Stanford



Eric Pop

Pease-Ye Professor, Professor of Electrical Engineering, Senior Fellow at the Precourt Institute for Energy and Professor, by courtesy, of Materials Science and Engineering and of Applied Physics

Curriculum Vitae available Online

Bio

BIO

Eric Pop is the Pease-Ye Professor of Electrical Engineering (EE) and, by courtesy, of Materials Science & Engineering and Applied Physics at Stanford and SLAC. He is also the faculty co-lead of the SystemX Alliance and a Senior Fellow at the Precourt Institute for Energy. Prior to Stanford, he spent several years on the faculty of UIUC, and in industry at Intel and IBM. His research interests include semiconductors, nanoelectronics, data storage, and energy. He received his PhD in EE from Stanford (2005) and three degrees from MIT (MEng and BS in EE, BS in Physics). His honors include the Intel Outstanding Researcher Award, the PECASE from the White House (highest honor given by the US government to early-career scientists & engineers), Young Investigator Awards from the Navy, Air Force, NSF CAREER, DARPA, and several best-paper awards with his students. He is an APS and IEEE Fellow, a Clarivate Highly Cited Researcher, he was Chair of the IEEE Device Research Conference (DRC) and the IEEE Non-Volatile Memory Technology Symposium (NVMTS), and he has also served on committees of the APS, MRS, IEDM, and VLSI conferences. In his spare time he tries to avoid injuries while snowboarding, and in a past life he was a college radio DJ at KZSU 90.1. More information about the Pop Lab is at https://poplab.stanford.edu and on Twitter/X at @profericpop.

ACADEMIC APPOINTMENTS

- Professor, Electrical Engineering
- Senior Fellow, Precourt Institute for Energy
- Professor (By courtesy), Materials Science and Engineering
- Member, Bio-X
- Affiliate, Precourt Institute for Energy

ADMINISTRATIVE APPOINTMENTS

- Faculty Co-Director of the SystemX Alliance, SystemX Alliance, (2024- present)
- Chair of EE faculty search committee, Electrical Engineering, (2023-2024)
- Chair of EE Culture, Equity, and Inclusion (CEI) Committee, Electrical Engineering, (2019-2022)
- Co-Lead of Heterogeneous Integration Focus Area, SystemX Alliance, (2015-2024)

HONORS AND AWARDS

- Pease-Ye Professorship, Stanford University (2023)
- Viskanta Fellowship, Purdue University (2023)
- APS Fellow, American Physical Society (2022)
- Intel 2021 Outstanding Researcher Award, Intel (2021)

- IEEE Fellow, IEEE (2021)
- Highly Cited Researcher, Clarivate (2018)
- Golden Reviewers List, IEEE Electron Device Letters (2017, 2013-09)
- Most Cited Researchers List in EE, Elsevier (2016)
- Okawa Foundation Grant, Okawa Foundation (2014)
- Engineering Council Award for Excellence in Advising, UIUC (2013)
- Award for Faculty Research, Xerox/UIUC (2011)
- Center for Advanced Study (CAS) Fellowship, UIUC (2011)
- Outstanding Presentation Award, E\PCOS Symposium (2011)
- Senior Member, IEEE (2011)
- AFOSR Young Investigator Program (YIP) Award, AFOSR (2010)
- CAREER Award, NSF (2010)
- ONR Young Investigator Program (YIP) Award, ONR (2010)
- PECASE (Presidential) Award from the White House, ARO (2010)
- List of Teachers Ranked as Excellent, UIUC (2009)
- DARPA Young Faculty Award (YFA), DARPA (2008)
- Arnold O. Beckman Research Award, UIUC (2007)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Fellow, APS (2022 - present)
- Fellow, IEEE (2021 - present)
- Member, AAAS (2012 - present)
- Member, APS (2011 - present)
- Senior Member, IEEE (2011 - present)
- Member, MRS (2007 - present)

PROGRAM AFFILIATIONS

- Stanford SystemX Alliance

PROFESSIONAL EDUCATION

- Ph.D., Stanford University , Electrical Engineering (2005)
- M.Eng., MIT , EECS (1999)
- B.S., MIT , EECS (1999)
- B.S., MIT , Physics (1999)

LINKS

- Pop Lab Research Website: https://poplab.stanford.edu
- 2D Transistor Benchmarking: https://2d.stanford.edu
- Google Scholar: https://scholar.google.com/citations?user=tRW2V-0AAAAJ
- Twitter: https://twitter.com/profericpop
- LinkedIn: https://www.linkedin.com/in/eric-pop

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research in the Pop Lab is at the intersection of nanoelectronics and nanoscale energy conversion. Most projects include both fundamental and applied, experimental and computational components. Some recent topics (as of 2013) include:

* Energy-efficient transistors, memory and integrated circuits
* Novel nanomaterials, e.g. graphene, BN, MoS2, carbon nanotubes, GeSbTe, etc.
* Fundamental physical limits of current and heat flow, e.g. ballistic electrons and phonons
* Applications of nanoscale energy transport, conversion and harvesting, e.g. thermoelectrics

For more details see the Pop Lab research website: http://poplab.stanford.edu

Teaching

COURSES

2026-27

- Energy in Electronics: EE 323 (Spr)
- Modern Semiconductor Fabrication and Manufacturing Seminar: EE 292N (Spr)

2025-26

- Modern Semiconductor Fabrication and Manufacturing Seminar: EE 292N (Aut)
- Principles and Models of Semiconductor Devices: EE 216 (Aut)

2024-25

- Principles and Models of Semiconductor Devices: EE 216 (Aut)

2023-24

- Circuits I: EE 101A (Win)
- Principles and Models of Semiconductor Devices: EE 216 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Koustav Jana, Mary Petty

Postdoctoral Faculty Sponsor

Zherui Han, Boran Kumral, Hao Yu Lan, Jerry Yang

Doctoral Dissertation Advisor (AC)

Yuan-Mau Lee, Young Suh Song, Haotian Su

Master's Program Advisor

Ziyu Feng, Larry Gu, Emerson Hsieh, Ryan Hurley, Zachary Kassner, Jerica Liu, Ronan Locker, Albert Wang, Yifan Zhang

Doctoral Dissertation Co-Advisor (AC)

Sydney Fultz-Waters

Doctoral (Program)

Connor Cremers, Cassandra Huff, Koustav Jana, Shi-Xi Kong, Frederick Nitta, Heather Phillips, Young Suh Song, Haotian Su, Jennifer Toy

Publications

PUBLICATIONS

- **Scaling nanoribbon transistors with monolayer transition metal dichalcogenides.** *Nature nanotechnology*
  Peña, T., Persson, A. E., Krayev, A., Friðriksdóttir, Á., Su, H., Lee, Y. M., Song, Y. S., Neilson, K., Zhang, Z., Hoang, A. T., Yang, J. A., Hoang, L., Wang, et al
  2026

- **An electro-optical Mott neuron based on niobium dioxide** *NATURE ELECTRONICS*
  Islam, M., Bohaichuk, S. M., Brown, T. D., Oh, S., Perez, C., Zhang, C., Park, T., Park, M., Talin, A., Ramanathan, S., Kumar, S., Pop, E.
  2025

- **Surface conduction and reduced electrical resistivity in ultrathin noncrystalline NbP semimetal.** *Science (New York, N.Y.)*
  Khan, A. I., Ramdas, A., Lindgren, E., Kim, H. M., Won, B., Wu, X., Saraswat, K., Chen, C. T., Suzuki, Y., da Jornada, F. H., Oh, I. K., Pop, E.
  2025; 387 (6729): 62-67

- **CMOS-compatible strain engineering for monolayer semiconductor transistors** *NATURE ELECTRONICS*
  Jaikissoon, M., Koeroglu, C., Yang, J. A., Neilson, K., Saraswat, K. C., Pop, E.
  2024; 7 (10): 885-891

- **Novel nanocomposite-superlattices for low energy and high stability nanoscale phase-change memory.** *Nature communications*
  Wu, X., Khan, A. I., Lee, H., Hsu, C. F., Zhang, H., Yu, H., Roy, N., Davydov, A. V., Takeuchi, I., Bao, X., Wong, H. P., Pop, E.
  2024; 15 (1): 13

- **Efficiency limit of transition metal dichalcogenide solar cells** *COMMUNICATIONS PHYSICS*
  Nazif, K., Nitta, F. U., Daus, A., Saraswat, K. C., Pop, E.
  2023; 6 (1)

- **Fast-Response Flexible Temperature Sensors with Atomically Thin Molybdenum Disulfide.** *Nano letters*
  Daus, A., Jaikissoon, M., Khan, A. I., Kumar, A., Grady, R. W., Saraswat, K. C., Pop, E.
  2022

- **How to report and benchmark emerging field-effect transistors** *NATURE ELECTRONICS*
  Cheng, Z., Pang, C., Wang, P., Le, S. T., Wu, Y., Shahrjerdi, D., Radu, I., Lemme, M. C., Peng, L., Duan, X., Chen, Z., Appenzeller, J., Koester, et al
  2022; 5 (7): 416-423

- **Direct measurement of nanoscale filamentary hot spots in resistive memory devices.** *Science advances*
  Deshmukh, S., Rojo, M. M., Yalon, E., Vaziri, S., Koroglu, C., Islam, R., Iglesias, R. A., Saraswat, K., Pop, E.
  2022; 8 (13): eabk1514

- **Ultralow-switching current density multilevel phase-change memory on a flexible substrate.** *Science (New York, N.Y.)*
  Khan, A. I., Daus, A., Islam, R., Neilson, K. M., Lee, H. R., Wong, H. P., Pop, E.
  2021; 373 (6560): 1243-1247

- **Thermal conductivity of crystalline AlN and the influence of atomic-scale defects** *JOURNAL OF APPLIED PHYSICS*
  Xu, R., Rojo, M., Islam, S. M., Sood, A., Vareskic, B., Katre, A., Mingo, N., Goodson, K. E., Xing, H., Jena, D., Pop, E.
  2019; 126 (18)

- **Ultrahigh thermal isolation across heterogeneously layered two-dimensional materials.** *Science advances*
  Vaziri, S., Yalon, E., Munoz Rojo, M., Suryavanshi, S. V., Zhang, H., McClellan, C. J., Bailey, C. S., Smithe, K. K., Gabourie, A. J., Chen, V., Deshmukh, S., Bendersky, L., Davydov, et al
  2019; 5 (8): eaax1325

- **An electrochemical thermal transistor.** *Nature communications*
  Sood, A., Xiong, F., Chen, S., Wang, H., Selli, D., Zhang, J., McClellan, C. J., Sun, J., Donadio, D., Cui, Y., Pop, E., Goodson, K. E.
  2018; 9 (1): 4510

- **HfSe2 and ZrSe2: Two-dimensional semiconductors with native high-κ oxides.** *Science advances*
  Mleczko, M. J., Zhang, C., Lee, H. R., Kuo, H. H., Magyari-Köpe, B., Moore, R. G., Shen, Z. X., Fisher, I. R., Nishi, Y., Pop, E.
  2017; 3 (8): e1700481
- **High Current Density and Low Thermal Conductivity of Atomically Thin Semimetallic WTe2.** *ACS nano*
  Mleczko, M. J., Xu, R. L., Okabe, K., Kuo, H., Fisher, I. R., Wong, H. P., Nishi, Y., Pop, E.
  2016; 10 (8): 7507-7514
- **Improved Contacts to MoS2 Transistors by Ultra-High Vacuum Metal Deposition** *NANO LETTERS*
  English, C. D., Shine, G., Dorgan, V. E., Saraswat, K. C., Pop, E.
  2016; 16 (6): 3824-3830
- **Direct observation of resistive heating at graphene wrinkles and grain boundaries** *APPLIED PHYSICS LETTERS*
  Grosse, K. L., Dorgan, V. E., Estrada, D., Wood, J. D., Vlassiouk, I., Eres, G., Lyding, J. W., King, W. P., Pop, E.
  2014; 105 (14)
- **Ballistic to diffusive crossover of heat flow in graphene ribbons** *NATURE COMMUNICATIONS*
  Bae, M., Li, Z., Aksamija, Z., Martin, P. N., Xiong, F., Ong, Z., Knezevic, I., Pop, E.
  2013; 4
- **Thermal properties of graphene: Fundamentals and applications** *MRS BULLETIN*
  Pop, E., Varshney, V., Roy, A. K.
  2012; 37 (12): 1273-1281
- **Transport in Nanoribbon Interconnects Obtained from Graphene Grown by Chemical Vapor Deposition** *NANO LETTERS*
  Behnam, A., Lyons, A. S., Bae, M., Chow, E. K., Islam, S., Neumann, C. M., Pop, E.
  2012; 12 (9): 4424-4430
- **Low-Power Switching of Phase-Change Materials with Carbon Nanotube Electrodes** *SCIENCE*
  Xiong, F., Liao, A. D., Estrada, D., Pop, E.
  2011; 332 (6029): 568-570
- **Energy Dissipation and Transport in Nanoscale Devices** *NANO RESEARCH*
  Pop, E.
  2010; 3 (3): 147-169
- **Avalanche-Induced Current Enhancement in Semiconducting Carbon Nanotubes** *PHYSICAL REVIEW LETTERS*
  liao, A., Zhao, Y., Pop, E.
  2008; 101 (25)
- **Heat generation and transport in nanometer-scale transistors** *PROCEEDINGS OF THE IEEE*
  Pop, E., Sinha, S., Goodson, K. E.
  2006; 94 (8): 1587-1601
- **Thermal conductance of an individual single-wall carbon nanotube above room temperature** *NANO LETTERS*
  Pop, E., Mann, D., Wang, Q., Goodson, K. E., Dai, H. J.
  2006; 6 (1): 96-100
- **Negative differential conductance and hot phonons in suspended nanotube molecular wires** *PHYSICAL REVIEW LETTERS*
  Pop, E., Mann, D., Cao, J., Wang, Q., Goodson, K. E., Dai, H. J.
  2005; 95 (15)
- **Cross-Domain Acceleration of Open Modification Search: From Commodity Platforms to Emerging Memory and Storage Devices** *IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS*
  Pinge, S., Song, C., Hsu, P., Li, Z., Moradifirouzabadi, A., Chen, Y., Wu, X., Chen, W., Pop, E., Yu, S., Wong, H., Rosing, T., Kang, et al
  2026; 16 (3): 723-737
- **Deep Learning to Automate Parameter Extraction and Model Fitting of Two-Dimensional Transistors** *RESEARCH*
  Bennett, R. K. A., Uslu, J., Gault, H. F., Khan, A., Hoang, L., Pena, T., Neilson, K., Song, Y., Zhang, Z., Mannix, A. J., Pop, E.
  2026; 9

- **Deep Learning to Automate Parameter Extraction and Model Fitting of Two-Dimensional Transistors.** *Research (Washington, D.C.)*
  Bennett, R. K., Uslu, J. L., Gault, H. F., Khan, A. I., Hoang, L., Peña, T., Neilson, K., Song, Y. S., Zhang, Z., Mannix, A. J., Pop, E.
  2026; 9: 1103
- **Wide-field hyperspectral optical microscopy for rapid characterization of two-dimensional semiconductors and heterostructures** *2D MATERIALS*
  Peng, Z., Uthman, A., Zhang, Z., Hoang, A., Zhu, X., Pop, E., Mannix, A. J.
  2026; 13 (2)
- **Nano-Raman imaging of monolayer MoS₂ nanoribbons** *APPLIED PHYSICS LETTERS*
  Krayev, A., Pena, T., Persson, A. E. O., Neilson, K., Hoang, A., Mannix, A. J., Pop, E.
  2026; 128 (20)
- **Flexible radio-frequency carbon nanotube transistors operating at frequencies above 100 GHz** *NATURE ELECTRONICS*
  Xia, F., Xia, T., Su, H., Gan, L., Hu, Q., Wang, W., Huang, R., Bai, T., Chen, Y., Ma, C., Long, G., Wang, S. X., Pop, et al
  2026
- **Spatio-Kinetic Electronic Heterogeneity in MoS₂ Revealed by Ultrafast Electron Microscopy: Implications for Optoelectronics** *ACS APPLIED NANO MATERIALS*
  Alcorn, F. M., Ellis, S. R., Perez, C., Hoang, L., Smoll, E. J., Fuller, E. J., Mannix, A. J., Pop, E., Chandler, D. W., Talin, A., Leonard, F., Kumar, S.
  2026
- **Gate-Dielectric Engineering with an Ultrathin Silicon Oxide Interfacial Dipole Layer for Low-Leakage Oxide-Semiconductor Memories.** *Nano letters*
  Athena, F. F., Hartanto, J., Passlack, M., Evans, J. C., Qin, J., Dede, D., Jana, K., Liu, S., Peña, T., Pop, E., Pitner, G., Radu, I. P., McIntyre, et al
  2026
- **Electrothermally Induced Channel Formation in a Spin-Crossover Neuron.** *ACS nano*
  Salagre, E., Islam, M., Yu, Y., Goyal, S., Brown, T. D., Jardali, F., Oh, S., Pop, E., Williams, R. S., Talin, A. A., Kumar, S., Shamberger, P. J., Fuller, et al
  2026
- **Nondestructive Atomic Defect Quantification of Two-Dimensional Materials and Devices.** *ACS applied materials & interfaces*
  Yang, Y., Xu, K., Peña, T., Neilson, K., Zheng, X., Hoang, A. T., Yang, K., Hennighausen, Z., Zhang, T., Holtzman, L. N., Nattoo, C. A., Hone, J. C., Barmak, et al
  2026
- **Low resistance p-type contacts to monolayer WSe2 through chlorinated solvent doping.** *Nature communications*
  Hoang, L., Bennett, R. K., Hoang, A. T., Peña, T., Zhang, Z., Hocking, M., Saunders, A. P., Jaikissoon, M., Liu, F., Pop, E., Mannix, A. J.
  2026; 17 (1): 718
- **Precursor Engineering of Atomic Layer Deposition for Top-Gate Insulators on Monolayer MoS2 Transistors.** *ACS nano*
  Shearer, A. B., Ko, J. S., Hoang, A. T., Werbrouck, A., Rothman, A., Volcanjk, D. F., Lee, Y. M., Bennett, R. K., Mannix, A. J., Saraswat, K. C., Pop, E., Bent, S. F.
  2025
- **Role of Oxygen Deficiencies on the Stability of Indium Tin Oxide (ITO) Transistors** *IEEE ELECTRON DEVICE LETTERS*
  Wahid, S., Toprasertpong, K., Islam, M., Kumar, A., Ul Karim, M., Simka, H., Wong, H., Pop, E.
  2025; 46 (9): 1553-1556
- **Optoelectronic Properties of Atomic Layer Deposited and Sputtered MoS2 Films.** *ACS applied materials & interfaces*
  Nattoo, C. A., Peña, T., Nassiri Nazif, K., Wu, X., Rahimisheikh, S., D'Acunto, G., Bent, S. F., Hadermann, J., Pop, E.
  2025
- **Synthesis-Related Nanoscale Defects in Mo-Based Janus Monolayers Revealed by Cross-Correlated AFM and TERS Imaging.** *Small (Weinheim an der Bergstrasse, Germany)*
  Zhang, T., Krayev, A., Yang, T. H., Mao, N., Hoang, L., Wang, Z., Liu, H., Peng, Y. R., Zhu, Y., Zheng, X., Isotta, E., Kira, M. E., Righi, et al
  2025: e2504742
- **Vibronically Coherent Exciton Trapping in Monolayer WS2.** *ACS nano*
  Boeije, Y., Hoang, A. T., Lim, J., Stranks, S. D., Chhowalla, M., Pop, E., Mannix, A. J., Rao, A.

2025

- **Transition metal dichalcogenide solar cells for indoor energy harvesting** *DEVICE*
  Nitta, F. U., Nazif, K., Pop, E.
  2025; 3 (7)
- **Fringe current correction for unpatterned-channel thin-film transistors including contact resistance and velocity saturation effects** *JOURNAL OF APPLIED PHYSICS*
  Koroglu, C., Daus, A., Wahid, S., Munoz Rojo, M., Pop, E.
  2025; 137 (22)
- **Threshold Voltage Control through Solvent Doping of Monolayer MoS2Transistors.** *Nano letters*
  Neilson, K., Mokhtarzadeh, C., Jaikissoon, M., Bennett, R. K., Buragohain, P., Verma Penumatcha, A., Kumar Pinnepalli, S. S., Rogan, C., Kozhakhmetov, A., Maxey, K., Clendenning, S., Pop, E., Metz, et al
  2025
- **High-Field Breakdown and Thermal Characterization of Indium Tin Oxide Transistors.** *ACS nano*
  Su, H., Lee, Y., Pena, T., Fultz-Waters, S., Kang, J., Koroglu, C., Wahid, S., Newcomb, C. J., Song, Y. S., Wong, H. P., Wang, S. X., Pop, E.
  2025
- **Monte Carlo Simulation of Electrical Transport with Joule Heating and Strain in Monolayer MoS2 Devices.** *Nano letters*
  Wang, M. A., Pop, E.
  2025
- **Achieving 1-nm-Scale Equivalent Oxide Thickness Top-Gate Dielectric on Monolayer Transition Metal Dichalcogenide Transistors With CMOS-Friendly Approaches** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Ko, J., Shearer, A. B., Lee, S., Neilson, K., Jaikissoon, M., Kim, K., Bent, S. F., Pop, E., Saraswat, K. C.
  2025; 72 (3): 1514-1519
- **Excitation Laser Energy Dependence of the Gap-Mode TERS Spectra of WS₂ and MoS₂ on Silver** *ACS PHOTONICS*
  Krayev, A., Isotta, E., Hoang, L., Yang, J. A., Neilson, K., Wang, M., Haughn, N., Pop, E., Mannix, A., Balogun, O., Wang, C.
  2025
- **Mobility and threshold voltage extraction in transistors with gate-voltage-dependent contact resistance** *NPJ 2D MATERIALS AND APPLICATIONS*
  Bennett, R. K. A., Hoang, L., Cremers, C., Mannix, A. J., Pop, E.
  2025; 9 (1)
- **Sub-Nanometer Equivalent Oxide Thickness and Threshold Voltage Control Enabled by Silicon Seed Layer on Monolayer MoS2 Transistors.** *Nano letters*
  Ko, J. S., Lee, S., Bennett, R. K., Schauble, K., Jaikissoon, M., Neilson, K., Hoang, A. T., Mannix, A. J., Kim, K., Saraswat, K. C., Pop, E.
  2025
- **Deep Learning to Automate Fitting and Parameter Extraction of 2D Transistors**
  Bennett, R. K. A., Gault, H. F., Khan, A., Hoang, L., Pena, T., Neilson, K., Song, Y., Zhang, Z., Mannix, A. J., Pop, E., IEEE
  IEEE.2025: 122-123
- **Impact of Dielectrics on Hysteresis and Bias Stress Stability in Oxide Semiconductor and 2D-Material Field-Effect Transistors**
  Dausl, A., Wahid, S., Phung, Q., Pope, E., IEEE
  IEEE.2025
- **What's Needed to Make 2D Semiconductors Useful for Electronics?**
  Pop, E., IEEE
  IEEE.2025
- **Efficiency Limit of Transition Metal Dichalcogenide-Silicon Tandem Solar Cells**
  Nitta, F. U., Nazif, K., Pop, E., IEEE
  IEEE.2025: 1275
- **Direct ALD of amorphous MoS2 thin films for extra-terrestrial photovoltaic applications**

Hamtaei, S., Kim, S., Nazif, K., Nattoo, C., Carr, J. M., Romanetz, L., Nitta, F. U., Reid, O. G., Vermang, B., Elam, J., Pop, E., IEEE
IEEE.2025: 1472

- **First Comparative Thermal Evaluation of 2D Semiconductor vs. Silicon Nanosheet Transistors**
  Song, Y., Su, H., Pena, T., Persson, A. E. O., Yang, K., Yalon, E., Bennett, R. K. A., Han, Z., Neilson, K., Kang, J., Yang, J. A., Wong, H., Wang, et al
  IEEE.2025
- **Thermal Evaluation and Comparison of CAA and GAA Indium Tin Oxide Vertical Channel Transistors**
  Song, Y., Kang, J., Gu, H., Su, H., Lee, Y., Wang, S. X., Kwon, J., Wong, H., Pop, E., IEEE
  IEEE.2025
- **Thermal Characterization of Ultrathin MgO Tunnel Barriers.** *Nano letters*
  Su, H., Kwon, H., Xue, F., Sato, N., Bhat, U., Tsai, W., Bosman, M., Asheghi, M., Goodson, K. E., Pop, E., Wang, S. X.
  2024
- **Understanding the Impact of Contact-Induced Strain on the Electrical Performance of Monolayer WS2 Transistors.** *Nano letters*
  Hoang, L., Jaikissoon, M., Köroğlu, Ç., Zhang, Z., Bennett, R. K., Song, J. H., Yang, J. A., Ko, J. S., Brongersma, M. L., Saraswat, K. C., Pop, E., Mannix, A. J.
  2024
- **Low-Energy Spiking Neural Network Using Ge₄Sb₆Te₇ Phase Change Memory Synapses** *IEEE ELECTRON DEVICE LETTERS*
  Bin Hamid, S., Khan, A., Zhang, H., Davydov, A. V., Pop, E.
  2024; 45 (10): 1819-1822
- **Axon-like active signal transmission.** *Nature*
  Brown, T. D., Zhang, A., Nitta, F. U., Grant, E. D., Chong, J. L., Zhu, J., Radhakrishnan, S., Islam, M., Fuller, E. J., Talin, A. A., Shamberger, P. J., Pop, E., Williams, et al
  2024
- **Chemically Tailored Growth of 2D Semiconductors via Hybrid Metal-Organic Chemical Vapor Deposition.** *ACS nano*
  Zhang, Z., Hoang, L., Hocking, M., Peng, Z., Hu, J., Zaborski, G., Reddy, P. D., Dollard, J., Goldhaber-Gordon, D., Heinz, T. F., Pop, E., Mannix, A. J.
  2024
- **Biaxial Strain Transfer in Monolayer MoS2 and WSe2 Transistor Structures.** *ACS applied materials & interfaces*
  Michail, A., Yang, J. A., Filintoglou, K., Balakeras, N., Nattoo, C. A., Bailey, C. S., Daus, A., Parthenios, J., Pop, E., Papagelis, K.
  2024
- **Toward Mass Production of Transition Metal Dichalcogenide Solar Cells: Scalable Growth of Photovoltaic-Grade Multilayer WSe2by Tungsten Selenization.** *ACS nano*
  Neilson, K. M., Hamtaei, S., Nassiri Nazif, K., Carr, J. M., Rahimisheikh, S., Nitta, F. U., Brammertz, G., Blackburn, J. L., Hadermann, J., Saraswat, K. C., Reid, O. G., Vermang, B., Daus, et al
  2024
- **Direct Exfoliation of Nanoribbons from Bulk van der Waals Crystals.** *Small (Weinheim an der Bergstrasse, Germany)*
  Saunders, A. P., Chen, V., Wang, J., Li, Q., Johnson, A. C., McKeown-Green, A. S., Zeng, H. J., Mac, T. K., Trinh, M. T., Heinz, T. F., Pop, E., Liu, F.
  2024: e2403504
- **Flexible Nanoscale Amorphous Oxide Transistors with a Gold-Assisted Transfer Method.** *ACS applied materials & interfaces*
  Wahid, S., Daus, A., Chen, V., Pop, E.
  2024
- **Strain Induced by Evaporated-Metal Contacts on Monolayer MoS₂ Transistors** *IEEE ELECTRON DEVICE LETTERS*
  Jaikissoon, M., Pop, E., Saraswat, K. C.
  2024; 45 (8): 1528-1531
- **Thermal optimization of two-terminal SOT-MRAM** *JOURNAL OF APPLIED PHYSICS*
  Su, H., Kwon, H., Hwang, W., Xue, F., Koroglu, C., Tsai, W., Asheghi, M., Goodson, K. E., Wang, S. X., Pop, E.
  2024; 136 (1)
- **Biaxial Tensile Strain Enhances Electron Mobility of Monolayer Transition Metal Dichalcogenides.** *ACS nano*

Yang, J. A., Bennett, R. K., Hoang, L., Zhang, Z., Thompson, K. J., Michail, A., Parthenios, J., Papagelis, K., Mannix, A. J., Pop, E.
2024

- **AlN: An Engineered Thermal Material for 3D Integrated Circuits** *ADVANCED FUNCTIONAL MATERIALS*
  Vaziri, S., Perez, C., Datye, I. M., Kwon, H., Hsu, C., Chen, M. E., Noshin, M., Lee, T., Asheghi, M., Woon, W., Pop, E., Goodson, K. E., Liao, et al
  2024
- **Nonvolatile Phase-Only Transmissive Spatial Light Modulator with Electrical Addressability of Individual Pixels.** *ACS nano*
  Fang, Z., Chen, R., Froch, J. E., Tanguy, Q. A., Khan, A. I., Wu, X., Tara, V., Manna, A., Sharp, D., Munley, C., Miller, F., Zhao, Y., Geiger, et al
  2024
- **Design Guidelines for Oxide Semiconductor Gain Cell Memory on a Logic Platform** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Liu, S., Jana, K., Toprasertpong, K., Chen, J., Liang, Z., Jiang, Q., Wahid, S., Qin, S., Chen, W., Pop, E., Wong, H.
  2024
- **Modeling and Understanding Threshold Voltage and Subthreshold Swing in Ultrathin Channel Oxide Semiconductor Transistors**
  Jana, K., Liu, S., Toprasertpong, K., Jiang, Q., Wahid, S., Kang, J., Chen, J., Pop, E., Wong, H., IEEE
  IEEE.2024
- **Flexible Monolayer WS₂-based Pseudo-CMOS Inverters for In-sensor Computing**
  Yang, J. A., Bora, A., Daus, A., Hoang, L., Zhang, Z., Mannix, A. J., Pop, E., IEEE
  IEEE.2024
- **Flexible Ferroelectric Memory using Non-adhesive Transfer Layer**
  Wahid, S., Saini, B., McIntyre, P., Daus, A., Pop, E., IEEE
  IEEE.2024
- **Scalable production of photovoltaic-grade WSe₂ via tungsten selenization**
  Neilson, K. M., Hamtaei, S., Nazif, K., Carr, J. M., Rahimi, S., Nitta, F., Brammertz, G., Blackburn, J. L., Hadermann, J., Saraswat, K. C., Reid, O. G., Vermang, B., Daus, et al
  IEEE.2024: 0142
- **SpecPCM: A Low-Power PCM-Based In-Memory Computing Accelerator for Full-Stack Mass Spectrometry Analysis** *IEEE JOURNAL ON EXPLORATORY SOLID-STATE COMPUTATIONAL DEVICES AND CIRCUITS*
  Fan, K., Moradifirouzabadi, A., Wu, X., Li, Z., Ponzina, F., Persson, A., Pop, E., Rosing, T., Kang, M.
  2024; 10: 161-169
- **A disposable reader-sensor solution for wireless temperature logging** *DEVICE*
  Kananian, S., Rho, J., Chen, C., Mirjalili, S., Daus, A., Kim, M., Niu, S., Pop, E., Wong, H., Bao, Z., Mani, A., Poon, A. S. Y.
  2023; 1 (6)
- **Effect of Back-Gate Dielectric on Indium Tin Oxide (ITO) Transistor Performance and Stability** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Daus, A., Hoang, L., Gilardi, C., Wahid, S., Kwon, J., Qin, S., Ko, J., Islam, M., Kumar, A., Neilson, K. M., Saraswat, K. C., Mitra, S., Wong, et al
  2023; 70 (11): 5685-5689
- **High Thermal Conductivity of Submicrometer Aluminum Nitride Thin Films Sputter-Deposited at Low Temperature.** *ACS nano*
  Perez, C., McLeod, A. J., Chen, M. E., Yi, S. I., Vaziri, S., Hood, R., Ueda, S. T., Bao, X., Asheghi, M., Park, W., Talin, A. A., Kumar, S., Pop, et al
  2023
- **Spatially-Resolved Thermometry of Filamentary Nanoscale Hot Spots in TiO2 Resistive Random Access Memories to Address Device Variability.** *ACS applied electronic materials*
  Swoboda, T., Gao, X., Rosário, C. M., Hui, F., Zhu, K., Yuan, Y., Deshmukh, S., Köroğlu, Ç., Pop, E., Lanza, M., Hilgenkamp, H., Rojo, M. M.
  2023; 5 (9): 5025-5031
- **Spatially-Resolved Thermometry of Filamentary Nanoscale Hot Spots in TiO2 Resistive Random Access Memories to Address Device Variability** *ACS APPLIED ELECTRONIC MATERIALS*
  Swoboda, T., Gao, X., Rosario, C. M. M., Hui, F., Zhu, K., Yuan, Y., Deshmukh, S., Koroglu, C., Pop, E., Lanza, M., Hilgenkamp, H., Rojo, M.
  2023
- **Area-Selective Atomic Layer Deposition for Resistive Random-Access Memory Devices.** *ACS applied materials & interfaces*

Oh, I. K., Khan, A. I., Qin, S., Lee, Y., Wong, H. P., Pop, E., Bent, S. F.
2023

- **Thiol-based defect healing of WSe2 and WS2** *NPJ 2D MATERIALS AND APPLICATIONS*
  Schwarz, A., Alon-Yehezkel, H., Levi, A., Yadav, R., Majhi, K., Tzuriel, Y., Hoang, L., Bailey, C. S., Brumme, T., Mannix, A. J., Cohen, H., Yalon, E., Heine, et al
  2023; 7 (1)

- **Imaging the electron charge density in monolayer MoS2 at the Ångstrom scale.** *Nature communications*
  Martis, J., Susarla, S., Rayabharam, A., Su, C., Paule, T., Pelz, P., Huff, C., Xu, X., Li, H. K., Jaikissoon, M., Chen, V., Pop, E., Saraswat, et al
  2023; 14 (1): 4363

- **A Purcell-enabled monolayer semiconductor free-space optical modulator** *NATURE PHOTONICS*
  Li, Q., Song, J., Xu, F., van de Groep, J., Hong, J., Daus, A., Lee, Y., Johnson, A. C., Pop, E., Liu, F., Brongersma, M. L.
  2023

- **Effect of Top-Gate Dielectric Deposition on the Performance of Indium Tin Oxide Transistors** *IEEE ELECTRON DEVICE LETTERS*
  Wahid, S., Daus, A., Kwon, J., Qin, S., Ko, J., Wong, H., Pop, E.
  2023; 44 (6): 951-954

- **Probing the Melting Transitions in Phase-Change Superlattices via Thin Film Nanocalorimetry.** *Nano letters*
  Zhao, J., Khan, A. I., Efremov, M. Y., Ye, Z., Wu, X., Kim, K., Lee, Z., Wong, H. P., Pop, E., Allen, L. H.
  2023

- **Ambipolar Thickness-Dependent Thermoelectric Measurements of WSe2.** *Nano letters*
  Chen, V., Lee, H. R., Köroğlu, Ç., McClellan, C. J., Daus, A., Pop, E.
  2023

- **Uncovering the Different Components of Contact Resistance to Atomically Thin Semiconductors** *ADVANCED ELECTRONIC MATERIALS*
  Ber, E., Grady, R. W., Pop, E., Yalon, E.
  2023

- **Intrinsic and Extrinsic Factors Influencing the Dynamics of VO2 Mott Oscillators** *PHYSICAL REVIEW APPLIED*
  Bohaichuk, S. M., Kumar, S., Islam, M., Rojo, M., Williams, R., Pitner, G., Jeong, J., Samant, M. G., Parkin, S. S. P., Pop, E.
  2023; 19 (4)

- **Nanoscale temperature sensing of electronic devices with calibrated scanning thermal microscopy.** *Nanoscale*
  Swoboda, T., Wainstein, N., Deshmukh, S., Koroglu, C., Gao, X., Lanza, M., Hilgenkamp, H., Pop, E., Yalon, E., Munoz Rojo, M.
  2023

- **Semimetal-Monolayer Transition Metal Dichalcogenides Photodetectors for Wafer-Scale Broadband Photonics** *ADVANCED PHOTONICS RESEARCH*
  Sinn, H., Kumar, A., Pop, E., Newaz, A.
  2023

- **High Thermal Conductivity Insulators for Thermal Management in 3D Integrated Circuits** *IEEE ELECTRON DEVICE LETTERS*
  Koroglu, C., Pop, E.
  2023; 44 (3): 496-499

- **High Number of Transport Modes: A Requirement for Contact Resistance Reduction to Atomically Thin Semiconductors** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Ber, E., Grady, R. W., Pop, E., Yalon, E.
  2023

- **How Do Quantum Effects Influence the Capacitance and Carrier Density of Monolayer MoS2 Transistors?** *Nano letters*
  Bennett, R. K., Pop, E.
  2023

- **Energy Efficient Neuro-inspired Phase Change Memory Based on Ge4 Sb6 Te7 as a Novel Epitaxial Nanocomposite.** *Advanced materials (Deerfield Beach, Fla.)*

Khan, A. I., Yu, H., Zhang, H., Goggin, J. R., Kwon, H., Wu, X., Perez, C., Neilson, K. M., Asheghi, M., Goodson, K. E., Vora, P. M., Davydov, A., Takeuchi, et al
2023: e2300107

- **Efficiency Limit of Transition Metal Dichalcogenide Solar Cells**
  Nazif, K., Nitta, F. U., Daus, A., Saraswat, K. C., Pop, E., IEEE
  IEEE.2023

- **Approaching the quantum limit in two-dimensional semiconductor contacts.** *Nature*
  Li, W., Gong, X., Yu, Z., Ma, L., Sun, W., Gao, S., Köroğlu, Ç., Wang, W., Liu, L., Li, T., Ning, H., Fan, D., Xu, et al
  2023; 613 (7943): 274-279

- **Stateful Logic Using Phase Change Memory** *IEEE JOURNAL ON EXPLORATORY SOLID-STATE COMPUTATIONAL DEVICES AND CIRCUITS*
  Hoffer, B., Wainstein, N., Neumann, C. M. M., Pop, E., Yalon, E., Kvatinsky, S.
  2022; 8 (2): 77-83

- **Strain-Enhanced Mobility of Monolayer MoS2.** *Nano letters*
  Datye, I. M., Daus, A., Grady, R. W., Brenner, K., Vaziri, S., Pop, E.
  2022

- **Understanding Interface-Controlled Resistance Drift in Superlattice Phase Change Memory** *IEEE ELECTRON DEVICE LETTERS*
  Wu, X., Khan, A., Ramesh, P., Perez, C., Kim, K., Lee, Z., Saraswat, K., Goodson, K. E., Wong, H., Pop, E.
  2022; 43 (10): 1669-1672

- **Electro-thermal Characterization of Dynamical VO2 Memristors via Local Activity Modeling.** *Advanced materials (Deerfield Beach, Fla.)*
  Brown, T. D., Bohaichuk, S. M., Islam, M., Kumar, S., Pop, E., Williams, R. S.
  2022: e2205451

- **How to report and benchmark emerging field-effect transistors (July, 10.1038/s41928-022-00798-8, 2022)** *NATURE ELECTRONICS*
  Cheng, Z., Pang, C., Wang, P., Le, S. T., Wu, Y., Shahrjerdi, D., Radu, I., Lemme, M. C., Peng, L., Duan, X., Chen, Z., Appenzeller, J., Koester, et al
  2022

- **Improved gradual resistive switching range and 1000x on/off ratio in HfOx PRAM achieved with a Ge2Sb2Te5 thermal barrier** *APPLIED PHYSICS LETTERS*
  Islam, R., Qin, S., Deshmukh, S., Yu, Z., Koroglu, C., Khan, A. I., Schauble, K., Saraswat, K. C., Pop, E., Wong, H. P.
  2022; 121 (8)

- **Unveiling the Effect of Superlattice Interfaces and Intermixing on Phase Change Memory Performance.** *Nano letters*
  Khan, A. I., Wu, X., Perez, C., Won, B., Kim, K., Ramesh, P., Kwon, H., Tung, M. C., Lee, Z., Oh, I., Saraswat, K., Asheghi, M., Goodson, et al
  2022

- **Extended Scale Length Theory for Low-Dimensional Field-Effect Transistors** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Gilardi, C., Bennett, R. K. A., Yoon, Y., Pop, E., Wong, H., Mitra, S.
  2022

- **Ultra-low-energy programmable non-volatile silicon photonics based on phase-change materials with graphene heaters** *NATURE NANOTECHNOLOGY*
  Fang, Z., Chen, R., Zheng, J., Khan, A., Neilson, K. M., Geiger, S. J., Callahan, D. M., Moebius, M. G., Saxena, A., Chen, M. E., Rios, C., Hu, J., Pop, et al
  2022

- **Substrate-dependence of monolayer MoS2 thermal conductivity and thermal boundary conductance** *JOURNAL OF APPLIED PHYSICS*
  Gabourie, A. J., Koroglu, C., Pop, E.
  2022; 131 (19)

- **Nonequilibrium Phonon Thermal Resistance at MoS2/Oxide and Graphene/Oxide Interfaces.** *ACS applied materials & interfaces*
  Zheng, W., McClellan, C. J., Pop, E., Koh, Y. K.
  2022

- **Electrically driven reprogrammable phase-change metasurface reaching 80% efficiency.** *Nature communications*

Abdollahramezani, S., Hemmatyar, O., Taghinejad, M., Taghinejad, H., Krasnok, A., Eftekhar, A. A., Teichrib, C., Deshmukh, S., El-Sayed, M. A., Pop, E., Wuttig, M., Alo, A., Cai, et al
2022; 13 (1): 1696

- ** Temperature-dependent thermal resistance of phase change memory ** *APPLIED PHYSICS LETTERS*
  Stern, K., Keller, Y., Neumann, C. M., Pop, E., Yalon, E.
  2022; 120 (11)
- **Electro-Thermal Confinement Enables Improved Superlattice Phase Change Memory** *IEEE ELECTRON DEVICE LETTERS*
  Khan, A., Kwon, H., Chen, M. E., Asheghi, M., Wong, H., Goodson, K. E., Pop, E.
  2022; 43 (2): 204-207
- **Nanoscale Phase Change Memory Arrays Patterned by Block Copolymer Directed Self-Assembly**
  Tung, M. C., Khan, A., Kwon, H., Asheghi, M., Goodson, K. E., Pop, E., Wong, H.
  edited by Panning, E. M., Liddle, J. A.
  SPIE-INT SOC OPTICAL ENGINEERING.2022
- **First Demonstration of Dual-Gated Indium Tin Oxide Transistors with Record Drive Current similar to 2.3 mA/mu m at L approximate to 60 nm and V-DS=1 V**
  Wahid, S., Daus, A., Kumar, A., Wong, H., Pop, E., IEEE
  IEEE.2022
- **Ultra-low energy programmable non-volatile silicon photonics based on phase-change materials with graphene heaters**
  Fang, Z., Chen, R., Zheng, J., Khan, A., Neilson, K. M., Geiger, S. J., Callahan, D. M., Moebius, M. G., Saxena, A., Chen, M. E., Rios, C., Hu, J., Pop, et al
  edited by Subramania, G. S., Foteinopoulou, S.
  SPIE-INT SOC OPTICAL ENGINEERING.2022
- **High-specific-power flexible transition metal dichalcogenide solar cells.** *Nature communications*
  Nassiri Nazif, K., Daus, A., Hong, J., Lee, N., Vaziri, S., Kumar, A., Nitta, F., Chen, M. E., Kananian, S., Islam, R., Kim, K., Park, J., Poon, et al
  2021; 12 (1): 7034
- **Lateral electrical transport and field-effect characteristics of sputtered p-type chalcogenide thin films** *APPLIED PHYSICS LETTERS*
  Wahid, S., Daus, A., Khan, A., Chen, V., Neilson, K. M., Islam, M., Chen, M. E., Pop, E.
  2021; 119 (23)
- **Transistors based on two-dimensional materials for future integrated circuits** *NATURE ELECTRONICS*
  Das, S., Sebastian, A., Pop, E., McClellan, C. J., Franklin, A. D., Grasser, T., Knobloch, T., Illarionov, Y., Penumatcha, A. V., Appenzeller, J., Chen, Z., Zhu, W., Asselberghs, et al
  2021; 4 (11): 786-799
- **Vibrational Properties of a Naturally Occurring Semiconducting van der Waals Heterostructure** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Costa, V., Liang, L., Vaziri, S., Miller, A., Pop, E., Newaz, A. M.
  2021; 125 (39): 21607-21613
- **Application-driven synthesis and characterization of hexagonal boron nitride deposited on metals and carbon nanotubes** *2D MATERIALS*
  Chen, V., Shin, Y., Mikheev, E., Lin, Q., Martis, J., Zhang, Z., Chatterjee, S., Majumdar, A., Wong, H., Goldhaber-Gordon, D., Pop, E.
  2021; 8 (4)
- **Field-effect at electrical contacts to two-dimensional materials (Jul, 10.1007/s12274-021-3670-y, 2021)** *NANO RESEARCH*
  Guo, Y., Sun, Y., Tang, A., Wang, C., Zhao, Y., Bai, M., Xu, S., Xu, Z., Tang, T., Wang, S., Qiu, C., Xu, K., Peng, et al
  2021
- **Sub-Nanosecond Pulses Enable Partial Reset for Analog Phase Change Memory** *IEEE ELECTRON DEVICE LETTERS*
  Stern, K., Wainstein, N., Keller, Y., Neumann, C. M., Pop, E., Kvatinsky, S., Yalon, E.
  2021; 42 (9): 1291-1294
- **Toward Low-Temperature Solid-Source Synthesis of Monolayer MoS2.** *ACS applied materials & interfaces*
  Tang, A., Kumar, A., Jaikissoon, M., Saraswat, K., Wong, H. P., Pop, E.
  2021

- **Field-effect at electrical contacts to two-dimensional materials.** *Nano research*
  Guo, Y., Sun, Y., Tang, A., Wang, C., Zhao, Y., Bai, M., Xu, S., Xu, Z., Tang, T., Wang, S., Qiu, C., Xu, K., Peng, et al
  2021: 1-7

- **A Comprehensive Study of WSe2 Crystals Using Correlated Raman, Photoluminescence (PL), Second Harmonic Generation (SHG), and Atomic Force Microscopy (AFM) Imaging** *SPECTROSCOPY*
  Schmidt, U., Bailey, C. S., Englert, J., Yalon, E., Ankonina, G., Pop, E., Hollricher, O., Dieing, T.
  2021; 36 (7): 23-30

- **Graphene-based electromechanical thermal switches** *2D MATERIALS*
  Chen, M. E., Rojo, M., Lian, F., Koeln, J., Sood, A., Bohaichuk, S. M., Neumann, C. M., Garrow, S. G., Goodson, K. E., Alleyne, A. G., Pop, E.
  2021; 8 (3)

- **High-performance flexible nanoscale transistors based on transition metal dichalcogenides** *NATURE ELECTRONICS*
  Daus, A., Vaziri, S., Chen, V., Koroglu, C., Grady, R. W., Bailey, C. S., Lee, H., Schauble, K., Brenner, K., Pop, E.
  2021

- **Uncovering Phase Change Memory Energy Limits by Sub-Nanosecond Probing of Power Dissipation Dynamics** *ADVANCED ELECTRONIC MATERIALS*
  Stern, K., Wainstein, N., Keller, Y., Neumann, C. M., Pop, E., Kvatinsky, S., Yalon, E.
  2021

- **Spectral decomposition of thermal conductivity: Comparing velocity decomposition methods in homogeneous molecular dynamics simulations** *PHYSICAL REVIEW B*
  Gabourie, A. J., Fan, Z., Ala-Nissila, T., Pop, E.
  2021; 103 (20)

- **Ultrathin Three-Monolayer Tunneling Memory Selectors.** *ACS nano*
  Wang, C., Chen, V., McClellan, C. J., Tang, A., Vaziri, S., Li, L., Chen, M. E., Pop, E., Wong, H. P.
  2021

- **Carbon nanotube thermoelectric devices by direct printing: Toward wearable energy converters** *APPLIED PHYSICS LETTERS*
  Lee, H., Furukawa, N., Ricco, A. J., Pop, E., Cui, Y., Nishi, Y.
  2021; 118 (17)

- **High-Performance p-n Junction Transition Metal Dichalcogenide Photovoltaic Cells Enabled by MoOx Doping and Passivation.** *Nano letters*
  Nassiri Nazif, K., Kumar, A., Hong, J., Lee, N., Islam, R., McClellan, C. J., Karni, O., van de Groep, J., Heinz, T. F., Pop, E., Brongersma, M. L., Saraswat, K. C.
  2021

- **High Current Density in Monolayer MoS2 Doped by AlOx.** *ACS nano*
  McClellan, C. J., Yalon, E., Smithe, K. K., Suryavanshi, S. V., Pop, E.
  2021

- **Dynamic Hybrid Metasurfaces.** *Nano letters*
  Abdollahramezani, S. n., Hemmatyar, O. n., Taghinejad, M. n., Taghinejad, H. n., Kiarashinejad, Y. n., Zandehshahvar, M. n., Fan, T. n., Deshmukh, S. n., Eftekhar, A. A., Cai, W. n., Pop, E. n., El-Sayed, M. A., Adibi, et al
  2021

- **Advanced Data Encryption using 2D Materials.** *Advanced materials (Deerfield Beach, Fla.)*
  Wen, C., Li, X., Zanotti, T., Puglisi, F. M., Shi, Y., Saiz, F., Antidormi, A., Roche, S., Zheng, W., Liang, X., Hu, J., Duhm, S., Roldan, et al
  2021: e2100185

- **Engineering Thermal Transport across Layered Graphene-MoS2 Superlattices.** *ACS nano*
  Sood, A., Sievers, C., Shin, Y. C., Chen, V., Chen, S., Smithe, K. K., Chatterjee, S., Donadio, D., Goodson, K. E., Pop, E.
  2021

- **Diamond Integration on GaN for Channel Temperature Reduction**
  Malakoutian, M., Xu, R., Ren, C., Pasayat, S., Sayed, I., Pop, E., Chowdhury, S., IEEE
  IEEE.2021: 70-74

- **Sub-200 Omega.mu m Alloyed Contacts to Synthetic Monolayer MoS2**
  Kumar, A., Schauble, K., Neilson, K. M., Tang, A., Ramesh, P., Wong, H., Pop, E., Saraswat, K., IEEE
  IEEE.2021
- **Uncovering Thermal and Electrical Properties of Sb2Te3/GeTe Superlattice Films.** *Nano letters*
  Kwon, H., Khan, A. I., Perez, C., Asheghi, M., Pop, E., Goodson, K. E.
  2021
- **Reduced thermal conductivity of supported and encased monolayer and bilayer MoS2** *2D MATERIALS*
  Gabourie, A. J., Suryavanshi, S., Farimani, A., Pop, E.
  2021; 8 (1)
- **Tuning electrical and interfacial thermal properties of bilayer MoS2 via electrochemical intercalation.** *Nanotechnology*
  Xiong, F. n., Yalon, E. n., McClellan, C. n., Zhang, J. n., Aslan, O. B., Sood, A. n., Sun, J. n., Andolina, C. M., Al-Saidi, W. A., Goodson, K. E., Heinz, T. n., Cui, Y. n., Pop, et al
  2021
- **Two-Fold Reduction of Switching Current Density in Phase Change Memory Using Bi2Te3 Thermoelectric Interfacial Layer** *IEEE ELECTRON DEVICE LETTERS*
  Khan, A., Kwon, H., Islam, R., Perez, C., Chen, M. E., Asheghi, M., Goodson, K. E., Wong, H., Pop, E.
  2020; 41 (11): 1657–60
- **Ultrahigh Doping of Graphene Using Flame-Deposited MoO3** *IEEE ELECTRON DEVICE LETTERS*
  Vaziri, S., Chen, V., Cai, L., Jiang, Y., Chen, M. E., Grady, R. W., Zheng, X., Pop, E.
  2020; 41 (10): 1592–95
- **Visualizing Energy Transfer at Buried Interfaces in Layered Materials Using Picosecond X-Rays** *ADVANCED FUNCTIONAL MATERIALS*
  Nyby, C., Sood, A., Zalden, P., Gabourie, A. J., Muscher, P., Rhodes, D., Mannebach, E., Corbett, J., Mehta, A., Pop, E., Heinz, T. F., Lindenberg, A. M.
  2020
- **Nonvolatile Electrically Reconfigurable Integrated Photonic Switch Enabled by a Silicon PIN Diode Heater.** *Advanced materials (Deerfield Beach, Fla.)*
  Zheng, J., Fang, Z., Wu, C., Zhu, S., Xu, P., Doylend, J. K., Deshmukh, S., Pop, E., Dunham, S., Li, M., Majumdar, A.
  2020: e2001218
- **VO2 Switch for Electrostatic Discharge Protection** *IEEE ELECTRON DEVICE LETTERS*
  Bohaichuk, S. M., Pelella, M. M., Sun, Y., Zhang, Z., Ramanathan, S., Pop, E.
  2020; 41 (2): 292–95
- **Stacking Independence and Resonant Interlayer Excitation of Monolayer WSe2/MoSe2 Heterostructures for Photocatalytic Energy Conversion** *ACS APPLIED NANO MATERIALS*
  Chen, J., Bailey, C., Cui, D., Wang, Y., Wang, B., Shi, H., Cai, Z., Pop, E., Zhou, C., Cronin, S. B.
  2020; 3 (2): 1175–81
- **Monolithic mtesla-level magnetic induction by self-rolled-up membrane technology.** *Science advances*
  Huang, W., Yang, Z., Kraman, M. D., Wang, Q., Ou, Z., Rojo, M. M., Yalamarthy, A. S., Chen, V., Lian, F., Ni, J. H., Liu, S., Yu, H., Sang, et al
  2020; 6 (3): eaay4508
- **Improved Current Density and Contact Resistance in Bilayer MoSe2 Field Effect Transistors by AlO x Capping.** *ACS applied materials & interfaces*
  Somvanshi, D. n., Ber, E. n., Bailey, C. S., Pop, E. n., Yalon, E. n.
  2020; 12 (32): 36355–61
- **Large temperature coefficient of resistance in atomically thin two-dimensional semiconductors** *Applied Physics Letters*
  Khan, A., Khakbaz, P., Brenner, K. A., Smithe, K., Mleczko, M. J., Esseni, D., Pop, E.
  2020; 116 (20)
- **Flexible Low-Power Superlattice-Like Phase Change Memory**
  Khan, A., Daus, A., Pop, E., IEEE

IEEE.2020

- **Ultra-scaled MoS2 transistors and circuits fabricated without nanolithography** *2D MATERIALS*
  Patel, K., Grady, R. W., Smithe, K. K. H., Pop, E., Sordan, R.
  2020; 7 (1)
- **Nonvolatile Electrically Reconfigurable Integrated Photonic Switches Using Phase-Change Materials**
  Zheng, J., Fang, Z., Wu, C., Zhu, S., Xu, P., Doylend, J. K., Deshmukh, S., Pop, E., Dunham, S., Li, M., Majumdar, A., IEEE
  IEEE.2020
- **Highly confined plasmons in individual single-walled carbon nanotube nanoantennas**
  Yu, S., Roberts, J., Lin, Q., Bohaichuk, S., Luo, Y., Choi, Y., Ho, P., Lee, K., Falk, A. L., Wilson, W. L., Pop, E., Wong, H., Fan, et al
  IEEE.2020
- **Phase Change Material Integrated Silicon Photonics: GST and Beyond**
  Fang, Z., Zheng, J., Xu, P., Deshmukh, S., Pop, E., Majumdar, A.
  edited by Jiang, S., Digonnet, M. J.
  SPIE-INT SOC OPTICAL ENGINEERING.2020
- **Uncovering the Effects of Metal Contacts on Monolayer MoS2.** *ACS nano*
  Schauble, K. n., Zakhidov, D. n., Yalon, E. n., Deshmukh, S. n., Grady, R. W., Cooley, K. A., McClellan, C. J., Vaziri, S. n., Passarello, D. n., Mohney, S. E., Toney, M. F., Sood, A. K., Salleo, et al
  2020
- **Localized Heating and Switching in MoTe2-Based Resistive Memory Devices.** *Nano letters*
  Datye, I. M., Rojo, M. M., Yalon, E. n., Deshmukh, S. n., Mleczko, M. J., Pop, E. n.
  2020
- **Temperature-Dependent Contact Resistance to Nonvolatile Memory Materials** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Deshmukh, S., Yalon, E., Lian, F., Schauble, K. E., Xiong, F., Karpov, I. V., Pop, E.
  2019; 66 (9): 3816–21
- **Layer-Dependent Interfacial Transport and Optoelectrical Properties of MoS2 on Ultraflat Metals** *ACS APPLIED MATERIALS & INTERFACES*
  Lee, H., Deshmukh, S., Wen, J., Costa, V. Z., Schuder, J. S., Sanchez, M., Ichimura, A. S., Pop, E., Wang, B., Newaz, A. M.
  2019; 11 (34): 31543–50
- **Localized Triggering of the Insulator-Metal Transition in VO2 Using a Single Carbon Nanotube.** *ACS nano*
  Bohaichuk, S. M., Munoz Rojo, M., Pitner, G., McClellan, C. J., Lian, F., Li, J., Jeong, J., Samant, M. G., Parkin, S. S., Wong, H. P., Pop, E.
  2019
- **Thermal boundary conductance of two-dimensional MoS2 interfaces** *JOURNAL OF APPLIED PHYSICS*
  Suryavanshi, S., Gabourie, A. J., Farimani, A., Pop, E.
  2019; 126 (5)
- **Strain- and Strain-Rate-Invariant Conductance in a Stretchable and Compressible 3D Conducting Polymer Foam** *MATTER*
  Chen, G., Rastak, R., Wang, Y., Yan, H., Feig, V., Liu, Y., Jiang, Y., Chen, S., Lian, F., Molina-Lopez, F., Jin, L., Cui, K., Chung, et al
  2019; 1 (1): 205–18
- **Significant Phonon Drag Enables High Power Factor in the AlGaN/GaN Two-Dimensional Electron Gas.** *Nano letters*
  Yalamarthy, A. S., Munoz Rojo, M., Bruefach, A., Boone, D., Dowling, K. M., Satterthwaite, P. F., Goldhaber-Gordon, D., Pop, E., Senesky, D. G.
  2019
- **Understanding the switching mechanism of interfacial phase change memory** *JOURNAL OF APPLIED PHYSICS*
  Okabe, K. L., Sood, A., Yalon, E., Neumann, C. M., Asheghi, M., Pop, E., Goodson, K. E., Wong, H.
  2019; 125 (18)
- **Quasi-Ballistic Thermal Transport Across MoS2 Thin Films** *NANO LETTERS*
  Sood, A., Xiong, F., Chen, S., Cheaito, R., Lian, F., Asheghi, M., Cui, Y., Donadio, D., Goodson, K. E., Pop, E.
  2019; 19 (4): 2434–42

- **Strongly tunable anisotropic thermal transport in MoS2 by strain and lithium intercalation: first-principles calculations** *2D MATERIALS*
  Chen, S., Sood, A., Pop, E., Goodson, K. E., Donadio, D.
  2019; 6 (2)
- **Quasi-Ballistic Thermal Transport Across MoS2 Thin Films.** *Nano letters*
  Sood, A., Xiong, F., Chen, S., Cheaito, R., Lian, F., Asheghi, M., Cui, Y., Donadio, D., Goodson, K. E., Pop, E.
  2019
- **Thermal transport in layer-by-layer assembled polycrystalline graphene films** *NPJ 2D MATERIALS AND APPLICATIONS*
  Estrada, D., Li, Z., Choi, G., Dunham, S. N., Serov, A., Lee, J., Meng, Y., Lian, F., Wang, N. C., Perez, A., Haasch, R. T., Zuo, J., King, et al
  2019; 3
- **Ternary content-addressable memory with MoS2 transistors for massively parallel data search** *NATURE ELECTRONICS*
  Yang, R., Li, H., Smithe, K. K. H., Kim, T. R., Okabe, K., Pop, E., Fan, J. A., Wong, H.
  2019; 2 (3): 108–14
- **Plasmon-Resonant Enhancement of Photocatalysis on Monolayer WSe2** *ACS PHOTONICS*
  Chen, J., Bailey, C. S., Hong, Y., Wang, L., Cai, Z., Shen, L., Hou, B., Wang, Y., Shi, H., Sambur, J., Ren, W., Pop, E., Cronin, et al
  2019; 6 (3): 787–92
- **Energy-Efficient Indirectly Heated Phase Change RF Switch** *IEEE ELECTRON DEVICE LETTERS*
  Yalon, E., Datye, I. M., Moon, J., Son, K., Lee, K., Pop, E.
  2019; 40 (3): 455–58
- **Engineering thermal and electrical interface properties of phase change memory with monolayer MoS2** *APPLIED PHYSICS LETTERS*
  Neumann, C. M., Okabe, K. L., Yalon, E., Grady, R. W., Wong, H., Pop, E.
  2019; 114 (8)
- **Thermal transport in MoS2 from molecular dynamics using different empirical potentials** *PHYSICAL REVIEW B*
  Xu, K., Gabourie, A. J., Hashemi, A., Fan, Z., Wei, N., Farimani, A., Komsa, H., Krasheninnikov, A., Pop, E., Ala-Nissila, T.
  2019; 99 (5)
- **Spatial Separation of Carrier Spin by the Valley Hall Effect in Monolayer WSe2 Transistors.** *Nano letters*
  Barre, E., Incorvia, J. A., Kim, S. H., McClellan, C. J., Pop, E., Wong, H. P., Heinz, T. F.
  2019
- **3D Heterogeneous Integration with 2D Materials**
  McClellan, C., Bailey, C., Datye, I., Gabourie, A., Grady, R., Schauble, K., Vaziri, S., Pop, E., IEEE
  IEEE.2019: 89–90
- **Fast Spiking of a Mott VO2-Carbon Nanotube Composite Device.** *Nano letters*
  Bohaichuk, S. M., Kumar, S. n., Pitner, G. n., McClellan, C. J., Jeong, J. n., Samant, M. G., Wong, H. P., Parkin, S. S., Williams, R. S., Pop, E. n.
  2019
- **Contact Engineering High-Performance n-Type MoTe2 Transistors.** *Nano letters*
  Mleczko, M. J., Yu, A. C., Smyth, C. M., Chen, V. n., Shin, Y. C., Chatterjee, S. n., Tsai, Y. C., Nishi, Y. n., Wallace, R. M., Pop, E. n.
  2019
- **Publisher Correction: An electrochemical thermal transistor.** *Nature communications*
  Sood, A. n., Xiong, F. n., Chen, S. n., Wang, H. n., Selli, D. n., Zhang, J. n., McClellan, C. J., Sun, J. n., Donadio, D. n., Cui, Y. n., Pop, E. n., Goodson, K. E.
  2019; 10 (1): 4465
- **Reconfigurable Infrared Spectral Imaging with Robust Phase Change Materials**
  Moon, J., Seo, H., Son, K., Yalon, E., Lee, K., Flores, E., Candia, G., Pop, E.
  edited by George, T., Islam, M. S.
  SPIE-INT SOC OPTICAL ENGINEERING.2019
- **Dry Transfer of van der Waals Crystals to Noble Metal Surfaces To Enable Characterization of Buried Interfaces.** *ACS applied materials & interfaces*

Krayev, A. n., Bailey, C. S., Jo, K. n., Wang, S. n., Singh, A. n., Darlington, T. n., Liu, G. Y., Gradecak, S. n., Schuck, P. J., Pop, E. n., Jariwala, D. n.
2019

- **Reduction of hysteresis in MoS2 transistors using pulsed voltage measurements** *2D MATERIALS*
  Datye, I. M., Gabourie, A. J., English, C. D., Smithe, K. K. H., McClellan, C. J., Wang, N. C., Pop, E.
  2019; 6 (1)
- **Thermal transport across graphene step junctions** *2D MATERIALS*
  Rojo, M., Li, Z., Sievers, C., Bornstein, A. C., Yalon, E., Deshmukh, S., Vaziri, S., Bae, M., Xiong, F., Donadio, D., Pop, E.
  2019; 6 (1)
- **Recommended Methods to Study Resistive Switching Devices** *ADVANCED ELECTRONIC MATERIALS*
  Lanza, M., Wong, H., Pop, E., Ielmini, D., Strukov, D., Regan, B. C., Larcher, L., Villena, M. A., Yang, J., Goux, L., Belmonte, A., Yang, Y., Puglisi, et al
  2019; 5 (1)
- **Nanoelectronics and Heterogeneous Integration with 2D Materials**
  Pop, E., IEEE
  IEEE.2019
- **Process-induced anomalous current transport in graphene/InAlN/GaN heterostructured diodes**
  Satterthwaite, P. F., Yalamarthy, A., Vaziri, S., Rojo, M., Pop, E., Senesky, D. G., IEEE
  IEEE.2019
- **Research Update: Recent progress on 2D materials beyond graphene: From ripples, defects, intercalation, and valley dynamics to straintronics and power dissipation** *APL MATERIALS*
  Lin, Z., Lei, Y., Subramanian, S., Briggs, N., Wang, Y., Lo, C., Yalon, E., Lloyd, D., Wu, S., Koski, K., Clark, R., Das, S., Wallace, et al
  2018; 6 (8)
- **Electronic synapses made of layered two-dimensional materials** *NATURE ELECTRONICS*
  Shi, Y., Liang, X., Yuan, B., Chen, V., Li, H., Hui, F., Yu, Z., Yuan, F., Pop, E., Wong, H., Lanza, M.
  2018; 1 (8): 458–65
- **High-Field Transport and Velocity Saturation in Synthetic Monolayer MoS2** *NANO LETTERS*
  Smithe, K. K. H., English, C. D., Suryavanshi, S. V., Pop, E.
  2018; 18 (7): 4516–22
- **GST-on-silicon hybrid nanophotonic integrated circuits: a non-volatile quasi-continuously reprogrammable platform** *OPTICAL MATERIALS EXPRESS*
  Zheng, J., Khanolkar, A., Xu, P., Deshmukh, S., Myers, J., Frantz, J., Pop, E., Hendrickson, J., Doylend, J., Boechler, N., Majumdar, A.
  2018; 8 (6): 1551–61
- **Tuning Electrical and Thermal Transport in AlGaN/GaN Heterostructures via Buffer Layer Engineering** *ADVANCED FUNCTIONAL MATERIALS*
  Yalamarthy, A., So, H., Rojo, M., Suria, A. J., Xu, X., Pop, E., Senesky, D. G.
  2018; 28 (22)
- **Unipolar n-Type Black Phosphorus Transistors with Low Work Function Contacts** *NANO LETTERS*
  Wang, C., Incorvia, J. C., McClellan, C. J., Yu, A. C., Mleczko, M. J., Pop, E., Wong, H.
  2018; 18 (5): 2822–27
- **Probing the Optical Properties and Strain-Tuning of Ultrathin Mo1-&ITx&ITW&ITx&ITTe2** *NANO LETTERS*
  Aslan, O., Datye, I. M., Mleczko, M. J., Cheung, K., Krylyuk, S., Bruma, A., Kalish, I., Davydov, A. V., Pop, E., Heinz, T. F.
  2018; 18 (4): 2485–91
- **Ultra-low contact resistance in graphene devices at the Dirac point** *2D MATERIALS*
  Anzi, L., Mansouri, A., Pedrinazzi, P., Guerriero, E., Fiocco, M., Pesquera, A., Centeno, A., Zurutuza, A., Behnam, A., Carrion, E. A., Pop, E., Sordan, R.
  2018; 5 (2)
- **Flexural resonance mechanism of thermal transport across graphene-SiO2 interfaces** *JOURNAL OF APPLIED PHYSICS*

Ong, Z., Qiu, B., Xu, S., Ruan, X., Pop, E.
2018; 123 (11)

- **Carbon nanomaterials for non-volatile memories** *NATURE REVIEWS MATERIALS*
  Ahn, E. C., Wong, H., Pop, E.
  2018; 3 (3)
- **Microstructural origin of resistance-strain hysteresis in carbon nanotube thin film conductors** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Jin, L., Chortos, A., Lian, F., Pop, E., Linder, C., Bao, Z., Cai, W.
  2018; 115 (9): 1986–91
- **Detection of Methylation on dsDNA at Single-Molecule Level using Solid State Nanopores**
  Bello, J., Kim, Y., Banerjee, S., Smithe, K., Estrada, D., Myong, S., Nardulli, A., Pop, E., Bashir, R., Shim, J.
  CELL PRESS.2018: 216A
- **Theoretical potential for low energy consumption phase change memory utilizing electrostatically-induced structural phase transitions in 2D materials** *NPJ COMPUTATIONAL MATERIALS*
  Rehn, D. A., Li, Y., Pop, E., Reed, E. J.
  2018; 4
- **Low Power Nanoscale Switching of VO2 using Carbon Nanotube Heaters**
  Bohaichuk, S., Rojo, M., Pitner, G., McClellan, C., Lian, F., Li, J., Jeong, J., Samant, M., Parkin, S., Wong, H., Pop, E., IEEE
  IEEE.2018
- **3D Monolithic Stacked 1T1R cells using Monolayer MoS2 FET and hBN RRAM Fabricated at Low (150 degrees C) Temperature**
  Wang, C., McClellan, C., Shi, Y., Zheng, X., Chen, V., Lanza, M., Pop, E., Wong, H., IEEE
  IEEE.2018
- **The Heat Conduction Renaissance**
  Sood, A., Pop, E., Asheghi, M., Goodson, K. E., IEEE
  IEEE.2018: 1396–1402
- **Investigation of Monolayer MX2 as Sub-Nanometer Copper Diffusion Barriers**
  Smithe, K. K. H., Zhu, Z., Bailey, C. S., Pop, E., Yoon, A., IEEE
  IEEE.2018
- **Localized Heating in MoTe2-Based Resistive Memory Devices**
  Datye, I. M., Rojo, M., Yalon, E., Mleczko, M. J., Pop, E., IEEE
  IEEE.2018
- **Probing Self-Heating in RRAM Devices by Sub-100 nm Spatially Resolved Thermometry**
  Deshmukh, S., Rojo, M., Yalon, E., Vaziri, S., Pop, E., IEEE
  IEEE.2018
- **Sub-Thermionic Steep Switching in Hole-Doped WSe2 Transistors**
  McClellan, C. J., Yalon, E., Cai, L., Suryavanshi, S., Zheng, X., Pop, E., IEEE
  IEEE.2018
- **Energy-Efficient Phase Change Memory Programming by Nanosecond Pulses**
  Yalon, E., Okabe, K., Neumann, C. M., Wong, H., Pop, E., IEEE
  IEEE.2018
- **Temperature-Dependent Thermal Boundary Conductance of Monolayer MoS2 by Raman Thermometry** *ACS APPLIED MATERIALS & INTERFACES*
  Yalon, E., Aslan, O., Smithe, K. K. H., McClellan, C. J., Suryavanshi, S. V., Xiong, F., Sood, A., Neumann, C. M., Xu, X., Goodson, K. E., Heinz, T. F., Pop, E.
  2017; 9 (49): 43013–20
- **Studies of two-dimensional h-BN and MoS2 for potential diffusion barrier application in copper interconnect technology** *NPJ 2D MATERIALS AND APPLICATIONS*

Lo, C., Catalano, M., Smithe, K. K. H., Wang, L., Zhang, S., Pop, E., Kim, M. J., Chen, Z.
2017; 1

- **Dense Vertically Aligned Copper Nanowire Composites as High Performance Thermal Interface Materials** *ACS APPLIED MATERIALS & INTERFACES*
  Barako, M. T., Isaacson, S. G., Lian, F., Pop, E., Dauskardt, R. H., Goodson, K. E., Tice, J.
  2017; 9 (48): 42067–74
- **Dense Vertically Aligned Copper Nanowire Composites as High Performance Thermal Interface Materials.** *ACS applied materials & interfaces*
  Barako, M. T., Isaacson, S. G., Lian, F., Pop, E., Dauskardt, R. H., Goodson, K. E., Tice, J.
  2017; 9 (48): 42067-42074
- **Improved Hysteresis and Reliability of MoS2 Transistors With High-Quality CVD Growth and Al2O3 Encapsulation** *IEEE ELECTRON DEVICE LETTERS*
  Illarionov, Y., Smithe, K. K. H., Waltl, M., Knobloch, T., Pop, E., Grasser, T.
  2017; 38 (12): 1763–66
- **Spatially Resolved Thermometry of Resistive Memory Devices** *SCIENTIFIC REPORTS*
  Yalon, E., Deshmukh, S., Rojo, M., Lian, F., Neumann, C. M., Xiong, F., Pop, E.
  2017; 7: 15360
- **Detection of methylation on dsDNA using nanopores in a MoS2 membrane** *NANOSCALE*
  Shim, J., Banerjee, S., Qiu, H., Smithe, K. K. H., Estrada, D., Bello, J., Pop, E., Schulten, K., Bashir, R.
  2017; 9 (39): 14836–45
- **Low Variability in Synthetic Monolayer MoS2 Devices** *ACS NANO*
  Smithe, K. K. H., Suryavanshi, S. V., Rojo, M., Tedjarati, A. D., Pop, E.
  2017; 11 (8): 8456–63
- **.** *Nano letters*
  Cai, L., McClellan, C. J., Koh, A. L., Li, H., Yalon, E., Pop, E., Zheng, X.
  2017
- **High-Gain Graphene Transistors with a Thin AlOx Top-Gate Oxide.** *Scientific reports*
  Guerriero, E., Pedrinazzi, P., Mansouri, A., Habibpour, O., Winters, M., Rorsman, N., Behnam, A., Carrion, E. A., Pesquera, A., Centeno, A., Zurutuza, A., Pop, E., Zirath, et al
  2017; 7 (1): 2419-?
- **Photoresponse of Natural van der Waals Heterostructures.** *ACS nano*
  Ray, K., Yore, A. E., Mou, T., Jha, S., Smithe, K. K., Wang, B., Pop, E., Newaz, A. K.
  2017
- **Electronics.** *Nano letters*
  Yalon, E., McClellan, C. J., Smithe, K. K., Muñoz Rojo, M., Xu, R. L., Suryavanshi, S. V., Gabourie, A. J., Neumann, C. M., Xiong, F., Farimani, A. B., Pop, E.
  2017
- **Transistors by Ultra-High Vacuum Metal Deposition.** *Nano letters*
  English, C. D., Shine, G., Dorgan, V. E., Saraswat, K. C., Pop, E.
  2017; 17 (4): 2739-?
- **Intrinsic electrical transport and performance projections of synthetic monolayer MoS2 devices** *2D MATERIALS*
  Smithe, K. K., English, C. D., Suryavanshi, S. V., Pop, E.
  2017; 4 (1)
- **Sub-15 nm Nanowires Enabled by Cryo Pulsed Self-Aligned Nanotrench Ablation on Carbon Nanotubes**
  Deshmukh, S., Lian, F., Yalon, E., Pitner, G., Wang, H., Pop, E., IEEE
  IEEE.2017: 489–90
- **INVITED: In Quest of the Next Information Processing Substrate Extended Abstract**

Datta, S., Seabaugh, A., Niemier, M., Raychowdhury, A., Schlom, D., Jena, D., Xing, G., Wong, H., Pop, E., Salahuddin, S., Gupta, S., Guha, S., IEEE
IEEE.2017

- **Invited: A Systems Approach to Computing in Beyond CMOS Fabrics**
  Patil, A., Shanbhag, N., Varshney, L., Pop, E., Wong, H., Mitra, S., Rabaey, J., Weldon, J., Pileggi, L., Manipatruni, S., Nikonov, D., Young, I., IEEE
  IEEE.2017
- **Metasurfaces Based on Nano-Patterned Phase-Change Memory Materials**
  Colburn, S., Zhan, A., Deshmukh, S., Myers, J., Frantz, J., Pop, E., Majumdar, A., IEEE
  IEEE.2017
- **Effective n-type Doping of Monolayer MoS2 by AlOx**
  McClellan, C. J., Yalon, E., Smithe, K. K. H., Suryavanshi, S. V., Pop, E., IEEE
  IEEE.2017
- **2D Molybdenum Disulfide (MoS2) Transistors Driving RRAMs with 1T1R Configuration**
  Yang, R., Li, H., Smithe, K. K. H., Kim, T. R., Okabe, K., Pop, E., Fan, J. A., Wong, H., IEEE
  IEEE.2017
- **Thermal Boundary Conductance of the MoS2-SiO2 Interface**
  Suryavanshi, S. V., Gabourie, A. J., Farimani, A., Yalon, E., Pop, E., IEEE
  IEEE.2017: 26–29
- **Active metasurfaces based on phase-change memory material digital metamolecules**
  Colburn, S., Zhan, A., Majumdar, A., Deshmukh, S., Pop, E., Myers, J., Frantz, J., IEEE
  IEEE.2017: 5–8
- **Electronic, Thermal, and Unconventional Applications of 2D Materials**
  Pop, E., Yalon, E., Munoz-Rojo, M., Mleczko, M., English, C., Wang, N., Smithe, K., Suryavanshi, S., Datye, I., McClellan, C., Gabourie, A., IEEE
  IEEE.2017: 916–17
- **S2DS: Physics-based compact model for circuit simulation of two-dimensional semiconductor devices including non-idealities** *JOURNAL OF APPLIED PHYSICS*
  Suryavanshi, S. V., Pop, E.
  2016; 120 (22)
- **Gate tunneling current and quantum capacitance in metal-oxide-semiconductor devices with graphene gate electrodes** *APPLIED PHYSICS LETTERS*
  An, Y., Shekhawat, A., Behnam, A., Pop, E., Ural, A.
  2016; 109 (22)
- **Visualization of Defect-Induced Excitonic Properties of the Edges and Grain Boundaries in Synthesized Monolayer Molybdenum Disulfide** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Yore, A. E., Smithe, K. K., Crumrine, W., Miller, A., TUCK, J. A., Redd, B., Pop, E., Wang, B., Newaz, A. K.
  2016; 120 (42): 24080-24087
- **Interfaces.** *Nano letters*
  Koh, Y. K., Lyons, A. S., Bae, M., Huang, B., Dorgan, V. E., Cahill, D. G., Pop, E.
  2016; 16 (10): 6014-6020
- **SANTA: Self-aligned nanotrench ablation via Joule heating for probing sub-20 nm devices** *NANO RESEARCH*
  Xiong, F., Deshmukh, S., Hong, S., Dai, Y., Behnam, A., Lian, F., Pop, E.
  2016; 9 (10): 2950-2959
- **Role of Remote Interfacial Phonon (RIP) Scattering in Heat Transport Across Graphene/SiO2 Interfaces** *NANO LETTERS*
  Koh, Y. K., Lyons, A. S., Bae, M., Huang, B., Dorgan, V. E., Cahill, D. G., Pop, E.
  2016; 16 (10): 6014-6020
- **Electrical and Thermoelectric Transport by Variable Range Hopping in Thin Black Phosphorus Devices** *NANO LETTERS*
  Choi, S. J., Kim, B., Lee, T., Kim, Y. H., Li, Z., Pop, E., Kim, J., Song, J. H., Bae, M.

2016; 16 (7): 3969-3975

- **Role of Pressure in the Growth of Hexagonal Boron Nitride Thin Films from Ammonia-Borane** *CHEMISTRY OF MATERIALS*
  Koepke, J. C., Wood, J. D., Chen, Y., Schmucker, S. W., Liu, X., Chang, N. N., Nienhaus, L., Do, J. W., Carrion, E. A., Hewaparakrama, J., Ranaarajan, A., Datye, I., Mehta, et al
  2016; 28 (12): 4169-4179

- **Kinetic Study of Hydrogen Evolution Reaction over Strained MoS2 with Sulfur Vacancies Using Scanning Electrochemical Microscopy** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  Li, H., Du, M., Mleczko, M. J., Koh, A. L., Nishi, Y., Pop, E., Bard, A. J., Zheng, X.
  2016; 138 (15): 5123-5129

- **Thermal conductivity of chirality-sorted carbon nanotube networks** *APPLIED PHYSICS LETTERS*
  Lian, F., Llinas, J. P., Li, Z., Estrada, D., Pop, E.
  2016; 108 (10)

- **Energy-Efficient Abundant-Data Computing: The N3XT 1,000x** *COMPUTER*
  Aly, M. M., Gao, M., Hills, G., Lee, C., Pitner, G., Shulaker, M. M., Wu, T. F., Asheghi, M., Bokor, J., Franchetti, F., Goodson, K. E., Kozyrakis, C., Markov, et al
  2015; 48 (12): 24-33

- **Energy-Efficient Phase-Change Memory with Graphene as a Thermal Barrier.** *Nano letters*
  Ahn, C., Fong, S. W., Kim, Y., Lee, S., Sood, A., Neumann, C. M., Asheghi, M., Goodson, K. E., Pop, E., Wong, H. P.
  2015; 15 (10): 6809-6814

- **Energy-Efficient Phase-Change Memory with Graphene as a Thermal Barrier** *NANO LETTERS*
  Ahn, C., Fong, S. W., Kim, Y., Lee, S., Sood, A., Neumann, C. M., Ashegh, M., Goodson, K. E., Pop, E., Wong, H. P.
  2015; 15 (10): 6809-6814

- **Engineering Ultra-Low Work Function of Graphene** *NANO LETTERS*
  Yuan, H., Chang, S., Bargatin, I., Wang, N. C., Riley, D. C., Wang, H., Schwede, J. W., Provine, J., Pop, E., Shen, Z., Pianetta, P. A., Melosh, N. A., Howe, et al
  2015; 15 (10): 6475-6480

- **Li Intercalation in MoS2: In Situ Observation of Its Dynamics and Tuning Optical and Electrical Properties** *NANO LETTERS*
  Xiong, F., Wang, H., Liu, X., Sun, J., Brongersma, M., Pop, E., Cui, Y.
  2015; 15 (10): 6777-6784

- **Nanoscale phase change memory with graphene ribbon electrodes** *APPLIED PHYSICS LETTERS*
  Behnam, A., Xiong, F., Cappelli, A., Wang, N. C., Carrion, E. A., Hong, S., Dai, Y., Lyons, A. S., Chow, E. K., Piccinini, E., Jacoboni, C., Pop, E.
  2015; 107 (12)

- **Forward-bias diode parameters, electronic noise, and photoresponse of graphene/silicon Schottky junctions with an interfacial native oxide layer** *JOURNAL OF APPLIED PHYSICS*
  An, Y., Behnam, A., Pop, E., Bosman, G., Ural, A.
  2015; 118 (11)

- **A Compact Virtual-Source Model for Carbon Nanotube FETs in the Sub-10-nm Regime-Part II: Extrinsic Elements, Performance Assessment, and Design Optimization** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Lee, C., Pop, E., Franklin, A. D., Haensch, W., Wong, H. P.
  2015; 62 (9): 3070-3078

- **A Compact Virtual-Source Model for Carbon Nanotube FETs in the Sub-10-nm Regime-Part I: Intrinsic Elements** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Lee, C., Pop, E., Franklin, A. D., Haensch, W., Wong, H. P.
  2015; 62 (9): 3061-3069

- **Graphene-Based Platform for Infrared Near-Field Nanospectroscopy of Water and Biological Materials in an Aqueous Environment.** *ACS nano*
  Khatib, O., Wood, J. D., McLeod, A. S., Goldflam, M. D., Wagner, M., Damhorst, G. L., Koepke, J. C., Doidge, G. P., Rangarajan, A., Bashir, R., Pop, E., Lyding, J. W., Thiemens, et al

2015; 9 (8): 7968-7975

- **Graphene-Based Platform for Infrared Near-Field Nanospectroscopy of Water and Biological Materials in an Aqueous Environment** *ACS NANO*
  Khatib, O., Wood, J. D., McLeod, A. S., Goldflam, M. D., Wagner, M., Damhorst, G. L., Koepke, J. C., Doidge, G. P., Rangarajan, A., Bashir, R., Pop, E., Lyding, J. W., Thiemens, et al
  2015; 9 (8): 7968-7975
- **Bright visible light emission from graphene** *NATURE NANOTECHNOLOGY*
  Kim, Y. D., Kim, H., Cho, Y., Ryoo, J. H., Park, C., Kim, P., Kim, Y. S., Lee, S., Li, Y., Park, S., Yoo, Y. S., Yoon, D., Dorgan, et al
  2015; 10 (8): 676-681
- **Solution-Mediated Selective Nanosoldering of Carbon Nanotube Junctions for Improved Device Performance** *ACS NANO*
  Do, J., Chang, N. N., Estrada, D., Lian, F., Cha, H., Duan, X. J., Haasch, R. T., Pop, E., Girolami, G. S., Lyding, J. W.
  2015; 9 (5): 4806-4813
- **Annealing free, clean graphene transfer using alternative polymer scaffolds.** *Nanotechnology*
  Wood, J. D., Doidge, G. P., Carrion, E. A., Koepke, J. C., Kaitz, J. A., Datye, I., Behnam, A., Hewaparakrama, J., Aruin, B., Chen, Y., Dong, H., Haasch, R. T., Lyding, et al
  2015; 26 (5): 055302-?
- **Annealing free, clean graphene transfer using alternative polymer scaffolds.** *Nanotechnology*
  Wood, J. D., Doidge, G. P., Carrion, E. A., Koepke, J. C., Kaitz, J. A., Datye, I., Behnam, A., Hewaparakrama, J., Aruin, B., Chen, Y., Dong, H., Haasch, R. T., Lyding, et al
  2015; 26 (5): 055302-?
- **Scaling of graphene integrated circuits** *NANOSCALE*
  Bianchi, M., Guerriero, E., Fiocco, M., Alberti, R., Polloni, L., Behnam, A., Carrion, E. A., Pop, E., Sordan, R.
  2015; 7 (17): 8076-8083
- **Heterogeneous nanometer-scale Joule and Peltier effects in sub-25 nm thin phase change memory devices** *JOURNAL OF APPLIED PHYSICS*
  Grosse, K. L., Pop, E., King, W. P.
  2014; 116 (12)
- **Nanometer-scale temperature imaging for independent observation of Joule and Peltier effects in phase change memory devices** *REVIEW OF SCIENTIFIC INSTRUMENTS*
  Grosse, K. L., Pop, E., King, W. P.
  2014; 85 (9)
- **Nanometer-scale temperature imaging for independent observation of Joule and Peltier effects in phase change memory devices.** *The Review of scientific instruments*
  Grosse, K. L., Pop, E., King, W. P.
  2014; 85 (9): 094904
- **Phase change materials and phase change memory** *MRS BULLETIN*
  Raoux, S., Xiong, F., Wuttig, M., Pop, E.
  2014; 39 (8): 703-710
- **Theoretical analysis of high-field transport in graphene on a substrate** *JOURNAL OF APPLIED PHYSICS*
  Serov, A. Y., Ong, Z., Fischetti, M. V., Pop, E.
  2014; 116 (3)
- **Substrate-supported thermometry platform for nanomaterials like graphene, nanotubes, and nanowires** *APPLIED PHYSICS LETTERS*
  Li, Z., Bae, M., Pop, E.
  2014; 105 (2)
- **Self-aligned Cu etch mask for individually addressable metallic and semiconducting carbon nanotubes.** *ACS nano*
  Jiang, Y., Xiong, F., Tsai, C. L., Ozel, T., Pop, E., Shim, M.
  2014; 8 (6): 6500-8

- **Ultrafast terahertz-induced response of GeSbTe phase-change materials** *APPLIED PHYSICS LETTERS*
  Shu, M. J., Zalden, P., Chen, F., Weems, B., Chatzakis, I., Xiong, F., Jeyasingh, R., Hoffmann, M. C., Pop, E., Wong, H. P., Wuttig, M., Lindenberg, A. M.
  2014; 104 (25)

- **Monolithic III-V Nanowire Solar Cells on Graphene via Direct van der Waals Epitaxy.** *Advanced materials*
  Mohseni, P. K., Behnam, A., Wood, J. D., Zhao, X., Yu, K. J., Wang, N. C., Rockett, A., Rogers, J. A., Lyding, J. W., Pop, E., Li, X.
  2014; 26 (22): 3755-3760

- **Self-Aligned Cu Etch Mask for Individually Addressable Metallic and Semiconducting Carbon Nanotubes** *ACS NANO*
  Jiang, Y., Xiong, F., Tsai, C., Ozel, T., Pop, E., Shim, M.
  2014; 8 (6): 6500-6508

- **Hysteresis-Free Nanosecond Pulsed Electrical Characterization of Top-Gated Graphene Transistors** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Carrion, E. A., Serov, A. Y., Islam, S., Behnam, A., Malik, A., Xiong, F., Bianchi, M., Sordan, R., Pop, E.
  2014; 61 (5): 1583-1589

- **Carbon Nanotube Circuit Integration up to Sub-20 nm Channel Lengths** *ACS NANO*
  Shulaker, M. M., Van Rethy, J., Wu, T. F., Liyanage, L. S., Wei, H., Li, Z., Pop, E., Gielen, G., Wong, H. P., Mitra, S.
  2014; 8 (4): 3434-3443

- **Nanoscale thermal transport. II. 2003-2012** *APPLIED PHYSICS REVIEWS*
  Cahill, D. G., Braun, P. V., Chen, G., Clarke, D. R., Fan, S., Goodson, K. E., Keblinski, P., King, W. P., Mahan, G. D., Majumdar, A., Maris, H. J., Phillpot, S. R., Pop, et al
  2014; 1 (1)

- **High-Field and Thermal Transport in 2D Atomic Layer Devices** *Conference on Micro- and Nanotechnology Sensors, Systems, and Applications VI*
  Serov, A., Dorgan, V. E., Behnam, A., English, C. D., Li, Z., Islam, S., Pop, E.
  SPIE-INT SOC OPTICAL ENGINEERING.2014

- **Energy Efficiency and Conversion in 1D and 2D Electronics** *44th European Solid-State Device Research Conference (ESSDERC)*
  Pop, E., English, C., Xiong, F., Lian, F., Serov, A., Li, Z., Islam, S., Dorgan, V.
  IEEE.2014: 35–37

- **Multi-Valley Hi :h-Field Transport in 2-Dimensional MoS2 Transistors** *72nd Annual Device Research Conference (DRC)*
  Serov, A. Y., Dorgan, V. E., English, C. D., Pop, E.
  IEEE.2014: 183–184

- **Improving Contact Resistance in MoS2 Field Effect Transistors** *72nd Annual Device Research Conference (DRC)*
  English, C. D., Shine, G., Dorgan, V. E., Saraswat, K. C., Pop, E.
  IEEE.2014: 193–194

- **Variability of Graphene Mobility and Contacts: Surface Effects, Doping and Strain** *72nd Annual Device Research Conference (DRC)*
  Carrion, E. A., Wood, J. D., Behman, A., Tung, M., Lyding, J. W., Pop, E.
  IEEE.2014: 199–200

- **Nanosoldering Carbon Nanotube Junctions by Local Chemical Vapor Deposition for Improved Device Performance** *NANO LETTERS*
  Do, J., Estrada, D., Xie, X., Chang, N. N., Mallek, J., Girolami, G. S., Rogers, J. A., Pop, E., Lyding, J. W.
  2013; 13 (12): 5844-5850

- **Helical Carbon Nanotubes Enhance the Early Immune Response and Inhibit Macrophage-Mediated Phagocytosis of Pseudomonas aeruginosa** *PLOS ONE*
  Walling, B. E., Kuang, Z., Hao, Y., Estrada, D., Wood, J. D., Lian, F., Miller, L. A., Shah, A. B., Jeffries, J. L., Haasch, R. T., Lyding, J. W., Pop, E., Lau, et al
  2013; 8 (11)

- **High field breakdown characteristics of carbon nanotube thin film transistors** *NANOTECHNOLOGY*
  Gupta, M. P., Behnam, A., Lian, F., Estrada, D., Pop, E., Kumar, S.

2013; 24 (40)

- **High-field electrical and thermal transport in suspended graphene.** *Nano letters*
  Dorgan, V. E., Behnam, A., Conley, H. J., Bolotin, K. I., Pop, E.
  2013; 13 (10): 4581-4586
- **Conductive preferential paths of hot carriers in amorphous phase-change materials** *APPLIED PHYSICS LETTERS*
  Cappelli, A., Piccinini, E., Xiong, F., Behnam, A., Brunetti, R., Rudan, M., Pop, E., Jacoboni, C.
  2013; 103 (8)
- **Compact Model for Carbon Nanotube Field-Effect Transistors Including Nonidealities and Calibrated With Experimental Data Down to 9-nm Gate Length** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Luo, J., Wei, L., Lee, C., Franklin, A. D., Guan, X., Pop, E., Antoniadis, D. A., Wong, H. P.
  2013; 60 (6): 1834-1843
- **Gigahertz Integrated Graphene Ring Oscillators** *ACS NANO*
  Guerriero, E., Polloni, L., Bianchi, M., Behnam, A., Carrion, E., Rizzi, L. G., Pop, E., Sordan, R.
  2013; 7 (6): 5588-5594
- **Resistive Random Access Memory Enabled by Carbon Nanotube Crossbar Electrodes** *ACS NANO*
  Tsai, C., Xiong, F., Pop, E., Shim, M.
  2013; 7 (6): 5360-5366
- **Direct observation of nanometer-scale Joule and Peltier effects in phase change memory devices** *APPLIED PHYSICS LETTERS*
  Grosse, K. L., Xiong, F., Hong, S., King, W. P., Pop, E.
  2013; 102 (19)
- **Signatures of dynamic screening in interfacial thermal transport of graphene** *PHYSICAL REVIEW B*
  Ong, Z., Fischetti, M. V., Serov, A. Y., Pop, E.
  2013; 87 (19)
- **The Role of External Defects in Chemical Sensing of Graphene Field-Effect Transistors** *NANO LETTERS*
  Kumar, B., Min, K., Bashirzadeh, M., Farimani, A. B., Bae, M., Estrada, D., Kim, Y. D., YASAEI, P., Park, Y. D., Pop, E., Aluru, N. R., Salehi-Khojin, A.
  2013; 13 (5): 1962-1968
- **Using nanoscale thermocapillary flows to create arrays of purely semiconducting single-walled carbon nanotubes** *NATURE NANOTECHNOLOGY*
  Jin, S. H., Dunham, S. N., Song, J., Xie, X., Kim, J., Lu, C., Islam, A., Du, F., Kim, J., Felts, J., Li, Y., Xiong, F., Wahab, et al
  2013; 8 (5): 347-355
- **InxGa1-xAs Nanowire Growth on Graphene: van der Waals Epitaxy Induced Phase Segregation** *NANO LETTERS*
  Mohseni, P. K., Behnam, A., Wood, J. D., English, C. D., Lyding, J. W., Pop, E., Li, X.
  2013; 13 (3): 1153-1161
- **Role of Joule Heating on Current Saturation and Transient Behavior of Graphene Transistors** *IEEE ELECTRON DEVICE LETTERS*
  Islam, S., Li, Z., Dorgan, V. E., Bae, M., Pop, E.
  2013; 34 (2): 166-168
- **Self-Aligned Nanotube-Nanowire Phase Change Memory** *NANO LETTERS*
  Xiong, F., Bae, M., Dai, Y., Liao, A. D., Behnam, A., Carrion, E. A., Hong, S., Ielmini, D., Pop, E.
  2013; 13 (2): 464-469
- **Effect of grain boundaries on thermal transport in graphene** *APPLIED PHYSICS LETTERS*
  Serov, A. Y., Ong, Z., Pop, E.
  2013; 102 (3)
- **Metal-semiconductor-metal photodetectors based on graphene/p-type silicon Schottky junctions** *APPLIED PHYSICS LETTERS*
  An, Y., Behnam, A., Pop, E., Ural, A.
  2013; 102 (1)

- **Atomic-Scale Evidence for Potential Barriers and Strong Carrier Scattering at Graphene Grain Boundaries: A Scanning Tunneling Microscopy Study** *ACS NANO*
  Koepke, J. C., Wood, J. D., Estrada, D., Ong, Z., He, K. T., Pop, E., Lyding, J. W.
  2013; 7 (1): 75-86
- **Substrate Dependent High-Field Transport of Graphene Transistors** *71st Device Research Conference (DRC)*
  Islam, S., Serov, A. Y., Meric, I., Shepard, K. L., Pop, E.
  IEEE.2013: 35–36
- **Realistic Simulation of Graphene Transistors Including Non-Ideal Electrostatics** *71st Device Research Conference (DRC)*
  Serov, A. Y., Islam, S., Pop, E.
  IEEE.2013: 31–32
- **Reliability, Failure, and Fundamental Limits of Graphene and Carbon Nanotube Interconnects** *IEEE International Electron Devices Meeting (IEDM)*
  Liao, A. D., Behnam, A., Dorgan, V. E., Li, Z., Pop, E.
  IEEE.2013
- **Novel 3D random-network model for threshold switching of phase-change memories** *IEEE International Electron Devices Meeting (IEDM)*
  Piccinini, E., Cappelli, A., Xiong, F., Behnam, A., Buscemi, F., Brunetti, R., Rudan, M., Pop, E., Jacoboni, C.
  IEEE.2013
- **High-Field Transport and Thermal Reliability of Sorted Carbon Nanotube Network Devices** *ACS NANO*
  Behnam, A., Sangwan, V. K., Zhong, X., Lian, F., Estrada, D., Jariwala, D., Hoag, A. J., Lauhon, L. J., Marks, T. J., Hersam, M. C., Pop, E.
  2013; 7 (1): 482-490
- **Electrochemistry at the Edge of a Single Graphene Layer in a Nanopore** *ACS NANO*
  Banerjee, S., Shim, J., Rivera, J., Jin, X., Estrada, D., Solovyeva, V., You, X., Pak, J., Pop, E., Aluru, N., Bashir, R.
  2013; 7 (1): 834-843
- **Impact of thermal boundary conductances on power dissipation and electrical breakdown of carbon nanotube network transistors** *JOURNAL OF APPLIED PHYSICS*
  Gupta, M. P., Chen, L., Estrada, D., Behnam, A., Pop, E., Kumar, S.
  2012; 112 (12)
- **Quantitative Thermal Imaging of Single-Walled Carbon Nanotube Devices by Scanning Joule Expansion Microscopy** *ACS NANO*
  Xie, X., Grosse, K. L., Song, J., Lu, C., Dunham, S., Du, F., Islam, A. E., Li, Y., Zhang, Y., Pop, E., Huang, Y., King, W. P., Rogers, et al
  2012; 6 (11): 10267-10275
- **Cascading Wafer-Scale Integrated Graphene Complementary Inverters under Ambient Conditions** *NANO LETTERS*
  Rizzi, L. G., Bianchi, M., Behnam, A., Carrion, E., Guerriero, E., Polloni, L., Pop, E., Sordan, R.
  2012; 12 (8): 3948-3953
- **Scanning Tunneling Microscopy Study and Nanomanipulation of Graphene-Coated Water on Mica** *NANO LETTERS*
  He, K. T., Wood, J. D., Doidge, G. P., Pop, E., Lyding, J. W.
  2012; 12 (6): 2665-2672
- **Effect of Carbon Nanotube Network Morphology on Thin Film Transistor Performance** *NANO RESEARCH*
  Timmermans, M. Y., Estrada, D., Nasibulin, A. G., Wood, J. D., Behnam, A., Sun, D., Ohno, Y., Lyding, J. W., Hassanien, A., Pop, E., Kauppinen, E. I.
  2012; 5 (5): 307-319
- **Effects of tip-nanotube interactions on atomic force microscopy imaging of carbon nanotubes** *NANO RESEARCH*
  Alizadegan, R., Liao, A. D., Xiong, F., Pop, E., Hsia, K. J.
  2012; 5 (4): 235-247
- **Nanometalization of single-wall carbon nanotubes and graphene quantum dots** *Symposium on Ionic Liquids - Science and Applications / 243rd National Spring Meeting of the American-Chemical-Society*
  Ye, W., Martin, P. A., Kumar, N., Estrada, D., Daly, S. R., Rockett, A. A., Abelson, J. R., Pop, E., Girolami, G. S., Lyding, J. W.
  AMER CHEMICAL SOC.2012

- **New Technique of DNA Sensing: Nanoribbon Transverse Electrodes** *56th Annual Meeting of the Biophysical-Society*
  Solovyeva, V., Chow, E., Bae, M., Estrada, D., Banerjee, S., Behnam, A., Dorgan, V. E., Chang, W., Pop, E., Bashir, R.
  CELL PRESS.2012: 428A–428A
- **Chemical sensors based on randomly stacked graphene flakes** *APPLIED PHYSICS LETTERS*
  Salehi-Khojin, A., Estrada, D., Lin, K. Y., Ran, K., Haasch, R. T., Zuo, J., Pop, E., Masel, R. I.
  2012; 100 (3)
- **Atomic-scale Study of Scattering and Electronic Properties of CVD Graphene Grain Boundaries** *12th IEEE International Conference on Nanotechnology (IEEE-NANO)*
  Koepke, J. C., Wood, J. D., Estrada, D., Ong, Z., Xiong, F., Pop, E., Lyding, J. W.
  IEEE.2012
- **IMPACT OF CONTACT RESISTANCES ON ELECTRICAL AND THERMAL TRANSPORT IN CARBON NANOTUBE NETWORK TRANSISTORS** *3rd ASME Micro/Nanoscale Heat and Mass Transfer International Conference (MNHMT2012)*
  Gupta, M. P., Estrada, D., Pop, E., Kumar, S.
  AMER SOC MECHANICAL ENGINEERS.2012: 769–776
- **Scanning Tunneling Microscopy Characterization of Graphene-coated Few-layered Water on Mica** *12th IEEE International Conference on Nanotechnology (IEEE-NANO)*
  He, K. T., Wood, J. D., Doidge, G. P., Pop, E., Lyding, J. W.
  IEEE.2012
- **Nanosoldering Carbon Nanotube Junctions with Metal via Local Chemical Vapor Deposition for Improved Device Performance** *12th IEEE International Conference on Nanotechnology (IEEE-NANO)*
  Do, J., Estrada, D., Xie, X., Chang, N. N., Girolami, G. S., Rogers, J. A., Pop, E., Lyding, J. W.
  IEEE.2012
- **Graphene Nanopores for Nucleic Acid Analysis** *12th IEEE International Conference on Nanotechnology (IEEE-NANO)*
  Shim, J., Solovyeva, V., Estrada, D., Banerjee, S., Rivera, J., Pop, E., Bashir, R.
  IEEE.2012
- **Improved Graphene Growth and Fluorination on Cu with Clean Transfer to Surfaces** *12th IEEE International Conference on Nanotechnology (IEEE-NANO)*
  Wood, J. D., Schmucker, S. W., Raasch, R. T., Doidge, G. P., Nienhaus, L., Damhorst, G. L., Lyons, A. S., Gruebele, M., Bashir, R., Pop, E., Lyding, J. W.
  IEEE.2012
- **Stacked Graphene-Al2O3 Nanopore Sensors for Sensitive Detection of DNA and DNA-Protein Complexes** *ACS NANO*
  Venkatesan, B. M., Estrada, D., Banerjee, S., Jin, X., Dorgan, V. E., Bae, M., Aluru, N. R., Pop, E., Bashir, R.
  2012; 6 (1): 441-450
- **Polycrystalline Graphene Ribbons as Chemiresistors** *ADVANCED MATERIALS*
  Salehi-Khojin, A., Estrada, D., Lin, K. Y., Bae, M., Xiong, F., Pop, E., Masel, R. I.
  2012; 24 (1): 53-?
- **Pressure tuning of the thermal conductance of weak interfaces** *PHYSICAL REVIEW B*
  Hsieh, W., Lyons, A. S., Pop, E., Keblinski, P., Cahill, D. G.
  2011; 84 (18)
- **A Web Service and Interface for Remote Electronic Device Characterization** *IEEE TRANSACTIONS ON EDUCATION*
  Dutta, S., Prakash, S., Estrada, D., Pop, E.
  2011; 54 (4): 646-651
- **Effects of Polycrystalline Cu Substrate on Graphene Growth by Chemical Vapor Deposition** *NANO LETTERS*
  Wood, J. D., Schmucker, S. W., Lyons, A. S., Pop, E., Lyding, J. W.
  2011; 11 (11): 4547-4554
- **Reduction of phonon lifetimes and thermal conductivity of a carbon nanotube on amorphous silica** *PHYSICAL REVIEW B*
  Ong, Z., Pop, E., Shiomi, J.

2011; 84 (16)

- **Scaling of High-Field Transport and Localized Heating in Graphene Transistors** *ACS NANO*
  Bae, M., Islam, S., Dorgan, V. E., Pop, E.
  2011; 5 (10): 7936-7944
- **Electronic, optical and thermal properties of the hexagonal and rocksalt-like Ge2Sb2Te5 chalcogenide from first-principle calculations** *JOURNAL OF APPLIED PHYSICS*
  Tsafack, T., Piccinini, E., Lee, B., Pop, E., Rudan, M.
  2011; 110 (6)
- **Stretchable, Transparent Graphene Interconnects for Arrays of Microscale Inorganic Light Emitting Diodes on Rubber Substrates** *NANO LETTERS*
  Kim, R., Bae, M., Kim, D. G., Cheng, H., Kim, B. H., Kim, D., Li, M., Wu, J., Du, F., Kim, H., Kim, S., Estrada, D., Hong, et al
  2011; 11 (9): 3881-3886
- **Effect of substrate modes on thermal transport in supported graphene** *PHYSICAL REVIEW B*
  Ong, Z., Pop, E.
  2011; 84 (7)
- **Electrical power dissipation in semiconducting carbon nanotubes on single crystal quartz and amorphous SiO2** *APPLIED PHYSICS LETTERS*
  Tsai, C., liao, A., Pop, E., Shim, M.
  2011; 99 (5)
- **Thermally Limited Current Carrying Ability of Graphene Nanoribbons** *PHYSICAL REVIEW LETTERS*
  Liao, A. D., Wu, J. Z., Wang, X., Tahy, K., Jena, D., Dai, H., Pop, E.
  2011; 106 (25)
- **Nanoscale Joule heating, Peltier cooling and current crowding at graphene-metal contacts** *NATURE NANOTECHNOLOGY*
  Grosse, K. L., Bae, M., Lian, F., Pop, E., King, W. P.
  2011; 6 (5): 287-290
- **Imaging dissipation and hot spots in carbon nanotube network transistors** *APPLIED PHYSICS LETTERS*
  Estrada, D., Pop, E.
  2011; 98 (7)
- **Reliably Counting Atomic Planes of Few-Layer Graphene (n > 4)** *ACS NANO*
  Koh, Y. K., Bae, M., Cahill, D. G., Pop, E.
  2011; 5 (1): 269-274
- **Imaging, Simulation, and Electrostatic Control of Power Dissipation in Graphene Devices** *NANO LETTERS*
  Bae, M., Ong, Z., Estrada, D., Pop, E.
  2010; 10 (12): 4787-4793
- **Frequency and polarization dependence of thermal coupling between carbon nanotubes and SiO2** *JOURNAL OF APPLIED PHYSICS*
  Ong, Z., Pop, E.
  2010; 108 (10)
- **Thermal dissipation and variability in electrical breakdown of carbon nanotube devices** *PHYSICAL REVIEW B*
  liao, A., Alizadegan, R., Ong, Z., Dutta, S., Xiong, F., Hsia, K. J., Pop, E.
  2010; 82 (20)
- **Heat Conduction across Monolayer and Few-Layer Graphenes** *NANO LETTERS*
  Koh, Y. K., Bae, M., Cahill, D. G., Pop, E.
  2010; 10 (11): 4363-4368
- **Mobility and saturation velocity in graphene on SiO2** *APPLIED PHYSICS LETTERS*
  Dorgan, V. E., Bae, M., Pop, E.
  2010; 97 (8)

- **Molecular dynamics simulation of thermal boundary conductance between carbon nanotubes and SiO2** *PHYSICAL REVIEW B*
  Ong, Z., Pop, E.
  2010; 81 (15)
- **Covalent Functionalization and Electron-Transfer Properties of Vertically Aligned Carbon Nanofibers: The Importance of Edge-Plane Sites** *CHEMISTRY OF MATERIALS*
  Landis, E. C., Klein, K. L., Iiao, A., Pop, E., Hensley, D. K., Melechko, A. V., Hamers, R. J.
  2010; 22 (7): 2357-2366
- **Reduced Thermal Conductivity in Nanoengineered Rough Ge and GaAs Nanowires** *NANO LETTERS*
  Martin, P. N., Aksamija, Z., Pop, E., Ravaioli, U.
  2010; 10 (4): 1120-1124
- **Reduction of hysteresis for carbon nanotube mobility measurements using pulsed characterization** *NANOTECHNOLOGY*
  Estrada, D., Dutta, S., Iiao, A., Pop, E.
  2010; 21 (8)
- **Topography and refractometry of nanostructures using spatial light interference microscopy** *OPTICS LETTERS*
  Wang, Z., Chun, I. S., Li, X., Ong, Z., Pop, E., Millet, L., Gillette, M., Popescu, G.
  2010; 35 (2): 208-210
- **Infrared Imaging of Heat Dissipation in Graphene Transistors** *2nd International Symposium on Graphene, Ge/III-V and Emerging Materials For Post-CMOS Applications / 217th Meeting of the Electrochemical Society (ECS)*
  Bae, M., Ong, Z., Estrada, D., Pop, E.
  ELECTROCHEMICAL SOC INC.2010: 51–62
- **Modeling of the Voltage Snap-Back in Amorphous-GST Memory Devices** *15th International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2010)*
  Rudan, M., Giovanardi, F., Tsafack, T., Xiong, F., Piccinini, E., Buscemi, F., Liao, A., Pop, E., Brunetti, R., JACOBONI, C.
  IEEE.2010: 257–260
- **Inducing chalcogenide phase change with ultra-narrow carbon nanotube heaters** *APPLIED PHYSICS LETTERS*
  Xiong, F., Iiao, A., Pop, E.
  2009; 95 (24)
- **Multiband Mobility in Semiconducting Carbon Nanotubes** *IEEE ELECTRON DEVICE LETTERS*
  Zhao, Y., Liao, A., Pop, E.
  2009; 30 (10): 1078-1080
- **Compact Thermal Model for Vertical Nanowire Phase-Change Memory Cells** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Chen, I., Pop, E.
  2009; 56 (7): 1523-1528
- **Electrical and Thermal Coupling to a Single-Wall Carbon Nanotube Device Using an Electrothermal Nanoprobe** *NANO LETTERS*
  Lee, J., Iiao, A., Pop, E., King, W. P.
  2009; 9 (4): 1356-1361
- **Impact of Phonon-Surface Roughness Scattering on Thermal Conductivity of Thin Si Nanowires** *PHYSICAL REVIEW LETTERS*
  Martin, P., Aksamija, Z., Pop, E., Ravaioli, U.
  2009; 102 (12)
- **A TWO-TEMPERATURE MODEL OF NARROW-BODY SILICON TRANSISTORS UNDER STEADY STATE AND TRANSIENT OPERATION** *3rd Energy Nanotechnology International Conference*
  Ong, Z., Pop, E.
  AMER SOC MECHANICAL ENGINEERS.2009: 97–108
- **Prediction of Reduced Thermal Conductivity in Nano-Engineered Rough Semiconductor Nanowires** *16th International Conference on Electron Dynamics in Semiconductors, Optoelectronics and Nanostructures (EDISON 16)*
  Martin, P. N., Aksamija, Z., Pop, E., Ravaioli, U.
  IOP PUBLISHING LTD.2009

- **ELECTRON-PHONON INTERACTION AND JOULE HEATING IN NANOSTRUCTURES** *3rd Energy Nanotechnology International Conference*
  Pop, E.
  AMER SOC MECHANICAL ENGINEERS.2009: 129–132
- **Comparison of Energy Relaxation in One-Dimensional Thermionic and Tunneling Transistors** *9th IEEE Conference on Nanotechnology (IEEE-NANO)*
  Ramasubramanian, B., Pop, E.
  IEEE.2009: 496–499
- **ELECTRON-PHONON INTERACTION AND JOULE HEATING IN NANOSTRUCTURES** *3rd Energy Nanotechnology International Conference*
  Pop, E.
  AMER SOC MECHANICAL ENGINEERS.2009: 129–132
- **Comparison of Energy Relaxation in One-Dimensional Thermionic and Tunneling Transistors** *9th IEEE Conference on Nanotechnology (IEEE-NANO)*
  Ramasubramanian, B., Pop, E.
  IEEE.2009: 496–499
- **The role of electrical and thermal contact resistance for Joule breakdown of single-wall carbon nanotubes** *NANOTECHNOLOGY*
  Pop, E.
  2008; 19 (29)
- **Thermal properties of metal-coated vertically aligned single-wall nanotube arrays** *JOURNAL OF HEAT TRANSFER-TRANSACTIONS OF THE ASME*
  Panzer, M. A., Zhang, G., Mann, D., Hu, X., Pop, E., Dai, H., Goodson, K. E.
  2008; 130 (5)
- **Operational voltage reduction of flash memory using high-kappa composite tunnel barriers** *IEEE ELECTRON DEVICE LETTERS*
  Verma, S., Pop, E., Kapur, P., Parat, K., Saraswat, K. C.
  2008; 29 (3): 252-254
- **Electrically driven light emission from hot single-walled carbon nanotubes at various temperatures and ambient pressures** *APPLIED PHYSICS LETTERS*
  Wang, X., Zhang, L., Lu, Y., Dai, H., Kato, Y. K., Pop, E.
  2007; 91 (26)
- **Thickness and stoichiometry dependence of the thermal conductivity of GeSbTe films** *APPLIED PHYSICS LETTERS*
  Reifenberg, J. P., Panzer, M. A., Kim, S., Gibby, A. M., Zhang, Y., Wong, S., Wong, H. P., Pop, E., Goodson, K. E.
  2007; 91 (11)
- **Electrical and thermal transport in metallic single-wall carbon nanotubes on insulating substrates** *JOURNAL OF APPLIED PHYSICS*
  Pop, E., Mann, D. A., Goodson, K. E., Dai, H.
  2007; 101 (9)
- **Electrically driven thermal light emission from individual single-walled carbon nanotubes** *NATURE NANOTECHNOLOGY*
  Mann, D., Kato, Y. K., Kinkhabwala, A., Pop, E., Cao, J., Wang, X., Zhang, L., Wang, Q., Guo, J., Dai, H.
  2007; 2 (1): 33-38
- **Electrical and thermal transport in metallic single-wall carbon nanotubes** *International Semiconductor Device Research Symposium*
  Pop, E.
  IEEE.2007: 401–402
- **Non-equilibrium phonon distributions in sub-100 nm silicon transistors** *JOURNAL OF HEAT TRANSFER-TRANSACTIONS OF THE ASME*
  Sinha, S., Pop, E., DUTTON, R. W., Goodson, K. E.
  2006; 128 (7): 638-647
- **Electrical transport properties and field effect transistors of carbon nanotubes** *NANO*
  Dai, H., Javey, A., Pop, E., Mann, D., Kim, W., Lu, Y.
  2006; 1 (1): 1-13

- **Thermally and molecularly stimulated relaxation of hot phonons in suspended carbon nanotubes** *JOURNAL OF PHYSICAL CHEMISTRY B*
  Mann, D., Pop, E., Cao, J., Wang, Q., Goodson, K. E., Dai, H. J.
  2006; 110 (4): 1502-1505
- **Advanced cooling technologies for microprocessors** *Workshop on Frontiers in Electronics (WOFE-04)*
  Kenny, T. W., Goodson, K. E., Santiago, J. G., Wang, E., Koo, J., Jiang, L., Pop, E., Sinha, S., Zhang, L., Fogg, D., Yao, S., Flynn, R., Chang, et al
  WORLD SCIENTIFIC PUBL CO PTE LTD.2006: 301–313
- **Electro-thermal transport in silicon and carbon nanotube devices** *14th International Conference on Nonequilibrium Carrier Dynamics in Semiconductors*
  Pop, E., Mann, D., ROWLETTE, J., Goodson, K., Dai, H.
  SPRINGER-VERLAG BERLIN.2006: 195–199
- **Multiphysics modeling and impact of thermal boundary resistance in phase change memory devices** *10th Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems*
  Reifenberg, J., Pop, E., Gibby, A., Wong, S., Goodson, K.
  IEEE.2006: 106–113
- **Thermal properties of metal-coated vertically-aligned single wall nanotube films** *10th Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems*
  Panzer, M., Zhang, G., Mann, D., Hu, X., Pop, E., Dai, H., Goodson, K. E.
  IEEE.2006: 1306–1313
- **Monte Carlo simulation of Joule heating in bulk and strained silicon** *APPLIED PHYSICS LETTERS*
  Pop, E., DUTTON, R. W., Goodson, K. E.
  2005; 86 (8)
- **Thermal phenomena in deeply scaled MOSFETs** *IEEE International Electron Devices Meeting*
  Rowlette, J., Pop, E., Sinha, S., Panzer, M., Goodson, K.
  IEEE.2005: 1005–1008
- **Joule heating under quasi-ballistic transport conditions in bulk and strained silicon devices** *International Conference on Simulation of Semiconductor Processes and Devices*
  Pop, E., Rowlette, J. A., DUTTON, R. W., Goodson, K. E.
  JAPAN SOCIETY APPLIED PHYSICS.2005: 307–310
- **Electro-thermal transport in metallic single-wall carbon nanotubes for interconnect applications** *IEEE International Electron Devices Meeting*
  Pop, E., Mann, D., Reifenberg, J., Goodson, K., Dai, H. J.
  IEEE.2005: 261–264
- **Thermal simulation techniques for nanoscale transistors** *IEEE/ACM International Conference on Computer Aided Design*
  Rowlette, J., Pop, E., Sinha, S., Panzer, M., Goodson, K.
  IEEE.2005: 225–228
- **Analytic band Monte Carlo model for electron transport in Si including acoustic and optical phonon dispersion** *JOURNAL OF APPLIED PHYSICS*
  Pop, E., DUTTON, R. W., Goodson, K. E.
  2004; 96 (9): 4998-5005
- **Electro-thermal comparison and performance optimization of thin-body SOI and GOI MOSFETs** *50th IEEE International Electron Devices Meeting*
  Pop, E., Chui, C. O., Sinha, S., Dutton, R., Goodson, K.
  IEEE.2004: 411–414
- **Thermal phenomena in nanoscale transistors** *9th Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems*
  Pop, E., Goodson, K. E.
  IEEE.2004: 1–7
- **Thermal analysis of ultra-thin body device scaling** *IEEE International Electron Devices Meeting*
  Pop, E., Dutton, R., Goodson, K.

IEEE.2003: 883–886

- **Detailed heat generation simulations via the Monte Carlo method** *IEEE International Conference on Simulation of Semiconductor Processes and Devices*
  Pop, E., Dutton, R., Goodson, K.
  IEEE.2003: 121–124