, H.-S.P. Wong, M. Asheghi, E. Pop, A. Talin, S. Kumar, K.E. Goodson, "Probing Phonon-Dominated Transport in Sb_2Se_3 Thin Films," *APS March Meeting*, Mar 2023, Las Vegas NV
320. **M. Islam**, **S.M. Bohaichuk**, T.D. Brown, C. Perez, C. Zhang, T.J. Park, A.A. Talin, S. Ramanathan, S. Kumar, E. Pop, "Origins of Visible Light Emission upon Resistive Switching in NbO_2 ," *APS March Meeting*, Mar 2023, Las Vegas NV
319. **S. Wahid**, **M. Islam**, C. Perez, T.D. Brown, **M.E. Chen**, M.A. Marcus, H. Ohldag, S. Kumar and E. Pop, "Contact-Induced Oxygen Scavenging in Indium Tin Oxide Transistors," *APS March Meeting*, Mar 2023, Las Vegas NV
318. **A.I. Khan**, **X. Wu**, B. Won, E.R. Lindgren, C. Perez, K.E. Goodson, Y. Suzuki, I.-K. Oh, H.-S.P. Wong, E. Pop, "Unconventional Resistivity Scaling in Polycrystalline NbP Thin Films," *APS March Meeting*, Mar 2023, Las Vegas NV
317. **X. Wu**, **A.I. Khan**, K. Kim, Z. Lee, H.-S.P. Wong, E. Pop, "Understanding Low Structural Relaxation in Phase-Change Chalcogenide Superlattices," *APS March Meeting*, Mar 2023, Las Vegas NV
316. **C.S. Bailey**, **K.M. Neilson**, E. Pop, "Improved P-Type Performance in Bilayer WSe_2 Transistors," *IEEE Semicon. Interface Specialist Conf. (SISC)*, Dec 2022, San Diego, CA
315. **S. Wahid**, **A. Daus**, A. Kumar, H.-S.P. Wong, E. Pop, "First Demonstration of Dual-Gated Indium Tin Oxide Transistors with Record Drive Current ~ 2.3 mA/ μm at $L \approx 60$ nm and $V_{\text{DS}} = 1$ V," *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2022, San Francisco CA
314. H. Yu, **A.I. Khan**, C. Wu, H. Zhang, A. Davydov, A. Mehta, M. Li, A.G. Kusne, E. Pop, I. Takeuchi, "Combinatorial Exploration of New Phase-Change Memory Materials for Neuromorphic Computing Applications," *MRS Fall Meeting*, Nov 2022, Boston MA
313. J. Zhao, J. Hui, **A.I. Khan**, Z. Ye, X. Wu, T. Lai, M. Efremov, H. Wang, E. Pop, L. Allen, "Revealing the crystallization kinetic in thin-film phase change material via 1,0000,000 K/s Nanocalorimetry," *MRS Fall Meeting*, Nov 2022, Boston MA
312. **A.I. Khan**, **X. Wu**, C. Perez, B. Won, I.-K. Oh, M. Asheghi, K.E. Goodson, H.-S.P. Wong, E. Pop, "Chalcogenide-Superlattice Interfaces and Intermixing Modulating Phase-Change Memory Performance," *MRS Fall Meeting*, Nov 2022, Boston MA
311. **X. Wu**, **A.I. Khan**, P. Ramesh, K. Saraswat, H.-S.P. Wong, E. Pop, "Engineering Superlattice Materials and Interfaces for Improved Resistance-Drift and Retention in Phase-Change Memory," *MRS Fall Meeting*, Nov 2022, Boston MA
310. R.M.A. Bona, **R.W. Grady**, E. Pop, R. Sordan, "Spread of the contact resistance in the channel of MoS_2 field-effect transistors," *Graphene Week 2022*, Sep 2022, Munich, Germany
309. C. Perez, **A.I. Khan**, **X. Wu**, T.D. Brown, H. Kwon, M. Asheghi, A.A. Talin, H.-S.P. Wong, S. Kumar, E. Pop, K.E. Goodson, "Revealing Interface-Controlled Transport Effects in GST-Based Superlattice Materials," *SRC TECHCON*, Sep 2022, Austin TX (**Top 10 TechCon Presenter Award**)
308. **C.S. Bailey**, **K.M. Neilson**, E. Pop, "Improved P-Type Performance in Bilayer WSe_2 Transistors," *SRC*

- TECHCON*, Sep 2022, Austin TX (**Top 10 TechCon Presenter Award**)
307. **M.E. Chen**, C. Perez, **Ç. Köroğlu**, **A. Sood**, **V. Chen**, C. Swank, S. Ueda, A. McLeod, Z. Sobell, S. George, A.C. Kummel, K.E. Goodson, E. Pop, "Wide Band Gap Heat Spreaders and Thermal Interface Materials for Heterogeneous Integration," *SRC TECHCON*, Sep 2022, Austin, TX (**Top 10 TechCon Presenter Award**)
 306. **A. Daus**, **K. Nassiri Nazif**, **S. Vaziri**, **V. Chen**, J. Hong, **Ç. Köroğlu**, N. Lee, **R.W. Grady**, **C.S. Bailey**, F. Nitta, **M.E. Chen**, H.R. Lee, A. Kumar, **K. Schauble**, S. Kananian, R. Islam, K.-H. Kim, J.-H. Park, **K. Brenner**, A.S.Y. Poon, M.L. Brongersma, K.C. Saraswat, E. Pop, "Flexible 2D Transistors and Solar Cells by Direct Transfer with Contacts," *Graphene 2022*, Jul 2022, Aachen, Germany
 305. **C.A. Nattoo**, **K. Schauble**, **C.S. Bailey**, E. Pop, "Rapid Analysis of 2D Material Quality Using Raman Spectroscopy," *Graphene 2022*, Jul 2022, Aachen, Germany
 304. E. Ber, **R.W. Grady**, E. Pop, E. Yalon, "Reducing Schottky Barrier Height vs. Width: Which is Most Effective in Improving Contact Resistance to Atomically Thin Semiconductors?" *Electronic Materials Conference (EMC)*, Jun 2022, Columbus OH
 303. **M. Islam**, **S.M. Bohaichuk**, J.A. Roberts, C. Zhang, T.J. Park, **V. Chen**, A.A. Talin, S. Ramanathan, J.A. Fan, S. Kumar, E. Pop, "Visible Light Emission during Electrical Threshold Switching of NbO₂ Mott Switches," *Electronic Materials Conference (EMC)*, Jun 2022, Columbus OH
 302. **L. Hoang**, **A. Daus**, **S. Wahid**, J. Kwon, **J.-S. Ko**, S. Qin, **M. Islam**, K.C. Saraswat, H.-S.P. Wong, E. Pop, "Bias Stress Stability of ITO Transistors and its Dependence on Dielectric Properties," *IEEE Device Research Conference (DRC)*, Jun 2022, Columbus OH
 301. **M. Jaikissoo**, **J.A. Yang**, **K.M. Neilson**, E. Pop, K. Saraswat, "Mobility Enhancement of Monolayer MoS₂ Transistors using Tensile-Stressed Silicon Nitride Capping Layers," *IEEE Device Research Conference (DRC)*, Jun 2022, Columbus OH
 300. **M. Islam**, R. Bhattacharya, C. Perez, T.D. Brown, R.S. Williams, V. Gambin, S. Kumar, E. Pop, "Electrically Triggered Spin-State Phase Transition in LaCoO₃," *IEEE Device Research Conference (DRC)*, Jun 2022, Columbus OH
 299. **X. Wu**, **A.I. Khan**, P. Ramesh, C. Perez, K. Kim, Z. Lee, K.E. Goodson, K. Saraswat, H.-S.P. Wong, E. Pop, "Interface-Controlled Ultralow Resistance Drift and Its Origin in Superlattice Phase Change Memory," *IEEE Device Research Conference (DRC)*, Jun 2022, Columbus OH
 298. **S. Wahid**, **A. Daus**, J. Kwon, S. Qin, **J.-S. Ko**, K.C. Saraswat, H.-S.P. Wong, E. Pop, "First Demonstration of Top-Gated ITO Transistors: Effect of Channel Passivation," *IEEE Device Research Conference (DRC)*, Jun 2022, Columbus OH
 297. **A.I. Khan**, C. Perez, **X. Wu**, B. Won, K. Kim, H. Kwon, P. Ramesh, **K.M. Neilson**, M. Asheghi, K. Saraswat, Z. Lee, I.K. Oh, H.-S.P. Wong, K.E. Goodson, E. Pop "First Demonstration of Ge₂Sb₂Te₅-Based Superlattice Phase Change Memory with Low Reset Current Density (~3 MA/cm²) and Low Resistance Drift (~0.002 at 105°C)," *IEEE VLSI Tech. Symp.*, Jun 2022, Honolulu HI (**Best Student Paper Award**)
 296. **M. Muñoz Rojo**, **S. Deshmukh**, **E. Yalon**, **S. Vaziri**, **C. Koroglu**, R. Islam, **R.A. Iglesias**, K. Saraswat, E. Pop, "Thermal mapping of nanoscale filamentary hot spots in Resistive Memory Devices," *Nano 2022*, Jun 2022, Sevilla, Spain
 295. T. Swoboda, X. Gao, **S. Deshmukh**, **C. Koroglu**, K. Zhu, F. Hui, N. Wainstein, C.M.M. Rosario, E. Yalon, M. Lanza, E. Pop, H. Hilgenkamp, M. Muñoz Rojo, "Spatially resolved thermometry of micro- and nano- devices using scanning thermal microscopy," *Nano 2022*, Jun 2022, Sevilla, Spain
 294. Z. Fang, R. Chen, J. Zheng, **A.I. Khan**, **K.M. Neilson**, A. Saxena, **M. Chen**, C. Rios, J. Hu, E. Pop, A. Majumdar, "Ultra-low energy programmable non-volatile silicon photonics based on graphene heaters," *CLEO: Science and Innovations*, May 2022, San Jose CA
 293. H. Yu, C. Wu, H. Zhang, **A.I. Khan**, A. Davydov, A. Mehta, E. Pop, M. Li, I. Takeuchi, "Combinatorial exploration of new phase change memory materials with enhanced properties," *MRS Spring Meeting*, May 2022, Honolulu HI

292. J.-H. Song, Q. Li, F. Xu, J. van de Groep, F. Liu, **A. Daus**, E. Pop, M.L. Brongersma, "Nonlocal, High-Q Metasurfaces for Precise Control of Light Waves in Energy-Momentum Space", *MRS Spring Meeting*, May 2022, Honolulu HI
291. Q. Li, J.-H. Song, F. Xu, J. van de Groep, **A. Daus**, J. Hong, Y.-J. Lee, E. Pop, F. Liu, M.L. Brongersma, "A Monolayer Semiconductor Free-Space Optical Modulator," *MRS Spring Meeting*, May 2022, Honolulu HI
290. **J.A. Yang**, A. Michail, **K.J. Thompson**, **C.A. Nattoo**, **C.S. Bailey**, J. Parthenios, **A. Daus**, K. Papagelis, E. Pop, "Probing the Effect of Biaxial Strain on Raman Scattering of CVD-grown WSe₂ Monolayers," *MRS Spring Meeting*, May 2022, Honolulu HI
289. **K.M. Neilson**, **M. Jaikissoon**, **C.S. Bailey**, K. Saraswat, E. Pop, "Synthesis and Characterization of Monolayer and Few-Layer InSe Electronics," *MRS Spring Meeting*, May 2022, Honolulu HI
288. **M. Jaikissoon**, **J.A. Yang**, E. Pop, K. Saraswat, "Strain Engineering Metal Contacts to Monolayer MoS₂ Transistors," *MRS Spring Meeting*, May 2022, Honolulu HI
287. A. Kumar, **K. Schauble**, **K.M. Neilson**, **A. Tang**, P. Ramesh, E. Pop, K. Saraswat, "In, Sn, and Bi Contacts to Monolayer MoS₂ – Alloying for Temperature Tolerance and Silicon CMOS Compatibility," *MRS Spring Meeting*, May 2022, Honolulu HI
286. C. Perez, **A.I. Khan**, **K. Neilson**, X. Wu, H.-S.P. Wong, M. Asheghi, A.A. Talin, S. Kumar, E. Pop, and K.E. Goodson. "Exposing Dynamical Phase Transitions and Electro-Thermal Transport in TiTe₂ Thin Films," *MRS Spring Meeting*, May 2022, Honolulu HI
285. **A.I. Khan**, H. Yu, H. Kwon, **A. Daus**, C. Perez, M. Asheghi, H.-S. P. Wong, K.E. Goodson, I. Takeuchi, E. Pop, "Novel Nanocomposite and Superlattice Materials Enabling Energy-Efficient Neuro-Inspired Phase Change Memory," *MRS Spring Meeting*, May 2022, Honolulu HI
284. **M. Chen**, C. Perez, S. Ueda, A. Mcleod, **V. Chen**, Z. Sobell, **C. Koroglu**, **A.I. Khan**, S. George, A.C. Kummel, K.E. Goodson, E. Pop, "Thermal and Electrical Properties of Wide Bandgap Nitride Thin Films Deposited at Low Temperatures for Heterogeneous Integration," *MRS Spring Meeting*, May 2022, Honolulu HI
283. **C.S. Bailey**, **C.J. McClellan**, **S.M. Bohaichuk**, **V. Chen**, S. Chatterjee, E. Pop, "Conformal Growth of Monolayer MoS₂ and WSe₂ on High Aspect Ratio Trenches," *MRS Spring Meeting*, May 2022, Honolulu HI
282. **K. Schauble**, A. Kumar, **S.M. Bohaichuk**, **R. Grady**, K.C. Saraswat, E. Pop, "Ultrathin Germanium as an Interlayer for Silver Contacts to Monolayer MoS₂," *MRS Spring Meeting*, May 2022, Honolulu HI
281. **J.S. Ko**, **K. Schauble**, K. Saraswat, E. Pop, "Integrating Ultrathin Gate Dielectrics on 2D Materials for High-Performance Transistors," *MRS Spring Meeting*, May 2022, Honolulu HI
280. **S. Wahid**, **A. Daus**, E. Pop, "Gold-Assisted Transfer of Top-gated Indium Tin Oxide Field-Effect Transistors on Flexible Substrates," *MRS Spring Meeting*, May 2022, Honolulu HI
279. **K. Nassiri Nazif**, **A. Daus**, J. Hong, N. Lee, **S. Vaziri**, A. Kumar, F. Nitta, **M.E. Chen**, S. Kananian, R. Islam, K.-H. Kim, J.-H. Park, A. Poon, M.L. Brongersma, E. Pop, K.C. Saraswat, "High-Specific-Power Flexible Transition Metal Dichalcogenide Solar Cells," *MRS Spring Meeting*, May 2022, Honolulu HI
278. M.C. Tung, **A.I. Khan**, H. Kwon, M. Asheghi, K.E. Goodson, E. Pop, H.-S. P. Wong, "Nanoscale phase change memory arrays patterned by block copolymer directed self-assembly," *Proc. SPIE, Novel Patterning Technologies* 2022, 12054, 39-46, April 2022
277. A. Kumar, **K. Schauble**, **K.M. Neilson**, **A. Tang**, P. Ramesh, H.-S.P. Wong, E. Pop, K. Saraswat, "Sub-200 Ω - μm Alloyed Contacts to Synthetic Monolayer MoS₂," *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2021, San Francisco CA
276. Y.K. Koh, W. Zheng, **C. McClellan**, E. Pop, "Non-Equilibrium Phonon Thermal Resistance at MoS₂/Oxide and Graphene/Oxide Interfaces," *MRS Fall Meeting*, Dec 2021, Boston, MA
275. M. Malakoutian, **R.L. Xu**, C. Ren, S. Pasayat, I. Sayed, E. Pop, S. Chowdhury, "Diamond Integration on GaN for Channel Temperature Reduction," *8th IEEE Workshop on Wide Bandgap Power Devices & Applications (WIPDA)*, Nov 2021

274. K. Stern, Y. Keller, **C.M. Neumann**, E. Pop, **E. Yalon**, “Temperature-Dependent Reset Power Consumption in Phase Change Memory,” *EPCOS (European Phase-Change and Ovonic Symposium)*, Sep 2021
273. **A. Daus**, K. Nassiri Nazif, S. Vaziri, **A.I. Khan**, **R.W. Grady**, **V. Chen**, **C.S. Bailey**, H.R. Lee, **C. Koroglu**, **K. Brenner**, **K. Schauble**, A. Kumar, K.C. Saraswat, E. Pop, “Flexible Transition Metal Dichalcogenide Devices for Environmental Sensors and Energy Harvesting,” *AVS 67th International Symposium & Exhibition*, Oct 2021, Charlotte NC
272. E. Ber, **R.W. Grady**, E. Pop, E. Yalon, “Pinpointing the Dominant Component of Contact Resistance to Atomically Thin Semiconductors,” *IEEE Device Research Conference (DRC)*, Jun 2021 (Online)
271. K. Stern, N. Wainstein, Y. Keller, **C.M. Neumann**, E. Pop, S. Kvatinsky, E. Yalon, “Sub-Nanosecond Partial Reset for Analog Phase Change Neuromorphic Devices,” *IEEE Device Research Conference (DRC)*, Jun 2021 (Online)
270. **V. Chen**, H.R. Lee, **C. Koroglu**, **C.J. McClellan**, **A. Daus**, E. Pop, “Ambipolar Thermoelectric Measurements of Multilayer WSe_2 ,” *Virtual MRS Spring Meeting*, Apr 2021
269. V.Z. Costa, L. Liang, A. Miller, **S. Vaziri**, S. Jamil, A. Ichimura, E. Pop, AKM Newaz, “Raman Studies of a Natural van der Waals Heterostructure,” *APS March Meeting*, Mar 2021
268. **A. Daus**, **C.J. McClellan**, **K. Schauble**, J.C. Costa, **R.W. Grady**, L. Petti, G. Cantarella, N.S. Münzenrieder, G. Tröster, E. Pop, “Aluminum Oxide as a Dielectric and Passivation Layer for (flexible) Metal-Oxide and 2D Semiconductor Devices,” *SPIE Photonics West*, Mar 2021, San Francisco CA
267. V.Z. Costa, A. Miller, **S. Vaziri**, S. Jamil, A. Ichimura, E. Pop, AKM Newaz, “Raman Studies of a Natural van der Waals Heterostructure,” *Virtual MRS Spring/Fall Meeting*, Nov 2020
266. **K. Schauble**, **R. Grady**, E. Pop, “ MoS_2 Defect Insights using Raman Spectroscopy,” *Virtual MRS Spring & Fall Meeting*, Nov 2020
265. S.-J. Yu, J.A. Roberts, Q. Lin, **S. Bohaichuk**, Y. Luo, Y.T. Choi, P.-H. Ho, K. Lee, A.L. Falk, W.L. Wilson, E. Pop, H.-S.P. Wong, J.A. Fan, “Highly confined plasmons in individual single-walled carbon nanotube nanoantennas,” *IEEE Conf. Lasers & Electro-Optics (CLEO)*, May 2020
264. J. Zheng, Z.R. Fang, C.M. Wu, S.F. Zhu, S. Zhu, P.P. Xu, J.K. Doylend, **S. Deshmukh**, E. Pop, S. Dunham, M. Li, A. Majumdar, “Nonvolatile Electrically Reconfigurable Integrated Photonic Switches Using Phase-Change Materials,” *IEEE Conf. Lasers & Electro-Optics (CLEO)*, May 2020
263. **C.S. Bailey**, **R.W. Grady**, **V. Chen**, E. Pop, “Ultra-Low Off-State Leakage Current in Monolayer WS_2 Transistors,” *Virtual MRS Spring & Fall Meeting*, Apr 2020, Phoenix AZ
262. **A. Daus**, **S. Vaziri**, **V. Chen**, **R.W. Grady**, **C.S. Bailey**, **C. Koroglu**, **K. Brenner**, **K. Schauble**, E. Pop, “Flexible Electronics Enabled by Direct Transfer of Two-Dimensional Transition Metal Dichalcogenides with Contacts,” *Virtual MRS Spring & Fall Meeting*, Apr 2020, Phoenix AZ
261. **I.M. Datye**, **A. Daus**, **K. Brenner**, **R.W. Grady**, E. Pop, “Improving the Electrical Performance of MoS_2 Transistors using Tensile Strain,” *Virtual MRS Spring & Fall Meeting*, Apr 2020, Phoenix AZ. **(Best Paper Award)**
260. S. Ueda, A. McLeod, **M. Chen**, C. Perez, E. Pop, D. Alvarez, A.C. Kummel, “Deposition of High Thermal Conductivity AlN Heat Spreader Films,” *IEEE VLSI-TSA*, pp. 110-111, Aug 2020
259. S. Ueda, A. McLeod, **M. Chen**, C. Perez, E. Pop, D. Alvarez, A. Kummel, “Atomic Layer Annealing of AlN to Template The Growth of High Thermal Conductivity Heat Spreader Films,” *20th Intl. Conf. Atomic Layer Deposition (ALD)*, Jul 2020
258. **A.I. Khan**, **A. Daus**, E. Pop, “Flexible Low-Power Superlattice-Like Phase Change Memory,” *IEEE Device Research Conference (DRC)*, Jun 2020, Columbus OH
257. Y.Y. Illarionov, T. Knobloch, **K.K.H. Smithe**, M. Waltl, **R.W. Grady**, D. Waldhoer, E. Pop, T. Grasser, “Anomalous Instabilities in CVD- MoS_2 FETs Suppressed by High-Quality Al_2O_3 Encapsulation,” *IEEE Device Research Conference (DRC)*, Jun 2020, Columbus OH
256. V.Z. Costa, **S. Vaziri**, S. Jamali, A. Miller, A. Ichimura, E. Pop, AKM Newaz, “Temperature-Dependent Raman Studies of a Natural van der Waals Heterostructure,” *IWEPNM*, Mar 2020,

Kirchberg in Tirol, Austria

255. V.Z. Costa, **S. Vaziri**, S. Jamali, A. Miller, A. Ichimura, E. Pop, AKM Newaz, "Temperature-Dependent Raman Studies of a Natural van der Waals Heterostructure," *APS March Meeting*, Mar 2020, Denver CO
254. **A.J. Gabourie** and E. Pop, "Interface Dependence of Thermal Properties in Two-Dimensional MoS₂," *IEEE Semicon. Interface Specialist Conf. (SISC)*, Dec 2019, San Diego, CA
253. J. Zheng, Z. Fang, S. Zhu, P. Xu, J. Doylend, **S. Deshmukh**, E. Pop, S. Dunham, A. Majumdar, "Nonvolatile Electrically Reconfigurable Silicon Photonic Switches Using Phase-Change Materials," *Frontiers in Optics*, Sep 2019, Washington DC
252. **C.S. Bailey**, **C.J. McClellan**, E. Pop, "Low Off-Current and High On/Off Ratios in Monolayer MoSe₂ and WSe₂ Transistors," *Electronic Materials Conference (EMC)*, Jun 2019, Ann Arbor MI
251. **S.M. Bohaichuk**, M.M. Pelella, Y. Sun, Z. Zhang, S. Ramanathan, E. Pop, "A Novel ESD Clamp Based on the VO₂ Insulator-Metal Transition," *IEEE Device Research Conference (DRC)*, Jun 2019, Ann Arbor MI
250. **A. Daus**, **S. Vaziri**, **K. Brenner**, **R.W. Grady**, A.U. Tang, E. Pop, "Flexible Top-Gated Monolayer MoS₂ Transistors with High Mobility," *IEEE Device Research Conference (DRC)*, Jun 2019, Ann Arbor MI
249. **A.I. Khan**, **K. Brenner**, **K.K.H. Smithe**, **M.J. Mleczko**, E. Pop, "Large Temperature Coefficient of Resistance in Atomically Thin 2D Devices," *IEEE Device Research Conference (DRC)*, Jun 2019, Ann Arbor MI
248. **C.J. McClellan**, **A.C. Yu**, C.-H. Wang, H.-S.P. Wong, E. Pop, "Vertical Sidewall MoS₂ Growth and Transistors," *IEEE Device Research Conference (DRC)*, Jun 2019, Ann Arbor MI
247. S. Chen, **A. Sood**, E. Pop, K.E. Goodson, D. Donadio, "Controlling Anisotropic Heat Transfer in MoS₂," *Phononics 2019*, Jun 2019, Tucson AZ
246. **S.M. Bohaichuk**, S. Kumar, G. Pitner, **C.J. McClellan**, J. Jeong, M.G. Samant, S.S.P. Parkin, H.-S.P. Wong, R.S. Williams, E. Pop, "Fast Periodic Spiking in VO₂ Driven by a Carbon Nanotube Heater," *MRS Spring Meeting*, Apr 2019, Phoenix AZ
245. **A.J. Gabourie**, **S.V. Suryavanshi**, A.B. Farimani, E. Pop, "Substrate Effects on Thermal Transport in Single-Layer MoS₂," *MRS Spring Meeting*, Apr 2019, Phoenix AZ
244. J-S. Moon, H.-C. Seo, K.K. Son, **E. Yalon**, K. Lee, E. Flores, G. Candia, E. Pop, "Reconfigurable Infrared Spectral Imaging with Robust Phase Change Materials," *SPIE-DCS*, Apr 2019, Baltimore MD
243. **P.F. Satterthwaite**, A.S. Yalamarthy, **S. Vaziri**, **M. Muñoz Rojo**, E. Pop, D.G. Senesky, "Process-induced anomalous current transport in graphene/InAlN/GaN heterostructured diodes," *IEEE Intl. Reliability Physics Symp. (IRPS)*, Apr 2019, Monterey CA
242. S. Kumar, **S. Bohaichuk**, L. Chen, **A. Sood**, D. Shapiro, H. Zhou, A. Lindenberg, L. Li, R.S. Williams, E. Pop, "Insights into the Anomalous Thermal Properties of VO₂ from Synchrotron Spectromicroscopy," *APS March Meeting*, Mar 2019, Boston MA
241. H. Lee, **S. Deshmukh**, J. Wen, V. Costa, E. Pop, B. Wang, A.K.M. Newaz, "Layer Number Dependent Barrier Height of MoS₂ on Ultra-Flat Conducting Surfaces," *APS March Meeting*, Mar 2019, Boston MA
240. E. Barré, **J.A.C. Incorvia**, S.H. Kim, **C.J. McClellan**, E. Pop, H.-S.P. Wong, T.F. Heinz, "Analysis of the Spatial Separation of Carrier Spin by the Valley Hall Effect in Monolayer WSe₂ Transistors," *APS March Meeting*, Mar 2019, Boston MA
239. L. Brandt, A.S. Yalamarthy, P. Satterthwaite, **S. Vaziri**, S. Benbrook, E. Pop, D. Senesky, "Graphene as a Diffusion Barrier in High-Temperature Electronics," *APS March Meeting*, Mar 2019, Boston MA
238. J. Zheng, A. Khanolkar, P. Xu, S. Colburn, **S. Deshmukh**, J. Myers, J. Frantz, E. Pop, J. Hendrickson, J. Doylend, N. Boechler, A. Majumdar, "Non-volatile quasi-continuously programmable silicon photonics using phase-change materials," *SPIE Photonics West*, Feb. 2019, San Francisco CA
237. **S.V. Suryavanshi**, P. Blaise, E. Pop, "Modulating Dipole Chemistry of Two-Dimensional Materials-

- Metal Interface for Reduced Contact Resistance,” *IEEE Semicon. Interface Specialist Conf. (SISC)*, Dec 2018, San Diego, CA
236. C.-H. Wang, **C.J. McClellan**, Y. Shi, X. Zheng, **V. Chen**, M. Lanza, E. Pop, H.-S.P. Wong, “3D Monolithic Stacked 1T1R cells using Monolayer MoS₂ FET and hBN RRAM,” *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2018, San Francisco CA
235. L. Li, B. Magyari-Köpe, C.-H. Wang, **S. Deshmukh**, Z. Jiang, H. Li, Y. Yang, H.-L. Li, H. Tian, E. Pop, T.-L. Ren, H.-S.P. Wong, “First Principles Study of Memory Selectors using Heterojunctions of 2D Layered Materials,” *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2018, San Francisco CA
234. **S. Deshmukh**, **C. Koroglu**, **M. Muñoz Rojo**, **S. Vaziri**, **E. Yalon**, E. Pop, “Thermal Measurement of Resistive Memory (RRAM) Devices by Calibrated Scanning Thermal Microscopy,” *Eurotherm Nanoscale & Microscale Heat Transfer VI (NMHT)*, Dec 2018, Levi, Finland
233. **M. Muñoz Rojo**, **Z. Li**, C. Sievers, **A.C. Bornstein**, **E. Yalon**, **S. Deshmukh**, **S. Vaziri**, **M.-H. Bae**, **F. Xiong**, D. Donadio, E. Pop, “Thermal Transport Across Graphene Step Junctions,” *Eurotherm Nanoscale & Microscale Heat Transfer VI (NMHT)*, Dec 2018, Levi, Finland
232. A.S. Yalamathy, **M. Muñoz Rojo**, A. Bruefach, E. Pop, D.G. Senesky, “Phonon drag Enhancement of the Seebeck Coefficient in the AlGa_N/Ga_N Two-dimensional Electron Gas,” *Eurotherm Nanoscale & Microscale Heat Transfer VI (NMHT)*, Dec 2018, Levi, Finland
231. **A. Sood**, **Y.C. Shin**, **V. Chen**, **K.K.H. Smithe**, K.E. Goodson, E. Pop, “Towards Engineering Giant Thermal Resistivity in Multilayer Graphene-MoS₂ Heterostructures,” *MRS Fall Meeting*, Nov 2018, Boston MA
230. **S. Vaziri**, **E. Yalon**, **M. Muñoz Rojo**, **S.V. Suryavanshi**, **C.J. McClellan**, **C.S. Bailey**, **A.J. Gabourie**, **V. Chen**, **S. Deshmukh**, **K.K.H. Smithe**, E. Pop, “Layer-by-Layer Temperature Probing Across 2D van der Waals Heterostructures,” *MRS Fall Meeting*, Nov 2018, Boston MA
229. **S. Deshmukh**, R. Islam, C. Saltonstall, **E. Yalon**, T.E. Beechem, K.C. Saraswat, E. Pop, “Tuning Thermal and Electrical Properties of NiO_x Films by UV/O₃ Treatment for Resistive Memory Applications,” *MRS Fall Meeting*, Nov 2018, Boston MA
228. K.L. Okabe, **A. Sood**, **E. Yalon**, **C.M. Neumann**, E. Pop, M. Asheghi, K.E. Goodson, H.-S.P. Wong, “Electrical and Thermal Analysis of Interfacial Phase Change Memory,” *E\PCOS (European Phase-Change and Ovonic Symposium)*, Catania Italy, Sep 2018 (**Best Presentation Award, 3rd Prize**)
227. **E. Yalon**, K. Okabe, **C.M. Neumann**, H.-S.P. Wong, E. Pop, “Improving PCM Energy-Efficiency by Reducing Pulse Widths,” *E\PCOS (European Phase-Change and Ovonic Symposium)*, Catania Italy, Sep 2018
226. **C.J. McClellan**, **E. Yalon**, L. Cai, **S. Suryavanshi**, X. Zheng, E. Pop, “Effective Hole Doping and Steep Switching in WSe₂ Transistors,” *SRC TECHCON*, Sep 2018, Austin TX (**Best Presentation Award**)
225. **K. Schauble**, **E. Yalon**, D. Zakhidov, **S. Deshmukh**, **C.J. McClellan**, **S. Vaziri**, A.K. Sood, A. Salleo, E. Pop, “Interfacial Reactions and Doping Effects at Metal Contacts to Monolayer MoS₂,” *SRC TECHCON*, Sep 2018, Austin TX
224. **S. Deshmukh**, **M. Muñoz Rojo**, **E. Yalon**, **S. Vaziri**, E. Pop, “Nanoscale Thermometry of RRAM Filaments with Intimate Graphene Contacts,” *SRC TECHCON*, Sep 2018, Austin, TX
223. **K. Schauble**, **E. Yalon**, D. Zakhidov, **S. Deshmukh**, **C.J. McClellan**, **S. Vaziri**, A.K. Sood, A. Salleo, E. Pop, “Interfacial Reactions and Doping Effects at Metal Contacts to Monolayer MoS₂,” *Electronic Materials Conference (EMC)*, Jun 2018, Santa Barbara, CA
222. **C.J. McClellan**, **E. Yalon**, L. Cai, **S.V. Suryavanshi**, X. Zheng, E. Pop, “Sub-Thermionic Steep Switching in Hole-Doped WSe₂ Transistors,” *IEEE Device Research Conference (DRC)*, Jun 2018, Santa Barbara, CA
221. **I.M. Datye**, **M. Muñoz Rojo**, **E. Yalon**, **M.J. Mleczko**, E. Pop, “Localized Heating in MoTe₂-Based Resistive Memory Devices,” *IEEE Device Research Conference (DRC)*, Jun 2018, Santa Barbara CA
220. **E. Yalon**, K. Okabe, **C.M. Neumann**, H.-S.P. Wong, E. Pop, “Energy-Efficient Phase Change Memory

- Programming by Nanosecond Pulses," *IEEE Device Research Conference (DRC)*, Jun 2018, Santa Barbara CA
219. Y.Y. Illarionov, **K.K.H. Smithe**, M. Walzl, **R.W. Grady**, **S. Deshmukh**, E. Pop, T. Grasser, "Annealing and Encapsulation of CVD-MoS₂ FETs with 10¹⁰ On/Off Current Ratio," *IEEE Device Research Conference (DRC)*, Jun 2018, Santa Barbara CA
218. **S. Deshmukh**, **M. Muñoz Rojo**, **E. Yalon**, **S. Vaziri**, E. Pop, "Probing Self-Heating in RRAM Devices by Sub-100 nm Spatially Resolved Thermometry," *IEEE Device Research Conference (DRC)*, Jun 2018, Santa Barbara CA
217. **S.M. Bohaichuk**, **M. Muñoz Rojo**, G. Pitner, **C.J. McClellan**, **F. Lian**, J. Li, J. Jeong, M.G. Samant, S.S.P. Parkin, H.-S. P. Wong, E. Pop, "Low Power Nanoscale Switching of VO₂ using Carbon Nanotube Heaters," *IEEE Device Research Conference (DRC)*, Jun 2018, Santa Barbara CA (**Best Poster Award**)
216. J. Zheng, A. Khanolkar, P. Xu, S. Colburn, **S. Deshmukh**, J. Myers, J. Frantz, E. Pop, N. Boechler, A. Majumdar, "Non-volatile All-Optical Quasi-Continuous Switching in GST-on-Silicon Microring Resonators," *CLEO 2018*, May 2018, San Jose CA
215. **R.L. Xu**, **M. Muñoz Rojo**, S.M. Islam, B. Vareskic, H.G. Xing, D. Jena, E. Pop, "Thermal Transport in AlN Single Crystals and AlN/GaN Superlattices," *MRS Spring Meeting*, Apr 2018, Phoenix AZ
214. **F. Lian**, T. Lei, **V. Chen**, **A. Sood**, **Z. Li**, K. Goodson, V. Gambin, Z. Bao, E. Pop, "High Electron and Hole Thermopower in Ultra-Pure Carbon Nanotube Networks," *MRS Spring Meeting*, Apr 2018, Phoenix AZ
213. **M. Chen**, **F. Lian**, **M. Muñoz Rojo**, **A. Sood**, K. Goodson, E. Pop, "Electrostatic Cycling of Suspended Graphene Thermal Switches," *MRS Spring Meeting*, Apr 2018, Phoenix AZ (**Best Presentation Award**)
212. A.S. Yalamathy, **M. Muñoz Rojo**, A. Bruefach, E. Pop, D.G. Senesky, "Low-Temperature Seebeck Coefficient Enhancement in Gated AlGaIn/GaN Heterostructures," *MRS Spring Meeting*, Apr 2018, Phoenix AZ
211. **K.K.H. Smithe**, Z. Zhu, **C.S. Bailey**, E. Pop, A. Yoon, "Investigation of Monolayer MX₂ as Sub-Nanometer Copper Diffusion Barriers," *IEEE Intl. Reliability Physics Symp. (IRPS)*, Mar 2018, Burlingame, CA
210. E. Barré, **J.A. Incorvia**, S.H. Kim, **C. McClellan**, E. Pop, H.-S.P. Wong, T.F. Heinz, "Spin and Valley Hall Effect in Monolayer WSe₂ Transistors at Near-Room Temperature," *APS March Meeting*, Los Angeles CA, Mar 2018
209. A. Yore, **K. Smithe**, S. Jha, K. Ray, N. Scandrette, V. Costa, E. Pop, A. Newaz, "Scalable fabrication of high performance monolayer MoS₂ photodetectors," *APS March Meeting*, Los Angeles CA, Mar 2018
208. A. Newaz, A. Yore, T. Mou, S. Jha, **K. Smithe**, B. Wang, E. Pop, "Photoresponse of Natural van der Waals Heterostructures," *APS March Meeting*, Los Angeles CA, Mar 2018
207. O. Karni, **K. Smithe**, **C. McClellan**, **C. Bailey**, E. Pop, T. Heinz, "Temperature dependence of charge transfer processes in WS₂/MoSe₂ heterobilayers probed by ultrafast spectroscopy," *APS March Meeting*, Los Angeles CA, Mar 2018
206. **S.V. Suryavanshi**, B. Sklenard, B. Magyari-Köpe, E. Pop, P. Blaise, "Understanding 2D Semiconductor-Metal Interface for Efficient Carrier Injection," *IEEE SISC*, Dec 2017, San Diego CA
205. R. Yang, H. Li, **K.K.H. Smithe**, T.R. Kim, K. Okabe, E. Pop, J.A. Fan, H.-S.P. Wong, "2D Molybdenum Disulfide (MoS₂) Transistors Driving RRAMs with 1T1R Configuration," *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2017, San Francisco CA
204. Y. Shi, C. Pan, **V. Chen**, N. Raghavan, K.L. Pey, F.M. Puglisi, E. Pop, H.-S.P. Wong, M. Lanza, "Coexistence of volatile and non-volatile resistive switching in 2D h-BN based electronic synapses," *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2017, San Francisco CA
203. **K.K.H. Smithe**, **C.S. Bailey**, **M. Muñoz Rojo**, A. Krayev, E. Pop, "Nanoscale Heterogeneities in

- Monolayer MoSe₂ and WSe₂ Revealed by Correlated SPM and TERS,” *MRS Fall Meeting*, Nov 2017, Boston MA
202. **J.A. Incorvia**, E. Barré, S.H. Kim, **C. McClellan**, E. Pop, H.-S.P. Wong, T. Heinz, “Spin and Valley Hall Effect in Monolayer WSe₂ Transistors at Near-Room Temperature controlled via Electric Field,” *62nd Annual Conf. on Magnetism and Magnetic Materials (MMM)*, Nov 2017, Pittsburgh PA
201. S. Chen, **A. Sood**, E. Pop, K. Goodson, D. Donadio, “Largely tunable anisotropic thermal conductivity of pristine and lithiated MoS₂,” *APS Meeting of the Far West Section*, Nov 2017, Merced CA
200. **K.K.H. Smithe**, **C.S. Bailey**, A. Krayev, E. Pop, “Perfectly Perforated Monolayer WSe₂,” *AVS 64th International Symposium & Exhibition*, Nov 2017, Tampa FL
199. **F. Xiong**, **E. Yalon**, **C. McClellan**, A. Sood, J. Zhang, K. Goodson, E. Pop, Y. Cui, “Tuning Two-Dimensional Material Properties via Electrochemical Intercalation,” *IEEE Nanotechnology Materials and Devices Conference (NMDC)*, Oct 2017, Singapore
198. J. Shim, S. Banerjee, H. Qiu, **K.K.H. Smithe**, **D. Estrada**, J. Bello, E. Pop, R. Bashir, “Detection of Methylation in DNA using Nanopores in MoS₂ Membrane,” *Biomedical Engineering Society (BMES) Annual Meeting*, Phoenix AZ, Oct 2017
197. Y.Y. Ilarionov, M. Waltl, **K.K.H. Smithe**, E. Pop, T. Grasser, “Encapsulated MoS₂ FETs with Improved Performance and Reliability,” *Grapchina*, Sep 2017, Nanjing, China
196. C.-H. Wang, J.A. Currivan-Incorvia, **C. McClellan**, **A.C. Yu**, **M.J. Mieczko**, E. Pop, H.-S.P. Wong, “N-type Black Phosphorus Transistor with Low Work Function Contacts,” *SRC TECHCON*, Sep 2017, Austin, TX
195. C.-L. Lo, M. Catalano, **K.K.H. Smithe**, L. Wang, E. Pop, M.J. Kim, Z. Chen, “On the Potential of 2D Layered Materials as Diffusion Barriers for Cu Interconnect Technology,” *SRC TECHCON*, Sep 2017, Austin, TX
194. **S.V. Suryavanshi**, B. Magyari-Köpe, P. Lim, **C. McClellan**, **K. Smithe**, E. Pop, “Understanding Contact Physics of 2D Semiconductors,” *SRC TECHCON*, Sep 2017, Austin TX
193. **C.J. McClellan**, **E. Yalon**, **K. Smithe**, **S. Suryavanshi**, E. Pop, “Effective n-type Doping of Monolayer MoS₂ by AlO_x,” *SRC TECHCON*, Sep 2017, Austin TX (**Best Paper in Session Award**)
192. **K.K.H. Smithe**, **C.D. English**, **S.V. Suryavanshi**, E. Pop, “High-Field Transport and Velocity Saturation in Monolayer MoS₂,” *SRC TECHCON*, Sep 2017, Austin TX
191. **K.K.H. Smithe**, **C.S. Bailey**, A. Krayev, E. Pop, “Grain Boundaries and Nanoscale Heterogeneities in Monolayer MoSe₂ Revealed by Correlated SPM and TERS,” *6th Intl. Conf. on Tip-Enhanced Raman Spectroscopy (TERS-6)*, Aug 2017, Gaithersburg, MD
190. **F. Xiong**, A. Sood, H. Wang, **E. Yalon**, **C.J. McClellan**, J. Zhang, J. Sun, K. Goodson, Y. Cui, E. Pop, “Tuning Electrical and Thermal Properties in Molybdenum Disulfide via Li Intercalation,” *Intl. Materials Research Congress (MRS-IMRC)*, Aug 2017, Cancun Mexico
189. **J.A. Currivan-Incorvia**, E. Barre, S.H. Kim, **C. McClellan**, E. Pop, H.-S.P. Wong, T. Heinz, “Room Temperature Electrical Control of Spin and Valley Hall Effect in Monolayer WSe₂ Transistors for Spintronic Applications,” *IEEE Nano*, Jul 2017, Pittsburgh PA
188. **S.V. Suryavanshi**, **A.J. Gabourie**, A.B. Farimani, **E. Yalon**, E. Pop, “Thermal Boundary Conductance of the MoS₂-SiO₂ Interface,” *IEEE Nano*, Jul 2017, Pittsburgh PA (**Best Paper Award**)
187. **S. Deshmukh**, **F. Lian**, **E. Yalon**, G. Pitner, H.-S.P. Wong, E. Pop, “Sub-15 nm Nanowires Enabled by Cryo Pulsed Self-Aligned Nanotrench Ablation on Carbon Nanotubes,” *IEEE Nano*, Jul 2017, Pittsburgh PA
186. S. Colburn, A. Zhan, A. Majumdar, **S. Deshmukh**, E. Pop, J. Myers, J. Frantz, “Active Metasurfaces Based on Phase-Change Memory Material Digital Metamolecules,” *IEEE Nano*, Jul 2017, Pittsburgh PA
185. **K.K.H. Smithe**, **C.D. English**, **S.V. Suryavanshi**, E. Pop, “High-Field Transport and Velocity Saturation in CVD Monolayer MoS₂,” *EDISON 20*, Jul 2017, Buffalo NY (**Best Student Paper Award**)

184. **C.J. McClellan, E. Yalon, K.K.H. Smithe, S.V. Suryavanshi**, E. Pop, "Effective n-type Doping of Monolayer MoS₂ by AlO_x," *IEEE Device Research Conference (DRC)*, Jun 2017, Notre Dame, IN
183. **N.C. Wang**, S. Sinha, B. Cline, **C.D. English**, G. Yeric, E. Pop, "Replacing Copper Interconnects with Graphene at a 7-nm Node," *IEEE Intl. Interconnect Tech. Conf. (IITC)*, May 2017, Hsinchu, Taiwan
182. C.-L. Lo, **K.K.H. Smithe**, R. Mehta, S. Chugh, E. Pop, Z. Chen, "Atomically Thin Diffusion Barriers for Ultra-Scaled Cu Interconnects Implemented by 2D Materials," *IEEE Intl. Reliability Physics Symp. (IRPS)*, Apr 2017, Monterey, CA
181. **C. McClellan**, L. Cai, **E. Yalon**, X. Zheng, E. Pop, "Record Current Density in Monolayer p-type WSe₂ with Ultrathin MoO₃ Hole Doping Layers," *MRS Spring Meeting*, Apr 2017, Phoenix AZ
180. **S. Bohaichuk**, G. Pitner, **F. Lian**, J. Jeong, M.G. Samant, S.S.P. Parkin, H.-S. Philip Wong, E. Pop, "Probing Metal-Insulator Transitions in VO₂ with Ultra-Narrow Carbon Nanotube Electrodes," *MRS Spring Meeting*, Apr 2017, Phoenix AZ
179. **M.J. Mleczko**, **A.C. Yu**, **Y.C. Shin**, C. Smyth, R.M. Wallace, Y. Nishi, E. Pop, "De-Pinning Metal Contacts to MoTe₂ Using Monolayer h-BN," *MRS Spring Meeting*, Apr 2017, Phoenix AZ
178. **F. Xiong**, **E. Yalon**, **C.J. McClellan**, A. Sood, J. Zhang, J. Sun, K.E. Goodson, Y. Cui, E. Pop, "Probing electrical and thermal properties in electrochemically Li-intercalated MoS₂ nanosheets with Raman spectroscopy," *MRS Spring Meeting*, Apr 2017, Phoenix AZ
177. **M. Chen**, **M. Muñoz-Rojo**, **F. Lian**, E. Pop, "Thermal Switching with Collapsible Graphene Membranes," *MRS Spring Meeting*, Apr 2017, Phoenix AZ
176. A. Sood, **F. Xiong**, H. Wang, Y. Cui, E. Pop, K.E. Goodson, "Understanding and tuning heat conduction in MoS₂: cross-plane diffusive-ballistic transport, and dynamic electrochemical Tuning of Thermal Conductivity by Li Intercalation," *MRS Spring Meeting*, Apr 2017, Phoenix AZ (**Graduate Student Gold Award**)
175. **E. Yalon**, **K.K.H. Smithe**, O.B. Aslan, **C. McClellan**, **F. Xiong**, **Y.C. Shin**, A. Sood, **S. Suryavanshi**, **A.J. Gabourie**, **R.L. Xu**, **C. Neumann**, K.E. Goodson, T.F. Heinz, E. Pop, "Thermal Boundary Conductance between Monolayer MoS₂ and SiO₂ via In Situ Raman Spectroscopy of Functioning MoS₂ Transistors," *MRS Spring Meeting*, Apr 2017, Phoenix AZ
174. O.B. Aslan, **I. Datye**, H.-H. Kuo, **M. Mleczko**, I. Fisher, E. Pop, T.F. Heinz, "Probing the Band Structure of Ultrathin MoTe₂ via Strain," *APS March Meeting*, New Orleans LA, Mar 2017
173. A.K.M. Newaz, A.E. Yore, A. Miller, W. Crumrine, B. Redd, J.A. Tuck, B. Wang, **K.K.H. Smithe**, E. Pop, "Visualization of defect-induced excitonic properties of the edges and grain boundaries in synthesized monolayer molybdenum disulfide," *APS March Meeting*, New Orleans LA, Mar 2017
172. **K.K.H. Smithe**, **S. Suryavanshi**, **C.D. English**, E. Pop, "High-Field Transport and Velocity Saturation in Synthetic Monolayer MoS₂," *APS March Meeting*, New Orleans LA, Mar 2017
171. A.K.M. Newaz, **K.K.H. Smithe**, K. Ray, A.E. Yore, B. Wang, E. Pop, "Opto-Electronic Properties of Synthesized Monolayer Molybdenum Disulfide," *2nd Intl. Symposium on Science & Technology of 2D Materials*, Orlando FL, Feb 2017
170. **F. Xiong**, **E. Yalon**, **A. Behnam**, **C.M. Neumann**, **K.L. Grosse**, **S. Deshmukh**, E. Pop, "Towards Ultimate Scaling Limits of Phase-Change Memory," *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2016, San Francisco CA (**Invited Paper**)
169. **C.D. English**, **K.K.H. Smithe**, **R.L. Xu**, E. Pop, "Approaching Ballistic Transport in Monolayer MoS₂ Transistors with Self-Aligned 10 nm Top Gates," *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2016, San Francisco CA
168. **Y.C. Shin**, A. Sood, **K.K.H. Smithe**, K.E. Goodson, E. Pop, "Optical and thermal properties of heterogeneously integrated CVD-grown 2D materials," *MRS Fall Meeting*, Nov 2016, Boston MA
167. **K.K.H. Smithe**, E. Pop, "Large-Grain Synthesis of Monolayer MoSe₂ and WSe₂," *MRS Fall Meeting*, Nov 2016, Boston MA
166. S. Dutta, Y. Yang, **N. Wang**, E. Pop, V. Cadambe, P. Grover, "Reliable matrix multiplication using error-prone dot-product nanofunctions with an application to logistic regression," *SRC TECHCON*, Sep

- 2016, Austin TX
165. **N.C. Wang**, S.K. Gonugondla, I. Nahlus, N.R. Shanbhag, E. Pop, “GDOT: A Graphene-Based Nanofunction for Dot-Product Computation,” *SRC TECHCON*, Sep 2016, Austin TX (**Best Paper in Session Award**)
164. M. Morea, K. Gu, V. Savikhin, C.S. Fenrich, E. Pop, J.S. Harris, “Optimization of TCR and Heat Transport in Group-IV Multiple-Quantum-Well Microbolometers,” *Proc. SPIE*, Aug 2016, San Diego CA
163. Y.K. Koh, **A.S. Lyons**, D.G. Cahill, E. Pop, “Electronic control of phonon heat flow across graphene interfaces,” *ASME Summer Heat Transfer Conference*, Jul 2016, Washington DC
162. **C.J. McClellan**, **M.J. Mleczko**, **K.K.H. Smithe**, Y. Nishi, E. Pop, “WTe₂ as a Two-Dimensional (2D) Metallic Contact for 2D Semiconductors,” *IEEE Device Research Conference (DRC)*, Jun 2016, Univ. Delaware DE
161. **E. Yalon**, **C.J. McClellan**, **K.K.H. Smithe**, **Y.C. Shin**, **R.L. Xu**, E. Pop, “Direct Observation of Power Dissipation in Monolayer MoS₂ Devices,” *IEEE Device Research Conference (DRC)*, Jun 2016, Univ. Delaware DE
160. **I.M. Datye**, **A.J. Gabourie**, **C.D. English**, **N.C. Wang**, E. Pop “Reduction of Hysteresis in MoS₂ Transistors Using Pulsed Voltage Measurements,” *IEEE Device Research Conference (DRC)*, Jun 2016, Univ. Delaware DE (**Best Poster Award**)
159. **M.J. Mleczko**, C. Zhang, H.R. Lee, H.H. Kuo, B. Magyari-Köpe, Z.-X. Shen, R.G. Moore, I.R. Fisher, Y. Nishi, E. Pop, “Atomically-Thin HfSe₂ Transistors with Native Metal Oxides,” *IEEE Device Research Conference (DRC)*, Jun 2016, Univ. Delaware DE
158. **N.C. Wang**, S.K. Gonugondla, I. Nahlus, N.R. Shanbhag, E. Pop, “GDOT: A Graphene-Based Nanofunction for Dot-Product Computation,” *IEEE VLSI Tech. Symp.*, Jun 2016, Honolulu HI
157. **R.L. Xu**, **M.J. Mleczko**, **S. Bohaichuk**, Y. Nishi, E. Pop, “Thermal Limitations of Two-Dimensional Semi-Metallic WTe₂ Devices,” *IEEE SNW (Silicon Nanoelectronics Workshop)*, Jun 2016, Honolulu HI
156. **R.S. Luo**, A.R. Alpert, M. Asheghi, E. Pop, K.E. Goodson, “Analytical Model of Graphene-Enabled Ultra-Low Power Phase Change Memory,” *ITHERM (Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems)*, Jun 2016, Las Vegas NV
155. **F. Xiong**, H. Wang, A. Sood, X. Liu, J. Sun, M. Brongersma, K. Goodson, E. Pop, Y. Cui, “Tuning Electrical, Optical and Thermal Properties in MoS₂ Nanosheets via Li Intercalation,” *MRS Spring Meeting*, Mar 2016, Phoenix AZ
154. A. Yore, W. Crumrine, **K.K.H. Smithe**, E. Pop, B. Wang, A. Newaz, “Giant blue shifted photoluminescence peak from the edges of CVD grown monolayer MoS₂,” *APS March Meeting*, Mar 2016, Baltimore, MD
153. Y.K. Koh, **A.S. Lyons**, D.G. Cahill, E. Pop, “Electronic control of phonon heat flow across graphene interfaces,” *Micro/Nanoscale Heat & Mass Transfer International Conference*, Jan 2016, Singapore
152. **S. Deshmukh**, R. Islam, C. Chen, **E. Yalon**, K.C. Saraswat, E. Pop, “Thermal Modeling of Metal Oxides for Highly Scaled Nanoscale RRAM,” *SISPAD*, Sep 2015, Washington DC
151. **S.V. Suryavanshi** and E. Pop, “Physics-based Verilog-A Model for Circuit Simulations of Two-dimensional Semiconductor Devices,” *SRC TECHCON*, Sep 2015, Austin TX
150. **N.C. Wang**, **E.A. Carrion**, **M.C. Tung** and E. Pop, “Reducing Graphene Device Variability with Yttrium Sacrificial Layers,” *SRC TECHCON*, Sep 2015, Austin TX
149. **K.K.H. Smithe**, **C.D. English**, E. Pop, “Record-High Mobility in Monolayer MoS₂ Devices Grown by Chemical Vapor Deposition,” *SRC TECHCON*, Sep 2015, Austin TX
148. P. Pedrinazzi, L. Anzi, M. Fiocco, E. Guerriero, A. Mansouri, **A. Behnam**, **E.A. Carrion**, A. Pesquera, A. Centeno, A. Zurutuza, E. Pop, R. Sordan, “Ultra-low contact resistance in graphene devices,” *Graphene Week*, Jun 2015, Manchester UK
147. **K.K.H. Smithe**, **C.D. English**, **S.V. Suryavanshi**, E. Pop, “High Mobility in Monolayer MoS₂ Devices Grown by Chemical Vapor Deposition,” *IEEE Device Research Conference (DRC)*, Jun 2015, Ohio

State OH

146. **S.V. Suryavanshi** and E. Pop, "Physics-Based Compact Model for Circuit Simulations of 2-Dimensional Semiconductor Devices," *IEEE Device Research Conference (DRC)*, Jun 2015, Ohio State OH
145. C.-S. Lee, E. Pop, H.-S.P. Wong, "Compact Modeling and Design Optimization of Carbon Nanotube Field-Effect Transistors for the Sub-10-nm Technology Nodes," *IEEE Device Research Conference (DRC)*, Jun 2015, Ohio State OH
144. **S. Deshmukh, F. Xiong, F. Lian**, Y. Cui, E. Pop, "Characterization of Highly Resistive Nanoscale RRAM Contacts," *MRS Spring Meeting*, Apr 2015, San Francisco CA
143. **K.K.H. Smithe, T.I. Anderson, N.C. Wang**, A.U. Tang, H.-S.P. Wong, E. Pop, "Large-Scale Analysis of Devices from MoS₂ Grown by Chemical Vapor Deposition," *MRS Spring Meeting*, Apr 2015, San Francisco CA
142. **N.C. Wang** and E. Pop, "Reducing Graphene Device Variability with Yttrium Sacrificial Layers," *MRS Spring Meeting*, Apr 2015, San Francisco CA
141. **M.J. Mleczko**, H.H. Kuo, H.R. Lee, B. Magyari-Kope, I. Fisher, Y. Nishi, E. Pop, "Growth and Device Applications of Narrow-Gap Dichalcogenide Semiconductors," *MRS Spring Meeting*, Apr 2015, San Francisco CA
140. A. Sood, **F. Xiong**, H. Wang, **F. Lian, Z. Li**, Y. Cui, E. Pop, K. Goodson, "Tunable thermal conductivity in MoS₂ thin films via Li intercalation," *MRS Spring Meeting*, Apr 2015, San Francisco CA
139. Y. An, B. Wu, **A. Behnam**, E. Pop, A. Ural, "Metal-oxide-semiconductor capacitors based on graphene and p-type silicon," *APS March Meeting*, Mar 2015, San Antonio TX
138. **S. Islam, A.Y. Serov**, I. Meric, J. Lee, D. Akinwande, K. Shepard, E. Pop, "Substrate Dependent High-Field Transport of Graphene Transistors," *SRC TECHCON*, Sep 2014, Austin TX
137. **C.D. English, V.E. Dorgan**, G. Shine, K.C. Saraswat, E. Pop, "Improving Contact Resistance in MoS₂ Field Effect Transistors," *SRC TECHCON*, Sep 2014, Austin TX (**Best Paper in Session Award**)
136. J.-W. Do, **D. Estrada**, X. Xie, N.N. Chang, J.L. Mallek, G.S. Girolami, J.A. Rogers, E. Pop, J.W. Lyding, "Self-Limiting and Selective Nanosoldering of Carbon Nanotube Junctions for Improved Device Performance," *International Conference on Nanoscience + Technology (ICN+T)*, July 2014, Vail CO
135. **A.Y. Serov, V.E. Dorgan, C.D. English**, E. Pop, "Multi-Valley High-Field Transport in 2-Dimensional MoS₂ Transistors," *IEEE Device Research Conference (DRC)*, Jun 2014, Santa Barbara CA
134. **E.A. Carrion, J.D. Wood, A. Behnam, M.C. Tung**, J.W. Lyding, E. Pop, "Variability of Graphene Mobility and Contacts: Surface Effects, Doping and Strain," *IEEE Device Research Conference (DRC)*, Jun 2014, Santa Barbara CA
133. **C.D. English, G. Shine, V.E. Dorgan**, K.C. Saraswat, E. Pop, "Improving Contact Resistance in MoS₂ Field Effect Transistors," *IEEE Device Research Conference (DRC)*, Jun 2014, Santa Barbara CA
132. J.-W. Do, **D. Estrada**, X. Xie, N.N. Chang, J. Mallek, G.S. Girolami, J.A. Rogers, E. Pop, J.W. Lyding, "Self-Limiting and Selective Nanosoldering of Carbon Nanotube Junctions for Improved Device Performance," *MRS Spring Meeting*, Apr 2014, San Francisco CA
131. **F. Lian, J.P. Llinas, Z. Li, D. Estrada**, E. Pop, "Thermal Transport in Chirality-Sorted Carbon Nanotube Networks," *MRS Spring Meeting*, Apr 2014, San Francisco CA
130. **A.Y. Serov, V.E. Dorgan, C.D. English**, E. Pop "High-Field Transport in MoS₂ Field-Effect Transistors," *MRS Spring Meeting*, Apr 2014, San Francisco CA
129. **F. Xiong, Y. Dai, A. Behnam**, E. Pop, "Activation Energy of Carbon Nanotube Joule Breakdown in Variable Oxygen Environments," *MRS Spring Meeting*, Apr 2014, San Francisco CA
128. S. Raoux, H.-Y. Cheng, J. Jordan-Sweet, **F. Xiong**, E. Pop, "GaSb-Based Phase Change Materials as Candidates for Phase Change Memory," *MRS Spring Meeting*, Apr 2014, San Francisco CA

127. **C.D. English, V.E. Dorgan**, G. Shine, **F. Xiong**, K.C. Saraswat, E. Pop, “Improving Contact Resistance in MoS₂ Field Effect Transistors,” *MRS Spring Meeting*, Apr 2014, San Francisco CA
126. O. Khatib, **J.D. Wood**, G.P. Doidge, G.L. Damhorst, A. Rangarajan, R. Bashir, E. Pop, J.W. Lyding, D.N. Basov, “Graphene-based platform for nano-scale infrared near-field spectroscopy of biological materials,” *APS March Meeting*, Mar 2014, Denver CO
125. **Z. Li**, Y. Liu, Y. Xu, W. Duan, E. Pop, “Ballistic Thermal Conductance in Layered Two-Dimensional Materials,” *APS March Meeting*, Mar 2014, Denver CO
124. E. Piccinini, A. Cappelli, **F. Xiong, A. Behnam**, F. Buscemi, R. Brunetti, M. Rudan, E. Pop, C. Jacoboni, “Novel 3D Random-Network Model for Threshold Switching of Phase-Change Memories,” *IEEE Intl. Electron Devices Meeting (IEDM)*, Dec 2013, Washington DC
123. **V.E. Dorgan, C.D. English**, E. Pop, “High-Field Negative Differential Conductance in MoS₂ Field-Effect Transistors,” *MRS Fall Meeting*, Nov 2013, Boston MA
122. S. Raoux, H.-Y. Cheng, J. Jordan-Sweet, T. Monin, **F. Xiong**, A. König, D. Garbin, R. Cheek, E. Pop, M. Wuttig “Crystallization properties of Ga-Sb Phase Change Alloys,” *EPCOS*, Sep 2013, Berlin, Germany
121. A. Cappelli, E. Piccinini, F. Buscemi, **F. Xiong, A. Behnam**, R. Brunetti, M. Rudan, E. Pop, C. Jacoboni, “3D-nHD: transport in a 3D network using the HydroDynamic model,” *EPCOS*, Sep 2013, Berlin, Germany
120. **E.A. Carrion, M. Tung, A. Malik, A. Behnam**, E. Pop, “Variability of Graphene Transistors: Roles of Contacts and Enhanced Characterization Techniques,” *SRC TECHCON*, Sep 2013, Austin TX (**Best Paper in Session Award**)
119. **A.Y. Serov, S. Islam** and E. Pop, “Simulation of realistic graphene transistors including non-ideal behavior,” *SRC TECHCON*, Sep 2013, Austin TX
118. **S. Islam, A.Y. Serov, E. Carrion**, E. Pop, “Effect of Channel Length Scaling on Current Saturation in Graphene Transistors,” *SRC TECHCON*, Sep 2013, Austin TX
117. **V.E. Dorgan, A. Behnam**, H.J. Conley, K.I. Bolotin, E. Pop, “High-Field Electrical and Thermal Transport in Suspended Graphene,” *SRC TECHCON*, Sep 2013, Austin TX
116. A. Cappelli, E. Piccinini, **F. Xiong, A. Behnam**, R. Brunetti, E. Pop, C. Jacoboni, “3D-nHD: A hydrodynamic model for trap-limited conduction in a 3D network,” *IEEE SISPAD*, Sep 2013, Glasgow, Scotland
115. M.P. Gupta, **D. Estrada, A. Behnam**, E. Pop, S. Kumar, “Impact of Network Morphology on Electrical Breakdown of Carbon Nanotube Thin-Film Transistors,” *InterPACK 2013*, Jul 2013, San Francisco CA
114. P.K. Mohseni, **A. Behnam, J.D. Wood, C.D. English**, L. Yu, D. Wasserman, J.W. Lyding, E. Pop, X. Li, “When van der Waals Epitaxy Meets a Commensurate Interface: Self-Segregation of InGaAs Nanowires on Graphene,” *Electronic Materials Conf. (EMC)*, Jun 2013, Notre Dame IN
113. **S. Islam, A.Y. Serov**, I. Meric, K.L. Shepard, E. Pop, “Substrate Dependent High-Field Transport of Graphene Transistors,” *IEEE Device Research Conference (DRC)*, Jun 2013, Notre Dame IN
112. **A.Y. Serov, S. Islam**, E. Pop, “Realistic Simulation of Graphene Transistors Including Non-Ideal Electrostatics,” *IEEE Device Research Conference (DRC)*, Jun 2013, Notre Dame IN
111. **J.D. Wood**, G.P. Doidge, J. Shim, J.C. Koepke, **E.A. Carrion**, I. Datye, G.L. Damhorst, E. Salm, Y. Chen, R. Bashir, E. Pop, J.W. Lyding, “Layered Graphene Membranes for Biomolecule Preservation and Programmable Hydration,” *Graphene Week*, June 2013, Chemnitz Germany
110. M. Bianchi, L. Rizzi, **A. Behnam, E. Carrion**, E. Guerriero, L. Polloni, E. Pop, R. Sordan, “Cascading Wafer-Scale Integrated Graphene Complementary Inverters in Ambient Air,” *E-MRS Spring Meeting*, May 2013, Strasbourg France
109. **J.D. Wood**, G.P. Doidge, J.C. Koepke, **E.A. Carrion**, G. Damhorst, E. Salm, R. Bashir, E. Pop, J.W. Lyding, “Clean Transfer of CVD Graphene for Biomolecule-Graphene Nanosandwiches,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
108. C.-L. Tsai, **F. Xiong**, Y. Jiang, **Y. Dai**, E. Pop, M. Shim, “Low-Power AlO_x-Based RRAM with Carbon

- Nanotube Crossbar Electrodes,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
107. **K.L. Grosse, F. Xiong, S. Hong**, W.P. King, E. Pop, “Nanometer-Scale Joule and Peltier Effects at Phase-Change Memory Contacts,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
 106. M.P. Gupta, **A. Behnam, D. Estrada**, E. Pop, S. Kumar, “Size Effects on Heat Dissipation and Thermal Reliability of Carbon Nanotube Thin-Film Transistors,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
 105. **F. Lian, D. Estrada**, H. Tian, **A.J. Hoag, J.P. Llinas**, M.Y. Timmermans, A.G. Nasibulin, E.I. Kauppinen, S. Sinha, E. Pop, “Thermal Imaging and Analysis of Carbon Nanotube Composites,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
 104. **V.E. Dorgan, A. Behnam**, E. Pop, “High-Field Transport in Suspended Graphene,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
 103. Y. An, **A. Behnam**, E. Pop, A. Ural, “Graphene/p-type silicon metal-semiconductor-metal photodetectors,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
 102. **D. Estrada, Z. Li**, S.N. Dunham, G.M. Choi, **N. Wang**, Y. Meng, **F. Lian**, J. Lee, J.-M. Zuo, W.P. King, J.A. Rogers, D.G. Cahill, E. Pop, “Thermal Anisotropy of Layer-by-Layer Assembled Graphene Films,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
 101. **A. Behnam**, A. Cappelli, **F. Xiong, Y. Dai**, S. Hong, **E. Carrion, A.S. Lyons**, E. Piccinini, C. Jacoboni, E. Pop, “Phase Change Memory with Graphene Ribbon Electrodes,” *MRS Spring Meeting*, Apr 2013, San Francisco CA
 100. J.C. Koepke, **J.D. Wood**, E. Pop, J.W. Lyding, “Growth and Contrast of Hexagonal Boron Nitride: From Sub-monolayer Islands to Multilayer Films,” *APS March Meeting*, Mar 2013, Baltimore MD
 99. S. Banerjee, J. Shim, J. Rivera, X. Jin, **D. Estrada**, V. Solovyeva, X. You, J. Pak, E. Pop, N. Aluru, R. Bashir, “Electrochemistry of Graphene Edge Embedded Nanopores,” *APS March Meeting*, Mar 2013, Baltimore MD
 98. **J.D. Wood**, G.P. Doidge, B. Aruin, H. Dong, J.C. Koepke, **E. Carrion**, I. Datye, K. Chatterjee, J. Moore, E. Pop, J.W. Lyding, “Alternative polymer scaffolds for clean transfer of CVD-grown graphene,” *APS March Meeting*, Mar 2013, Baltimore MD
 97. S. Banerjee, J. Shim, J. Rivera, X. Jin, **D. Estrada**, E. Pop, N.R. Aluru, and R. Bashir, “Stacked Graphene-Al₂O₃ Nanopore Architecture for DNA detection”, *IEEE-EMBS Micro- and Nanoengineering in Medicine Conf. (MNMC)*, Dec 2012, Ka’anapali, Maui HI
 96. P.K. Mohseni, **A. Behnam, J.D. Wood**, J.W. Lyding, E. Pop, and X. Li, “Van der Waals Epitaxy of Self-Organized In_xGa_{1-x}As/InAs Nanowire Heterostructures on Single Layer Graphene Substrates,” *MRS Fall Meeting*, Nov 2012, Boston MA
 95. **A.D. Liao, C.M. Neumann**, E. Pop, “Probing the Upper Limits of Current Density in One-Dimensional Carbon Interconnects,” *MRS Fall Meeting*, Nov 2012, Boston MA
 94. **K.L. Grosse, X. Xie, F. Xiong, M.-H. Bae, F. Lian, V.E. Dorgan**, J.A. Rogers, E. Pop, W.P. King, “Nanometer-scale Thermometry of Graphene, Carbon Nanotubes, and Phase Change Memory,” *Intl. Mechanical Engineering Congress and Expo (IMECE)*, Nov 2012, Houston TX
 93. M.P. Gupta, L. Chen, **D. Estrada, A. Behnam**, E. Pop, S. Kumar, “Impact of Network Morphology on Electrical Breakdown of Carbon Nanotube Thin-Film Transistors,” *IMECE*, Nov 2012, Houston TX
 92. **A.Y. Serov**, E. Pop, “High Field Transport and Velocity Saturation in Graphene Transistors,” *SRC TECHCON 2012*, Sep 2012, Austin TX
 91. J.-W. Do, **D. Estrada**, X. Xie, N. Chang, G. Girolami, J. Rogers, E. Pop, J. Lyding, “Nanosoldering Carbon Nanotube Junctions with Metal via Local Chemical Vapor Deposition for Improved Device Performance,” *IEEE Nano*, Aug 2012, Birmingham UK
 90. K.T. He, **J.D. Wood**, G.P. Doidge, E. Pop, J.W. Lyding, “Scanning Tunneling Microscopy Characterization of Graphene-Coated Few-layered Water on Mica,” *IEEE Nano*, Aug 2012, Birmingham UK
 89. **J.D. Wood**, S.W. Schmucker, R.T. Haasch, G.P. Doidge, G.L. Damhorst, **A.S. Lyons**, R. Bashir, E.

- Pop, J.W. Lyding, "Improved Graphene Growth and Fluorination on Cu with Clean Transfer to Surfaces," *IEEE Nano*, Aug 2012, Birmingham UK
88. J.C. Koepke, **J.D. Wood, D. Estrada, Z.-Y. Ong**, E. Pop, J.W. Lyding, "Atomic-Scale Study of Scattering and Electronic Properties of CVD Graphene Grain Boundaries," *IEEE Nano*, Aug 2012, Birmingham UK (**Geim and Novoselov Graphene Prize**)
87. **A.Y. Serov**, E. Pop, "Grain-Boundary Limited Thermal Transport in Graphene," *Phonons 2012*, Jul 2012, Ann Arbor, MI
86. **Z. Li, M.-H. Bae, P. Martin**, E. Pop, "Ballistic to Diffusive Crossover of Phonon Flow in Graphene Ribbons," *Phonons 2012*, Jul 2012, Ann Arbor, MI
85. **E. Carrion, A. Malik, A. Behnam, S. Islam, F. Xiong**, E. Pop, "Pulsed Nanosecond Characterization of Graphene Transistors," *IEEE Device Research Conference (DRC)*, Jun 2012, State College PA
84. **F. Xiong, M.-H. Bae, Y. Dai, A.D. Liao, A. Behnam, E. Carrion, S. Hong**, D. Ielmini, E. Pop, "Nanowire Phase Change Memory with Carbon Nanotube Electrodes," *IEEE Device Research Conference (DRC)*, Jun 2012, State College PA
83. **N. Wang, C.D. English**, E. Pop, "Comparison of Graphene Nanoribbons With Cu and Al Interconnects," *IEEE Device Research Conference (DRC)*, Jun 2012, State College PA
82. **A.Y. Serov, Z.-Y. Ong, V.E. Dorgan**, Eric Pop, "Role of Screening, Heating, and Dielectrics on High-Field Transport in Graphene," *IEEE Device Research Conference (DRC)*, Jun 2012, State College PA
81. **A. Behnam, A. Lyons, M.-H. Bae**, E.K. Chow, **S. Islam, C.M. Neumann**, E. Pop, "Graphene Nanoribbons from CVD Graphene," *MRS Spring Meeting*, Apr 2012, San Francisco CA
80. **M.-H. Bae, Z. Li**, P. Martin, **F. Lian**, E. Pop, "From Ballistic to Diffusive Thermal Transport in Graphene and Graphene Nanoribbons," *MRS Spring Meeting*, Apr 2012, San Francisco CA
79. **A. Behnam, D. Estrada**, V. Sangwan, X. Zhong, D. Jariwala, L. Lauhon, T.J. Marks, M.C. Hersam, E. Pop, "Performance Limits and Degradation of Carbon Nanotube Network Transistors," *MRS Spring Meeting*, Apr 2012, San Francisco CA
78. W. Ye, P.A.P. Martin, N. Kumar, **D. Estrada**, S.R. Daly, A.A. Rockett, J.R. Abelson, E. Pop, G.S. Girolami, J.W. Lyding, "Nanometalization of Single-Wall Carbon Nanotubes and Graphene Quantum Dots," *ACS (American Chemical Society) 243rd National Meeting*, Mar 2012, San Diego CA
77. **J.D. Wood**, S. Schmucker, G. Doidge, T. Krawczyk, **A.S. Lyons**, E. Pop, J.W. Lyding, "Crystallographic effects of copper substrate on graphene growth and fluorination," *APS March Meeting*, Mar 2012, Boston MA
76. **A.D. Liao, C. Neumann**, E. Pop, "Fundamental Limits of Current Flow in One-dimensional Carbon Nanomaterials," *APS March Meeting*, Mar 2012, Boston MA
75. G. Doidge, **J.D. Wood**, E. Pop, J.W. Lyding, "Confinement of organic solvents by wet transfer of graphene," *APS March Meeting*, Mar 2012, Boston MA
74. M.P. Gupta, **D. Estrada**, E. Pop, S. Kumar, "Impact of Contact Resistances on Electrical and Thermal Transport in Carbon Nanotube Network Transistors," *ASME Micro/Nanoscale Heat & Mass Transfer Intl. Conf.*, Mar 2012, Atlanta GA
73. V. Solovyeva, E. Chow, **M.-H. Bae, D. Estrada**, S. Banerjee, **A. Behnam, V.E. Dorgan**, W.J. Chang, E. Pop, R. Bashir, "New technique of DNA sensing: transverse nanoribbon electrodes," *Biophysical Society 56th Annual Meeting*, Feb 2012, San Diego CA
72. **J.D. Wood**, K.T. He, E. Pop, J.W. Lyding, "Scanning Tunneling Microscopy and Nanomanipulation of Graphene-Coated Water on Mica," *AVS Meeting 2011*, Oct 2011, Nashville TN
71. **A. Liao**, J. Wu, X. Wang, K. Tahy, D. Jena, H. Dai, E. Pop, "Thermally-Limited Current Carrying Ability of Graphene Nanoribbons," *SRC TECHCON*, Sep 2011, Austin TX
70. **F. Xiong, M.-H. Bae, A. Liao, Y. Dai**, E. Pop, "Phase-Change Memory Nanowires with Self-Aligned Carbon Nanotube Electrodes," *SRC TECHCON*, Sep 2011, Austin TX (**Best Paper in Session Award**)
69. **S. Islam, M.-H. Bae, V. Dorgan**, E. Pop, "Effect of Oxide Thickness Scaling on Self-Heating in

- Graphene Transistors,” *IEEE Device Research Conference (DRC)*, Jun 2011, Santa Barbara CA
68. **A. Lyons, A. Behnam**, E.K. Chow, E. Pop, “Transport Properties of CVD-Grown Graphene Nanoribbon Field-Effect Transistors,” *IEEE Device Research Conference (DRC)*, Jun 2011, Santa Barbara CA
 67. M.Y. Timmermans, **D. Estrada**, A.G. Nasibulin, E. Pop, E.I. Kauppinen, “Optimizing Carbon Nanotube Network Morphology for Thin Film Transistors,” *Nanotubes-11 (NT11)*, Jul 2011, Cambridge, UK
 66. **D. Estrada, C.-M. Chin, D. Ortigara**, E. Pop, “Dissipation and Breakdown in Carbon Nanotube Network Transistors,” *Nanotubes 2011 (NT11)*, Jul 2011, Cambridge, UK
 65. **A. Liao**, J. Wu, X. Wang, K. Tahy, D. Jena, H. Dai, E. Pop, “Thermally-Limited Current Carrying Ability of Graphene Nanoribbons,” *Graphene 2011*, Apr 2011, Bilbao, Spain
 64. **A.S. Lyons**, E.K. Chow, **V.E. Dorgan**, E. Pop, “Large Scale CVD Graphene Nanoribbon Transistors with High- κ Dielectrics and Top Gates,” *Graphene 2011*, Apr 2011, Bilbao, Spain
 63. **J.D. Wood**, S.W. Schmucker, J.C. Koepke, **A.S. Lyons**, E. Pop, J.W. Lyding, “Effects of Polycrystalline Cu Substrate on Graphene Growth by Chemical Vapor Deposition,” *Graphene 2011*, Apr 2011, Bilbao, Spain
 62. J. Koepke, **J.D. Wood, D. Estrada**, E. Pop, J.W. Lyding, “Atomic Scale Electronic Characterization of Grain Boundaries in Graphene Grown by Chemical Vapor Deposition on Copper Foil,” *Graphene 2011*, Apr 2011, Bilbao, Spain
 61. **J.D. Wood**, S.W. Schmucker, **A.S. Lyons**, E. Pop, J.W. Lyding, “Copper Crystallographic Dependence for Graphene Grown by Chemical Vapor Deposition,” *MRS Spring Mtg.*, Apr 2011, San Francisco CA
 60. **F. Xiong, M.-H. Bae, A. Liao, Y. Dai**, E. Pop, "GST Nanowires with Self-aligned Carbon Nanotube Electrodes," *MRS Spring Meeting*, Apr 2011, San Francisco CA
 59. **J. Wood**, S. Sivapalan, **V. Dorgan**, C. Murphy, E. Pop, J.W. Lyding, "Aligned, ultra-long graphene nanoribbon network fabrication by nanowire etch masks," *APS March Meeting*, Mar 2011, Dallas TX
 58. **Z.-Y. Ong**, E. Pop, "Surprising Effects of Substrate on Thermal Transport in Supported Graphene," *APS March Meeting*, Mar 2011, Dallas TX
 57. J. Koepke, **D. Estrada, J. Wood**, E. Pop, J. Lyding, "Scanning Tunneling Microscopy Study of Grain Boundaries in Graphene Grown by Chemical Vapor Deposition on Copper Foil," *APS March Meeting*, Mar 2011, Dallas TX
 56. **F. Xiong, A. Liao, M.-H. Bae, D. Estrada**, E. Pop, “Integrating Carbon-Based Nanoelectronics with Chalcogenide Phase Change Memory,” *IEEE EDSSC*, Dec 2010, Hong Kong
 55. **K. Grosse, M.-H. Bae, F. Lian**, E. Pop, W.P. King, “Current Crowding, Joule Heating, and Peltier Cooling at Graphene Device Contacts,” *MRS Fall Meeting*, Nov 2010, Boston MA
 54. M. Rudan, F. Giovanardi, **T. Tsafack, F. Xiong**, E. Piccinini, F. Buscemi, **A. Liao**, E. Pop, R. Brunetti, C. Jacoboni, “Modeling of the Voltage Snap-Back in Amorphous-GST Memory Devices,” *SISPAD*, Sep 2010, Bologna Italy
 53. **V. Dorgan, M.-H. Bae**, E. Pop, "Mobility and Velocity-Field Relationship in Graphene above Room Temperature," *SRC TECHCON*, Sep 2010, Austin TX
 52. **A. Liao**, R. Alizadegan, **S. Dutta, Z.-Y. Ong**, K. J. Hsia, E. Pop, "Thermal Dissipation, Reliability, and Breakdown of Single-Wall Carbon Nanotubes," *SRC TECHCON*, Sep 2010, Austin TX
 51. **D. Estrada, S. Dutta, A. Liao**, E. Pop, "Pulsed characterization for hysteresis-free carbon nanotube mobility measurements," *Nanotubes 2010 (NT10)*, June 2010, Montreal, Canada
 50. **J. D. Wood**, V. Nazareth, J. W. Lyding, E. Pop, "Wafer-Scale Carbon Nanotube Alignment and Interaction on Hydrophobic and Hydrophilic Surfaces," *Nanotubes 2010 (NT10)*, Montreal Canada
 49. **F. Xiong, A. Liao, D. Estrada**, E. Pop, "Ultra-Low Power Phase Change Memory with Carbon Nanotube Interconnects," *IEEE Device Research Conference (DRC)*, June 2010, Notre Dame IN
 48. **V. Dorgan, M.-H. Bae**, E. Pop, "Mobility and Velocity-Field Relationship in Graphene," *IEEE Device*

Research Conference (DRC), June 2010, Notre Dame IN

47. **S. Dutta, S. Prakash, D. Estrada**, E. Pop, "A Web Service and Interface for Electronic Device Characterization," *American Society of Engineering Education (ASEE) Annual Conference & Expo*, June 2010, Louisville KY
46. **V. Dorgan, M.-H. Bae**, E. Pop, "Mobility and High-Field Velocity Saturation in Graphene," *6th Intl. Nanotechnology Conference on Communication & Cooperation (INC6)*, May 2010, Grenoble, France
45. Y. K. Koh, **M.-H. Bae**, E. Pop, D. G. Cahill, "Thermal Conductance of Monolayer and Few-Layer Graphenes," *MRS Spring Meeting*, Apr 2010, San Francisco CA
44. **A. Liao, S. Dutta, Z.-Y. Ong**, E. Pop, "Joule Breakdown and Thermal Dissipation of Carbon Nanotubes with SiO₂ Substrates," *MRS Spring Meeting*, Apr 2010, San Francisco CA
43. **M.-H. Bae, Z.-Y. Ong, D. Estrada**, E. Pop, "Infrared imaging of power dissipation in graphene field effect transistors," *APS March Meeting*, Mar 2010, Portland OR
42. **Z.-Y. Ong** and E. Pop, "Molecular dynamics simulation of carbon nanotube to SiO₂ heat dissipation," *APS March Meeting*, Mar 2010, Portland OR
41. C. Richter, O. Jurchescu, X. Liang, D. Gundlach, **A. Liao**, E. Pop, "Noise in single-wall carbon nanotubes under high electric field stress," *APS March Meeting*, Mar 2010, Portland OR
40. **D. Estrada, A. San Miguel, R. Pecora**, E. Pop, "Tailored ON/OFF ratio of nanotube network transistors by pulsed breakdown," *IEEE Intl. Semic. Device Research Symposium (ISDRS)*, Univ. Maryland, College Park MD, Dec 2009
39. **F. Xiong, A. Liao**, E. Pop, "Ultra-Low Current Phase-Change Antifuse with Carbon Nanotube Electrodes," *IEEE Non-Volatile Memory Technology Symposium (NVMTS)*, Oct 2009, Portland OR
38. E. Pop, **M.-H. Bae, D. Estrada, A. Liao, Z.-Y. Ong, F. Xiong**, "Energy Efficiency in Nanoscale Electronic Devices," *NANO-DDS*, Oct 2009, Ft Lauderdale FL
37. **Z.-Y. Ong** and E. Pop, "Molecular Dynamics Simulation of Thermal Boundary Resistance Between Carbon Nanotubes and SiO₂," *SRC TECHCON*, Sep 2009, Austin TX
36. **A. Liao, F. Xiong**, K. Darmawikarta, J. Abelson, E. Pop, "Chalcogenide Phase Change Induced with Single-Wall Carbon Nanotube Heaters," *SRC TECHCON*, Sep 2009, Austin TX
35. **P. Martin, Z. Aksamija**, E. Pop, U. Ravaioli, "Prediction of Reduced Thermal Conductivity in Nano-Engineered Rough Semiconductor Nanowires," *EDISON 16*, Aug 2009, Montpellier France
34. **M.-H. Bae, Z.-Y. Ong, D. Estrada**, E. Pop, "Infrared Microscopy of Joule Heating in Graphene Field Effect Transistors," *IEEE Nano*, July 2009, Genoa Italy
33. **B. Ramasubramanian** and E. Pop, "Comparison of Energy Relaxation in One-Dimensional Thermionic and Tunneling Transistors," *IEEE Nano*, July 2009, Genoa Italy
32. **D. Estrada, S. Dutta, A. Liao**, E. Pop, "Reduction of Hysteresis in Mobility Measurements of Carbon Nanotube Transistors by Pulsed Characterization," *IEEE Device Research Conference (DRC)*, Jun 2009, State College PA
31. **A. Liao, F. Xiong**, K. Darmawikarta, J. Abelson, E. Pop, "Chalcogenide Phase Change Induced with Single-Wall Carbon Nanotube Heaters," *IEEE Device Research Conference (DRC)*, Jun 2009, State College PA
30. **Z.-Y. Ong** and E. Pop, "Molecular dynamics simulation of interfacial thermal resistance between a (10,10) carbon nanotube and SiO₂," *MRS Spring Mtg.*, Apr 2009, San Francisco CA
29. **I. Chen** and E. Pop, "Compact Thermal Model for Segmented Nanowire Phase Change Memory Cell," *MRS Spring Mtg.*, Apr 2009, San Francisco CA
28. K. Darmawikarta, B. Lee, S. Raoux, **A. Liao**, E. Pop, S. Bishop, J. Abelson, "Analysis of Nanoscale Transformation of Phase Change Materials," *MRS Spring Mtg.*, Apr 2009, San Francisco CA
27. **Z.-Y. Ong**, E. Pop, "A Two-Temperature Model of Narrow-Body Silicon Transistors under Steady State and Transient Operation," *ASME 3rd Energy Nanotech. Conf. (ENIC)*, Jacksonville FL, Aug 2008
26. **A. Liao**, E. Pop, "Impact Ionization in Semiconducting Single Wall Carbon Nanotubes," *IEEE Device*

Research Conference (DRC), Santa Barbara CA, Jun 2008

25. E. Pop, "Role of Electrical and Thermal Contact Resistance in the High-Bias Joule Breakdown of Single-Wall Carbon Nanotube Devices," *IEEE Device Research Conf. (DRC)*, Jun 2007, Notre Dame IN
24. S. Verma, E. Pop, P. Kapur, P. Majhi, K. Parat, K. Saraswat, "Feasibility Study of Composite Dielectric Tunnel Barriers for Flash Memory," *IEEE Device Research Conf. (DRC)*, Jun 2007, Notre Dame IN
23. E. Pop, "Heat Generation and Transport in SOI and GOI Devices," *211th Electrochemical Society (ECS) Meeting*, SOI Symposium, May 2007, Chicago IL
22. D. Mann, Y. K. Kato, E. Pop and H. Dai, "Electro-thermal Light Emission in Individual Metallic Single-walled Carbon Nanotubes," *MRS Spring Meeting*, Apr 2007, San Francisco CA
21. J. Reifenberg, S. Kim, Y. Zhang, E. Pop, H.-S. P. Wong, K. Goodson, "Phase Transitions and Thermal Properties of GeSbTe," *MRS Spring Meeting*, Apr 2007, San Francisco CA
20. Y. K. Kato, D. Mann, A. Kinkhabwala, E. Pop, J. Cao, X. Wang, L. Zhang, Q. Wang, J. Guo and H. Dai, "Electrically driven thermal light emission from individual single-walled carbon nanotubes," *APS March Meeting*, Mar 2007, Denver CO
19. J. Reifenberg, E. Pop, A. Gibby, S. Wong and K. Goodson, "Multiphysics Modeling and Impact of Thermal Boundary Resistance in Phase Change Memory Devices," *ITHERM*, May 2006, San Diego CA
18. M. Panzer, G. Zhang, D. Mann, X. Hu, E. Pop, H. Dai, K. Goodson, "Thermal Properties of Metal-Coated Vertically-Aligned Single Wall Nanotube Films," *ITHERM*, p. 1306, May 2006, San Diego, CA
17. D. Mann, E. Pop, H. Dai, "Hot Phonons in Suspended Carbon Nanotubes," *Electrochemical Society (ECS) 209th Meeting*, May 2006, Denver CO
16. D. Mann, E. Pop, J. Cao, H. Dai, "Self-Heating and Non-Equilibrium Optical Phonons in Suspended Carbon Nanotubes," *APS March 2006 Meeting*, Baltimore, MD
15. E. Pop, D. Mann, J. Reifenberg, K. Goodson and H. Dai, "Electro-Thermal Transport in Metallic Single-Wall Carbon Nanotubes for Interconnect Applications," *IEEE Intl. Electron Devices Meeting (IEDM)*, pp. 253-256, Dec. 2005, Washington, DC
14. J. Rowlette, E. Pop, S. Sinha, M. Panzer and K. Goodson, "Thermal Phenomena in Deeply Scaled MOSFETs," *IEEE Intl. Electron Devices Meeting (IEDM)*, pp. 984-987, Dec. 2005, Washington, DC
13. J. Rowlette, E. Pop, S. Sinha, M. Panzer and K. Goodson, "Thermal Simulation Techniques for Nano-Transistors," *IEEE-ACM ICCAD*, pp. 225-228, Nov. 2005, San Jose CA
12. J. Rowlette, E. Pop, S. Sinha, R. Dutton and K. Goodson, "Coupled Electron-Phonon Transport in Nanometer-Scale Silicon Devices," *SRC TECHCON*, Oct. 2005, Portland OR
11. E. Pop, J. Rowlette, R. Dutton and K. Goodson, "Joule Heating under Quasi-Ballistic Transport Conditions in Bulk and Strained Silicon Devices," *SISPAD*, p. 307-310, Sep. 2005, Tokyo Japan
10. E. Pop, C. O. Chui, S. Sinha, R. Dutton, K. Goodson, "Electro-Thermal Comparison and Performance Optimization of Thin-Body SOI and GOI MOSFETs," *IEEE Intl. Electron Devices Meeting (IEDM)*, pp. 411-414, Dec. 2004, San Francisco, CA
9. S. Sinha, E. Pop, K. Goodson, "A Split-Flux Model for Phonon Transport Near Hotspots," *ASME Intl. Mechanical Engineering Congress and Expo (IMECE)*, Nov. 2004, Anaheim, CA
8. E. Pop, K. Goodson, R. Dutton, "Thermal Analysis of Ultra-Thin Body Device Scaling," *IEEE Intl. Electron Devices Meeting (IEDM)*, pp. 883-886, Dec. 2003, Washington DC
7. E. Pop, K. Goodson, R. Dutton, "Detailed Heat Generation Simulations via the Monte Carlo Method," *SISPAD*, pp. 121-124, Sep. 2003, Boston MA
6. E. Pop, K. Goodson, R. Dutton, "Monte Carlo Simulation of Heat Generation in Silicon Nano-Devices," *SRC TECHCON*, Aug. 2003, Dallas TX (**Best Paper in Session Award**)
5. E. Pop, S. Sinha, K. Goodson, "Monte Carlo Modeling of Heat Generation in Electronic Nanostructures," *ASME Intl. Mech. Eng. Congress and Expo (IMECE)*, Nov. 2002, New Orleans, LA
4. E. Pop, "Heat Generation in Three- and Two-Dimensional Nanostructures," *SRC TECHCON*, Sep.

2002, Dallas, TX (**Outstanding Research Presentation Award**)

3. E. Pop, K. Banerjee, P. Sverdrup, R. Dutton, K. Goodson, "Localized Heating Effects and Scaling of Sub-0.18 Micron CMOS Devices", *IEEE Intl. Electron Dev. Mtg. (IEDM)*, p. 677, Dec. 2001, Washington DC
2. P. Sverdrup, S. Sinha, E. Pop, O. Tornblad, R. Dutton, K. Goodson. "Advanced Electro-Thermal Modeling and Simulation Techniques for Deep Sub-Micron Devices," *SRC TECHCON*, Sep. 2000, Phoenix AZ
1. J. Slinkman, E. Pop, W. Clark, "Temperature Dependence of Subthreshold Current in Submicron Metal-Oxide-Silicon Field Effect Transistors," *APS March Meeting*, Mar 1998, Los Angeles CA

Invited Presentations (plenaries, keynotes, tutorials and awards in bold)

246. ECS Meeting "Nano for Industry" Symposium, San Francisco CA, May 2024
245. MRS Spring Meeting (Symposium EL05), Seattle WA, Apr 2024
244. Molecules to Systems: Future of Semiconductors with 1D & 2D Nanomaterials, Tucson AZ, Feb 2024
243. AKM Newaz Symposium, SF State Univ. San Francisco CA, Jan 2024
242. MRS Fall Meeting (Symposium EL09), Boston MA, Nov 2023
241. MRS Fall Meeting (Symposium EL07), Boston MA, Nov 2023
240. AVS (American Vacuum Society) 69th Intl. Symposium & Exhibition, Portland OR, Nov 2023
239. Corning West Technology Center Klatch Talk, Sunnyvale CA, Nov 2023
- 238. IEEE NMDC (Nanotechnology Materials & Devices Conf.), Paestum Italy, Oct 2023**
- 237. California-US Government (CA-USG) Workshop on 2D Materials, Irvine CA, Sep 2023**
236. Texas Materials Institute Seminar, UT Austin, Austin TX, Sep 2023
- 235. Purdue Viskanta Fellowship Tutorial, West Lafayette IN, Aug 2023**
- 234. Purdue Viskanta Fellowship Seminar, West Lafayette IN, Aug 2023**
233. IEEE Electron Devices Society Santa Clara Valley/San Francisco Seminar, Jul 2023
232. Samsung SAIT Invited Seminar, Suwon Korea, Jul 2023
- 231. AEFM (Adv. Epitaxy for Freestanding Membranes and 2D Materials), Seoul Korea, Jul 2023**
230. 2D Transition Metal Dichalcogenides 2023, Cambridge UK, Jun 2023
229. MRS Spring Meeting (Symposium EL01), San Francisco CA, Apr 2023
228. APS Fellow FIAP Awards, Las Vegas NV, Mar 2023
227. NVMTS (Non-Volatile Memory Technology Symposium), Stanford CA, Dec 2022
- 226. MRS Fall Meeting (Symposium EQ10), Boston MA, Nov 2022**
225. MRS Fall Meeting (Symposium EQ04), Boston MA, Nov 2022
- 224. RPGR2022 (Recent Progress of Graphene and 2D Materials Research), Taipei Taiwan, Nov 2022**
223. SJSU Interdisciplinary Engineering Seminar, San Jose CA, Nov 2022
- 222. IEEE ICSICT (Intl. Conf. Solid-State and Integrated Circuit Tech.), Nanjing China, Oct 2022**
221. E/PCOS (European Phase-Change and Ovonic Symposium), Oxford, England, Sep 2022
220. Samsung Global Research Symposium (GRS), Napa CA, Aug 2022
219. Telluride Science Research Center, Thermal Transport at the Nanoscale, Telluride CO, Jun 2022
- 218. SystemX Faculty Tutorial, Stanford CA, May 2022**
217. SystemX Spring Workshop, Stanford CA, May 2022
216. MRS Spring Meeting (Symposium SF15), Honolulu HI, May 2022
215. VLSI-TSA Symposium, Hsinchu Taiwan, Apr 2022
214. UCLA ECE Department Seminar, Apr 2022
213. Duke ECE Department Seminar, Apr 2022

212. Stanford Interdisciplinary Graduate Fellows (SIGFs) guest speaker, Stanford CA, Feb 2022
- 211. Future Chips 2021, The 6th Future Chips Forum, Tsinghua University, Dec 2021**
- 210. Virtual Graphene 2021 Keynote, Grenoble France, Nov 2021**
- 209. ICN2 NanoSeminar in Physics, Oct 2021**
- 208. IIRW (Intl. Integrated Reliability Workshop) Tutorial, Oct 2021**
207. MITRE Corp. Smart Materials and Intelligent Systems (SMIS) Seminar, Oct 2021
206. Univ. Michigan MSE Department Seminar, Sep 2021
205. Stanford eWEAR Symposium (with A. Daus), Sep 2021
204. National Research Council of Canada (NRC-CNRC), Aug 2021
203. 3rd International Memory Symposium, Hong Kong, May 2021
- 202. CarbOnlineHagen Keynote, Copenhagen Denmark, Apr 2021, <http://www.carbonhagen.com>**
201. Wayne State Physics Seminar (via Zoom), Oct 2020
200. SSDM (Intl. Conference on Solid State Devices & Materials), Tokyo Japan (via Zoom), Sep 2020
199. Micron Summer Intern Seminar (via Zoom), Jun 2020
198. Yonsei University Seminar, Seoul Korea, Feb 2020
197. Samsung Seminar, Seoul Korea, Feb 2020
196. SK Hynix Seminar, Seoul Korea, Feb 2020
- 195. Nano-KISS (Korean Intl. Summer School on Nanoelectronics), KCS, Korea, Feb 2020**
194. Micron Seminar, Boise, ID, Feb 2020
193. Boise State Materials Research Seminar, Boise, ID, Feb 2020
192. "How to Prepare for the Academic Interview," Stanford BEAM (Career Services) Seminar, Stanford CA, Jan 2020
191. UC Berkeley, Berkeley CA, Dec 2019
190. WINDS (Workshop on Innovative Nanoscale Devices and Systems), Waimea HI, Dec 2019
189. Duke University, Durham NC, Oct 2019
188. IEEE NVMTS (Non-Volatile Memory Technology Symposium), Durham NC, Oct 2019
187. IMEC Memory Workshop, Leuven Belgium, Oct 2019
186. Apple Seminar, Cupertino CA, Oct 2019
185. SLAC SSRL/LCLS Users' Meeting, Sep 2019
- 184. "2D Materials: From Fundamentals to Spintronics" Workshop, Natal Brazil, Sep 2019**
183. Peking University, Beijing China, Sep 2019
182. Tsinghua University, Beijing China, Sep 2019
181. Beijing Information Science & Technology University (BISTU), Beijing China, Sep 2019
- 180. IEEE DRC (Device Research Conference) Rump Session, Ann Arbor, MI, Jun 2019**
179. IEEE SNW (Silicon Nanoelectronics Workshop), Kyoto Japan, Jun 2019
- 178. IEEE VLSI Symposium Workshop on 2D Materials & Applications, Kyoto Japan, Jun 2019**
177. US-EU Workshop on 2D Layered Materials and Devices, State College PA, May 2019
176. "Let's Have an Awesome Time Doing Science" (LHAATDS) Workshop, Stanford CA, May 2019
175. Micron Seminar, Boise ID, Apr 2019
- 174. IEEE WMED (Workshop on Microelectronics & Electron Devices), Boise ID, Apr 2019**
173. MRS Spring Meeting (Symposium QN03), Phoenix AZ, Apr 2019
172. MRS Spring Meeting (Symposium EP08), Phoenix AZ, Apr 2019
171. MIT MTL Seminar, Cambridge MA, Mar 2019
170. APS (American Physical Society) March Meeting, Boston MA, Mar 2019
169. UIUC MNTL Seminar, Urbana IL, Feb 2019

168. Stanford GLAM Condensed Matter Seminar, Stanford CA, Feb 2019
167. Apple Seminar, Cupertino CA, Jan 2019
166. Applied Materials (AMAT) Seminar, Santa Clara CA, Jan 2019
- 165. Eurotherm Nanoscale & Microscale Heat Transfer VI (NMHT), Levi, Finland, Dec 2018**
164. Stanford BEAM (Career Services) Future Faculty Seminar, Stanford CA, Oct 2018
163. AVS (American Vacuum Society) 65th Intl. Symposium & Exhibition, Long Beach CA, Oct 2018
162. IEEE NMDC (Nanotechnology Materials & Devices Conf.), Portland OR, Oct 2018
161. E\PCOS (European Phase-Change and Ovonic Symposium), Catania, Italy, Sep 2018
160. CEA-LETI Seminar, Grenoble France, Sep 2018
159. Graphene Week, San Sebastian Spain, Sep 2018
- 158. SSDM (Intl. Conference on Solid State Devices & Materials), Tokyo Japan, Sep 2018**
- 157. Graphene 2018 Keynote, Dresden Germany, Jun 2018**
156. Lawrence Symposium, Arizona State Univ., Phoenix AZ, Feb 2018
155. Rising Stars Workshop, Stanford CA, Nov 2017
154. Stanford BEAM (Career Services) Future Faculty Seminar, Stanford CA, Oct 2017
153. US-EU Workshop on 2D Layered Materials and Devices, Arlington VA, Oct 2017
152. MIT S3TEC Seminar, Cambridge MA, Sep 2017
151. Micron Seminar, Boise ID, Sep 2017
150. Lund University Colloquium, Lund Sweden, Aug 2017
- 149. Carbonhagen Keynote (8th Symposium on 2D Materials), Copenhagen, Aug 2017**
148. IEEE NANO, Pittsburgh PA, Jul 2017
- 147. EDISON 20 Keynote (Intl. Conf. Electron Dynamics Semic., Opto., Nano.), Buffalo NY, Jul 2017**
146. Western Digital, San Jose CA, Jun 2017
- 145. IEEE DRC (Device Research Conf.), Phase-Change Memory tutorial, Notre Dame IN, Jun 2017**
- 144. "Nanoscale Energy, Thermal & Thermoelectric Effects" short course, Univ. Pisa, Italy, Jun 2017**
143. UT Austin, NASCENT Colloquium, Austin TX, May 2017
142. IEEE ICICDT (Intl. Conf. IC Design & Tech.), Austin TX, May 2017
141. UC Santa Cruz, EE Colloquium, Santa Cruz CA, Apr 2017
140. MRS Spring Meeting (Symposium NM2), Phoenix AZ, Apr 2017
139. MRS Spring Meeting (Symposium NM1), Phoenix AZ, Apr 2017
138. 2nd Intl. Symposium on Science & Technology of 2D Materials, Orlando FL, Feb 2017
137. Northrop Grumman NG Next Workshop, Redondo Beach CA, Jan 2017
136. Monash Univ., Melbourne Australia, Jan 2017
135. IEEE IEDM (Intl. Electron Devices Meeting), San Francisco CA, Dec 2016
134. Stanford BEAM (Career Services) Future Faculty Seminar, Stanford CA, Oct 2016
133. 2Dfun (2D Functional MX2-Graphene Heterostructures) Workshop, IMEC, Leuven Belgium, Oct 2016
132. EU-US Workshop on 2D Layered Materials and Devices, Manchester UK, Oct 2016
131. IEEE SFBA Nanotechnology Council, Santa Clara CA, Sep 2016
130. CEA-LETI Seminar, Grenoble France, Sep 2016
129. STW (Steep Transistor Workshop), Lausanne Switzerland, Sep 2016
128. StarNET LEAST & SONIC Beyond CMOS Circuits & Systems Workshop, Notre Dame IN, Aug 2016
127. TSMC R&D Technical Forum, Jul 2016
126. IEEE Electron Devices Society (EDS) Santa Clara Valley Chapter, Santa Clara CA, Jul 2016
125. InterPACK Workshop on IOT Packaging, Santa Clara CA, Jun 2016
- 124. Univ. Minnesota 2D Summer School, Minneapolis MN, Jun 2016**

123. E-MRS (European Materials Research Society) Spring Meeting, Lille, France, May 2016
122. ON Semiconductor, Phoenix, AZ, Mar 2016
121. MRS Spring Meeting, Phoenix AZ, Mar 2016
120. SPIE Photonics West, San Francisco CA, Feb 2016
119. DARPA MTO Unplugged Offsite Meeting, Warrensburg VA, Jan 2016
118. Samsung R&D Future Technology Seminar, Hwaseong, Korea, Oct 2015
- 117. Nano-KISS (Korean Intl. Summer School on Nanoelectronics), ETRI, Daejeon Korea, Oct 2015**
116. IEEE NMDC (Nanotechnology Materials and Devices Conference), Anchorage AK, Sep 2015
115. Intl. Materials Research Congress (MRS-IMRC), Cancun Mexico, Aug 2015
114. IEEE NANO, Rome Italy, Jul 2015
113. USC, MHI Distinguished Speaker Series, Los Angeles CA, Jun 2015
112. MRS Spring Meeting, San Francisco CA, Apr 2015
111. US-EU Workshop on 2D Layered Materials and Devices, Arlington VA, Apr 2015
110. SystemX Alliance Seminar, Stanford CA, Apr 2015
- 109. NanoTechnology for Defense Conference (NT4D) 2D devices tutorial, Chantilly VA, Nov 2014**
108. AVS (American Vacuum Society), Baltimore MD, Nov 2014
- 107. "Thermoelectrics 101," GCEP Symposium, Stanford CA, Oct 2014**
- 106. ESSDERC (European Solid-State Device Conference) plenary talk, Venice Italy, Sep 2014**
105. Army Research Lab (ARL) 2D Technology Applications Meeting, Adelphi MD, Aug 2014
104. Tsukuba Nanotechnology Symposium 2014 (TNS'14), Tsukuba Japan, Jul 2014
103. US-Japan Joint Seminar on Nanoscale Transport Phenomena, Santa Cruz CA, Jul 2014
102. Lockheed-Martin Space Systems Company (LMCO), Palo Alto CA, Jun 2014
- 101. Japan-America Frontiers of Engineering Symposium (JAFOE), Tokyo Japan, Jun 2014**
100. SPIE DSS (Defense, Security, Sensing), Baltimore MD, May 2014
99. Micron Seminar, Boise ID, May 2014
98. Boise State University (BSU) Colloquium, Boise ID, May 2014
97. Applied Materials (AMAT) Seminar, Santa Clara CA, Jan 2014
96. Sandia Labs "Beyond Moore Workshop," Albuquerque NM, Jan 2014
95. DARPA DSRC (Defense Sciences Research Council), Arlington VA, Jan 2014
94. ISDRS (Intl. Semiconductor Device Research Symposium), Bethesda MD, Dec 2013
93. IEEE IEDM (Intl. Electron Devices Meeting), Washington DC, Dec 2013
92. Stanford MSE (Materials Science and Engineering) Colloquium, Stanford CA, Nov 2013
91. SLAC (Stanford Linear Accelerator Center) SIMES Seminar, Palo Alto CA, Oct 2013
90. UC Berkeley Nanoscience and Nanoengineering Institute (BNNI) Seminar, Oct 2013
89. NRL (Naval Research Lab), Alexandria VA, Oct 2013
88. Stanford Precourt Institute for Energy (PIE) Energy Seminar, Stanford CA, Sep 2013
87. EMS (Electronic Materials Symposium), Santa Clara CA, Sep 2013
86. Univ. Erlangen Colloquium, Erlangen Germany, Sep 2013
85. E\PCOS (European Phase-Change and Ovonic Symposium), Berlin, Germany, Sep 2013
84. PTES (First International Conference on Phononics and Thermal Energy Science), Shanghai, China, Sep 2013
83. IWCE (Intl. Workshop Computational Electronics), Nara, Japan, Jun 2013
82. Keio University EE Seminar, Tokyo, Japan, Jun 2013
81. Univ. Tokyo ME Seminar, Tokyo, Japan, Jun 2013
80. HGST (Hitachi Global Storage Technologies) seminar, San Jose CA, May 2013

79. Stanford Energy & Environment Affiliates Program (EEAP), Stanford CA, May 2013
78. UT Austin, Nanoscale Thermal Energy Symposium, Austin TX, May 2013
77. Intel Corp., memory seminar, Santa Clara CA, Apr 2013
76. MRS Spring Meeting, San Francisco CA, Apr 2013
75. Univ. Minnesota, Mechanical Engineering Colloquium, Minneapolis MN, Mar 2013
74. Beckman Institute Director's Seminar, Univ. Illinois Urbana-Champaign, Urbana IL, Jan 2013
73. MRS Fall Meeting, Boston MA, Nov 2012
72. IEEE Nanotechnology Materials and Devices Conf. (IEEE-NMDC), Honolulu HI, Oct 2012
71. Wright-Patterson Air Force Research Labs (AFRL), Dayton OH, Oct 2012
70. Intl. Materials Research Congress (MRS-IMRC), Cancun Mexico, Aug 2012
69. CMOS Emerging Technologies (ET) Conference, Vancouver BC, Canada, Jul 2012
68. Silicon Nanoelectronics Workshop (IEEE-SNW), Honolulu HI, June 2012
67. IEEE Intl. Conference on IC Design and Technology (IEEE-ICICDT), Austin TX, May 2012
66. UT Dallas, Materials Science & Engineering Seminar, Dallas TX, May 2012
65. U. Washington, Center for Nanotechnology Seminar, Seattle WA, Apr 2012
64. MRS Spring Meeting, San Francisco CA, Apr 2012
63. MIT, EECS Seminar, Cambridge MA, Apr 2012
62. Georgia Tech, MRSEC Seminar Series, Atlanta GA, Mar 2012
61. TU Delft, Quantum Nanoscience Seminar, Netherlands, Mar 2012
- 60. "The Device-to-System Spectrum – A Tutorial on IC Design with Nanomaterials," co-taught tutorial at *Design, Automation & Test in Europe (DATE)*, Dresden, Germany, Mar 2012**
59. Stanford, Electrical Engineering seminar, Stanford CA, Feb 2012
58. Cornell, joint Physics and EE seminar, Ithaca NY, Feb 2012
57. RPI, joint Materials Science and Mechanical Engineering Colloquium, Troy NY, Feb 2012
56. Stanford, Materials Science & Engineering Colloquium, Stanford CA, Nov 2011
55. Purdue, Electrical & Computer Engineering Colloquium, West Lafayette IN, Nov 2011
54. Univ. Missouri, Dept. Physics O.M. Stewart Colloquium, Columbia MO, Oct 2011
53. UIUC Condensed Matter Physics Colloquium, Urbana IL, Oct 2011
52. Politecnico di Milano, Milano Italy, Sep 2011
51. Micron and STMicroelectronics, Agrate Italy, Sep 2011
50. E/PCOS, Zurich Switzerland, Sep 2011 (**Outstanding Oral Presentation Award**)
49. NANO-DDS, Brooklyn NY, Aug 2011
48. Nanotubes 2011, Graphene Satellite Workshop, Cambridge UK, July 2011
47. Albany Nanotechnology Center (IBM and Global Foundries), Albany NY, July 2011
46. DARPA DSRC (Defense Sciences Research Council), Norfolk VA, June 2011
45. CalTech, Applied Physics Colloquium, Pasadena CA, May 2011
44. MIT, Mechanical Eng. Seminar, Cambridge MA, May 2011
43. FET11 Conference, Micro-Energy ICT Panel, Budapest, Hungary, May 2011
42. UC Berkeley, EECS Seminar, Berkeley CA, April 2011
41. APS March 2011 Meeting, Dallas TX, Mar 2011
40. MRS Fall 2010 Meeting, Boston MA, Nov 2010
39. D. Estrada and E. Pop, Argonne National Labs, Argonne IL, Oct 2010
38. Washington U., Applied Physics Seminar, St. Louis MO, Oct 2010
37. Carbon Electronics Workshop, SUNY Albany, Sep 2010
36. SRC Compact Modeling Workshop, Berkeley CA, Aug 2010

35. Wright-Patterson Air Force Research Labs (AFRL), Dayton OH, July 2010
34. TIENCS Workshop, Natl. Univ. Singapore (NUS), Singapore, July 2010
33. UGIM Symposium, Purdue University, West Lafayette IN, June 2010
32. Univ. Wisconsin, Madison WI, Apr 2010
31. M.-H. Bae, Z.-Y. Ong, D. Estrada, E. Pop, ECS Meeting, Vancouver BC, Canada, Apr 2010
30. ECS Meeting, Vancouver BC, Canada, Apr 2010
- 29. “Carbon Nanoelectronics: Towards Energy-Efficient Computing,” invited tutorial at *Design, Automation & Test in Europe (DATE)*, Dresden, Germany, Mar 2010**
28. Univ. Michigan WIMS Seminar, Ann-Arbor MI, Feb 2010
27. IMECE (Intl. Mech. Eng. Congress and Expo), Lake Buena Vista FL, Nov 2009
26. Univ. Maryland Physics Colloquium, College Park, MD, Oct 2009
25. UT Austin, Dept. of Mechanical Eng., Electrical Eng. and Physics, Austin TX, Sep 2009
- 24. “Graphene Thermal Physics,” invited tutorial at *IEEE Device Research Conference (DRC)*, June 2009, State College PA**
23. University of Modena, Italy, June 2009
22. IRPS (Intl. Reliability Phys. Symp.), Montreal Canada, Apr 2009
21. IBM T.J. Watson Center, Yorktown Heights NY, Jan 2009
- 20. ENIC-2008 (ASME 3rd Energy Nano Intl. Conf.) Keynote talk, Jacksonville FL, Aug 2008**
19. Argonne National Labs, Argonne IL, Aug 2008
18. 6th US-Japan Joint Seminar on Nanoscale Transport, MIT, Cambridge MA, Jul 2008
17. Northrop-Grumman Space Technology, Redondo Beach CA, Jun 2008
16. Institute for Energy Technology (IFE), Kjeller, Norway, Jun 2008
- 15. “Memory Technology: Putting the nano in your iPod,” University High School, Urbana IL, May 2008 – available on the nanoHUB.org**
14. Beckman Institute Nanohour, Urbana IL, May 2008 – available on the nanoHUB.org
13. Notre Dame Univ., Solid-State Colloquium, South Bend IN, Apr 2008
12. CSL (Coordinated Science Lab) Colloquium, UIUC, Feb 2008
11. ISDRS, University of Maryland, College Park, Dec 2007
10. ECE Colloquium, UIUC, Nov 2007
9. USC Dept. of EE Colloquium, Los Angeles, CA, Jun 2007
8. MRS Spring Meeting, San Francisco, CA, Apr 2007
- 7. “Electro-Thermal Interaction, Modeling and Measurement in Nanoscale Devices,” *Great Lakes VLSI Symposium (GLSVLSI)*, Lago Maggiore, Italy, March 2007**
6. MSE Colloquium, Stanford University, Dec 2006
5. UIUC Dept. of ECE, Urbana IL, May 2006
4. Northwestern Dept. of EE, Evanston IL, Mar 2006
3. NASA Ames Research Center, Mountain View, CA, Nov 2005
2. HCIS-14 (Hot Carriers in Semiconductors), Chicago, IL, Jul 2005
1. UCLA Dept. of EE, Los Angeles CA, Apr 2005

Patents and Disclosures

10. K. Neilson, K. Nassiri Nazif, A.S. Daus, E. Pop, S. Hamtaei, “Method of fabricating high-efficiency transition metal dichalcogenide solar cells,” Provisional App. 63/533474, Aug 2023
9. A. Kumar, K. Schauble, K.M. Neilson, E. Pop, K.C. Saraswat, “Apparatuses and Methods Involving Use of Low-Resistance Metal Contacts,” U.S. Patent App. No. 63/275,794, Nov 4, 2021
8. S. Ueda, A. McLeod, A. Kummel, M. Burkland, S. Kilcoyne, E. Chumbles, T. Kazior, E. Pop, M. Chen,

- C. Perez, M. Rodwell, “Low-Temperature Deposition of High-Quality Aluminum Nitride Films for Heat Spreading Applications,” U.S. Patent App. No. 17/169914, Feb 8, 2021
7. A.I. Khan, E. Pop, R. Islam, H.-S.P. Wong, K.E. Goodson, M. Asheghi, H. Kwon, “Low-Power Phase-Change Memory Technology with Interfacial Thermoelectric Heating Enhancement,” Provisional App. 63/089776, Oct 9, 2020
 6. A. Daus, S. Vaziri, E. Pop, “Multi-layered semiconductive device and methodology with polymer and transition metal dichalcogenide material,” App. 62/864232, Jun 6, 2019
 5. Y. Kim, C. Ahn, A. Sood, E. Pop, H.-S.P. Wong, K.E. Goodson, S. Fong, S. Lee, C.M. Neumann, M. Asheghi, “Graphene-Inserted Phase Change Memory Device and Method of Fabricating the Same,” US Patent 9,583,702, Feb 28, 2017
 4. E. Pop, F. Xiong, M.-H. Bae, “Methods for Forming a Nanowire and Apparatus Thereof,” US Patent 9,412,442, Aug 9, 2016
 3. E. Pop, F. Xiong, A.D. Liao, “Adaptive Resistive Device and Methods Thereof,” US Patent No. 9,324,422, Apr 26, 2016
 2. E. Pop, “State Changing Device,” US Patent No. 8,860,004, issued Oct. 14, 2014
 1. E. Pop, “Resistive Changing Device,” US Patent No. 8,586,961, issued Nov. 19, 2013

Students and Post-Docs Supervised

• Post-Doctoral Researchers

Anton Persson	2023–
Anh Tuan Hoang	2023–
Tara Peña	2023–
Koosha Nassiri Nazif	2021–
Alwin Daus	2018–21
Sam Vaziri	2016–20
Kevin Brenner	2017–19
Aditya Sood	2018
Miguel Muñoz Rojo	2016–18
Eilam Yalon	2015–18
Yong Cheol Shin	2015–16
Michal Mleczko	2017
Zuanyi Li	2014–15
Feng Xiong	2013–16
Ashkan Behnam	2010–13
Myung-Ho Bae	2009–11

After Pop Lab or Current Position

Asst. Prof., Univ. Freiburg
TSMC
Asst. Prof., Southern Methodist Univ. (SMU)
Asst. Prof. Princeton Univ.
Asst. Prof., Univ. Twente
Asst. Prof., Technion
Korea Inst. Sci & Tech Eval & Planning (KISTEP)
Intel
ASML
Asst. Prof., Univ. Pittsburgh
Intel
Korea Research Institute (KRISS)

• Graduate Students Supervised

Haotian Su	Ph.D. EE, expected 2027
Xiangjin Wu	Ph.D. EE, expected 2026
Lauren Hoang	Ph.D. EE, expected 2026
Robert Bennett	Ph.D. EE, expected 2026
Jerry Yang	Ph.D. EE, expected 2025
Maritha Wang	Ph.D. MSE, expected 2025
Crystal Nattoo	Ph.D. EE, expected 2025
Mahnaz Islam	Ph.D. EE, expected 2024
Sumaiya Wahid	Ph.D. EE, expected 2024

After Pop Lab or Current Position

Katie Neilson	Ph.D. EE, expected 2024	
Jung-Soo Ko	Ph.D. EE, expected 2024	
Çağıl Köroğlu	Ph.D. EE, expected 2023	
Asir Khan	Ph.D. EE, 2023	
Michelle Chen	Ph.D. MSE, 2023	
Connor Bailey	Ph.D. EE, 2023	Northrop Grumman
Victoria Chen	Ph.D. EE, 2022	Applied Materials
Kirstin Schauble	Ph.D. EE, 2022	Anello Photonics
Alexander Gabourie	Ph.D. EE, 2021	DeepSim, Inc.
Connor McClellan	Ph.D. EE, 2021	DeepSim, Inc.
Isha Datye	Ph.D. EE, 2020	TSMC
Stephanie Bohaichuk	Ph.D. EE, 2020	Univ. Waterloo, QV Ideas Lab
Runjie Lily Xu	Ph.D. EE, 2020	Apple
Christopher Neumann	Ph.D. EE, 2019	Intel
Sanchit Deshmukh	Ph.D. EE, 2019	Apple
Saurabh Suryavanshi	Ph.D. EE, 2018	ARM
Kirby Smithe	Ph.D. EE, 2018	Intel
Ning Wang	Ph.D. EE, 2018	Cirrus Logic
Feifei Lian	Ph.D. EE, 2018	Northrop Grumman
Christopher English	Ph.D. EE, 2017	Apple
Michal Mleczko	Ph.D. EE, 2016	post-doc, Stanford
Zuanyi Li	Ph.D. Physics, 2015	post-doc, Stanford
Sharnali Islam	Ph.D. ECE, 2015	Intel
Enrique Carrion	Ph.D. ECE, 2015	Intel
Andrey Serov	Ph.D. ECE, 2014	SanDisk
Kyle Grosse	Ph.D. MechSE, 2014	Raytheon
Vincent Dorgan	Ph.D. ECE, 2014	Intel
Feng Xiong	Ph.D. ECE, 2014	post-doc, Stanford
Joshua Wood	Ph.D. ECE, 2013	post-doc, Northwestern
David Estrada	Ph.D. ECE, 2013	Assoc. Prof., Boise State
Albert Liao	Ph.D. ECE, 2012	Micron
Zhun-Yong Ong	Ph.D. Physics, 2011	IHCP/A*STAR Singapore
Ryan Grady	M.S. EE, 2019	MicroLink Devices
Sungduk Hong	2011–13	UIUC MatSE
Austin Lyons	M.S. ECE, 2011	Intel
B. Ramasubramanian	M.S. ECE, 2010	Intel
Eros Reato	2023 (visiting from RWTH Aachen Univ., advisor: M. Lemme)	
Massimiliano Bianchi	2013 (visiting from Poli Milano, advisor: R. Sordan)	
Andrea Cappelli	2012–13 (visiting from U. Modena, advisor: C. Jacoboni)	
Ilaria Imperiale	2011–12 (visiting from U. Bologna, advisor: M. Rudan)	
Thierry Tsafack	2009–10 (visiting from U. Bologna, advisor: M. Rudan)	

- **Undergraduate Researchers Supervised (Bachelor's Honors Theses in bold)**

Kamila Thompson (2021), Noor Fakh (2020), Maisy Lam (2020), Sidra Nadeem (2020), Paul Bates Walter (2019), Linsen Li (2018), Bozo Vareskic (2017), **Andrew Yu (2015-17)**, Stephone Christian (2016), Anika Manzo (2016), Aria Tedjarati (2016), Erin Antono (2015-16), Peter Satterthwaite

(2015), Justin Doong (2014-15), Job Nalyanya (2014), Tim Anderson (2014), Yeshar Hadi (2014), **Maryann Tung (2013)**, **Muneeb Ahmed (2013)**, Juan Pablo Llinas (2012-13), **Christopher Neumann (2010-12)**, Alicia Hoag (2011-12), **Yuan Dai (2011-12)**, Akshay Malik (2011-12), Xuanyu Zhong (2011-12), **Sumit Dutta (2009-11)**, Daifeng Guo (2011), Jose Matamoros (2011), Eric Kwan (2011), **Gautam Shine (2011)**, **Feifei Lian (2009-11)**, Dominic Ortigara (2010), Shreya Prakash (2009-10), Chun-Ming Chin (2010), Jen-Chieh Liu (2010), Ryan Pecora (2009-10), **Yang Zhao (2008-09)**, Aidee San Miguel (2009), **I-Ru (Tim) Chen (2008)**, Jerry Lee (2008), **William Wahby (2007)**.

Collaborators and Former Advisors

- **Collaborators (last 48 months):**

Zhenan Bao, Mark Brongersma, Wei Cai, Yi Cui, Jonathan Fan, Reinhold Dauskardt, Ian Fisher, David Goldhaber-Gordon, Kenneth Goodson, Tony Heinz, Roger Howe, Aaron Lindenberg, Nick Melosh, Subhasish Mitra, Yoshio Nishi, Piero Pianetta, Evan Reed, Alberto Salleo, Krishna Saraswat, Debbie Senesky, Z.-X. Shen, H.-S. Philip Wong, Xiaolin Zheng (Stanford), Rashid Bashir, David Cahill, Matthew Gilbert, William King, Joseph Lyding, Umberto Ravaioli (UIUC), Deji Akinwande, Alex Demkov, Xiuling Li (UT Austin), Jonathan Bird (SUNY Buffalo), Ali Adibi, Suman Datta (GA Tech), Amir B. Farimani (CMU), Davide Donadio (UC Davis), Grace Xing, Debdeep Jena (Cornell), Robert Wallace (UT Dallas), Steve Koester (Univ. Minnesota), Zhihong Chen, Shriram Ramanathan, Xiulin Ruan (Purdue), Arka Majumdar (Univ. Washington), Irena Knezevic (Wisconsin), AKM Newaz (SFSU), Vikas Varshney, Ajit Roy (AFRL), Andrey Krayev (Horiba Scientific), Suhas Kumar (Sandia), R. Stanley Williams (HP), Jeong Moon (HRL), Jaewoo Jeong, Mahesh Samant (IBM), Stuart Parkin (IBM & Max Planck), Ilya Karpov (Intel), Sergiy Krylyuk, Albert Davydov, Huairuo Zhang (NIST), Vincent Gambin (Northrop Grumman), Mario Pelella (ON Semiconductor), Tapio Ala-Nissilä, Esko Kauppinen (Aalto University), Natalio Mingo (CEA), Ajay K. Sood (IIS), Daniele Ielmini, Roman Sordan (Poli. Milano), Yee Kan Koh (NUS), Junichiro Shiomi (Univ. Tokyo), David Esseni (Univ. Udine), Tibor Grasser (TU Wien).

- **Advisors:**

M.Eng. Thesis: Dimitri Antoniadis (MIT) and Peter Cottrell (IBM)

Ph.D. Thesis: Kenneth Goodson and Robert Dutton (Stanford)

Post-Doctoral: Hongjie Dai and Kenneth Goodson (Stanford)

Visitors Hosted

Eros Reato	2023	RWTH Aachen University
Prof. Matthew Gilbert	2018	University of Illinois Urbana-Champaign
Mr. Luis Ruelas	Summer 2017	Downtown College Prep, Alum Rock
Prof. Xinran Wang	Spring 2017	Nanjing University
Prof. Akiko Ueda	Winter 2017	University of Tsukuba
Takaaki Uno	2015-2017	JSR Corp. Japan
Mr. Henry Fung	Summer 2016	Irvington High School, Fremont
Prof. Davide Donadio	Spring 2015	Max Planck, Mainz
Prof. Daniele Ielmini	Summer 2010	Politecnico di Milano
Prof. Junichiro Shiomi	Summer 2009	University of Tokyo