



## Thomas Kenny

Senior Associate Dean for Student Affairs and Richard W. Weiland Professor in the School of Engineering  
Mechanical Engineering

### CONTACT INFORMATION

- **Administrator**

Linda Huber - Administrative Associate

**Email** lhuber@stanford.edu

**Tel** (650) 736-1283

### Bio

---

#### BIO

Kenny's group is researching fundamental issues and applications of micromechanical structures. These devices are usually fabricated from silicon wafers using integrated circuit fabrication tools. Using these techniques, the group builds sensitive accelerometers, infrared detectors, and force-sensing cantilevers. This research has many applications, including integrated packaging, inertial navigation, fundamental force measurements, experiments on bio-molecules, device cooling, bio-analytical instruments, and small robots. Because this research field is multidisciplinary in nature, work in this group is characterized by strong collaborations with other departments, as well as with local industry.

#### ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Member, Bio-X

#### ADMINISTRATIVE APPOINTMENTS

- Senior Associate Dean of Engineering for Student Affairs, School of Engineering, (2015- present)
- The Paul Davies Family University Fellow in Undergraduate Education, Bass Foundation Fellow, (2019-2024)

#### HONORS AND AWARDS

- Member, National Academy of Engineering (2022-)
- President's Award for Excellence through Diversity, Stanford University (2019)
- Tau Beta Pi Teaching Honor Roll, Tau Beta Pi (2019)
- Daniel Noble Award for Emerging Technologies, IEEE (2018)
- General Chair, Transducers 2015 (2015)
- Technical Achievement Award, IEEE (2011)
- Secretary of Defense Award for Exceptional Public Service, US Department of Defense (2010)
- Program Manager, DARPA Microsystems Technology Office (2006-2010)
- Captain, Ultimate Frisbee Coed World Champions (RFBF) (1999)

- Captain, Ultimate Frisbee Coed National Champions (RFBF) (1998)
- CAREER Award, NSF (1995-1999)
- Robert Bosch Faculty Scholar, Robert Bosch Foundation (1995-1999)
- Terman Fellowship, Stanford University (1995-1998)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- CEO Founder and Board Member, Applaud Medical (2020 - 2022)
- President, Transducers Research Foundation (2016 - present)

## **PROGRAM AFFILIATIONS**

- Stanford SystemX Alliance

## **PROFESSIONAL EDUCATION**

- PhD, UC Berkeley , Physics (1989)

## **PATENTS**

- Robert Grubbs, Marshall Stoller, Hoyong Chung, Alissa Fitzgerald, Thomas Kenny, Renee Thomas. "United States Patent 10,149,906 Targeting Microbubbles", Caltech, Dec 10, 2018
- Thomas Kenny, Mark Munch, Peng Zhou, James Gill Shook, Kenneth Goodson, Dave Corbin, Mark McMaster, James Lovette. "United States Patent US 8,464,781 Cooling Systems Incorporating Heat Exchangers and Thermoelectric Layers", Cooligy, Inc, Jul 18, 2013
- Robert J. Full, Ronald S. Fearing, Thomas W. Kenny, Kellar Autumn. "United States Patent US 6,737,160 Adhesive Microstructure and Method of Forming Same", The Regents Of The University Of California, May 18, 0004

## **LINKS**

- <http://mems.stanford.edu>: <http://mems.stanford.edu>

## **Teaching**

---

### **COURSES**

#### **2021-22**

- Discover Engineering: How to Aim High, Embrace Uncertainty, and Achieve Impact: ENGR 193 (Spr)
- Introduction to Mechatronics: ME 210 (Win)
- Introduction to Sensors: ME 220 (Spr)
- Want to Be an Engineer?: ENGR 1 (Aut)

#### **2020-21**

- Discover Engineering: How to Aim High, Embrace Uncertainty, and Achieve Impact: ENGR 193 (Spr)
- Want to Be an Engineer?: ENGR 1 (Aut)

#### **2019-20**

- Discover Engineering: How to Aim High, Embrace Uncertainty, and Achieve Impact: ENGR 193 (Spr)
- Introduction to Mechatronics: EE 118, ME 210 (Win)
- Want to Be an Engineer?: ENGR 1 (Aut)

#### **2018-19**

- Discover Engineering: How to Aim High, Embrace Uncertainty, and Achieve Impact: ENGR 193 (Spr)
- Introduction to Mechatronics: EE 118, ME 210 (Win)
- Solid State Physics for Mechanical Engineering Experiments: ME 414 (Sum)

- Want to Be an Engineer?: ENGR 1 (Aut)

## STANFORD ADVISEES

### Doctoral Dissertation Reader (AC)

Christopher Cameron, Sri Lingamneni

### Doctoral Dissertation Advisor (AC)

Nicholas Bousse, Saisneha Koppaka

### Master's Program Advisor

Dolly Mantle, Jadal Williams

### Doctoral Dissertation Co-Advisor (AC)

Tina White

## Publications

---

### PUBLICATIONS

- **A temperature compensated biaxial eFM accelerometer in Epi-seal process** *SENSORS AND ACTUATORS A-PHYSICAL*  
Shin, S., Kwon, H., Vukasin, G. D., Kenny, T. W., Ayazi, F.  
2021; 330
- **Amplitude stabilization of micromechanical oscillators using engineered nonlinearity** *PHYSICAL REVIEW RESEARCH*  
Miller, J. L., Gomez-Franco, A., Shin, D. D., Kwon, H., Kenny, T. W.  
2021; 3 (3)
- **Nonlinear Dissipation in Epitaxial SCS and Polysilicon MEMS Driven at Large Amplitudes (vol 29, pg 1118, 2020)** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Alter, A. L., Flader, I. B., Chen, Y., Shin, D. D., Kenny, T. W.  
2021; 30 (2): 330
- **Quantification of Energy Dissipation Mechanisms in Toroidal Ring Gyroscope** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Wang, Y., Lin, Y., Glaze, J., Vukasin, G., Shin, D. D., Kwon, H., Heinz, D. B., Chen, Y., Gerrard, D. D., Kenny, T. W., Shkel, A. M.  
2021; 30 (2): 193–202
- **A Novel Spring Disk Resonator Gyroscope for Maximizing Q/F**  
Cameron, C. P., Gerrard, D., Rodriguez, J., Yang, Y., Ng, E., Kenny, T. W., IEEE  
IEEE.2021
- **Bicontinuous Mesoporous Metal Foams with Enhanced Conductivity and Tunable Pore Size and Porosity via Electrodeposition for Electrochemical and Thermal Systems** *ACS APPLIED NANO MATERIALS*  
Katz, J. S., Zhang, C., Barako, M. T., Kim, H. K., Asheghi, M., Kenny, T. W., Goodson, K. E.  
2020; 3 (12): 12408–15
- **Negative Nonlinear Dissipation in Microelectromechanical Beams (vol 29, pg 1, 2020)** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Bousse, N., Miller, J., Alter, A., Cameron, C., Kwon, H., Vukasin, G., Kenny, T. W.  
2020; 29 (6): 1582
- **Characterization of Accelerated Fatigue in Thick Epi-Polysilicon Vacuum Encapsulated MEMS Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Alter, A. L., Flader, I. B., Chen, Y., Ortiz, L., Shin, D. D., Kenny, T. W.  
2020; 29 (6): 1483–92
- **Numerical Modelling of Non-Linearities in MEMS Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Zega, V., Gattere, G., Koppaka, S., Alter, A., Vukasin, G. D., Frangi, A., Kenny, T. W.  
2020; 29 (6): 1443–54

- **Nonlinear Dissipation in Epitaxial SCS and Polysilicon MEMS Driven at Large Amplitudes** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Alter, A. L., Flader, I. B., Chen, Y., Shin, D. D., Kenny, T. W.  
2020; 29 (5): 1118–20
- **Anchor Design Affects Dominant Energy Loss Mechanism in a Lame Mode MEM Resonator** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Vukasin, G. D., Sanchez, V. K., Glaze, J., Bousse, N. E., Bissel, N., Shin, D. D., Kwon, H., Heinz, D., Yen, E., Kenny, T. W.  
2020; 29 (5): 860–66
- **Limits to Thermal-Piezoresistive Cooling in Silicon Micromechanical Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Miller, J. L., Zhu, H., Sundaram, S., Vukasin, G. D., Chen, Y., Flader, I. B., Shin, D. D., Kenny, T. W.  
2020; 29 (5): 677–84
- **Quality Factor Extraction and Enhancement Across Temperature in Ring Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Alter, A. L., Gerrard, D. D., Kwon, H., Vukasin, G. D., Kenny, T. W.  
2020; 29 (5): 1124–26
- **Negative Nonlinear Dissipation in Microelectromechanical Beams** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Bousse, N., Miller, J., Alter, A., Cameron, C., Kwon, H., Vukasin, G., Kenny, T. W.  
2020; 29 (5): 954–59
- **Crystal Orientation Dependent Dual Frequency Ovenized MEMS Resonator With Temperature Stability and Shock Robustness**  
Kwon, H., Vukasin, G. D., Bousse, N. E., Kenny, T. W.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2020: 1130–31
- **On the effect of linear feedback and parametric pumping on a resonator's frequency stability** *NEW JOURNAL OF PHYSICS*  
Mohammadi, Z., Heugel, T. L., Miller, J. L., Shin, D. D., Kwon, H., Kenny, T. W., Chitra, R., Zilberberg, O., Villanueva, L.  
2020; 22 (9)
- **Spectral narrowing of parametrically pumped thermomechanical noise** *APPLIED PHYSICS LETTERS*  
Miller, J. L., Shin, D. D., Kwon, H., Shaw, S. W., Kenny, T. W.  
2020; 117 (3)
- **Low-Power Dual Mode MEMS Resonators With PPB Stability Over Temperature**  
Ortiz, L., Kwon, H., Rodriguez, J., Chen, Y., Vukasin, G. D., Heinz, D. B., Shin, D. D., Kenny, T. W.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2020: 190–201
- **Quality factor tuning of micromechanical resonators via electrical dissipation** *APPLIED PHYSICS LETTERS*  
Bousse, N. E., Miller, J. L., Kwon, H., Vukasin, G. D., Kenny, T. W.  
2020; 116 (2)
- **AN EPI-SEAL ENCAPSULATED FRANKLIN OSCILLATOR SUSTAINING MORE THAN 200,000,000 ELECTRIC SWITCHING CYCLES**  
Kassie, D. A., Flader, I. B., Shmulevich, S., Kwon, H., Kenny, T. W., Elata, D., IEEE  
IEEE.2020: 230–33
- **Thermal Accelerometer Performance Enhancements through AC Biasing Schemes**  
Kaplan, K. E., Winterkorn, M. M., Kim, H. K., Everhart, C. M., Prinz, F. B., Kenny, T. W., IEEE  
IEEE.2020
- **Design Comparison and Survivability of Epitaxially Encapsulated MEMS Disc Resonating Gyroscopes at High Shock (> 27,000g)**  
Cameron, C. P., Imamura, T., Devmalya, C., Vukasin, G., Alter, A., Kenny, T., IEEE  
IEEE.2020
- **THERMAL STABILITY OF DETF MEMS RESONATORS: NUMERICAL MODELLING AND EXPERIMENTAL VALIDATION**  
Zega, V., Opreni, A., Mussi, G., Kwon, H., Vukasin, G., Gattere, G., Langfelder, G., Frangi, A., Kenny, T. W., IEEE  
IEEE.2020: 1207–10
- **FREQUENCY STABILIZATION IN AN ENCAPSULATED HIGH-Q MICROMECHANICAL RESONATOR VIA INTERNAL RESONANCE**  
Yu, J., Kwon, H., Vukasin, G. D., Kenny, T. W., Cho, H., IEEE  
IEEE.2020: 1191–94

- **TEMPERATURE HYSTERESIS IN PIEZORESISTIVE MICROCANTILEVERS**  
Miller, J. L., Zhang, Z., Bousse, N. E., Coso, D., Sadat, S., IEEE  
IEEE.2020: 1203–6
- **NONLINEAR MODAL INTERACTIONS AND INTERNAL RESONANCE IN A MICROMACHINED DISK RESONATOR**  
Sun, J., Zhang, H., Chen, D., Pandit, M., Sobreviela, G., Xiao, D., Zhuo, M., Gerrard, D. D., Kwon, R., Vukasin, G., Kenny, T. W., Seshia, A., IEEE  
IEEE.2020: 769–72
- **Thermomechanical-Noise-Limited Capacitive Transduction of Encapsulated MEM Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Miller, J. L., Bousse, N. E., Heinz, D. B., Kim, H. K., Kwon, H., Vukasin, G. D., Kenny, T. W.  
2019; 28 (6): 965–76
- **Phase Control of Self-Excited Parametric Resonators** *PHYSICAL REVIEW APPLIED*  
Miller, J. L., Shin, D. D., Kwon, H., Shaw, S. W., Kenny, T. W.  
2019; 12 (4)
- **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
- **Electrical Properties of Ultrathin Platinum Films by Plasma-Enhanced Atomic Layer Deposition** *ACS APPLIED MATERIALS & INTERFACES*  
Kim, H. K., Kaplan, K. E., Schindler, P., Xu, S., Winterkorn, M. M., Heinz, D. B., English, T. S., Provine, J., Prinz, F. B., Kenny, T. W.  
2019; 11 (9): 9594–99
- **Direct Detection of Akhiezer Damping in a Silicon MEMS Resonator.** *Scientific reports*  
Rodriguez, J., Chandorkar, S. A., Watson, C. A., Glaze, G. M., Ahn, C. H., Ng, E. J., Yang, Y., Kenny, T. W.  
2019; 9 (1): 2244
- **Direct Detection of Akhiezer Damping in a Silicon MEMS Resonator** *SCIENTIFIC REPORTS*  
Rodriguez, J., Chandorkar, S. A., Watson, C. A., Glaze, G. M., Ahn, C. H., Ng, E. J., Yang, Y., Kenny, T. W.  
2019; 9
- **High-speed video microscopy and numerical modeling of bubble dynamics near a surface of urinary stone.** *The Journal of the Acoustical Society of America*  
Pishchalnikov, Y. A., Behnke-Parks, W. M., Schmidmayer, K. n., Maeda, K. n., Colonius, T. n., Kenny, T. W., Laser, D. J.  
2019; 146 (1): 516
- **Pseudo-Extensional Mode MEMS Ring Gyroscope**  
Prihodko, I. P., Gregory, J. A., Shin, D., Kwon, R., Kenny, T. W., Judy, M. W., IEEE  
IEEE.2019
- **Dynamic modulation of modal coupling in microelectromechanical gyroscopic ring resonators.** *Nature communications*  
Zhou, X. n., Zhao, C. n., Xiao, D. n., Sun, J. n., Sobreviela, G. n., Gerrard, D. D., Chen, Y. n., Flader, I. n., Kenny, T. W., Wu, X. n., Seshia, A. A.  
2019; 10 (1): 4980
- **NONLINEARITY OF DEGENERATELY DOPED FLEXURAL MODE SILICON MICROMECHANICAL RESONATORS**  
Koppaka, S., Alter, A. L., Vukasin, G. D., Shin, D. D., Flader, I. B., Chen, Y., Kenny, T. W., IEEE  
IEEE.2019: 1897–1900
- **SIGNAL ENHANCEMENT IN MEM RESONANT SENSORS USING PARAMETRIC SUPPRESSION**  
Miller, J. L., Bousse, N. E., Shin, D. D., Kwon, H., Kenny, T. W., IEEE  
IEEE.2019: 881–84
- **EFFECT OF SUBSTRATE THICKNESS ON ANCHOR DAMPING IN MEMS DEVICES**  
Vukasin, G. D., Sanchez, V. K., Cameron, C. P., Kwon, H., Rodriguez, J., Flader, I. B., Chen, Y., Kenny, T. W., IEEE  
IEEE.2019: 1843–45
- **EXPERIMENTALLY OBSERVED NONLINEAR DISSIPATION LINKED TO CONTRIBUTIONS FROM GAS DAMPING AND TED IN MEMS FLEXURAL MODE RESONATORS**  
Alter, A. L., Vukasin, G. D., Flader, I. B., Kim, H., Chen, Y., Shin, D. D., Kenny, T. W., IEEE  
IEEE.2019: 2095–98

- **AN OVEN-CONTROLLED MEMS OSCILLATOR (OCMO) WITH SUB 10MW, +/- 1.5 PPB STABILITY OVER TEMPERATURE**  
Kwon, H., Ortiz, L., Vukasin, G. D., Chen, Y., Shin, D. D., Kenny, T. W., IEEE  
IEEE.2019: 2072–75
- **A Dual-Axis Resonant Accelerometer Based on Electrostatic Stiffness Modulation in Epi-Seal Process**  
Shin, S., Wen, H., Kwon, H., Vukasin, G. D., Kenny, T. W., Ayazi, F., IEEE  
IEEE.2019
- **Effective quality factor tuning mechanisms in micromechanical resonators** *APPLIED PHYSICS REVIEWS*  
Miller, J., Ansari, A., Heinz, D. B., Chen, Y., Flader, I. B., Shin, D. D., Villanueva, L., Kenny, T. W.  
2018; 5 (4)
- **Thermal-Piezoresistive Tuning of the Effective Quality Factor of a Micromechanical Resonator** *PHYSICAL REVIEW APPLIED*  
Miller, J., Zhu, H., Heinz, D. B., Chen, Y., Flader, I. B., Shin, D. D., Lee, J., Kenny, T. W.  
2018; 10 (4)
- **Direct Detection of Anchor Damping in MEMS Tuning Fork Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Rodriguez, J., Chandorkar, S., Glaze, G. M., Gerrard, D. D., Chen, Y., Heinz, D. B., Flader, I. B., Kenny, T. W.  
2018; 27 (5): 800–809
- **Assessing failure in epitaxially encapsulated micro-scale sensors using micro and nano x-ray computed tomography** *MRS COMMUNICATIONS*  
Ortiz, L., Heinz, D. B., Flader, I. B., Alter, A. L., Shin, D. D., Chen, Y., Kenny, T. W.  
2018; 8 (2): 275–82
- **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
- **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
- **Experimental observations and numerical modeling of lipid-shell microbubbles with calcium-adhering moieties for minimally-invasive treatment of urinary stones.** *Proceedings of meetings on acoustics. Acoustical Society of America*  
Pishchalnikov, Y. A., Behnke-Parks, W. n., Maeda, K. n., Colonius, T. n., Mellema, M. n., Hopcroft, M. n., Luong, A. n., Wiener, S. n., Stoller, M. L., Kenny, T. n., Laser, D. J.  
2018; 35 (1)
- **Lateral Diffusion Doping of Silicon for Temperature Compensation of MEMS Resonators**  
Shin, D. D., Heinz, D. B., Kwon, H., Chen, Y., Kenny, T. W., IEEE  
IEEE.2018: 125–28
- **Active Temperature Compensation of Thermal Accelerometer for Improved Stability**  
Kaplan, K. E., Winterkorn, M. M., Everhart, C. M., Shin, D. D., O'Brien, G. J., Prinz, F. B., Kenny, T. W., IEEE  
IEEE.2018: 155–56
- **Investigation of Orientation Dependence of the Thermal Expansion Coefficient in Silicon MEMS Resonators**  
Rodriguez, J., Vukasin, G. D., Glaze, G. M., Hopcroft, M. A., Ortiz, L., Ahn, C. H., Ng, E., Park, W., Kenny, T. W., Watson, C. A., IEEE  
IEEE.2018: 108–11
- **High Quality Factor Mode Ordered Dual Foucault Pendulum Gyroscope**  
Asadian, M. H., Askari, S., Flader, I. B., Chen, Y., Gerrard, D. D., Shin, D. D., Kwon, H., Kenny, T. W., Shkel, A. M., IEEE  
IEEE.2018: 1130–33
- **EPITAXIAL ENCAPSULATION OF FULLY DIFFERENTIAL ELECTRODES AND LARGE TRANSDUCTION GAPS FOR MEMS RESONANT STRUCTURES**  
Flader, I. B., Chen, Y., Ahn, C., Shin, D. D., Alter, A. L., Rodriguez, J., Kenny, T. W., IEEE  
IEEE.2018: 483–86
- **EXPERIMENTAL FRACTAL-LIKE INSTABILITY BANDS IN A RESONANT SILICON-SILICON CONTACT PULL-IN VIBRATION DETECTOR**

- 
- Maiwald, V., Flader, I. B., Muller, M., Chen, Y., Pluss, S., Shin, D. D., Roman, C., Heinz, D. B., Kenny, T. W., Hierold, C., IEEE  
IEEE.2018: 984–87
- **TEMPERATURE COMPENSATION OF RESONANT ACCELEROMETER VIA NONLINEAR OPERATION**  
Shin, D. D., Chen, Y., Flader, I. B., Kenny, T. W., IEEE  
IEEE.2018: 1012–15
  - **UNANTICIPATED RESULTS IN THE FIRST DIRECT MEASUREMENTS OF ANCHOR DAMPING IN MEMS RESONATORS**  
Rodriguez, J., Gerrard, D. D., Glaze, G. M., Chandorkar, S., Chen, Y., Flader, I. B., Shin, D. D., Kenny, T. W., IEEE  
IEEE.2018: 543–46
  - **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
  - **Robust Method of Fabricating Epitaxially Encapsulated MEMS Devices with Large Gaps** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Chen, Y., Flader, I. B., Shin, D. D., Ahn, C., Rodriguez, J., Kenny, T. W.  
2017; 26 (6): 1235–43
  - **Measurement of Young's modulus and residual stress of atomic layer deposited Al<sub>2</sub>O<sub>3</sub> and Pt thin films** *JOURNAL OF MICROMECHANICS AND MICROENGINEERING*  
Purkl, F., Daus, A., English, T. S., Provine, J., Feyh, A., Urban, G., Kenny, T. W.  
2017; 27 (8)
  - **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)
  - **Modeling and Analysis for Thermal Management in Gallium Nitride HEMTs Using Microfluidic Cooling** *JOURNAL OF ELECTRONIC PACKAGING*  
Agarwal, G., Kazior, T., Kenny, T., Weinstein, D.  
2017; 139 (1)
  - **EFFECTIVE QUALITY FACTOR AND TEMPERATURE DEPENDENCE OF SELF-OSCILLATIONS IN A THERMAL-PIEZORESISTIVELY PUMPED RESONATOR**  
Miller, J. L., Heinz, D. B., Flader, I. B., Chen, Y., Shin, D. D., Kenny, T. W., IEEE  
IEEE.2017: 1907–10
  - **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
  - **HIGH-G (>20,000g) INERTIAL SHOCK SURVIVABILITY OF EPITAXIALLY ENCAPSULATED SILICON MEMS DEVICES**  
Heinz, D. B., Hong, V. A., Yang, Y., Ahn, C., Kenny, T. W., IEEE  
IEEE.2017: 1122–25
  - **EPITAXIALLY-ENCAPSULATED QUAD MASS RESONATOR WITH SHAPED COMB FINGERS FOR FREQUENCY TUNING**  
Taheri-Tehrani, P., Defoort, M., Chen, Y., Flader, I., Shin, D. D., Kenny, T. W., Horsley, D. A., IEEE  
IEEE.2017: 1111–14
  - **TRI-MODE OPERATION OF HIGHLY DOPED SILICON RESONATORS FOR TEMPERATURE COMPENSATED TIMING REFERENCES**  
Chen, Y., Shin, D. D., Flader, I. B., Kenny, T. W., IEEE  
IEEE.2017: 1158–61
  - **MANIPULATION OF HEAT FLUX PATHS IN THERMO-ELASTICALLY DAMPED RESONATORS FOR Q OPTIMIZATION**  
Gerrard, D. D., Rodriguez, J., Ortiz, L., Chandorkar, S. A., Flader, I. B., Chen, Y., Shin, D. D., Kenny, T. W., IEEE  
IEEE.2017: 1130–33
  - **ENVIRONMENTALLY ROBUST DIFFERENTIAL RESONANT ACCELEROMETER IN A WAFER-SCALE ENCAPSULATION PROCESS**  
Shin, D. D., Ahn, C., Chen, Y., Christensen, D. L., Flader, I. B., Kenny, T. W., IEEE  
IEEE.2017: 17–20

- **ON CROSS-TALK BETWEEN GYROSCOPES INTEGRATED ON A FOLDED MEMS IMU CUBE**  
Efimovskaya, A., Lin, Y., Yang, Y., Ng, E., Chen, Y., Flader, I., Ahn, C. H., Hong, V., Kenny, T. W., Shkel, A. M., IEEE  
IEEE.2017: 1142-45
- **Fabrication of Wide and Deep Cavities for Silicon MEMS Devices Without Wafer Bonding**  
Chen, Y., Flader, I. B., Shin, D. D., Ahn, C., Ortiz, L., Kenny, T. W., IEEE  
IEEE.2017: 113-16
- **Electrostatic Tuning of Temperature Coefficient of Frequency of Anisotropic Disk-Shaped Resonators**  
Shin, D. D., Ahn, C., Chen, Y., Hong, V. A., Ng, E. J., Yang, Y., Kenny, T. W., IEEE  
IEEE.2017: 164-67
- **Dual-Resonator MEMS Lorentz Force Magnetometer Based on Differential Frequency Modulation**  
Sonmezoglu, S., Flader, I. B., Chen, Y., Shin, D. D., Kenny, T. W., Horsley, D. A., IEEE  
IEEE.2017: 160-63
- **Compact Roll-Pitch-Yaw Gyroscope Implemented in Wafer-level Epitaxial Silicon Encapsulation Process**  
Efimovskaya, A., Yang, Y., Ng, E., Chen, Y., Flader, I., Kenny, T. W., Shkel, A. M., IEEE  
IEEE.2017: 181-82
- **EPITAXIALLY ENCAPSULATED RESONANT ACCELEROMETER WITH AN ON-CHIP MICRO-OVEN**  
Shin, D. D., Chen, Y., Flader, I. B., Kenny, T. W., IEEE  
IEEE.2017: 595-98
- **WAFER-SCALE ENCAPSULATION OF FULLY DIFFERENTIAL ELECTRODES FOR MUTLI-AXIS INERTIAL SENSING**  
Flader, I. B., Chen, Y., Gerrard, D. D., Kenny, T. W., IEEE  
IEEE.2017: 591-94
- **TOPOLOGY OPTIMIZATION FOR REDUCTION OF THERMO-ELASTIC DISSIPATION IN MEMS RESONATORS**  
Gerrard, D. D., Chen, Y., Chandorkar, S. A., Yu, G., Rodriguez, J., Flader, I. B., Shin, D. D., Meinhart, C. D., Sigmund, O., Kenny, T. W., IEEE  
IEEE.2017: 794-97
- **DIRECT COMPARISON OF STICTION PROPERTIES OF OXIDE COATED POLYSILICON AND SMOOTH SINGLE CRYSTAL SILICON**  
Heinz, D. B., Fickler, I. B., Chen, Y., Vukasin, G. D., Ortiz, L., Kenny, T. W., IEEE  
IEEE.2017: 1203-6
- **DUAL-RESONATOR MEMS MAGNETIC SENSOR WITH DIFFERENTIAL AMPLITUDE MODULATION**  
Sonmezoglu, S., Flader, I. B., Chen, Y., Shin, D. D., Kenny, T. W., Horsley, D. A., IEEE  
IEEE.2017: 814-17
- **Direct Measurements of Anchor Damping in MEMS Resonators**  
Rodriguez, J., Gerrard, D. D., Glaze, G. M., Chandorkar, S., Comenecia, L., Chen, Y., Flader, I. B., Kenny, T. W., IEEE  
IEEE.2017: 10-12
- **Nonlinear damping and dephasing in nanomechanical systems** *PHYSICAL REVIEW B*  
Atalaya, J., Kenny, T. W., Roukes, M. L., Dykman, M. I.  
2016; 94 (19)
- **Nonlinearity of Degenerately Doped Bulk-Mode Silicon MEMS Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Yang, Y., Ng, E. J., Polunin, P. M., Chen, Y., Flader, I. B., Shaw, S. W., Dykman, M. I., Kenny, T. W.  
2016; 25 (5): 859-869
- **Phase Noise Reduction in an MEMS Oscillator Using a Nonlinearly Enhanced Synchronization Domain** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Shoshani, O., Heywood, D., Yang, Y., Kenny, T. W., Shaw, S. W.  
2016; 25 (5): 870-876
- **Parallel preparation of plan-view transmission electron microscopy specimens by vapor-phase etching with integrated etch stops** *ULTRAMICROSCOPY*  
English, T. S., Provine, J., Marshall, A. F., Koh, A. L., Kenny, T. W.  
2016; 166: 39-47



- **Experimental Investigation Into Stiction Forces and Dynamic Mechanical Anti-Stiction Solutions in Ultra-Clean Encapsulated MEMS Devices** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Heinz, D. B., Hong, V. A., Ahn, C. H., Ng, E. J., Yang, Y., Kenny, T. W.  
2016; 25 (3): 469-478
- **A Unified Epi-Seal Process for Fabrication of High-Stability Microelectromechanical Devices** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Yang, Y., Ng, E. J., Chen, Y., Flader, I. B., Kenny, T. W.  
2016; 25 (3): 489-497
- **Characterization of MEMS Resonator Nonlinearities Using the Ringdown Response** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Polunin, P. M., Yang, Y., Dykman, M. I., Kenny, T. W., Shaw, S. W.  
2016; 25 (2): 297-303
- **Stable Encapsulated Charge-Biased Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Ng, E. J., Harrison, K. L., Yang, Y., Ahn, C. H., Hong, V. A., Howe, R. T., Kenny, T. W.  
2016; 25 (1): 30-37
- **OVENIZED DUAL-MODE CLOCK (ODNIC) BASED ON HIGHLY DOPED SINGLE CRYSTAL SILICON RESONATORS**  
Chen, Y., Ng, E. J., Shin, D. D., Ahn, C. H., Yang, Y., Flader, I. B., Hong, V. A., Kenny, T. W., IEEE  
IEEE.2016: 91-94
- **OVERCOMING STICTION FORCES WITH RESONANT OVER-TRAVEL STOPS**  
Hong, V. A., Heinz, D. B., Christensen, D. L., Shin, D. D., Chen, Y., Ahn, C., Yang, Y., Ng, E. J., Flader, I. B., Kenny, T. W., IEEE  
IEEE.2016: 47-50
- **STOCHASTIC METHOD FOR DISK RESONATING GYROSCOPE MODE MATCHING AND QUADRATURE NULLING**  
Flader, I. B., Ahn, C., Ng, E. J., Yang, Y., Hong, V. A., Kenny, T. W., IEEE  
IEEE.2016: 998-1001
- **Q-FACTOR OPTIMIZATION IN DISK RESONATOR GYROSCOPES VIA GEOMETRIC PARAMETERIZATION**  
Gerrard, D. D., Ahn, C. H., Flader, I. B., Chen, Y., Ng, E. J., Yang, Y., Kenny, T. W., IEEE  
IEEE.2016: 994-97
- **ENCAPSULATED DISK RESONATOR GYROSCOPE WITH DIFFERENTIAL INTERNAL ELECTRODES**  
Ahn, C., Shin, D. D., Hong, V. A., Yang, Y., Ng, E. J., Chen, Y., Flader, I. B., Kenny, T. W., IEEE  
IEEE.2016: 962-65
- **EPITAXIALLY-ENCAPSULATED QUAD MASS GYROSCOPE WITH NONLINEARITY COMPENSATION**  
Taheri-Tehrani, P., Kline, M., Izyumin, I., Eminoglu, B., Yeh, Y., Yang, Y., Chen, Y., Flader, I., Ng, E. J., Kenny, T. W., Boser, B. E., Horsley, D. A., IEEE  
IEEE.2016: 966-69
- **Mode-Matched MEMS Coriolis Vibratory Gyroscopes: Myth or Reality?**  
Prikhodko, I. P., Gregory, J. A., Clark, W. A., Geen, J. A., Judy, M. W., Ahn, C. H., Kenny, T. W., IEEE  
IEEE.2016: 1-4
- **Autonomous Calibration of MEMS Disk Resonating Gyroscope for Improved Sensor Performance**  
Flader, I. B., Ahn, C. H., Gerrard, D. D., Ng, E. J., Yang, Y., Hong, V. A., Pavone, M., Kenny, T. W., IEEE  
IEEE.2016: 5803-10
- **Investigation of a Vacuum Encapsulated Si-to-Si Contact Microswitch Operated From-60 degrees C to 400 degrees C** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Soon, B. W., Qian, Y., Ng, E. J., Hong, V. A., Yang, Y., Ahn, C. H., Kenny, T. W., Lee, C.  
2015; 24 (6): 1906-1915
- **Temperature Dependence of the Elastic Constants of Doped Silicon (vol 24, pg 730, 2015)** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Ng, E. J., Hong, V. A., Yang, Y., Ahn, C., Everhart, C. M., Kenny, T. W.  
2015; 24 (6): 2178
- **Characterization of Oxide-Coated Polysilicon Disk Resonator Gyroscope Within a Wafer-Scale Encapsulation Process** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*

- Ahn, C. H., Ng, E. J., Hong, V. A., Huynh, J., Wang, S., Kenny, T. W.  
2015; 24 (6): 1687-1694
- **Nonhomogeneous morphology and the elastic modulus of aligned carbon nanotube films** *JOURNAL OF MICROMECHANICS AND MICROENGINEERING*  
Won, Y., Gao, Y., Guzman de Villoria, R., Wardle, B. L., Xiang, R., Maruyama, S., Kenny, T. W., Goodson, K. E.  
2015; 25 (11)
  - **Thermal Conduction in Vertically Aligned Copper Nanowire Arrays and Composites.** *ACS applied materials & interfaces*  
Barako, M. T., Roy-Panzer, S., English, T. S., Kodama, T., Asheghi, M., Kenny, T. W., Goodson, K. E.  
2015; 7 (34): 19251-19259
  - **Multifunctional Integrated Sensors for Multiparameter Monitoring Applications** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Roozeboom, C. L., Hill, B. E., Vu Anh Hong, V. A., Ahn, C. H., Ng, E. J., Yang, Y., Kenny, T. W., Hopcroft, M. A., Pruitt, B. L.  
2015; 24 (4): 810-821
  - **Targeted microbubbles: a novel application for the treatment of kidney stones** *BJU INTERNATIONAL*  
Ramaswamy, K., Marx, V., Laser, D., Kenny, T., Chi, T., Bailey, M., Sorensen, M. D., Grubbs, R. H., Stoller, M. L.  
2015; 116 (1): 9-16
  - **Predicting the closed-loop stability and oscillation amplitude of nonlinear parametrically amplified oscillators** *APPLIED PHYSICS LETTERS*  
Zega, V., Nitzan, S., Li, M., Ahn, C. H., Ng, E., Hong, V., Yang, Y., Kenny, T., Corigliano, A., Horsley, D. A.  
2015; 106 (23)
  - **Temperature Dependence of the Elastic Constants of Doped Silicon** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Ng, E. J., Hong, V. A., Yang, Y., Ahn, C. H., Everhart, C. L., Kenny, T. W.  
2015; 24 (3): 730-741
  - **Mode-Matching of Wineglass Mode Disk Resonator Gyroscope in (100) Single Crystal Silicon** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Ahn, C. H., Ng, E. J., Hong, V. A., Yang, Y., Lee, B. J., Flader, I., Kenny, T. W.  
2015; 24 (2): 343-350
  - **Fatigue Experiments on Single Crystal Silicon in an Oxygen-Free Environment** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Hong, V. A., Yoneoka, S., Messana, M. W., Graham, A. B., Salvia, J. C., Branchflower, T. T., Ng, E. J., Kenny, T. W.  
2015; 24 (2): 351-359
  - **Accurate Modeling of Quality Factor Behavior of Complex Silicon MEMS Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Ghaffari, S., Ng, E. J., Ahn, C. H., Yang, Y., Wang, S., Hong, V. A., Kenny, T. W.  
2015; 24 (2): 276-288
  - **Self-induced parametric amplification arising from nonlinear elastic coupling in a micromechanical resonating disk gyroscope** *SCIENTIFIC REPORTS*  
Nitzan, S. H., Zega, V., Li, M., Ahn, C. H., Corigliano, A., Kenny, T. W., Horsley, D. A.  
2015; 5
  - **SILICON-TO-SILICON MICROSWITCH WITH WIDE OPERATION TEMPERATURE RANGE**  
Soon, B., Qian, Y., Ng, E. J., Kenny, T. W., Lee, C., IEEE  
IEEE.2015: 2105-8
  - **A 7PPM, 6 degrees/HR FREQUENCY-OUTPUT MEMS GYROSCOPE**  
Izyumin, I. I., Kline, M. H., Yeh, Y., Eminoglu, B., Ahn, C., Hong, V. A., Yang, Y., Ng, E. J., Kenny, T. W., Boser, B. E., IEEE  
IEEE.2015: 33-36
  - **MODELING THE EFFECT OF ANCHOR GEOMETRY ON THE QUALITY FACTOR OF BULK MODE RESONATORS**  
Gerrard, D. D., Ng, E. J., Ahn, C. H., Hong, V. A., Yang, Y., Kenny, T. W., IEEE  
IEEE.2015: 1997-2000
  - **A UNIFIED EPI-SEAL PROCESS FOR RESONATORS AND INERTIAL SENSORS**  
Yang, Y., Ng, E. J., Chen, Y., Flader, I. B., Ahn, C., Hong, V. A., Kenny, T. W., IEEE  
IEEE.2015: 1326-29
  - **IN-SITU OVENIZATION OF LAME-MODE SILICON RESONATORS FOR TEMPERATURE COMPENSATION**  
Chen, Y., Ng, E. J., Yang, Y., Ahn, C., Flader, I., Kenny, T. W., IEEE

IEEE.2015: 809–12

- **EXPERIMENTAL INVESTIGATION ON MODE COUPLING OF BULK MODE SILICON MEMS RESONATORS**  
Yang, Y., Ng, E., Polunin, P., Chen, Y., Strachan, S., Vu Hong, Ahn, C., Shoshani, O., Shaw, S., Dykman, M., Kenny, T., IEEE  
IEEE.2015: 1008–11
- **Disk Resonator Gyroscope with Whole-Angle Mode Operation**  
Taheri-Tehrani, P., Izyumin, O., Izyumin, I., Ahn, C. H., Ng, E. J., Hong, V. A., Yang, Y., Kenny, T. W., Boser, B. E., Horsley, D. A., IEEE  
IEEE.2015: 9–12
- **TUNABLE QUALITY FACTOR THROUGH 1:1 MODAL COUPLING IN A DISK RESONATOR**  
Flader, I. B., Ahn, C. H., Yang, Y., Ng, E. J., Hong, V. A., Baek, J., Kenny, T. W., IEEE  
IEEE.2015: 1199–1202
- **Encapsulated high frequency (235 kHz), high-Q (100 k) disk resonator gyroscope with electrostatic parametric pump** *APPLIED PHYSICS LETTERS*  
Ahn, C. H., Nitzan, S., Ng, E. J., Hong, V. A., Yang, Y., Kimbrell, T., Horsley, D. A., Kenny, T. W.  
2014; 105 (24)
- **Fabrication and Characterization of a Vacuum Encapsulated Curved Beam Switch for Harsh Environment Application** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Soon, B. W., Ng, E. J., Hong, V. A., Yang, Y., Ahn, C. H., Qian, Y., Kenny, T. W., Lee, C.  
2014; 23 (5): 1121-1130
- **CHARACTERIZATION OF STICTION FORCES IN ULTRA-CLEAN ENCAPSULATED MEMS DEVICES**  
Heinz, D. B., Hong, V. A., Ng, E. J., Ahn, C., Yang, Y., Kenny, T. W., IEEE  
IEEE.2014: 588–91
- **STABLE PULL-IN ELECTRODES FOR NARROW GAP ACTUATION**  
Ng, E. J., Yang, Y., Hong, V. A., Ahn, C., Christensen, D. L., Gibson, B. A., Qalandar, K. R., Turner, K. L., Kenny, T. W., IEEE  
IEEE.2014: 1281–84
- **STABLE CHARGE-BIASED CAPACITIVE RESONATORS WITH ENCAPSULATED SWITCHES**  
Ng, E. J., Harrison, K. L., Everhart, C. L., Hong, V. A., Yang, Y., Ahn, C., Heinz, D. B., Howe, R. T., Kenny, T. W., IEEE  
IEEE.2014: 1277–80
- **Zippering, entanglement, and the elastic modulus of aligned single-walled carbon nanotube films** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Won, Y., Gao, Y., Panzer, M. A., Xiang, R., Maruyama, S., Kenny, T. W., Cai, W., Goodson, K. E.  
2013; 110 (51): 20426-20430
- **Experimental Validation of Topology Optimization for RF MEMS Capacitive Switch Design** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Philippine, M. A., Zareie, H., Sigmund, O., Rebeiz, G. M., Kenny, T. W.  
2013; 22 (6): 1296-1309
- **The effect of the temperature-dependent nonlinearities on the temperature stability of micromechanical resonators** *JOURNAL OF APPLIED PHYSICS*  
Lee, H. K., Melamud, R., Kim, B., Chandorkar, S., Salvia, J. C., Kenny, T. W.  
2013; 114 (15)
- **Lorentz force magnetometer using a micromechanical oscillator** *APPLIED PHYSICS LETTERS*  
Li, M., Ng, E. J., Hong, V. A., Ahn, C. H., Yang, Y., Kenny, T. W., Horsley, D. A.  
2013; 103 (17)
- **Vacuum encapsulated resonators for humidity measurement** *SENSORS AND ACTUATORS B-CHEMICAL*  
Hennessy, R. G., Shulaker, M. M., Messana, M., Graham, A. B., Klejwa, N., Provine, J., Kenny, T. W., Howe, R. T.  
2013; 185: 575-581
- **Crystallographic effects in modeling fundamental behavior of MEMS silicon resonators** *MICROELECTRONICS JOURNAL*  
Ghaffari, S., Ahn, C. H., Ng, E. J., Wang, S., Kenny, T. W.  
2013; 44 (7): 586-591
- **Stability of Silicon Microelectromechanical Systems Resonant Thermometers** *IEEE SENSORS JOURNAL*

- Ng, E. J., Lee, H. K., Ahn, C. H., Melamud, R., Kenny, T. W.  
2013; 13 (3)
- **Topology Optimization of Stressed Capacitive RF MEMS Switches** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Philippine, M. A., Sigmund, O., Rebeiz, G. M., Kenny, T. W.  
2013; 22 (1): 206-215
  - **RESONANT PRESSURE SENSOR WITH ON-CHIP TEMPERATURE AND STRAIN SENSORS FOR ERROR CORRECTION** *26th IEEE International Conference on Micro Electro Mechanical Systems (MEMS)*  
Chiang, C., Graham, A. B., Lee, B. J., Ahn, C. H., Ng, E. J., O'Brien, G. J., Kenny, T. W.  
IEEE.2013: 45–48
  - **Quantum limit of quality factor in silicon micro and nano mechanical resonators.** *Scientific reports*  
Ghaffari, S., Chandorkar, S. A., Wang, S., Ng, E. J., Ahn, C. H., Hong, V., Yang, Y., Kenny, T. W.  
2013; 3: 3244-?
  - **SUB-10 NANOMETER UNCOOLED PLATINUM BOLOMETERS VIA PLASMA ENHANCED ATOMIC LAYER DEPOSITION**  
Purkl, F., English, T., Yama, G., Provine, J., Samara, A. K., Feyh, A., O'Brien, G., Ambacher, O., Howe, R. T., Kenny, T. W., IEEE  
IEEE.2013: 185–88
  - **Quantum limit of quality factor in silicon micro and nano mechanical resonators.** *Scientific reports*  
Ghaffari, S., Chandorkar, S. A., Wang, S., Ng, E. J., Ahn, C. H., Hong, V., Yang, Y., Kenny, T. W.  
2013; 3: 3244-?
  - **Bidirectionally tuning Kapitza conductance through the inclusion of substitutional impurities** *JOURNAL OF APPLIED PHYSICS*  
Duda, J. C., English, T. S., Piekos, E. S., Beechem, T. E., Kenny, T. W., Hopkins, P. E.  
2012; 112 (7)
  - **Phase and thickness dependent modulus of Ge<sub>2</sub>Sb<sub>2</sub>Te<sub>5</sub> films down to 25 nm thickness** *APPLIED PHYSICS LETTERS*  
Won, Y., Lee, J., Asheghi, M., Kenny, T. W., Goodson, K. E.  
2012; 100 (16)
  - **Electrical and Thermal Conduction in Atomic Layer Deposition Nanobridges Down to 7 nm Thickness** *NANO LETTERS*  
Yoneoka, S., Lee, J., Liger, M., Yama, G., Kodama, T., Gunji, M., Provine, J., Howe, R. T., Goodson, K. E., Kenny, T. W.  
2012; 12 (2): 683-686
  - **Mechanical characterization of aligned multi-walled carbon nanotube films using microfabricated resonators** *CARBON*  
Won, Y., Gao, Y., Panzer, M. A., Dogbe, S., Pan, L., Kenny, T. W., Goodson, K. E.  
2012; 50 (2): 347-355
  - **Reduction of Initial Stress Stiffening by Topology Optimization** *Symposium on Design, Test, Integration and Packaging of MEMS/MOEMS (DTIP)*  
Philippine, M. A., Sigmund, O., Rebeiz, G. M., Kenny, T. W.  
IEEE COMPUTER SOC.2012: 148–153
  - **ANHARMONIC PHONON DISPERSION RELATIONS, GROUP VELOCITIES, AND BRANCH-DEPENDENT SPECIFIC HEAT CAPACITIES MEASURED DIRECTLY FROM MOLECULAR DYNAMICS SIMULATIONS AT FINITE TEMPERATURES** *ASME Summer Heat Transfer Conference (SHTC)*  
English, T. S., Kenny, T. W., Smoyer, J. L., Baker, C. H., Le, N. Q., Duda, J. C., Norris, P. M., Hopkins, P. E.  
AMER SOC MECHANICAL ENGINEERS.2012: 617–624
  - **A SINGLE PROCESS FOR BUILDING CAPACITIVE PRESSURE SENSORS AND TIMING REFERENCES WITH PRECISE CONTROL OF RELEASED AREA USING LATERAL ETCH STOP** *25th IEEE International Conference on Micro Electro Mechanical Systems (MEMS)*  
Chiang, C., Graham, A. B., O'Brien, G. J., Kenny, T. W.  
IEEE.2012
  - **Crust Removal and Effective Modulus of Aligned Multi-walled Carbon Nanotube Films** *13th IEEE InterSociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm)*  
Won, Y., Gao, Y., de Villoria, R. G., Wardle, B. L., Kenny, T. W., Goodson, K. E.  
IEEE.2012: 1070–1076
  - **Electrostatic Tuning to Achieve Higher Stability Microelectromechanical Composite Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*

- Lee, H. K., Melamud, R., Kim, B., Hopcroft, M. A., Salvia, J. C., Kenny, T. W.  
2011; 20 (6): 1355-1365
- **Stable Operation of MEMS Oscillators Far Above the Critical Vibration Amplitude in the Nonlinear Regime** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Lee, H. K., Melamud, R., Chandorkar, S., Salvia, J., Yoneoka, S., Kenny, T. W.  
2011; 20 (6): 1228-1230
  - **Influence of the temperature dependent nonlinearities on the performance of micromechanical resonators** *APPLIED PHYSICS LETTERS*  
Lee, H. K., Kim, B., Melamud, R., Hopcroft, M. A., Salvia, J. C., Kenny, T. W.  
2011; 99 (19)
  - **Orientation angle and the adhesion of single gecko setae** *JOURNAL OF THE ROYAL SOCIETY INTERFACE*  
Hill, G. C., Soto, D. R., Peattie, A. M., Full, R. J., Kenny, T. W.  
2011; 8 (60): 926-933
  - **AC Polarization for Charge-Drift Elimination in Resonant Electrostatic MEMS and Oscillators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Bahl, G., Salvia, J. C., Melamud, R., Kim, B., Howe, R. T., Kenny, T. W.  
2011; 20 (2): 355-364
  - **Wafer-Level Epitaxial Silicon Packaging for Out-of-Plane RF MEMS Resonators with Integrated Actuation Electrodes** *IEEE TRANSACTIONS ON COMPONENTS PACKAGING AND MANUFACTURING TECHNOLOGY*  
Chen, K., Wang, S., Salvia, J. C., Melamud, R., Howe, R. T., Kenny, T. W.  
2011; 1 (3): 310-317
  - **3-D visualization of flow in microscale jet impingement systems** *INTERNATIONAL JOURNAL OF THERMAL SCIENCES*  
Won, Y., Wang, E. N., Goodson, K. E., Kenny, T. W.  
2011; 50 (3): 325-331
  - **Motional Impedance of Resonators in the Nonlinear Regime** *5th Joint Conference of the 65th IEEE International Frequency Control Symposium/25th European Frequency and Time Forum*  
Lee, H. K., Melamud, R., Chandorkar, S., Qu, Y. Q., Salvia, J., Kenny, T. W.  
IEEE.2011: 372-377
  - **Tip-Based Nanofabrication: An Approach to True Nanotechnology**  
Bloschock, K. P., Schofield, A. R., Kenny, T. W., George, T., Islam, M. S., Dutta, A. K.  
SPIE-INT SOC OPTICAL ENGINEERING.2011
  - **Stability Measurements of Silicon MEMS Resonant Thermometers** *10th IEEE Conference on Sensors*  
Ng, E. J., Lee, H. K., Ahn, C. H., Melamud, R., Kenny, T. W.  
IEEE.2011: 1257-1260
  - **Active Electrostatic Compensation of Micromechanical Resonators Under Random Vibrations** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Yoneoka, S., Salvia, J. C., Bahl, G., Melamud, R., Chandorkar, S. A., Kenny, T. W.  
2010; 19 (5): 1270-1272
  - **Effect of fibril shape on adhesive properties** *APPLIED PHYSICS LETTERS*  
Soto, D., Hill, G., Parness, A., Esparza, N., Cutkosky, M., Kenny, T.  
2010; 97 (5)
  - **Characterization of Encapsulated Micromechanical Resonators Sealed and Coated With Polycrystalline SiC** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Yoneoka, S., Roper, C. S., Candler, R. N., Chandorkar, S. A., Graham, A. B., Provine, J., Maboudian, R., Howe, R. T., Kenny, T. W.  
2010; 19 (2): 357-366
  - **What is the Young's Modulus of Silicon?** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Hopcroft, M. A., Nix, W. D., Kenny, T. W.  
2010; 19 (2): 229-238
  - **A Method for Wafer-Scale Encapsulation of Large Lateral Deflection MEMS Devices** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Graham, A. B., Messana, M. W., Hartwell, P. G., Provine, J., Yoneoka, S., Melamud, R., Kim, B., Howe, R. T., Kenny, T. W.

2010; 19 (1): 28-37

- **Real-Time Temperature Compensation of MEMS Oscillators Using an Integrated Micro-Oven and a Phase-Locked Loop** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Salvia, J. C., Melamud, R., Chandorkar, S. A., Lord, S. F., Kenny, T. W.  
2010; 19 (1): 192-201
- **Model and Observations of Dielectric Charge in Thermally Oxidized Silicon Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Bahl, G., Melamud, R., Kim, B., Chandorkar, S. A., Salvia, J. C., Hopcroft, M. A., Elata, D., Hennessy, R. G., Candler, R. N., Howe, R. T., Kenny, T. W.  
2010; 19 (1): 162-174
- **INFLUENCE OF THE TEMPERATURE DEPENDENT A-F EFFECT ON THE DESIGN AND PERFORMANCE OF MEMS OSCILLATORS** *23rd IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2010)*  
Lee, H. K., Salvia, J., Bahl, G., Melamud, R., Yoneoka, S., Qu, Y. Q., Chandorkar, S., Hopcroft, M. A., Kim, B., Kenny, T. W.  
IEEE.2010: 699-702
- **STRESS RELAXATION STUDY OF SPUTTERED PLATINUM THIN FILMS AT NEAR ROOM TEMPERATURE USING AN ULTRA-SENSITIVE STRAIN GAUGE** *23rd IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2010)*  
Qu, Y. Q., Melamud, R., Chandorkar, S., Lee, H. K., Kenny, T. W.  
IEEE.2010: 548-551
- **NONLINEARITY OF HERMETICALLY ENCAPSULATED HIGH-Q DOUBLE BALANCED BREATHE-MODE RING RESONATOR** *23rd IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2010)*  
Wang, S., Chandorkar, S., Salvia, J., Melamud, R., Qu, Y., Lee, H. K., Kenny, T. W.  
IEEE.2010: 715-718
- **Encapsulated MEMS Resonators - A technology path for MEMS into Frequency Control Applications** *2010 IEEE International Frequency Control Symposium*  
Kim, B., Melamud, R., CANDLER, R. A., Hopcroft, M. A., Jha, C. M., Chandorkar, S., Kenny, T. W.  
IEEE.2010: 1-4
- **A NOVEL CHARACTERIZATION METHOD FOR TEMPERATURE COMPENSATION OF COMPOSITE RESONATORS** *23rd IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2010)*  
Lee, H. K., Yoneoka, S., Bahl, G., Salvia, J., Qu, Y. Q., Melamud, R., Chandorkar, S., Kim, B., Hopcroft, M. A., Kenny, T. W.  
IEEE.2010: 743-746
- **CHARGE-DRIFT ELIMINATION IN RESONANT ELECTROSTATIC MEMS** *23rd IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2010)*  
Bahl, G., Salvia, J., Bargatin, I., Yoneoka, S., Melamud, R., Kim, B., Chandorkar, S., Hopcroft, M. A., Bahl, R., Howe, R. T., Kenny, T. W.  
IEEE.2010: 108-111
- **HIGH-CYCLIC FATIGUE EXPERIMENTS OF SINGLE CRYSTAL SILICON IN AN OXYGEN-FREE ENVIRONMENT** *23rd IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2010)*  
Yoneoka, S., Qu, Y. Q., Wang, S., Messana, M. W., Graham, A. B., Salvia, J., Kim, B., Melamud, R., Bahl, G., Kenny, T. W.  
IEEE.2010: 224-227
- **AN OPTIMIZATION DESIGN FOR A MEMS FABRICATED JET IMPINGEMENT COOLING DEVICE** *ASME InterPack Conference*  
Won, Y. J., Lee, J. H., Wang, E. N., Goodson, K. E., Kenny, T. W.  
AMER SOC MECHANICAL ENGINEERS.2010: 491-496
- **Development of wafer scale encapsulation process for large displacement piezoresistive MEMS devices** *SENSORS AND ACTUATORS A-PHYSICAL*  
Ayanoor-Vitikkate, V., Chen, K., Park, W., Kenny, T. W.  
2009; 156 (2): 275-283
- **Temperature-Insensitive Composite Micromechanical Resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Melamud, R., Chandorkar, S. A., Kim, B., Lee, H. K., Salvia, J. C., Bahl, G., Hopcroft, M. A., Kenny, T. W.  
2009; 18 (6): 1409-1419
- **Performance Evaluation and Equivalent Model of Silicon Interconnects for Fully-Encapsulated RF MEMS Devices** *IEEE TRANSACTIONS ON ADVANCED PACKAGING*  
Chen, K., Salvia, J., Potter, R., Howe, R. T., Kenny, T. W.

2009; 32 (2): 402-409

- **Multimode thermoelastic dissipation** *JOURNAL OF APPLIED PHYSICS*  
Chandorkar, S. A., Candler, R. N., Duwel, A., Melamud, R., Agarwal, M., Goodson, K. E., Kenny, T. W.  
2009; 105 (4)
- **Hermeticity and diffusion investigation in polysilicon film encapsulation for microelectromechanical systems** *JOURNAL OF APPLIED PHYSICS*  
Kim, B., Candler, R. N., Melamud, R., Hopcroft, M. A., Yoneoka, S., Lee, H. K., Agarwal, M., Chandorkar, S. A., Yama, G., Kenny, T. W.  
2009; 105 (1)
- **AN INTEGRATED SOLUTION FOR WAFER-LEVEL PACKAGING AND ELECTROSTATIC ACTUATION OF OUT-OF-PLANE DEVICES** *22nd International Conference on Micro Electro Mechanical Systems (MEMS)*  
Chen, K., Melamud, R., Wang, S., Kenny, T. W.  
IEEE.2009: 1071–1074
- **EPITAXIAL SILICON MICROSHELL VACUUM-ENCAPSULATED CMOS-COMPATIBLE 200 MHz BULK-MODE RESONATOR** *22nd International Conference on Micro Electro Mechanical Systems (MEMS)*  
Chen, K., Chandralahim, H., Graham, A. B., Bhave, S. A., Howe, R. T., Kenny, T. W.  
IEEE.2009: 23–26
- **ACCELERATION COMPENSATION OF MEMS RESONATORS USING ELECTROSTATIC TUNING** *22nd International Conference on Micro Electro Mechanical Systems (MEMS)*  
Yoneoka, S., Bahl, G., Salvia, J., Chen, K. L., Graham, A. B., Lee, H. K., Yama, G., Candler, R. N., Kenny, T. W.  
IEEE.2009: 805–808
- **3-D VISUALIZATION OF FLOW IN MICROSCALE JET IMPINGEMENT SYSTEM** *7th International Conference on Nanochannels, Microchannels and Minichannels*  
Won, Y. J., David, M., Wang, E. N., Goodson, K. E., Kenny, T. W.  
AMER SOC MECHANICAL ENGINEERS.2009: 759–764
- **PHASE LOCK LOOP BASED TEMPERATURE COMPENSATION FOR MEMS OSCILLATORS** *22nd International Conference on Micro Electro Mechanical Systems (MEMS)*  
Salvia, J., Melamud, R., Chandorkar, S., Lee, H. K., Qu, Y. Q., Lord, S. F., Murmann, B., Kenny, T. W.  
IEEE.2009: 661–664
- **WAFER SCALE ENCAPSULATION OF LARGE LATERAL DEFLECTION MEMS STRUCTURES** *22nd International Conference on Micro Electro Mechanical Systems (MEMS)*  
Graham, A. B., Messana, M., Hartwell, P., Provine, J., Yoneoka, S., Kim, B., Melamud, R., Howe, R. T., Kenny, T. W.  
IEEE.2009: 745–748
- **Acceleration insensitive encapsulated silicon microresonator** *APPLIED PHYSICS LETTERS*  
Jha, C. M., Salvia, J., Chandorkar, S. A., Melamud, R., Kuhl, E., Kenny, T. W.  
2008; 93 (23)
- **Temperature dependence of quality factor in MEMS resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Kim, B., Hopcroft, M. A., Candler, R. N., Jha, C. M., Agarwal, M., Melamud, R., Chandorkar, S. A., Yama, G., Kenny, T. W.  
2008; 17 (3): 755-766
- **Mission results for Sapphire, a student-built satellite** *ACTA ASTRONAUTICA*  
Swartwout, M., Kitts, C., Twiggs, R., Kenny, T., Smith, B. R., Lu, R., Stattenfield, K., Pranajaya, F.  
2008; 62 (8-9): 521-538
- **A study of electrostatic force nonlinearities in resonant microstructures** *APPLIED PHYSICS LETTERS*  
Agarwal, M., Chandorkar, S. A., Mehta, H., Candler, R. N., Kim, B., Hopcroft, M. A., Melamud, R., Jha, C. M., Bahl, G., Yama, G., Kenny, T. W., Murmann, B.  
2008; 92 (10)
- **Thermal isolation of encapsulated MEMS resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Jha, C. M., Hopcroft, M. A., Chandorkar, S. A., Salvia, J. C., Agarwal, M., Candler, R. N., Melamud, R., Kim, B., Kenny, T. W.  
2008; 17 (1): 175-184
- **Exploring the Limits and Practicality of Q-based Temperature Compensation for Silicon Resonators** *IEEE International Electron Devices Meeting*

- Salvia, J., Messina, M., Ohline, M., Hopcroft, M. A., Melamud, R., Chandorkar, S., Lee, H. K., Bahl, G., Murmann, B., Kenny, T. W.  
IEEE.2008: 671–674
- **Variable thermal resistors (VTR) for thermal management of chip scale atomic clocks (CSAC)** *21st IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2008)*  
Kim, H., Liao, H., Song, H. O., Kenny, T. W.  
IEEE.2008: 852–855
  - **Identification and management of diffusion pathways in polysilicon encapsulation for MEMS devices** *21st IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2008)*  
Kim, B., Candler, R. N., Melamud, R., Yoneoka, S., Lee, H. K., Yama, G., Kenny, T. W.  
IEEE.2008: 104–107
  - **Limits of quality factor in bulk-mode micromechanical resonators** *21st IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2008)*  
Chandorkar, S. A., Agarwal, M., Melamud, R., Candler, R. N., Goodson, K. E., Kenny, T. W.  
IEEE.2008: 74–77
  - **Ultraminiature encapsulated accelerometers as a fully implantable sensor for implantable hearing aids** *13th International Conference on Solid-State Sensors, Actuators and Microsystems*  
Park, W., O'Connor, K. N., Chen, K., Mallon, J. R., Maetani, T., Dalal, P., Candler, R. N., Ayanoor-Vitikate, V., Roberson, J. B., Puria, S., Kenny, T. W.  
SPRINGER.2007: 939–49
  - **Scaling of amplitude-frequency-dependence nonlinearities in electrostatically transduced microresonators** *JOURNAL OF APPLIED PHYSICS*  
Agarwal, M., Mehta, H., Candler, R. N., Chandorkar, S. A., Kim, B., Hopcroft, M. A., Melamud, R., Bahl, G., Yama, G., Kenny, T. W., Murmann, B.  
2007; 102 (7)
  - **High resolution microresonator-based digital temperature sensor** *APPLIED PHYSICS LETTERS*  
Jha, C. M., Bahl, G., Melamud, R., Chandorkar, S. A., Hopcroft, M. A., Kim, B., Agarwal, M., Salvia, J., Mehta, H., Kenny, T. W.  
2007; 91 (7)
  - **Using the temperature dependence of resonator quality factor as a thermometer** *APPLIED PHYSICS LETTERS*  
Hopcroft, M. A., Kim, B., Chandorkar, S., Melamud, R., Agarwal, M., Jha, C. M., Bahl, G., Salvia, J., Mehta, H., Lee, H. K., Candler, R. N., Kenny, T. W.  
2007; 91 (1)
  - **Temperature-compensated high-stability silicon resonators** *APPLIED PHYSICS LETTERS*  
Melamud, R., Kim, B., Chandorkar, S. A., Hopcroft, M. A., Agarwal, M., Jha, C. M., Kenny, T. W.  
2007; 90 (24)
  - **A multiaxis force sensor for the study of insect biomechanics** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Bartsch, M. S., Federle, W., Full, R. J., Kenny, T. W.  
2007; 16 (3): 709-718
  - **Frequency stability of wafer-scale film encapsulated silicon based MEMS resonators** *SENSORS AND ACTUATORS A-PHYSICAL*  
Kim, B., Candler, R. N., Hopcroft, M. A., Agarwal, M., Park, W., Kenny, T. W.  
2007; 136 (1): 125-131
  - **Wafer-scale fabrication of infrared detectors based on tunneling displacement transducers** *SENSORS AND ACTUATORS A-PHYSICAL*  
Ajakaiye, A., Grade, J., Shin, C., Kenny, T.  
2007; 134 (2): 575-581
  - **Inhibition of metalloprotease botulinum serotype A from a pseudo-peptide binding mode to a small molecule that is active in primary neurons** *JOURNAL OF BIOLOGICAL CHEMISTRY*  
Burnett, J. C., Ruthel, G., Stegmann, C. M., Panchal, R. G., Nguyen, T. L., Hermone, A. R., Stafford, R. G., Lane, D. J., Kenny, T. A., McGrath, C. F., Wipf, P., Stahl, A. M., Schmidt, et al  
2007; 282 (7): 5004-5014
  - **Acceleration sensitivity in beam-type electrostatic microresonators** *APPLIED PHYSICS LETTERS*  
Agarwal, M., Park, K. K., Chandorkar, S. A., Candler, R. N., Kim, B., Hopcroft, M. A., Melamud, R., Kenny, T. W., Murmann, B.  
2007; 90 (1)



- **Investigating the role of orientation angle on gecko, setae adhesion using a dual-axis MEMS force sensor** *14th International Conference on Solid-State Sensors, Actuators and Microsystems/21st European Conference on Solid-State Transducers*  
Hill, G. C., Soto, D. R., Lue, S. J., Peattie, M., Full, R. J., Kenny, T. W.  
IEEE.2007
- **Composite flexural-mode resonator with controllable turnover temperature** *20th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2007)*  
Melamud, R., Kim, B., Hopcroft, M. A., Chandorkar, S., Agarwal, M., Jha, C. M., Kenny, T. W.  
IEEE.2007: 378–381
- **Using MEMS to build the device and the package** *14th International Conference on Solid-State Sensors, Actuators and Microsystems/21st European Conference on Solid-State Transducers*  
Kim, B., Hopcroft, M., Jha, C. M., Melamud, R., Chandorkar, S., Agarwal, M., Chen, K. L., Park, W. T., Candler, R., Yama, G., Partridge, A., Lutz, M., Kenny, et al  
IEEE.2007
- **CMOS compatible wafer-scale encapsulation with MEMS resonators** *ASME InterPACK Conference*  
Kim, B., Hopcroft, M. A., Melamud, R., Jha, C. M., Agarwal, M., Chandorkar, S. A., Kenny, T. W.  
AMER SOC MECHANICAL ENGINEERS.2007: 499–504
- **Si-SiO<sub>2</sub> composite MEMS resonators in CMOS compatible wafer-scale thin-film encapsulation** *Joint IEEE International Frequency Control Symposium/21st European Frequency and Time Forum*  
Kim, B., Melamud, R., Hopcroft, M. A., Chandorkar, S. A., Bahl, G., Messana, M., Candler, R. N., Yama, G., Kenny, T.  
IEEE, ELECTRON DEVICES SOC & RELIABILITY GROUP.2007: 1214–1219
- **Non-isothermal micromechanical resonators** *20th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2007)*  
Chandorkar, S. A., Mehta, H., Agarwal, M., Hopcroft, M. A., Jha, C. M., Candler, R. N., Yama, G., Bahl, G., Kim, B., Melamud, R., Goodson, K. E., Kenny, T. W.  
IEEE.2007: 714–717
- **Impact of miniaturization on the current handling of electrostatic MEMS resonators** *20th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2007)*  
Agarwal, M., Mehta, H., Candler, R. N., Chandorkar, S. A., Kim, B., Hopcroft, M. A., Melamud, R., Bahl, G., Yama, G., Kenny, T. W., Murmann, B.  
IEEE.2007: 530–533
- **An improved method of thermal resistance measurement for variable thermal resistors** *ASME InterPACK Conference*  
Kim, H., Song, H. O., Kenny, T. W.  
AMER SOC MECHANICAL ENGINEERS.2007: 249–253
- **Cmos-compatible dual-resonator mems temperature sensor with milli-degree accuracy** *14th International Conference on Solid-State Sensors, Actuators and Microsystems/21st European Conference on Solid-State Transducers*  
Jha, C. M., Bahl, G., Melamud, R., Chandorkar, S. A., Hopcroft, M. A., Kim, B., Agarwal, M., Salvia, J., Mehta, H., Kenny, T. W.  
IEEE.2007
- **A high-stability MEMS frequency reference** *14th International Conference on Solid-State Sensors, Actuators and Microsystems/21st European Conference on Solid-State Transducers*  
Hopcroft, M. A., Lee, H. K., Kim, B., Melamud, R., Chandorkar, S., Agarwal, M., Jha, C. M., Salvia, J., Bahl, G., Mehta, H., Kenny, T. W.  
IEEE.2007
- **Long-term and accelerated life testing of a novel single-wafer vacuum encapsulation for MEMS resonators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Candler, R. N., Hopcroft, M. A., Kim, B., Park, W., Melamud, R., Agarwal, M., Yama, G., Partridge, A., Lutz, M., Kenny, T. W.  
2006; 15 (6): 1446-1456
- **Engineering MEMS resonators with low thermoelastic damping** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Duwel, A., Candler, R. N., Kenny, T. W., Varghese, M.  
2006; 15 (6): 1437-1445
- **Optimal drive condition for nonlinearity reduction in electrostatic microresonators** *APPLIED PHYSICS LETTERS*  
Agarwal, M., Chandorkar, S. A., Candler, R. N., Kim, B., Hopcroft, M. A., Melamud, R., Jha, C. M., Kenny, T. W., Murmann, B.  
2006; 89 (21)

- **Impact of geometry on thermoelastic dissipation in micromechanical resonant beams** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Candler, R. N., Duwel, A., Varghese, M., Chandorkar, S. A., Hopcroft, M. A., Park, W., Kim, B., Yama, G., Partridge, A., Lutz, M., Kenny, T. W.  
2006; 15 (4): 927-934
- **A hybrid method for bubble geometry reconstruction in two-phase microchannels** *EXPERIMENTS IN FLUIDS*  
Wang, E. N., Devasenathipathy, S., Lin, H., Hidrovo, C. H., Santiago, J. G., Goodson, K. E., Kenny, T. W.  
2006; 40 (6): 847-858
- **Encapsulated submillimeter piezoresistive accelerometers** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Park, W., Partridge, A., Candler, R. N., Ayanoor-Vitikkate, V., Yama, G., Lutz, M., Kenny, T. W.  
2006; 15 (3): 507-514
- **Two-phase microfluidics for semiconductor circuits and fuel cells** *HEAT TRANSFER ENGINEERING*  
Hidrovo, C. H., Kramer, T. A., Wang, E. N., Vigneron, E., Steinbrenner, J. E., Koo, J. M., Wang, F. M., Fogg, D. W., Flynn, R. D., Lee, E. S., Cheng, C. H., Kenny, T. W., Eaton, et al  
2006; 27 (4): 53-63
- **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
- **Temperature dependence of quality factor in MEMS resonators** *19th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2006)*  
Kim, B., Jha, C. M., White, T., Candler, R. N., Hopcroft, M., Agarwal, M., Park, K. K., Melamud, R., Chandorkar, S., Kenny, T. W.  
IEEE.2006: 590-593
- **Wafer Scale Encapsulation of Wide Gaps using oxidation of Sacrificial Beams** *31st IEEE/CPMT International Electronic Manufacturing Technology Symposium*  
Ayanoor-vitikkate, V., Chen, K., Park, W., Yama, G., Kenny, T. W.  
IEEE.2006: 300-306
- **Temperature compensation of a MEMS resonator using quality factor as a thermometer** *19th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2006)*  
Hopcroft, M. A., Agarwal, M., Park, K. K., Kim, B., Jha, C. M., Candler, R. N., Yama, G., Murmann, B., Kenny, T. W.  
IEEE.2006: 222-225
- **Nonlinear characterization of electrostatic MEMS resonators** *IEEE International Frequency Control Symposium and Exposition*  
Agarwal, M., Park, K. K., Candler, R. N., Kim, B., Hopcroft, M. A., Chandorkar, S. A., Jha, C. M., Melamud, R., Kenny, T. W., Murmann, B.  
IEEE.2006: 209-212
- **Effects of mechanical vibrations and bias voltage noise on phase noise of MEMS resonator based oscillators** *19th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2006)*  
Agarwal, M., Park, K. K., Hopcroft, M., Chandorkar, S., Candler, R. N., Kim, B., Melamud, R., Yama, G., Murmann, B., Kenny, T. W.  
IEEE.2006: 154-157
- **Phase change phenomena in silicon microchannels** *INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER*  
Zhang, L. A., Wang, E. N., Goodson, K. E., Kenny, T. W.  
2005; 48 (8): 1572-1582
- **Sub-mm encapsulated accelerometers: A fully implantable sensor for cochlear implants** *13th International Conference on Solid-State Sensors, Actuators and Microsystems*  
Park, W. T., O'Connor, K. N., Mallon, J. R., Maetani, T., Candler, R. N., Ayanoor-Vitikkate, V., Roberson, J. B., Puria, S., Kenny, T. W.  
IEEE.2005: 109-112
- **Study of high speed acoustic separation in micro channels using mu-PIV** *8th International Conference on Miniaturized Systems for Chemistry and Life Sciences*  
Li, H., Vitikkate, V., Kenny, T. W.  
SPRINGER.2005: 12-14
- **Two-phase microfluidics for semiconductor circuits and fuel cells** *3rd International Conference on Microchannels and Minichannels*  
Hidrovo, C. H., Kramer, T. A., Wang, E. N., Vigneron, S., Steinbrenner, J. E., Koo, J., Wang, F., Fogg, D. W., Flynn, R. D., Lee, E. S., Cheng, C., Kenny, T. W., Eaton, et al

AMER SOC MECHANICAL ENGINEERS.2005: 49–58

- **Impact of slot location on thermoelastic dissipation in micromechanical resonators** *13th International Conference on Solid-State Sensors, Actuators and Microsystems*  
Candler, R. N., Hopcroft, M., Low, C. W., Chandorkar, S., Kim, B., Varghese, M., Duwel, A., Kenny, T. W.  
IEEE.2005: 597–600
- **Frequency stability of wafer-scale encapsulated MEMS resonators** *13th International Conference on Solid-State Sensors, Actuators and Microsystems*  
Kim, B., Candler, R. N., Hopcroft, M., Agarwal, M., Park, W. T., Kenny, T. W.  
IEEE.2005: 1965–1968
- **Fully encapsulated sub-millimeter accelerometers** *18th IEEE International Conference on Micro Electro Mechanical Systems (MEMS)*  
Park, W. T., Candler, R. N., Ayanoor-Vitikkate, V., Lutz, M., Partridge, A., Yama, G., Kenny, T. W.  
IEEE.2005: 347–350
- **Effects of stress on the temperature coefficient of frequency in double clamped resonators** *13th International Conference on Solid-State Sensors, Actuators and Microsystems*  
Melamud, R., Hopcroft, M., Jha, C., Kim, B., Chandorkar, S., Candler, R., Kenny, T. W.  
IEEE.2005: 392–395
- **Hydrogen diffusion and pressure control of encapsulated MEMS resonators** *13th International Conference on Solid-State Sensors, Actuators and Microsystems*  
Candler, R. N., Park, W. T., Hopcroft, M., Kim, B., Kenny, T. W.  
IEEE.2005: 920–923
- **Non-linearity cancellation in MEMS resonators for improved power-handling** *IEEE International Electron Devices Meeting*  
Agarwal, M., Park, K., Candler, R., Hopcroft, M., Jha, C., Melamud, R., Kim, B., Murmann, B., Kenny, T. W.  
IEEE.2005: 295–298
- **Micromachined jets for liquid impingement cooling of VLSI chips (vol 13, pg 833, 2004)** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Wang, E. N., Zhang, L., Jiang, L. N., Koo, J. M., Maveety, J. G., Sanchez, E. A., Goodson, K. E., Kenny, T. W.  
2004; 13 (6): 1072-1072
- **Micromachined jets for liquid impingement cooling of VLSI chips** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Wang, E. N., Zhang, L., Jiang, L. N., Koo, J. M., Maveety, J. G., Sanchez, E. A., Goodson, K. E., Kenny, T. W.  
2004; 13 (5): 833-842
- **Comparison of thermal and piezoresistive sensing approaches for atomic force microscopy topography measurements** *APPLIED PHYSICS LETTERS*  
King, W. P., Kenny, T. W., Goodson, K. E.  
2004; 85 (11): 2086-2088
- **Fatigue crack growth in micro-machined single-crystal silicon** *JOURNAL OF MATERIALS RESEARCH*  
Renuart, E. D., Fitzgerald, A. M., Kenny, T. W., Dauskardt, R. H.  
2004; 19 (9): 2635-2640
- **Nucleation and growth of vapor bubbles in a heated silicon microchannel** *JOURNAL OF HEAT TRANSFER-TRANSACTIONS OF THE ASME*  
Wang, E. N., Devasenathipathy, S., Santiago, J. G., Goodson, K. E., Kenny, T. W.  
2004; 126 (4): 497-497
- **Measurement system for low force and small displacement contacts** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Pruitt, B. L., Park, W. T., Kenny, T. W.  
2004; 13 (2): 220-229
- **Development and characterization of a TES optical imaging array for astrophysics applications** *10th International Workshop on Low Temperature Detectors*  
Burney, J., Bay, T. J., Brink, P. L., Cabrera, B., Castle, J. P., Romani, R. W., Tomada, A., Nam, S. W., Miller, A. J., Martinis, J., Wang, E., Kenny, T., Young, et al  
ELSEVIER SCIENCE BV.2004: 533–36
- **High speed particles separation using ultrasound for microTAS and lab-on-a-chip application.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*  
Li, H., Kenny, T.  
2004; 4: 2631-2634

- **High speed particles separation using ultrasound for micro-TAS and lab-on-a-chip application** *26th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*  
Li, H., Kenny, T.  
IEEE.2004: 2631–2634
- **Fundamental noise in MEMS force sensors** *Conference on Noise and Information in Nanoelectronics, Sensors and Standards II*  
Kenny, T. W., Liang, Y. C., Pruitt, B. L., Harley, J. A.  
SPIE-INT SOC OPTICAL ENGINEERING.2004: 143–151
- **Measurements of cooling by room-temperature thermionic emission across a nanometer gap** *JOURNAL OF APPLIED PHYSICS*  
Hishinuma, Y., Geballe, T. H., Moyzhes, B. Y., Kenny, T. W.  
2003; 94 (7): 4690-4696
- **Stress wave interference effects during fracture of silicon micromachined specimens** *EXPERIMENTAL MECHANICS*  
Fitzgerald, A. M., Kenny, T. W., Dauskardt, R. H.  
2003; 43 (3): 317-322
- **Single wafer encapsulation of MEMS devices** *IEEE TRANSACTIONS ON ADVANCED PACKAGING*  
Candler, R. N., Park, W. T., Li, H. M., Yama, G., Partridge, A., Lutz, M., Kenny, T. W.  
2003; 26 (3): 227-232
- **Design of piezoresistive MEMS-based accelerometer for integration with wireless sensing unit for structural monitoring** *JOURNAL OF AEROSPACE ENGINEERING*  
Lynch, J. P., Partridge, A., Law, K. H., Kenny, T. W., Kiremidjian, A. S., Carryer, E.  
2003; 16 (3): 108-114
- **Design of large deflection electrostatic actuators** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Grade, J. D., Jerman, H., Kenny, T. W.  
2003; 12 (3): 335-343
- **Piezoresistive cantilevers and measurement system for characterizing low force electrical contacts** *SENSORS AND ACTUATORS A-PHYSICAL*  
Pruitt, B. L., Kenny, T. W.  
2003; 104 (1): 68-77
- **Embedment of structural monitoring algorithms in a wireless sensing unit** *STRUCTURAL ENGINEERING AND MECHANICS*  
Lynch, J. P., Sundararajan, A., Law, K. H., Kiremidjian, A. S., Kenny, T., Carryer, E.  
2003; 15 (3): 285-297
- **On-chip coupling of isoelectric focusing and free solution electrophoresis for multidimensional separations** *ANALYTICAL CHEMISTRY*  
Herr, A. E., Molho, J. I., Drouvalakis, K. A., Mikkelsen, J. C., Utz, P. J., Santiago, J. G., Kenny, T. W.  
2003; 75 (5): 1180-1187
- **Hard X-ray polarimetry with the Ramaty High Energy Solar Spectroscopic Imager (RHESSI)** *Conference on Polarimetry in Astronomy*  
McConnell, M. L., Smith, D. M., Emslie, A. G., Lin, R. P., Ryan, J. M.  
SPIE-INT SOC OPTICAL ENGINEERING.2003: 8–19
- **Two-tiered wireless sensor network architecture for structural health monitoring** *Smart Structures and Materials 2003 Conference*  
Kottapalli, V. A., Kiremidjian, A. S., Lynch, J. P., Carryer, E., Kenny, T. W., Law, K. H., Lei, Y.  
SPIE-INT SOC OPTICAL ENGINEERING.2003: 8–19
- **Experimental study on two-phase heat transfer in microchannel heat sinks with hotspots** *19th Annual IEEE Semiconductor Thermal Measurement and Management Symposium*  
Cho, E. S., Koo, J. M., Jiang, L., Prasher, R. S., Kim, M. S., Santiago, J. G., Kenny, T. W., Goodson, K. E.  
IEEE.2003: 242–246
- **Statistical damage detection using time series analysis on a structural health monitoring benchmark problem** *9th International Conference on Applications of Statistics and Probability in Civil Engineering*  
Lei, Y., Kiremidjian, A. S., Nair, K. K., Lynch, J. P., Law, K. H., Kenny, T. W., Carryer, E., Kottapalli, A.  
MILLPRESS SCIENCE PUBLISHERS.2003: 581–587

- **UV-IR science prospects with TES imaging arrays** *Workshop on Hubbles Science Legacy - Future Optical/Ultraviolet Astronomy from Space*  
Romani, R. W., Burney, J., Brink, P., Cabrera, B., Castle, P., Kenny, T., Wang, E., Young, B., Miller, A. J., Nam, S. W.  
ASTRONOMICAL SOC PACIFIC.2003: 399–402
- **Small insect measurements using a custom MEMS force sensor** *12th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 03)*  
Bartsch, M. S., Federle, W., Full, R. J., Kenny, T. W.  
IEEE.2003: 1039–1042
- **Wafer-scale film encapsulation of micromachined accelerometers** *12th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 03)*  
Park, W. T., Candler, R. N., Kronmueller, S., Lutz, M., Partridge, A., Yama, G., Kenny, T. W.  
IEEE.2003: 1903–1906
- **Wafer scale encapsulation of MEMS devices** *International Electronic Packaging Technical Conference*  
Park, V. T., Candler, R. N., Li, H. J., Cho, J., Li, H., Kenny, T. W., Partridge, A., Yama, G., Lutz, M.  
AMER SOC MECHANICAL ENGINEERS.2003: 209–212
- **Investigation of energy loss mechanisms in micromechanical resonators** *12th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 03)*  
Candler, R. N., Li, H. M., Lutz, M., Park, W. T., Partridge, A., Yama, G., Kenny, T. W.  
IEEE.2003: 332–335
- **Mass-loaded cantilevers with suppressed higher-order modes for magnetic resonance force microscopy** *12th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 03)*  
Chui, B. W., Hishinuma, Y., Budakian, R., Mamin, H. J., Kenny, T. W., Rugar, D.  
IEEE.2003: 1120–1123
- **Closed-loop cooling technologies for microprocessors** *IEEE International Electron Devices Meeting*  
Upadhy, G., Zhou, P., Goodson, K., Munch, M., Kenny, T.  
IEEE.2003: 775–778
- **Development of superconducting transition edge sensors for time and energy resolved single photon counters with application to imaging astronomy** *Conference on Materials for Infrared Detectors III*  
Bay, T. J., Burney, J. A., Brink, P. L., Cabrera, B., Castle, J. P., Romani, R. W., Tomada, A., Young, B. A., Nam, S. W., Miller, A. J., Martinis, J. M., Kenny, T., Wang, et al  
SPIE-INT SOC OPTICAL ENGINEERING.2003: 192–200
- **Silicon electroosmotic micropumps for integrated circuit thermal management** *12th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 03)*  
Laser, D. J., Myers, A. M., Yao, S. H., BELL, K. F., Goodson, K. E., Santiago, J. G., Kenny, T. W.  
IEEE.2003: 151–154
- **Process compatible polysilicon-based electrical through-wafer interconnects in silicon substrates** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Chow, E. M., Chandrasekaran, V., Partridge, A., Nishida, T., Sheplak, M., Quate, C. F., Kenny, T. W.  
2002; 11 (6): 631-640
- **Design of atomic force microscope cantilevers for combined thermomechanical writing and thermal reading in array operation** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
King, W. P., Kenny, T. W., Goodson, K. E., Cross, G. L., Despont, M., Durig, U. T., Rothuizen, H., Binnig, G., Vettiger, P.  
2002; 11 (6): 765-774
- **Vacuum thermionic refrigeration with a semiconductor heterojunction structure** *APPLIED PHYSICS LETTERS*  
Hishinuma, Y., Moyzhes, B. Y., Geballe, T. H., Kenny, T. W.  
2002; 81 (22): 4242-4244
- **Evidence for van der Waals adhesion in gecko setae** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Autumn, K., Sitti, M., Liang, Y. C., Peattie, A. M., Hansen, W. R., Sponberg, S., Kenny, T. W., Fearing, R., Israelachvili, J. N., Full, R. J.  
2002; 99 (19): 12252-12256

- **Closed-loop electroosmotic microchannel cooling system for VLSI circuits** *17th Annual IEEE Semiconductor Thermal Measurement and Management Symposium*  
Jiang, L. N., Mikkelsen, J., Koo, J. M., Huber, D., Yao, S. H., Zhang, L., Zhou, P., Maveety, J. G., Prasher, R., Santiago, J. G., Kenny, T. W., Goodson, K. E.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2002: 347–55
- **Subcritical crack growth in single-crystal silicon using micromachined specimens** *JOURNAL OF MATERIALS RESEARCH*  
Fitzgerald, A. M., Iyer, R. S., Dauskardt, R. H., Kenny, T. W.  
2002; 17 (3): 683-692
- **Measurements and modeling of two-phase flow in microchannels with nearly constant heat flux boundary conditions** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Zhang, L., Koo, J. M., Jiang, L., Asheghi, M., Goodson, K. E., Santiago, J. G., Kenny, T. W.  
2002; 11 (1): 12-19
- **Characterization of a two-dimensional cantilever array with through-wafer electrical interconnects** *APPLIED PHYSICS LETTERS*  
Chow, E. M., Yaralioglu, G. G., Quate, C. F., Kenny, T. W.  
2002; 80 (4): 664-666
- **E-cadherin extra-cellular domain interaction examined by atomic force microscopy**  
Rudnitsky, R. G., Drees, F., NELSON, W. J., Kenny, T. W.  
CELL PRESS.2002: 55A–55A
- **Transient and sub-atmospheric performance of a closed-loop electroosmotic microchannel cooling system** *THERMES 2002 International Conference*  
Jiang, L., Mikkelsen, J., Koo, J. M., Zhang, L., Huber, D., Yao, S., Bari, A., Zhou, P., Santiago, J., Kenny, T., Goodson, K. E., Maveety, J., Prasher, et al  
MILLPRESS SCIENCE PUBLISHERS.2002: 133–139
- **Enhanced nucleate boiling in microchannels** *15th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2002)*  
Zhang, L., Wang, E. N., Koo, J. M., Jiang, L., Goodson, K. E., Santiago, J. G., Kenny, T. W.  
IEEE.2002: 89–92
- **A wireless modular monitoring system for civil structures** *20th IMAC Conference on Structural Dynamics*  
Lynch, J. P., Law, K. H., Kiremidjian, A. S., Kenny, T., Carryer, E.  
SOC EXPERIMENTAL MECHANICS INC.2002: 1–6
- **Validation of a wireless modular monitoring system for structures** *Smart Structures and Materials 2002 Conference*  
Lynch, J. P., Law, K. H., Kiremidjian, A. S., Carryer, E., Kenny, T. W., Partridge, A., Sundararajan, A.  
SPIE-INT SOC OPTICAL ENGINEERING.2002: 124–135
- **Electron spin relaxation near a micron-size ferromagnet** *PHYSICAL REVIEW LETTERS*  
Stipe, B. C., Mamin, H. J., Yannoni, C. S., Stowe, T. D., Kenny, T. W., Rugar, D.  
2001; 87 (27)
- **A high-stiffness axial resonant probe for atomic force microscopy** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Harley, J. A., Kenny, T. W.  
2001; 10 (3): 434-441
- **A high-precision, wide-bandwidth micromachined tunneling accelerometer** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Liu, C. H., Kenny, T. W.  
2001; 10 (3): 425-433
- **Noncontact friction and force fluctuations between closely spaced bodies** *PHYSICAL REVIEW LETTERS*  
Stipe, B. C., Mamin, H. J., Stowe, T. D., Kenny, T. W., Rugar, D.  
2001; 87 (9)
- **Nanometer-Scale Force Sensing with MEMS Devices** *IEEE SENSORS JOURNAL*  
Kenny, T.  
2001; 1 (2): 148-157
- **Refrigeration by combined tunneling and thermionic emission in vacuum: Use of nanometer scale design** *APPLIED PHYSICS LETTERS*  
Hishinuma, Y., Geballe, T. H., Moyzhes, B. Y., Kenny, T. W.

2001; 78 (17): 2572-2574

- **Magnetic dissipation and fluctuations in individual nanomagnets measured by ultrasensitive cantilever magnetometry** *PHYSICAL REVIEW LETTERS*  
Stipe, B. C., Mamin, H. J., Stowe, T. D., Kenny, T. W., Rugar, D.  
2001; 86 (13): 2874-2877
- **Optimization of turn geometries for microchip electrophoresis** *ANALYTICAL CHEMISTRY*  
Molho, J. I., Herr, A. E., Mosier, B. P., Santiago, J. G., Kenny, T. W., Brennen, R. A., Gordon, G. B., Mohammadi, B.  
2001; 73 (6): 1350-1360
- **Adventures in attonewton force detection** *APPLIED PHYSICS A-MATERIALS SCIENCE & PROCESSING*  
Rugar, D., Stipe, B. C., Mamin, H. J., Yannoni, C. S., Stowe, T. D., Yasumura, K. Y., Kenny, T. W.  
2001; 72: S3-S10
- **Atomic force microscope cantilevers for combined thermomechanical data writing and reading** *APPLIED PHYSICS LETTERS*  
King, W. P., Kenny, T. W., Goodson, K. E., Cross, G., Despont, M., Durig, U., Rothuizen, H., Binnig, G. K., Vettiger, P.  
2001; 78 (9): 1300-1302
- **A micromachined silicon low-voltage parallel-plate electrokinetic pump** *11th International Conference on Solid-State Sensors and Actuators*  
Laser, D., Yao, S. H., Chen, C. H., Mikkelsen, J., Goodson, K., Santiago, J., Kenny, T.  
SPRINGER-VERLAG BERLIN.2001: 920-923
- **Low force electrical contact measurements using piezoresistive MEMS cantilevers to characterize thin-film metallization** *11th International Conference on Solid-State Sensors and Actuators*  
Pruitt, B., Choi, D. H., Florando, J., Martens, R., Wenzel, S., Reynolds, C., Nix, W., Kenny, T.  
SPRINGER-VERLAG BERLIN.2001: 1032-1035
- **Two-phase microchannel heat sinks for an electrokinetic VLSI chip cooling system** *17th Annual IEEE Semiconductor Thermal Measurement and Management Symposium*  
Jiang, L. N., Koo, J. M., Zeng, S. L., Mikkelsen, J. C., Zhang, L., Zhou, P., Santiago, J. G., Kenny, T. W., Goodson, K. E., Maveety, J. G., Tran, Q. A.  
IEEE.2001: 153-157
- **New thin film epitaxial polysilicon encapsulation for piezoresistive accelerometers** *14th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2001)*  
Partridge, A., Rice, A. E., Kenny, T. W., Lutz, M.  
IEEE.2001: 54-59
- **Modeling of two-phase microchannel heat sinks for VLSI chips** *14th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2001)*  
Koo, J. M., Jiang, L. N., Zhang, L., Zhou, P., Banerjee, S. S., Kenny, T. W., Santiago, J. G., Goodson, K. E.  
IEEE.2001: 422-426
- **Performance characterization of ultra-thin n-type piezoresistive cantilevers** *11th International Conference on Solid-State Sensors and Actuators*  
Liang, Y. A., Ueng, S. W., Kenny, T. W.  
SPRINGER-VERLAG BERLIN.2001: 998-1001
- **Exploring insect biomechanics with micromachined force sensors** *11th International Conference on Solid-State Sensors and Actuators*  
Bartsch, M., Federle, W., Full, R., Kenny, T.  
SPRINGER-VERLAG BERLIN.2001: 1662-1665
- **A micromachined magnetic-field sensor based on an electron tunneling displacement transducer** *SENSORS AND ACTUATORS A-PHYSICAL*  
DiLella, D., Whitman, L. J., Colton, R. J., Kenny, T. W., Kaiser, W. J., Vote, E. C., Podosek, J. A., Miller, L. M.  
2000; 86 (1-2): 8-20
- **Adhesive force of a single gecko foot-hair** *NATURE*  
Autumn, K., Liang, Y. A., Hsieh, S. T., Zesch, W., Chan, W. P., Kenny, T. W., Fearing, R., Full, R. J.  
2000; 405 (6787): 681-685
- **1/f noise considerations for the design and process optimization of piezoresistive cantilevers** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Harley, J. A., Kenny, T. W.  
2000; 9 (2): 226-235

- **Integration of through-wafer interconnects with a two-dimensional cantilever array** *10th International Conference on Solid-State Sensors and Actuators*  
Chow, E. M., Soh, H. T., Lee, H. C., Adams, J. D., Minne, S. C., Yaralioglu, G., Atalar, A., Quate, C. F., Kenny, T. W.  
ELSEVIER SCIENCE SA.2000: 118–23
- **Fracture toughness and crack growth phenomena of plasma-etched single crystal silicon** *10th International Conference on Solid-State Sensors and Actuators*  
Fitzgerald, A. M., Dauskardt, R. H., Kenny, T. W.  
ELSEVIER SCIENCE SA.2000: 194–99
- **Rapid biochemical detection and differentiation with magnetic force microscope cantilever arrays** *10th International Conference on Solid-State Sensors and Actuators*  
Rudnitsky, R. G., Chow, E. M., Kenny, T. W.  
ELSEVIER SCIENCE SA.2000: 256–62
- **Packaging a piezoresistive pressure sensor to measure low absolute pressures over a wide sub-zero temperature range** *10th International Conference on Solid-State Sensors and Actuators*  
Reynolds, J. K., Catling, D., Blue, R. C., Maluf, N. I., Kenny, T.  
ELSEVIER SCIENCE SA.2000: 142–49
- **Electroosmotic capillary flow with nonuniform zeta potential** *Analytical chemistry*  
Herr, A. E., Molho, J. I., Santiago, J. G., Mungal, M. G., Kenny, T. W., Garguilo, M. G.  
2000; 72 (5): 1053-7
- **Electroosmotic capillary flow with nonuniform zeta potential** *ANALYTICAL CHEMISTRY*  
Herr, A. E., Molho, J. I., Santiago, J. G., Mungal, M. G., Kenny, T. W., Garguilo, M. G.  
2000; 72 (5): 1053-1057
- **Quality factors in micron- and submicron-thick cantilevers** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Yasumura, K. Y., Stowe, T. D., Chow, E. M., Pfafman, T., Kenny, T. W., Stipe, B. C., Rugar, D.  
2000; 9 (1): 117-125
- **Designing corner compensation for electrophoresis in compact geometries** *4th International Symposium on Micro Total Analysis Systems ((mu)TAS 2000)*  
Molho, J. I., Herr, A. E., Mosier, B. P., Santiago, J. G., Kenny, T. W., Brennen, R. A., Gordon, G. B.  
SPRINGER.2000: 287–290
- **Miniaturized capillary isoelectric focusing (cIEF): Towards a portable high-speed separation method** *4th International Symposium on Micro Total Analysis Systems ((mu)TAS 2000)*  
Herr, A. E., Molho, J. I., Santiago, J. G., Kenny, T. W., Borkholder, D. A., Kintz, G. J., Belgrader, P., Northrup, M. A.  
SPRINGER.2000: 367–370
- **High-resolution measurement of crack growth in micro-machined single crystal silicon** *Symposium MM on Materials Science of Microelectromechanical Systems (MEMS) Devices II held at the 1999 MRS Fall Meeting*  
Fitzgerald, A. M., Dauskardt, R. H., Kenny, T. W.  
MATERIALS RESEARCH SOCIETY.2000: 43–48
- **Experimental investigation of flow transition in microchannels using micron-resolution particle image velocimetry** *7th Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems*  
Zeighami, R., LASER, D., Zhou, P., Asheghi, M., Devasenathipathy, S., Kenny, T., Santiago, J., Goodson, K.  
IEEE.2000: 148–153
- **Silicon dopant imaging by dissipation force microscopy** *APPLIED PHYSICS LETTERS*  
Stowe, T. D., Kenny, T. W., Thomson, D. J., Rugar, D.  
1999; 75 (18): 2785-2787
- **An integrated controller for tunnel sensors** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*  
Partridge, A., Reynolds, J. K., Grade, J. D., Kane, B. J., Maluf, N. I., Kovacs, G. T., Kenny, T. W.  
1999; 34 (8): 1099-1107
- **High-sensitivity piezoresistive cantilevers under 1000 angstrom thick** *APPLIED PHYSICS LETTERS*  
Harley, J. A., Kenny, T. W.  
1999; 75 (2): 289-291



- **Intrinsic-carrier thermal runaway in silicon microcantilevers** *MICROSCALE THERMOPHYSICAL ENGINEERING*  
Chui, B. W., Asheghi, M., Ju, Y. S., Goodson, K. E., Kenny, T. W., Mamin, H. J.  
1999; 3 (3): 217-228
- **Ultra-high-density atomic force microscopy data storage with erase capability** *APPLIED PHYSICS LETTERS*  
Binnig, G., Despont, M., Drechsler, U., Haberle, W., Lutwyche, M., Vettiger, P., Mamin, H. J., Chui, B. W., Kenny, T. W.  
1999; 74 (9): 1329-1331
- **Technique for measurement of the noise of a sensor in the presence of large background signals** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
Barzilai, A., VanZandt, T., Kenny, T.  
1998; 69 (7): 2767-2772
- **Characterization of a high-sensitivity micromachined tunneling accelerometer with micro-g resolution** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Liu, C. H., Barzilai, A. M., Reynolds, J. K., Partridge, A., Kenny, T. W., Grade, J. D., Rockstad, H. K.  
1998; 7 (2): 235-244
- **Independent detection of vertical and lateral forces with a sidewall-implanted dual-axis piezoresistive cantilever** *APPLIED PHYSICS LETTERS*  
Chui, B. W., Kenny, T. W., Mamin, H. J., Terris, B. D., Rugar, D.  
1998; 72 (11): 1388-1390
- **Low-stiffness silicon cantilevers with integrated heaters and piezoresistive sensors for high-density AFM thermomechanical data storage** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Chui, B. W., Stowe, T. D., Ju, Y. S., Goodson, K. E., Kenny, T. W., Mamin, H. J., Terris, B. D., Ried, R. P., Rugar, D.  
1998; 7 (1): 69-78
- **Sidewall-implanted dual-axis piezoresistive cantilever for AFM data storage readback and tracking** *11th Annual International Workshop on Micro Electro Mechanical Systems*  
Chui, B. W., Mamin, H. J., Terris, B. D., Rugar, D., Kenny, T. W.  
IEEE.1998: 12-17
- **Numerical framework for the modeling of electrokinetic flows** *Microfluidic Devices and Systems*  
Deshpande, M., GHADDAR, C., Gilbert, J. R., St John, P. M., WOUDEBERG, T., Connell, C., Molho, J., Herr, A., Mungal, G., Kenny, T.  
SPIE-INT SOC OPTICAL ENGINEERING.1998: 217-227
- **Attonewton force detection using ultrathin silicon cantilevers** *APPLIED PHYSICS LETTERS*  
Stowe, T. D., Yasumura, K., Kenny, T. W., Botkin, D., Wago, K., Rugar, D.  
1997; 71 (2): 288-290
- **Fabrication of collimating grids for an x-ray solar telescope using LIGA methods** *MICROSYSTEM TECHNOLOGIES*  
Brennen, R. A., Hecht, M. H., Wiberg, D. V., MANION, S. J., Bonivert, W. D., Hruby, J. M., Scholz, M. L., Stowe, T. D., Kenny, T. W., Jackson, K. H., Malek, C. K.  
1997; 3 (3): 91-96
- **Torsional force probes optimized for higher order mode suppression** *9th International Conference on Solid-State Sensors and Actuators*  
STOWE, T., Yasumura, K., Pfafman, T., Kenny, T., Botkin, D., Rugar, D.  
IEEE.1997: 141-144
- **Development of a modal analysis accelerometer based on a tunneling displacement transducer** *9th International Conference on Solid-State Sensors and Actuators*  
Scheeper, P. R., Reynolds, J. K., Kenny, T. W.  
IEEE.1997: 867-870
- **Wafer-scale processing, assembly, and testing of tunneling infrared detectors.** *9th International Conference on Solid-State Sensors and Actuators*  
Grade, J., Barzilai, A., Reynolds, J. K., Liu, C. H., Partridge, A., Jerman, H., Kenny, T.  
IEEE.1997: 1241-1244
- **Characterization of a high-sensitivity micromachined tunneling accelerometer** *9th International Conference on Solid-State Sensors and Actuators*  
Liu, C. H., Grade, J. D., Barzilai, A. M., Reynolds, J. K., Partridge, A., Rockstad, H. K., Kenny, T. W.  
IEEE.1997: 471-472

- **Low frequency drift in tunnel sensors** *9th International Conference on Solid-State Sensors and Actuators*  
Grade, J., Barzilai, A., Reynolds, J. K., Liu, C. H., Partridge, A., Miller, L. M., Podosek, J. A., Kenny, T.  
IEEE.1997: 871–874
- **Micromachined heaters with 1- $\mu$ s thermal time constants for AFM thermomechanical data storage** *9th International Conference on Solid-State Sensors and Actuators*  
Chui, B. W., Mamin, H. J., Terris, B. D., Rugar, D., Goodson, K. E., Kenny, T. W.  
IEEE.1997: 1085–1088
- **Low-stiffness silicon cantilevers for thermal writing and piezoresistive readback with the atomic force microscope** *APPLIED PHYSICS LETTERS*  
Chui, B. W., Stowe, T. D., Kenny, T. W., Mamin, H. J., Terris, B. D., Rugar, D.  
1996; 69 (18): 2767-2769
- **A miniature, high-sensitivity, electron tunneling accelerometer** *8th International Conference on Solid-State Sensors and Actuators (Eurosensors IX)*  
Rockstad, H. K., Tang, T. K., Reynolds, J. K., Kenny, T. W., Kaiser, W. J., Gabrielson, T. B.  
ELSEVIER SCIENCE SA.1996: 227–31
- **Micromachined infrared sensors using tunneling displacement transducers** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
Kenny, T. W., Reynolds, J. K., Podosek, J. A., Vote, E. C., Miller, L. M., Rockstad, H. K., Kaiser, W. J.  
1996; 67 (1): 112-128
- **A microfabricated electron-tunneling accelerometer as a directional underwater acoustic sensor** *Workshop on Acoustic Particle Velocity Sensors - Design, Performance, and Applications*  
Rockstad, H. K., Kenny, T. W., Kelly, P. J., Gabrielson, T. B.  
AIP PRESS.1996: 57–68
- **A mu-magnetometer based on electron tunneling** *IEEE 9th Annual International Workshop on Micro Electro Mechanical Systems - An Investigation of Micro Structures, Sensors, Actuators, Machines and Systems*  
Miller, L. M., Podosek, J. A., Kruglick, E., Kenny, T. W., KOVACICH, J. A., Kaiser, W. J.  
IEEE.1996: 467–472
- **SENSORS BASED ON TUNNELING DISPLACEMENT TRANSDUCERS - DESIGN, APPLICATIONS, AND LIMITATIONS**  
Kenny, T.  
AMER CHEMICAL SOC.1995: 50-COLL
- **Fabricating sub-collimating grids for an X-ray solar imaging spectrometer using LIGA techniques** *1st Annual SPIE Conference on Microlithography and Metrology in Micromachining*  
Brennen, R. A., Hecht, M. H., WIEBERG, D. V., MANION, S. J., Bonivert, W. D., Hruby, J. M., Scholz, M. L., Stowe, T. D., Kenny, T. W., Jackson, K. H., Malek, C. K.  
SPIE - INT SOC OPTICAL ENGINEERING.1995: 214–225
- **MICROINSTRUMENTS AND MICROSENSORS FOR SPACE SCIENCE** *43rd Astronautical Congress*  
VARSI, G., Chrisp, M., Jones, R., VanZandt, T., Kenny, T., Kaiser, W., BANERDT, W., Hui, E., Crisp, D.  
PERGAMON-ELSEVIER SCIENCE LTD.1994: 705–13
- **WIDE-BANDWIDTH ELECTROMECHANICAL ACTUATORS FOR TUNNELING DISPLACEMENT TRANSDUCERS** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Kenny, T. W., Kaiser, W. J., Rockstad, H. K., Reynolds, J. K., Podosek, J. A., Vote, E. C.  
1994; 3 (3): 97-104
- **A MINIATURE HIGH-SENSITIVITY BROAD-BAND ACCELEROMETER BASED ON ELECTRON-TUNNELING TRANSDUCERS** *7th International Conference on Solid-State Sensors and Actuators (Transducers 93)*  
Rockstad, H. K., Kenny, T. W., Reynolds, J. K., Kaiser, W. J., Gabrielson, T. B.  
ELSEVIER SCIENCE SA LAUSANNE.1994: 107–14
- **CAPACITIVE EDGE SENSOR DESIGN FOR SELENE SEGMENTED PRIMARY MIRROR** *Conference on Laser Power Beaming*  
Miller, L. M., Kaiser, W. J., Kenny, T., VanZandt, T.  
SPIE - INT SOC OPTICAL ENGINEERING.1994: 125–138
- **MICROMACHINED TUNNELING DISPLACEMENT TRANSDUCERS FOR PHYSICAL SENSORS** *39TH NATIONAL SYMP OF THE AMERICAN VACUUM SOC*

Kenny, T. W., Kaiser, W. J., Podosek, J. A., Rockstad, H. K., Reynolds, J. K., Vote, E. C.  
A V S AMER INST PHYSICS.1993: 797-802

● **FABRICATION AND CHARACTERIZATION OF A MICROMACHINED DEFORMABLE MIRROR FOR ADAPTIVE OPTICS APPLICATIONS** *Conference on Space Astronomical Telescopes and Instruments II*

Miller, L. M., AGRONIN, M. L., Bartman, R. K., Kaiser, W. J., Kenny, T. W., Norton, R. L., Vote, E. C.  
SPIE - INT SOC OPTICAL ENGINEERING.1993: 421-430

● **ELECTRON TUNNEL SENSORS** *38TH NATIONAL SYMP OF THE AMERICAN VACUUM SOC*

Kenny, T. W., Kaiser, W. J., Reynolds, J. K., Podosek, J. A., Rockstad, H. K., Vote, E. C., WALTMAN, S. B.  
A V S AMER INST PHYSICS.1992: 2114-18

● **NOVEL POSITION SENSOR TECHNOLOGIES FOR MICROACCELEROMETERS** *CONF ON SENSORS AND SENSOR SYSTEMS FOR GUIDANCE AND NAVIGATION 2*

VANZANDT, T. R., Kenny, T. W., Kaiser, W. J.  
SPIE - INT SOC OPTICAL ENGINEERING.1992: 165-172

● **A MICROMACHINED SILICON ELECTRON-TUNNELING SENSOR** *3RD WORKSHOP ON MICRO ELECTRO MECHANICAL SYSTEMS ( MEMS 90 )*

Kenny, T. W., WALTMAN, S. B., Reynolds, J. K., Kaiser, W. J.  
I E E E.1990: 192-196

● **ELECTRON TUNNEL SENSOR TECHNOLOGY** *CONF ON TECHNOLOGY 2000*

Kenny, T. W., WALTMAN, S. B., Reynolds, J. K., Kaiser, W. J.  
NASA.1990: 370-381