




Kenneth Goodson

Davies Family Provostial Professor, Senior Associate Dean for Faculty and Academic Affairs and Professor, by courtesy, of Materials Science and Engineering

Mechanical Engineering

 Curriculum Vitae available Online

CONTACT INFORMATION

• Administrative Contact

Andrea Kuduk - Dean's office administrator

Email akuduk@stanford.edu

Bio

BIO

As Mechanical Engineering Chair & Vice Chair (2008-2019), Ken Goodson led two strategic plans and recruited 15 faculty who transformed the department's scholarship and diversity.

Goodson specializes in heat transfer and electronics cooling, with an emphasis on nanoscale conduction, microfluidic heat sinks, and transport physics. His lab pioneered phonon free path measurements using silicon nanolayers and helped IC companies launch SOI, PCRAM, and other technologies. Current projects address power devices, vehicles, and data centers with ARPA-E, Google, Toyota, Intel, Bosch, SRC/ASCENT, and NSF/POETS. Goodson has 35 patents and co-founded Cooligy, which built heat sinks for Apple products and was acquired by Emerson.

Goodson is a member of the National Academy of Engineering and a Fellow with ASME, IEEE, APS, AAAS, and the National Academy of Inventors. He received the ASME Kraus Medal, the inaugural IEEE Richard Chu Award, the AIChE Kern Award, SRC Technical Excellence Award, the SIA University Researcher Award and the Heat Transfer Memorial Award for Science. His PhD alums include dozens at IC firms and 20+ Professors at MIT, UC Berkeley, and other schools.

Goodson moonlights as a baritone oratorio soloist. Appearances include Davies Symphony Hall with the SF Choral Society and, in May 2020, the title role in Mendelssohn's Elijah with Schola Cantorum. His wife, Laura Dahl, is a concert pianist with the Stanford music faculty.

ACADEMIC APPOINTMENTS

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

ADMINISTRATIVE APPOINTMENTS

- Senior Associate Dean for Faculty & Academic Affairs, School of Engineering, (2019- present)
- Department Chair, Mechanical Engineering, (2013-2019)
- Vice Department Chair, Mechanical Engineering, (2008-2013)

- Presidential Search Committee, Stanford University, (2015-2016)

HONORS AND AWARDS

- University Researcher Award, Semiconductor International Association (2020)
- Member, National Academy of Engineering (2020)
- Fellow, National Academy of Inventors (2019)
- Elected Fellow: AAAS, ASME, IEEE, APS (2010-2016)
- Inaugural Richard Chu Achievement Award, IEEE (2018)
- InterPACK Achievement Award, ASME (2017)
- Charles Russ Richards Memorial Award, Pi Tau Sigma & ASME (2016)
- Donald Q. Kern Heat Transfer Award, AIChE (2015)
- Rohsenow Lectureship, MIT (2015)
- Aisinjiro-Soo Distinguished Lectureship, University of Illinois Urbana-Champaign (2015)
- Hawkins Lectureship, Purdue University (2015)
- Heat Transfer Memorial Award for Science, ASME (2014)
- Technical Excellence Award, Semiconductor Research Corporation (2014)
- THERMI Award, IEEE (2013)
- Kraus Thermal Management Medal, ASME (2010)
- Plenary Lectures, IITHERM, PHONONS, InterPACK, ISSCC, Thermnic, SemiTherm (2002-present)
- Dusenberre Lectureship, Penn State University (2010)
- Golden/Outstanding Reviewer, IEEE, ASME (2010, 1999)
- Young Investigator Award, Office of Naval Research (1996)
- CAREER Award, National Science Foundation (1996)
- JSPS Visiting Professorship, Tokyo Institute of Technology (1996)
- Best/Outstanding Paper, IITHERM, SemiTherm, IEDM (2012, 2001, 1992)
- Voice Fellow, Tanglewood Music Festival (1990, 1991)
- Luis Sudler Prize for Arts Achievement, MIT (1989)
- Graduate Fellowship, Office of Naval Research (1989-1992)
- Tau Beta Pi, Phi Beta Kappa, Burchard Scholar, MIT (1988, 1989)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- ASME (Fellow), IEEE (Fellow), APS (Fellow), AAAS (Fellow), NAI (Fellow) (2010 - present)
- Chief Editor, Nanoscale & Microscale Thermophysical Engineering (2007 - 2012)
- Associate Editor, Journal of Heat Transfer (2008 - 2012)
- Member, Tau Beta Pi, Phi Beta Kappa, Sigma Xi (1989 - present)

PROGRAM AFFILIATIONS

- Stanford SystemX Alliance

PROFESSIONAL EDUCATION

- PhD ME, MIT (1993)
- MSME, MIT. ONR Graduate Fellow (1991)

- BSME, MIT. Tau Beta Pi, Pi Tau Sigma (1989)
- BS Humanities, MIT. Phi Beta Kappa. Sudler Prize (1989)

PATENTS

- "SELECTED PATENTS FROM 35 TOTAL"
- US Patent 9601452 (2017): Barako, Goodson, et al. "High-Conductivity Bonding of Metal Nanowire Arrays", assigned to Northrop Grumman & Stanford
- US Patent 7104312 (2006): Goodson, Upadhy, Zhou, et al. "Method and Apparatus for Achieving Temperature Uniformity and Hot Spot Cooling in a Heat Producing Device", assigned to Cooligy (acquired by Emerson)
- US Patent 5843224 (1998): Zachai, Gutheit, Goodson. "Composite structure comprising a semiconductor layer arranged on a diamond or diamond-like layer and process for its production", assigned to DaimlerBenz
- US Patent 6942018 (2005): Goodson, Santiago, Kenny, et al. "Electroosmotic Microchannel Cooling System", assigned to Stanford, licensed to Cooligy (acquired by Emerson)

LINKS

- Goodson Research Lab: <http://nanoheat.stanford.edu>
- Google Scholar: <http://scholar.google.com/citations?user=oUhOkhUAAAAJ&hl=en>
- Web of Science: <http://www.researcherid.com/rid/C-3545-2011>
- Strava: <https://www.strava.com/athletes/2453572>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The Nanoheat Lab studies heat transfer in electronic nanostructures, microfluidic heat sinks, and packaging, with an emphasis on basic transport physics and industrial impact. We work closely with companies on novel cooling strategies for power devices, portables, ASICs, & data centers.

Current projects (see list below) include microfluidic heat sinks and vapor chambers for power electronics and 3D logic chips, also electron and phonon conduction and energy conversion in nanostructures. We collaborate with EE and MatSci experts, and current sponsors include ARPA-E, the NSF POETS Center, SRC ASCENT, Google, Toyota, Ford, Bosch, and Intel.

Historically, the lab pioneered phonon free path measurements using silicon nanolayers and helped IC companies commercialize SOI transistors, PCRAM, low-k dielectric passivation, and other thermally-hard technologies. Professor Goodson has 35 patents including several that launched Cooligy, a startup that built heat sinks for Apple products and was acquired by Emerson.

More recently, the Nanoheat Lab developed a record-breaking heat sink with Raytheon as part of DARPA ICECOOL, achieving low superheat using diamond channels, porous copper inverse opals, and 3D manifolding. We leveraged this progress to help UIUC launch an NSF Center for power electronics (POETS), which is an ongoing, major research catalyst for the lab.

Over the decades, lab sponsorship has been split between government grants and customized corporate contracts and gifts. We tailor our research for the benefit of both companies and our PhD students. Dozens of Goodson's PhD graduates now work at IC and energy companies, and 20+ are Professors at MIT, UC Berkeley, Stanford, UIUC, Purdue, UCLA, and other schools.

PROJECTS

- Exploring the Limits of Cooling for Extreme Heat Flux Applications: Data Centers and Power Electronics (ARPA-E) (1/1/2020)
- Development of a High Performance Microcooler with Minimal Packaging Overhead (NSF POETS) (8/1/2019)

- Nanomaterial-Based Thermal Management Solutions for 3D Monolithic Chips (SRC ASCENT) (7/1/2018)
- Microchannel & 3D Manifold for Power Electronics Cooling Applications (Ford Motor Company) (1/1/2018)
- Interfacial Phase Change Memory: Scaling, Performance, Optimization and Understanding the Physics of Switching (SRC) (7/1/2018)
- Thermal Engineering, Optimization, and Understanding the Physics of Electron & Phonon Conduction at Solid Interfaces (SRC) (1/1/2019)
- Microporous Copper Inverse Opal (CIO) Wick Technology for High Heat Flux Vapor Chamber Application (Bosch) (10/1/2019)
- High Aspect Ratio Vertically Aligned Copper Nano/Micro Wire PDMS Composites for Thermal Interface Materials (Google + Intel) (1/1/2020)
- Nanopatterning and Temporal Control of Phase-Change Materials for High-Bandwidth Devices (NSF) (8/15/2017)

Teaching

COURSES

2019-20

- Fundamentals of Heat Conduction: ME 352B (Win)

2018-19

- Fundamentals of Heat Conduction: ME 352B (Win)
- The Engineering of Opera: OSPFLOR 66 (Aut)

2017-18

- Fundamentals of Heat Conduction: ME 352B (Win)

2016-17

- Fundamentals of Heat Conduction: ME 352B (Win)

STANFORD ADVISEES

Doctoral Dissertation Advisor (AC)

Sougata Hazra, Ki Wook Jung, Heungdong Kwon, Sri Lingamneni, Tanya Liu, Chris Perez, Alisha Piazza, Qianying Wu

Doctoral Dissertation Co-Advisor (AC)

ZHENGLIANG BIAN

Master's Program Advisor

Karsu Kilic, Joel Martis

Doctoral (Program)

Farid Soroush

Publications

PUBLICATIONS

- **Publication Overview: 230 Journal Articles, 300 Conference Papers, 32 Patents, 9 Book Chapters, 2 Books.** 32000+ Citations, $H = 84$ (Google Scholar). 17,000+ Citations, $H = 59$ (Web of Science)
Goodson, K. E.
2020
- **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
- **Enhanced Capillary-Fed Boiling in Copper Inverse Opals via Template Sintering** *ADVANCED FUNCTIONAL MATERIALS*

- Zhang, C., Palko, J. W., Barako, M. T., Asheghi, M., Santiago, J. G., Goodson, K. E.
2018; 28 (41)
- **Extreme Two-Phase Cooling from Laser-Etched Diamond and Conformal, Template-Fabricated Microporous Copper** *ADVANCED FUNCTIONAL MATERIALS*
Palko, J. W., Lee, H., Zhang, C., Dusseault, T. J., Maitra, T., Won, Y., Agonafer, D. D., Moss, J., Houshmand, F., Rong, G., Wilbur, J. D., Rockosi, D., Mykyta, et al
2017; 27 (45)
 - **Modulation of thermal and thermoelectric transport in individual carbon nanotubes by fullerene encapsulation** *NATURE MATERIALS*
Kodama, T., Ohnishi, M., Park, W., Shiga, T., Park, J., Shimada, T., Shinohara, H., Shiomi, J., Goodson, K. E.
2017; 16 (9): 892-+
 - **Thermal transport: Cool electronics.** *Nature materials*
Cho, J., Goodson, K. E.
2015; 14 (2): 136-137
 - **Ordering up the Minimum Thermal Conductivity of Solids** *SCIENCE*
Goodson, K. E.
2007; 315: 342-343
 - **Heat generation and transport in nanometer-scale transistors** *PROCEEDINGS OF THE IEEE*
Pop, E., Sinha, S., Goodson, K. E.
2006; 94 (8): 1587-1601
 - **Tunable, passive thermal regulation through liquid to vapor phase change** *APPLIED PHYSICS LETTERS*
Liu, T., Palko, J. W., Katz, J. S., Dede, E., Zhou, F., Asheghi, M., Goodson, K. E.
2019; 115 (25)
 - **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)
 - **Single-phase thermal and hydraulic performance of embedded silicon micro-pin fin heat sinks using R245fa** *INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER*
Kong, D., Jung, K., Jung, S., Jung, D., Schaadt, J., Lyengar, M., Malone, C., Kharangate, C. R., Asheghi, M., Goodson, K. E., Lee, H.
2019; 141: 145-55
 - **Micro-Tethering for Fabrication of Encapsulated Inertial Sensors With High Sensitivity** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*
Flader, I. B., Chen, Y., Yang, Y., Ng, E. J., Shin, D. D., Heinz, D. B., Ortiz, L., Alter, A. L., Park, W., Goodson, K. E., Kenny, T. W.
2019; 28 (3): 372-81
 - **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
 - **Embedded cooling with 3D manifold for vehicle power electronics application: Single-phase thermal-fluid performance** *INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER*
Jung, K., Kharangate, C. R., Lee, H., Palko, J., Zhou, F., Asheghi, M., Dede, E. M., Goodson, K. E.

2019; 130: 1108–19

- **A Compact 50-kW Traction Inverter Design Using Off-the-Shelf Components**
Alizadeh, R., Adamson, T., Balda, J., Zhao, Y., Asheghi, M., Goodson, K. E., IEEE
IEEE.2019: 2614–19
- **Optical and electrical properties of phase change materials for high-speed optoelectronics**
Burrow, J. A., Guo, P., Sevison, G. A., Kwon, H., Perez, C., Asheghi, M., Hendrickson, J. R., Sarangan, A., Goodson, K. E., Agha, I., IEEE
IEEE.2019
- **Publisher Correction: 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.
2019; 10 (1): 4465
- **A method for quantifying in plane permeability of porous thin films** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*
Rong, G., Palko, J. W., Oyarzun, D. I., Zhang, C., Hammerle, J., Asheghi, M., Goodson, K. E., Santiago, J. G.
2018; 530: 667–74
- **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
- **Improving the performance of Ge₂Sb₂Te₅ materials via nickel doping: Towards RF-compatible phase-change devices** *APPLIED PHYSICS LETTERS*
Guo, P., Burrow, J. A., Sevison, G. A., Sood, A., Asheghi, M., Hendrickson, J. R., Goodson, K. E., Agha, I., Sarangan, A.
2018; 113 (17)
- **Optimizing the design of composite phase change materials for high thermal power density** *JOURNAL OF APPLIED PHYSICS*
Barako, M. T., Lingamneni, S., Katz, J. S., Liu, T., Goodson, K. E., Tice, J.
2018; 124 (14)
- **Tailoring Permeability of Microporous Copper Structures through Template Sintering** *ACS APPLIED MATERIALS & INTERFACES*
Zhang, C., Palko, J. W., Rong, G., Pringle, K. S., Barako, M. T., Dusseault, T. J., Asheghi, M., Santiago, J. G., Goodson, K. E.
2018; 10 (36): 30487–94
- **Phonon Scattering in Silicon by Multiple Morphological Defects: A Multiscale Analysis** *JOURNAL OF ELECTRONIC MATERIALS*
Lorenzi, B., Dettori, R., Dunham, M. T., Melis, C., Tonini, R., Colombo, L., Sood, A., Goodson, K. E., Narducci, D.
2018; 47 (9): 5148–57
- **Tailoring Permeability of Microporous Copper Structures through Template Sintering.** *ACS applied materials & interfaces*
Zhang, C., Palko, J. W., Rong, G., Pringle, K. S., Barako, M. T., Dusseault, T. J., Asheghi, M., Santiago, J. G., Goodson, K. E.
2018
- **Impact of thermally dead volume on phonon conduction along silicon nanoladders** *NANOSCALE*
Park, W., Sohn, J., Romano, G., Kodama, T., Sood, A., Katz, J. S., Kim, B. Y., So, H., Ahn, E. C., Asheghi, M., Kolpak, A. M., Goodson, K. E.
2018; 10 (23): 11117–22
- **Impact of thermally dead volume on phonon conduction along silicon nanoladders.** *Nanoscale*
Park, W., Sohn, J., Romano, G., Kodama, T., Sood, A., Katz, J. S., Kim, B. S., So, H., Ahn, E. C., Asheghi, M., Kolpak, A. M., Goodson, K. E.
2018
- **Experimental Characterization of Microfabricated Thermoelectric Energy Harvesters for Smart Sensor and Wearable Applications** *ADVANCED MATERIALS TECHNOLOGIES*
Dunham, M. T., Barako, M. T., Cornett, J. E., Gao, Y., Haidar, S., Sun, N., Asheghi, M., Chen, B., Goodson, K. E.
2018; 3 (6)
- **Direct Visualization of Thermal Conductivity Suppression Due to Enhanced Phonon Scattering Near Individual Grain Boundaries** *NANO LETTERS*
Sood, A., Cheaito, R., Bai, T., Kwon, H., Wang, Y., Li, C., Yates, L., Bougher, T., Graham, S., Asheghi, M., Goorsky, M., Goodson, K. E.
2018; 18 (6): 3466–72
- **Experimental Investigation of Embedded Micropin-Fins for Single-Phase Heat Transfer and Pressure Drop** *JOURNAL OF ELECTRONIC PACKAGING*
Kharangate, C. R., Jung, K., Jung, S., Kong, D., Schaadt, J., Iyengar, M., Malone, C., Lee, H., Asheghi, M., Goodson, K. E.

2018; 140 (2)

- **Enhanced Heat Transfer Using Microporous Copper Inverse Opals**
Lee, H., Maitra, T., Palko, J., Kong, D., Zhang, C., Barako, M. T., Won, Y., Asheghi, M., Goodson, K. E.
ASME.2018
- **A method for quantifying in plane permeability of porous thin films.** *Journal of colloid and interface science*
Rong, G., Palko, J. W., Oyarzun, D. I., Zhang, C., Hammerle, J., Asheghi, M., Goodson, K. E., Santiago, J. G.
2018; 530: 667–74
- **Direct Visualization of Thermal Conductivity Suppression Due to Enhanced Phonon Scattering Near Individual Grain Boundaries.** *Nano letters*
Sood, A., Cheaito, R., Bai, T., Kwon, H., Wang, Y., Li, C., Yates, L., Bougher, T., Graham, S., Asheghi, M., Goorsky, M., Goodson, K. E.
2018
- **Porous micropillar structures for retaining low surface tension liquids** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*
Agonafer, D. D., Lee, H., Vasquez, P. A., Won, Y., Jung, K., Lingamneni, S., Ma, B., Shan, L., Shuai, S., Du, Z., Maitra, T., Palko, J. W., Goodson, et al
2018; 514: 316–27
- **Dielectric barrier layers by low-temperature plasma-enhanced atomic layer deposition of silicon dioxide** *THIN SOLID FILMS*
Barako, M. T., English, T. S., Roy-Panzer, S., Kenny, T. W., Goodson, K. E.
2018; 649: 24–29
- **Anti-Hermitian photodetector facilitating efficient subwavelength photon sorting** *NATURE COMMUNICATIONS*
Kim, S., Kang, J., Mutlu, M., Park, J., Park, W., Goodson, K. E., Sinclair, R., Fan, S., Kik, P. G., Brongersma, M. L.
2018; 9: 316
- **Thermal Management Research - from Power Electronics to Portables**
Jung, K., Zhang, C., Liu, T., Asheghi, M., Goodson, K. E., IEEE
IEEE.2018: 17–18
- **Busbar Design for Distributed DC-Link Capacitor Banks for Traction Applications**
Alizadeh, R., Schupbach, M., Adamson, T., Balda, J., Zhao, Y., Long, S., Jung, K. W., Kharangate, C., Asheghi, M., Goodson, K. E., IEEE
IEEE.2018: 4810–15
- **Highly Anisotropic Thermal Conductivity in Spin-Cast Polystyrene Nano-Films**
Katz, J. S., Barako, M. T., Park, W., Sood, A., Asheghi, M., Goodson, K. E., IEEE
IEEE.2018: 477–81
- **The Heat Conduction Renaissance**
Sood, A., Pop, E., Asheghi, M., Goodson, K. E., IEEE
IEEE.2018: 1396–1402
- **Modular Heat Sink for Chip-Scale GaN Transistors in Multilevel Converters**
Pallo, N., Kharangate, C., Modeer, T., Schaadt, J., Asheghi, M., Goodson, K., Pilawa-Podgurski, R., IEEE
IEEE.2018: 2798–2805
- **THERMAL EFFECTS OF OVENIZED CLOCKS ON EPISEAL ENCAPSULATED INERTIAL MEASUREMENT UNITS**
Ortiz, L., Flader, I. B., Vukasin, G. D., Gerrard, D. D., Chandorkar, S. A., Rodriguez, J., Shin, D. D., Kwon, R., Heinz, D. B., Chen, Y., Park, W., Goodson, K. E., Kenny, et al
IEEE.2018: 980–83
- **HIGH STABILITY THERMAL ACCELEROMETER BASED ON ULTRATHIN PLATINUM ALD NANOSTRUCTURES**
Everhart, C. M., Kaplan, K. E., Winterkorn, M. M., Kwon, H., Provine, J., Asheghi, M., Goodson, K. E., Prinz, F. B., Kenny, T. W., IEEE
IEEE.2018: 976–79
- **Temperature-Dependent Thermal Boundary Conductance of Monolayer MoS₂ by Raman Thermometry** *ACS APPLIED MATERIALS & INTERFACES*
Yalon, E., Aslan, O., Smithe, 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
- **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

- **Thermal Conduction across Metal-Dielectric Sidewall Interfaces** *ACS APPLIED MATERIALS & INTERFACES*
Park, W., Kodama, T., Park, J., Cho, J., Sood, A., Barako, M. T., Asheghi, M., Goodson, K. E.
2017; 9 (35): 30100–30106
- **Phonon conduction in silicon nanobeams** *APPLIED PHYSICS LETTERS*
Park, W., Shin, D. D., Kim, S., Katz, J. S., Park, J., Ahn, C., Kodama, T., Asheghi, M., Kenny, T. W., Goodson, K. E.
2017; 110 (21)
- **Fabrication and Characterization of Bi₂Te₃-Based Chip-Scale Thermoelectric Energy Harvesting Devices** *JOURNAL OF ELECTRONIC MATERIALS*
Cornett, J., Chen, B., Haidar, S., Berney, H., McGuinness, P., Lane, B., Gao, Y., He, Y., Sun, N., Dunham, M., Asheghi, M., Goodson, K., Yuan, et al
2017; 46 (5): 2844-2846
- **Phonon conduction in GaN-diamond composite substrates** *JOURNAL OF APPLIED PHYSICS*
Cho, J., Francis, D., Altman, D. H., Asheghi, M., Goodson, K. E.
2017; 121 (5)
- **COPPER INVERSE OPAL SURFACES FOR ENHANCED BOILING HEAT TRANSFER**
Lee, H., Maitra, T., Palko, J., Zhang, C., Barako, M., Won, Y., Asheghi, M., Goodson, K. E., ASME
AMER SOC MECHANICAL ENGINEERS.2017
- **Phonon Conduction in Silicon Nanobeam Labyrinths.** *Scientific reports*
Park, W., Romano, G., Ahn, E. C., Kodama, T., Park, J., Barako, M. T., Sohn, J., Kim, S. J., Cho, J., Marconnet, A. M., Asheghi, M., Kolpak, A. M., Goodson, et al
2017; 7 (1): 6233
- **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
- **Enhanced Thermal Conduction Through Nanostructured Interfaces** *NANOSCALE AND MICROSCALE THERMOPHYSICAL ENGINEERING*
Park, W., Sood, A., Park, J., Asheghi, M., Sinclair, R., Goodson, K. E.
2017; 21 (3): 134–44
- **MICRO-TETHERING FOR IN-PROCESS STICTION MITIGATION OF HIGHLY COMPLIANT STRUCTURES**
Flader, I. B., Chen, Y., Shin, D. D., Heinz, D. B., Ortiz, L., Alter, A. L., Park, W., Goodson, K. E., Kenny, T. W., IEEE
IEEE.2017: 675–78
- **Thermal Conductivity Measurements on Suspended Diamond Membranes Using Picosecond and Femtosecond Time-Domain Thermoreflectance**
Cheaito, R., Sood, A., Yates, L., Bougher, T. L., Cheng, Z., Asheghi, M., Graham, S., Goodson, K., IEEE
IEEE.2017: 706–10
- **INVESTIGATION OF THE HETEROGENEOUS THERMAL CONDUCTIVITY IN BULK CVD DIAMOND FOR USE IN ELECTRONICS THERMAL MANAGEMENT**
Yates, L., Cheaito, R., Sood, A., Cheng, Z., Bougher, T., Asheghi, M., Goodson, K., Goorsky, M., Faili, F., Twitchen, D., Graham, S., ASME
AMER SOC MECHANICAL ENGINEERS.2017
- **Experimental Considerations of CVD Diamond Film Measurements using Time Domain Thermoreflectance**
Bougher, T. L., Yates, L., Cheng, Z., Cola, B. A., Graham, S., Chaeito, R., Sood, A., Ashegi, M., Goodson, K. E., IEEE
IEEE.2017: 30–38
- **THERMAL CONDUCTIVITY MEASUREMENT OF IN(0.10)GA(0.90)AS(0.96)N(0.04) THIN FILM**
Jan, A., Cheaito, R., Goodson, K. E., Clemens, B. M., ASME
AMER SOC MECHANICAL ENGINEERS.2017
- **Thermal Modeling of Single-phase and Two-phase 2D-chip Cooling using Microchannels**
Kharangate, C. R., Lee, H., Liu, T., Jung, K., Iyengar, M. K., Malone, C., Asheghi, M., Goodson, K. E., IEEE
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PRESENTATIONS

- Hawkins Lectureship, Purdue University (2015) - Purdue University
- Aisinjoro-Soo Lectureship, University of Illinois Urbana-Champaign (2015)
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- Dusenberre Lectureship, Penn State (2012)
- Conference Plenaries, InterPACK (2002, 2017)
- Conference Plenaries, ITherm (2004, 2018)
- Conference Plenary, THERMINIC (2004)
- Opening Conference Plenary, PHONONS (2012)