

**THE UNIVERSITY OF TEXAS AT AUSTIN**  
**Cockrell School of Engineering**  
**Standard Resume**

**FULL NAME:** Neal Allen Hall **TITLE:** Associate Professor

**DEPARTMENT:** Electrical and Computer Engineering

**EDUCATION:**

Georgia Institute of Technology	Mechanical Engineering	Ph.D.	Fall 2004
Georgia Institute of Technology	Mechanical Engineering	M.S.	Spring 2002
The University of Texas at Austin	Mechanical Engineering	B.S.	Fall 1999

**CURRENT AND PREVIOUS ACADEMIC POSITIONS:**

University of Texas at Austin	Associate Professor	Sept. 1, 2015-Present
University of Texas at Austin	Assistant Professor	Spring 2009-August 31, 2015

**OTHER PROFESSIONAL EXPERIENCE:**

Silicon Audio, Inc. <sup>†</sup>	Founder and C.T.O	Jan. 2007-Present
Sandia National Laboratories	Intelligence Community Post-Doc	Oct. 2004-Aug. 2006

<sup>†</sup> Silicon Audio is a technology company selling seismic sensors to the scientific and resource exploration markets. The company won competitive SBIR funding in its early years, and subsequently secured strategic investment deals with private companies in 2012. Today Silicon Audio manufactures and sells the highest dynamic range seismometer in the world.

**SPECIAL RESEARCH AWARDS AND HONORS**

- ONR Young Investigator Award (YIA): "Femto-Photonics: Towards Micromachined Underwater Acoustic Vector Sensors with Optoelectronic Readout." 05/15/2014 - 05/15/2017
- DARPA Young Faculty Award (YFA): "Ultra-Small, Ultra-Low-Noise, Broadband Acoustic Sensors." 08/02/2012 - 08/01/2014.

**SPECIAL TEACHING AWARDS AND HONORS**

- 2016 recipient of the Gordon T. Lepley IV Endowed Memorial Teaching Award, established by the Board of Regents of the University of Texas System.
- 2014 Regents Outstanding Teaching Award: Offered annually in recognition of faculty members at the nine academic and six health University of Texas System institutions who have demonstrated extraordinary classroom performance and innovation in undergraduate instruction. The Regents' Outstanding Teaching Awards are the Board of Regents' highest honor. Faculty members undergo a series of rigorous evaluations by students, peer faculty and external reviewers.
- Spring 2012, Neal was awarded the 2011-2012 AXA Outstanding Professor Award by a social fraternity on campus.

## **DISCLOSURES, PATENTS PENDING AND PATENTS AWARDED**

### **A. U.S. Patents**

- Neal A. Hall, Donghwan Kim, Randy Williams, David Gawalt, Bradley Avenson, Caesar Garcia, and Kris Gleason, "Solid-state shear stress sensors with high selectivity," U.S. Patent # 10,309,845 issued on June 4, 2019.
- Neal A. Hall, "Solid state shear-stress sensor," U.S. Patent # 10,018,521 issued on July 10, 2018, formerly U.S. Application # 15/211,554.
- N. A. Hall, C. T. Garcia, B. Avenson, and A. G. Onaran, "Entrained Microphones," U.S. Patent # 9,832,573, issued on 11/28/2017. Formerly US Application 15/182,233 and Publication # 20160295333.
- B.D. Avenson, M.R. Christensen, C.T. Garcia, N.A. Hall, A.G. Onaran, J.C. Schlicher, and A. Zaatari, "Closed loop control techniques for displacement sensors with optical readout," U.S. Patent # 9,702,992, issued July 11, 2017.
- N.A. Hall and Donghwan Kim, "Multi-Mode Microphones," U.S. Patent # 9,503,820, issued on November 22, 2016.
- N.A. Hall and Donghwan Kim, "Multi-Mode Microphones," U.S. Patent # 9,479,875, issued on October 25, 2016.
- Neal A. Hall, Michael Kuntzman, Donghwan Kim, and Nishshanka Hewa-Kasakarage, "Acoustic Sensor," U.S. Patent: 9,372,111, issued June 21, 2016.
- N. A. Hall, M. L. Kuntzman, and K. Kirk, "Differential microphone with sealed backside cavities and diaphragms coupled to a rocking structure thereby providing resistance to deflection under atmospheric pressure and providing a directional response to sound pressure," U.S. Patent: 8,989,411, issued March 24, 2015.
- B. D. Avenson, C. T. Garcia, N. A. Hall, and A. G. Onaran, "Signal Processing within an Optical Microphone," U.S. Patent: 8,488,973, issued July 16, 2013.
- B. D. Avenson, C. T. Garcia, N. A. Hall, and A. G. Onaran, "Optical Microphone Packaging," U.S. Patent: 8,391,517, issued March 5, 2013.
- N. A. Hall and F. L. Degertekin, "Displacement-Measuring Optical Device with Orifice," U.S. Patent: 7,518,737, issued April 14, 2009.
- F. L. Degertekin, W. Lee, and N. A. Hall, "Displacement Sensor Employing Discrete Light Pulse Detection," U.S. Patent: 7,485,847, issued February 3, 2009.
- F. L. Degertekin, N. A. Hall, and W. Lee, "Highly-Sensitive Displacement-Measuring Optical Device," U.S. Patent: 7,440,117, issued October 21, 2008.
- F. L. Degertekin, N. A. Hall, and W. Lee, "Highly-Sensitive Displacement-Measuring Optical Device," U.S. Patent: 7,116,430, issued October 3, 2006.

## B. U.S. Patent and Patent Cooperation Treaty (PCT) Applications

- Michael Kuntzman, Karen Kirk, and Neal A. Hall, "Surface micromachined microphone with broadband signal detection," U.S. application Publication # 20160337761, Publication date Nov. 17, 2016.
- B. Avenson, M. Christianson, C. Garcia, N. Hall, and A.G. Onaran, "Closed Loop Control Techniques for Displacement Sensors with Optical Readout," PCT/US Application No. PCT/US2013/032584 filed March 15, 2013. Converted to Canadian Application # 2,890,298.

## UNIVERSITY COMMITTEE ASSIGNMENTS:

Departmental-	ECE Core Curriculum Reform Committee (Chair)	5/01/2018 - Present
	ECE Curriculum Planning Committee	1/1/2015 - Present
	ECE Junior Faculty Recruiting Committee	9/28/2016 - 5/01/2017
	Electromagnetic and Acoustics (EA) Area Graduate Student Admissions Committee (Chair)	Spring 2015 - Present
	ECE Faculty Recruiting Committee	2014-2015
	Electromagnetics and Acoustics (EA) Area Graduate Student Admissions Committee (Member)	Spring 2010, 2011, 2012, 2013, and 2014
	ECE Faculty Recruiting Committee	December 2010 – May 2011
School-	Mechanical Engineering (ME) Ph.D. Oral and Written Qualifying Examination Committee in Acoustics	2009 – Present
	Engineering Representative for Digital Arts and Media section of the Bridging Disciplines Program (BDP)	May 2018 - Present
University-	Outside Member of the Mechanical Engineering (ME) Recruiting Committee	December 2012 – May 2013
	Regents Outstanding Teaching Award (ROTA) selection committee	2/1/2017 - 3/5/2017, and 2/1/2016 - 3/5/2016

## PUBLICATIONS

### A. Refereed Archival Journal Publications

- J41. Tang, Xiyuan; Li, Shaolan; Yang, Xiangxing; Shen, Linxiao; Zhao, Wenda; Williams, Ralldall; Liu, Jiaxin; Tan, Zhichao; Hall, Neal ; Pan, David Z.; Sun, Nan, "16-fJ/Conversion-Step Time-Domain Incremental Two-Step Capacitance-to-Digital Converter," *IEEE Journal of Solid State Circuits*, In-Review, submitted November 2019.

- J40. Y. Seo, D. Kim, & N. A. Hall, "Piezoelectric Pressure Sensors for Hypersonic Flow Measurements," *Journal of Microelectromechanical Systems*, 28(2), 271-278, 2019.  
<http://dx.doi.org/10.1109/jmems.2019.2899266>
- J39. D. Kim, & N. A. Hall, "A Shear-stress Sensor for Hypersonic Flow Measurements," *Journal of Microelectromechanical Systems*, Early Access as of June 25, 2019.  
<http://dx.doi.org/10.1109/jmems.2019.2899256>
- J38. R. P. Williams & N. A. Hall, "A Thévenin-inspired approach to multiple scattering in acoustics," *Journal of Vibration and Acoustics*, 141(1), 011016-1-12, 2019.  
<https://doi.org/10.1115/1.4040927>
- J37. R. P. Williams, D. Kim, K.L. Gleason & N. A. Hall, "Towards acoustic particle velocity sensors in air using entrained balloons: Measurements and modeling," *The Journal of the Acoustical Society of America*, 143(2), 780-785, 2018.  
<https://doi.org/10.1121/1.5022801>
- J36. Randy Williams, Samuel K. Hord, and Neal A. Hall, "Optically-read displacement detection using phase-modulated diffraction gratings with reduced zeroth-order reflections," *Applied Physics Letters*, vol. 110, p. 0151104, 2017.  
<https://doi.org/10.1016/j.sna.2017.04.001>
- J35. Yoonho Seo, Daniel Corona, and Neal A. Hall, "On the theoretical maximum achievable signal-to-noise ratio (SNR) of piezoelectric microphones," *Sensors and Actuators A*, vol. 264, p. 341-346, 2017.  
<https://doi.org/10.1016/j.sna.2017.04.001>
- J34. R. P. Williams, D. Kim, D. P. Gawalt, & N. A. Hall, "Surface micromachined differential piezoelectric shear-stress sensors," *Journal of Micromechanics and Microengineering*, vol. 27, p. 015011, 2017.  
<http://dx.doi.org/10.1088/0960-1317/27/1/015011>
- J33. R. Williams and N.A. Hall, "Thevenin Acoustics," *The Journal of the Acoustical Society of America*, vol. 140, p. 4449-4455, 2016.  
<http://dx.doi.org/10.1121/1.4971284>
- J32. M. L. Kuntzman, D. Kim, and N. A. Hall, "Microfabrication and Experimental Evaluation of a Rotational Capacitive Micromachined Ultrasonic Transducer," *Journal of Microelectromechanical System*, vol. 24(2), pp. 404-413, April 2015.  
<http://dx.doi.org/10.1109/JMEMS.2014.2332255>
- J31. M. L. Kuntzman, N. N. Hewa-Kasakarage, A. Rocha, D. Kim, and N. A. Hall, "Micromachined In-Plane Pressure-Gradient Piezoelectric Microphones," *IEEE Sensors Journal*, vol. 15(3), pp. 1347-1357, March 2015.  
<http://dx.doi.org/10.1109/JSEN.2014.2361118>
- J30. D. Kim, M. L. Kuntzman, and N. A. Hall, "A Transmission Line Model of Back-Cavity Dynamics for In-Plane Pressure-Gradient Microphones," *The Journal of the Acoustical Society of America*, vol. 136(5), pp. 2544-2553, November 2014.  
<http://dx.doi.org/10.1121/1.4897401>
- J29. D. Kim, N. N. Hewa-Kasakarage, and N. A. Hall, "A Theoretical and Experimental Comparison of 3-3 and 3-1 Mode Piezoelectric Microelectromechanical Systems (MEMS)," *Sensors and Actuators A: Physical*, vol. 219, pp. 112-122, November 2014.  
<http://dx.doi.org/10.1016/j.sna.2014.08.006>

- J28. D. Kim, M. L. Kuntzman, and N. A. Hall, "A Rotational Capacitive Micromachined Ultrasonic Transducer (RCMUT) with an Internally Sealed Pivot," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control (TUFFC)*, vol. 61(9), pp. 1545-1551, September 2014.  
<http://dx.doi.org/10.1109/TUFFC.2014.3068>
- J27. M. L. Kuntzman and N. A. Hall, "Sound Source Localization Inspired by the Ears of the *Ormia Ochracea*," *Applied Physics Letters*, vol. 105(3), pp. 033701-4, July 2014.  
<http://dx.doi.org/10.1063/1.4887370>
- J26. M. L. Kuntzman and N. A. Hall, "A Broadband, Capacitive, Surface-Micromachined, Omnidirectional Microphone with more than 200 kHz Bandwidth," *The Journal of the Acoustical Society of America*, vol. 135, pp. 3416-3424, June 2014.  
<http://dx.doi.org/10.1121/1.4874620>
- J25. D. Kim and N. A. Hall, "Towards a Sub 15-dBA Optical Micromachined Microphone," *The Journal of the Acoustical Society of America*, vol. 135, pp. 2664-2673, May 2014.  
<http://dx.doi.org/10.1121/1.4871181>
- J24. D. Kim, C. T. Garcia, B. Avenson, and N. A. Hall, "Design and Experimental Evaluation of a Low-Noise Backplate for a Grating-Based Optical Interferometric Sensor," *Journal of Microelectromechanical Systems*, vol. PP (99), pp. 1-1, March 2014.  
<http://dx.doi.org/10.1109/JMEMS.2014.2304840>
- J23. M. L. Kuntzman and N. A. Hall, "Rotational Capacitive Micromachined Ultrasonic Transducers (cMUTs)," *Journal of Microelectromechanical Systems*, vol. 23(1), pp. 1-3, February 2014.  
<http://dx.doi.org/10.1109/JMEMS.2013.2288577>
- J22. N. N. Hewa-Kasakarage, D. Kim, M. L. Kuntzman, and N. A. Hall, "Micromachined Piezoelectric Accelerometers via Epitaxial Silicon Cantilevers and Bulk Silicon Proof Masses," *Journal of Microelectromechanical Systems*, vol. 22(6), pp. 1438-1446, December 2013.  
<http://dx.doi.org/10.1109/JMEMS.2013.2262581>
- J21. M. L. Kuntzman, D. Kim, N. N. Hewa-Kasakarage, K. D. Kirk, and N. A. Hall, "Network Modeling of Multiple-Port, Multiple-Vibration-Mode Transducers and Resonators," *Sensors and Actuators A: Physical*, vol. 201, pp. 93-100, October 2013.  
<http://dx.doi.org/10.1016/j.sna.2013.05.031>
- J20. D. Kim, N. N. Hewa-Kasakarage, M. L. Kuntzman, K. D. Kirk, S. H. Yoon, and N. A. Hall, "Piezoelectric Micromachined Microphones with Out-of-Plane Directivity," *Applied Physics Letters*, vol. 103, pp. 013502-5, July 2013.  
<http://dx.doi.org/10.1063/1.4812298>
- J19. D. Kim, N. N. Hewa-Kasakarage, S. H. Yoon, K. D. Kirk, M. Kuntzman, and N. A. Hall, "Electrical Admittance Spectroscopy for Piezoelectric MEMS," *Journal of Microelectromechanical Systems*, vol. 22(2), pp. 295-302, April 2013.  
<http://dx.doi.org/10.1109/JMEMS.2012.2221157>
- J18. M. L. Kuntzman, J. G. Lee, N. N. Hewa-Kasakarage, D. Kim, and N. A. Hall, "Micromachined Piezoelectric Microphones with In-Plane Directivity," *Applied Physics Letters*, vol. 102, pp. 054109-4, February 2013.  
<http://dx.doi.org/10.1063/1.4776687>
- J17. J. W. Suk, K. Kirk, Y. Hao, N. A. Hall, and R. S. Ruoff, "Thermoacoustic Sound Generation from Monolayer Graphene for Transparent and Flexible Sound Sources," *Advanced Materials*, vol. 24(47), pp. 6342-6347, December 2012.  
<http://dx.doi.org/10.1002/adma.201201782>  
- Also appeared in Chemistry World Magazine on Sept 26, 2012

- <http://www.rsc.org/chemistryworld/2012/09/graphene-loudspeaker-thermoacoustic>  
 - Also appeared in "Advances in Engineering," April 2013  
<http://advanceseng.com/mechanical-engineering/thermoacoustic-sound-generation-from-monolayer-graphene-for-transparent-and-flexible-sound-sources/>
- J16. D. Kim, N. N. Hewa-Kasakarage, S. Yoon, and N. A. Hall, "On the Minimum Coupling Required for Maximum Theoretical Power Capture from Vibration Energy Harvesters," *Applied Physics Letters*, vol. 101, pp. 103904-3, September 2012.  
<http://dx.doi.org/10.1063/1.4749824>
- J15. M. L. Kuntzman, C. T. Garcia, A. G. Onaran, B. Avenson, K. D. Kirk, and N. A. Hall, "Performance and Modeling of a Fully Packaged Micromachined Optical Microphone," *Journal of Microelectromechanical Systems*, vol. 20(4), pp. 828-833, August 2011.  
<http://dx.doi.org/10.1109/JMEMS.2011.2148164>
- J14. B. Bicen, S. Jolly, K. Jeelani, C. T. Garcia, N. A. Hall, F. L. Degertekin, S. Quang, C. Weili, and R. N. Miles, "Integrated Optical Displacement Detection and Electrostatic Actuation for Directional Optical Microphones with Micromachined Biomimetic Diaphragms," *IEEE Sensors Journal*, vol. 9(12), pp. 1933-1941, December 2009.  
<http://dx.doi.org/10.1109/JSEN.2009.2031810>
- J13. R. N. Miles, Q. Su, W. Cui, M. Shetye, F. L. Degertekin, B. Bicen, C. Garcia, S. Jones, and N. Hall, "A Low-Noise Differential Microphone Inspired by the Ears of the Parasitoid Fly *Ormia ochracea*," *The Journal of the Acoustical Society of America*, vol. 125(4), pp. 2013-2026, April 2009.  
<http://dx.doi.org/10.1121/1.3082118>
- J12. N. A. Hall, M. Okandan, R. Littrell, B. Bicen, and F. L. Degertekin, "Simulation of Thin-Film Damping and Thermal Mechanical Noise Spectra for Advanced Micromachined Microphone Structures," *Journal of Microelectromechanical Systems*, vol. 17(3), pp. 688-697, June 2008.  
<http://dx.doi.org/10.1109/JMEMS.2008.918384>
- J11. N. A. Hall, M. Okandan, R. Littrell, D. K. Serkland, G. A. Keeler, K. Peterson, B. Bicen, C. Garcia, and F. L. Degertekin, "Micromachined Accelerometers with Optical Interferometric Read-Out and Integrated Electrostatic Actuation," *Journal of Microelectromechanical Systems*, vol. 17(1), pp. 37-44, February 2008.  
<http://dx.doi.org/10.1109/JMEMS.2007.910243>
- J10. R. Littrell, N. A. Hall, M. Okandan, R. Olsson, and D. Serkland, "Impact of Relative Intensity Noise of Vertical-Cavity Surface-Emitting Lasers on Optics-Based Micromachined Audio and Seismic Sensors," *Applied Optics*, vol. 46(28), pp. 6907-6911, October 2007.  
<http://dx.doi.org/10.1364/AO.46.006907>
- J9. N. A. Hall, M. Okandan, R. Littrell, B. Bicen, and F. L. Degertekin, "Micromachined Optical Microphone Structures with Low Thermal-Mechanical Noise Levels," *The Journal of the Acoustical Society of America*, vol. 122(4), pp. 2031-2037, October 2007.  
<http://dx.doi.org/10.1121/1.2769615>
- J8. N. A. Hall, M. Okandan, and F. L. Degertekin, "Surface and Bulk Micromachined Optical Displacement Sensor Fabricated with SwIFT-Lite™ Process," *Journal of Microelectromechanical Systems*, vol. 15(4), pp. 770-776, August 2006.  
<http://dx.doi.org/10.1109/JMEMS.2006.878884>
- J7. N. A. Hall, B. Bicen, M. K. Jeelani, W. Lee, S. Qureshi, F. L. Degertekin, and M. Okandan, "Micromachined Microphones with Diffraction-Based Optical Displacement Detection," *The Journal of the Acoustical Society of America*, vol. 118(5), pp. 3000-3009, November 2005.  
<http://dx.doi.org/10.1121/1.2062429>

- J6. F. L. Degertekin, A. G. Onaran, M. Balantekin, W. Lee, N. A. Hall, and C. F. Quate, "Sensor for Direct Measurement of Interaction Forces in Probe Microscopy," *Applied Physics Letters*, vol. 87(21), pp. 213109, November 2005.  
<http://dx.doi.org/10.1063/1.2136430>  
 - Also in *Virtual Journal of Nanoscale Science & Technology*, November 28, 2005, Volume 12, Issue 22.
- J5. W. Lee, N. A. Hall, and F. L. Degertekin, "A Grating-Assisted Resonant-Cavity-Enhanced Optical Displacement Detection Method for Micromachined Sensors," *Applied Physics Letters*, vol. 85(15), pp. 3032-3034, October 2004.  
<http://dx.doi.org/10.1063/1.1804605>
- J4. W. Lee, N. A. Hall, Z. Zhiping, and F. L. Degertekin, "Fabrication and Characterization of a Micromachined Acoustic Sensor with Integrated Optical Readout," *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 10(3), pp. 643-651, May-June 2004. – Invited paper  
<http://dx.doi.org/10.1109/JSTQE.2004.829198>
- J3. N. A. Hall, W. Lee, and F. L. Degertekin, "Capacitive Micromachined Ultrasonic Transducers with Diffraction-Based Integrated Optical Displacement Detection," *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, vol. 50(11), pp. 1570-1580, November 2003.  
<http://dx.doi.org/10.1109/TUFFC.2003.1251141>
- J2. N. A. Hall and F. L. Degertekin, "Integrated Optical Interferometric Detection Method for Micromachined Capacitive Acoustic Transducers," *Applied Physics Letters*, vol. 80(20), pp. 3859-3861, May 2002.  
<http://dx.doi.org/10.1063/1.1480486>  
 - Also in *Virtual Journal of Nanoscale Science & Technology*, May 27, 2002 Volume 5, Issue 21.
- J1. J. A. Carter, K. M. Martin, W. B. Campbell, N. A. Hall, and O. A. Ezekoye, "Design of an Oscillating Flow Apparatus for the Study of Low Reynolds Number Particle Dynamics," *Experiments in Fluids*, vol. 30(5), pp. 578-583, May 2001.  
<http://dx.doi.org/10.1007/s003480000238>

## B. Conference Proceedings

- B20. Yoonho Seo, Donghwan Kim, and Neal A. Hall, "High Temperature Piezoelectric Pressure Sensors for Hypersonic Flow Measurements," presented at *Transducers 2019, The 20th International Conference on Solid State Sensors, Actuators, and Microsystems* in Berlin, Germany.  
[10.1109/TRANSDUCERS.2019.8808755](https://doi.org/10.1109/TRANSDUCERS.2019.8808755)  
 \*Winner of an Outstanding Paper Award, Poster Presentation Category (3 winners, 440 entries)\*
- B19. Randy Williams, Brad Avenson, and Neal A. Hall, "Grating-based Acceleration Sensors with Optical Interferometric Readout and Closed-Loop Control," presented at *Transducers 2019, The 20th International Conference on Solid State Sensors, Actuators, and Microsystems* in Berlin, Germany.  
[10.1109/TRANSDUCERS.2019.8808749](https://doi.org/10.1109/TRANSDUCERS.2019.8808749)
- B18. Xiyuan Tang, Shaolan Li, Linxiao Shen, Wenda Zhao, Xiangxing Yang, Randy Williams, Jiaxin Liu, Zhichao Tan, Neal A. Hall, and Nan Sun, "18.2 A 16 fJ/Conversion-Step Time-Domain Two-Step Capacitance-to-Digital Converter," 2019 IEEE International Solid-State Circuits Conference - (ISSCC), San Francisco, CA, USA, 2019, pp. 296-297.  
<https://ieeexplore.ieee.org/document/8662359>
- B17. D. Kim, M. L. Kuntzman, and N. A. Hall, "A Rotational Capacitive Micromachined Ultrasonic Transducer (RCMUT)," in *IEEE Sensors 2014*, Valencia, Spain, November 4, 2014.  
<http://dx.doi.org/10.1109/ICSENS.2014.6985150>



- B16. D. Kim, M. L. Kuntzman, and N. A. Hall, "Microfabrication of a Capacitive Micromachined Ultrasonic Transducer (CMUT) with an Internally Sealed Pivot," in *2014 IEEE International Ultrasonics Symposium*, Chicago, IL, September 5, 2014, pp. 595-599.  
<http://dx.doi.org/10.1109/ULTSYM.2014.0146>
- B15. D. Kim, M. L. Kuntzman, and N. A. Hall, "Rotational Capacitive Micromachined Ultrasonic Transducers," in *2014 IEEE International Ultrasonics Symposium*, Chicago, IL, September 4, 2014, pp. 170-173.  
<http://dx.doi.org/10.1109/ULTSYM.2014.0043>
- B14. C. T. Garcia, G. Onaran, B. Avenson, M. R. Christensen, Z. Liu, N. Hewa-Kasakarage, and N. A. Hall, "Micro-Seismometers via Advanced Meso-Scale Fabrication," in *2011 Monitoring Research Review: Ground-Based Nuclear Explosion Monitoring Technologies*, Tucson, AZ, 2011, pp. 274-282.  
<http://www.osti.gov/scitech/biblio/1027453>
- B13. C. T. Garcia, G. Onaran, B. Avenson, B. A. Yocom, and N. A. Hall, "Micro-Seismometers via Advanced Meso-Scale Fabrication," in *2010 Monitoring Research Review: Ground-Based Nuclear Explosion Monitoring Technologies*, Orlando, FL, 2010, pp. 280-288.  
<http://www.osti.gov/scitech/biblio/1027452>
- B12. C. T. Garcia, G. Onaran, B. Avenson, M. Ellis, and N. A. Hall, "Micro-Seismometers via Advanced Meso-Scale Fabrication " in *2009 Monitoring Research Review: Ground-Based Nuclear Explosion Monitoring Technologies*, Tucson, AZ, 2009, pp. 330-337.  
<http://www.osti.gov/scitech/biblio/992203>
- B11. N. A. Hall, "Micro-Seismometers via Advanced Mesoscale Fabrication," in *30th Monitoring Research Review: Ground-Based Nuclear Explosion Monitoring Technologies*, Portsmouth, VA, 2008, pp. 610-614.  
<http://www.osti.gov/scitech/biblio/960561>
- B10. M. Okandan, N. Hall, B. Bicen, C. Garcia, and F. Degertekin, "Optical Microphone Structures Fabricated for Broad Bandwidth and Low Noise," in *2007 IEEE Sensors*, Atlanta, GA, 2007, pp. 1472-1475.  
<http://dx.doi.org/10.1109/ICSENS.2007.4388692>
- B9. S.-Y. Peng, M. S. Qureshi, P. E. Hasler, N. A. Hall, and F. L. Degertekin, "High SNR Capacitive Sensing Transducer," in *2006 IEEE International Symposium on Circuits and Systems*, Island of Kos, Greece, 2006, pp. 1175-1178.  
<http://dx.doi.org/10.1109/ISCAS.2006.1692800>
- B8. W. Cui, B. Bicen, N. Hall, S. A. Jones, F. Degertekin, and R. N. Miles, "Optical Sensing in a Directional MEMS microphone Inspired by the Ears of the Parasitoid Fly, *Ormia ochracea*," in *19th IEEE International Conference on Micro Electro Mechanical Systems*, Istanbul, Turkey, 2006, pp. 614-617.  
<http://dx.doi.org/10.1109/MEMSYS.2006.1627874>
- B7. N. A. Hall, R. O. Guldiken, J. McLean, and F. L. Degertekin, "Modeling and Design of CMUTs using Higher Order Vibration Modes [Capacitive Micromachined Ultrasonic Transducers]," in *2004 IEEE Ultrasonics Symposium*, Montréal, Canada, 2004, vol. 1, pp. 260-263.  
<http://dx.doi.org/10.1109/ULTSYM.2004.1417716>
- B6. W. Lee, N. Hall, and F. L. Degertekin, "Micromachined Acoustic Sensor Array with Diffraction-Based Optical Interferometric Detection," in *MOEMS Display and Imaging Systems*, San Jose, CA, 2003, vol. 4985, pp. 140-151.  
<http://dx.doi.org/10.1117/12.472862>
- B5. N. A. Hall, W. Lee, J. Dervan, and F. L. Degertekin, "Micromachined Capacitive Transducers with Improved Optical Detection for Ultrasound Applications in Air," in *2002 IEEE Ultrasonics Symposium*, Munich, Germany, 2002, vol. 2, pp. 1027-1030.



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- B4. F. L. Degertekin, N. A. Hall, and W. Lee, "Capacitive Micromachined Ultrasonic Transducers with Integrated Optoelectronic Readout," in *2001 IEEE Ultrasonics Symposium*, Atlanta, GA, 2001, vol. 2, pp. 875-881. – Invited Paper  
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