

## **Christian A. Zorman, Ph.D.**

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### ***Education***

- 1991-1994      *Case Western Reserve University, Cleveland, Ohio*  
Ph.D. Experimental Solid State Physics  
Dissertation title: “Annealing of Diamond and Diamondlike-carbon Films: An Ion Beam Analysis Study”  
Research Advisor: R.W. Hoffman.
- 1988-1991      *Case Western Reserve University, Cleveland, Ohio*  
MS Physics
- 1982-1988      *The Ohio State University, Columbus, Ohio.*  
BS cum laude Physics  
BA cum laude Economics

### ***Experience***

- 9/18 to pres.      Associate Dean for Research  
Case School of Engineering  
Case Western Reserve University, Cleveland Ohio
- 7/18 to pres.      Leonard Case Jr. Professor of Engineering  
Department of Electrical Engineering and Computer Science  
Department of Biomedical Engineering (secondary appointment)  
Department of Mechanical and Aerospace Engineering (secondary appointment)  
Case Western Reserve University, Cleveland, Ohio
- 9/17 to 8/18      Interim Associate Dean for Research  
Case School of Engineering  
Case Western Reserve University, Cleveland Ohio
- 7/14 to 6/18      Professor  
Department of Electrical Engineering and Computer Science  
Department of Biomedical Engineering (secondary appointment)  
Department of Mechanical and Aerospace Engineering (secondary appointment)  
Case Western Reserve University, Cleveland, Ohio
- 4/11 to pres.      Director  
Microfabrication Laboratory  
Case Western Reserve University, Cleveland, Ohio
- 2/10 to 6/14      Associate Professor – Secondary Appointment  
Department of Mechanical and Aerospace Engineering  
Case Western Reserve University, Cleveland, Ohio
- 9/09 to 6/14      Associate Professor – Secondary Appointment  
Department of Biomedical Engineering  
Case Western Reserve University, Cleveland, Ohio

- 5/09 to pres. Co-Director of Research and Scientific Affairs  
Advanced Platform Technology Center of Excellence  
Department of Veterans Affairs  
Louis Stokes VA Medical Center, Cleveland, Ohio
- 7/08 to 6/14 Associate Professor (with tenure)  
Department of Electrical Engineering and Computer Science  
Case Western Reserve University, Cleveland, Ohio
- 8/05 to pres. Research Scientist/Research Associate/Co-Investigator  
Advanced Platform Technology Center of Excellence  
Department of Veterans Affairs  
Louis Stokes VA Medical Center, Cleveland, Ohio
- 8/02 to 6/08 Associate Professor  
Department of Electrical Engineering and Computer Science  
Case Western Reserve University, Cleveland, Ohio
- 11/00 to 8/02 Interim Administrative Director  
Microfabrication Laboratory  
Case Western Reserve University, Cleveland, Ohio
- 6/00 to 8/02 Researcher  
Department of Electrical Engineering and Computer Science  
Case Western Reserve University, Cleveland, Ohio
- 3/00 to 8/02 Adjunct Assistant Professor  
Department of Electrical Engineering and Computer Science  
Case Western Reserve University, Cleveland, Ohio.
- 6/97 to 5/00 Senior Research Associate.  
Department of Electrical Engineering and Applied Physics  
Case Western Reserve University, Cleveland, Ohio
- 6/94 to 5/97 Research Associate  
Department of Electrical Engineering and Applied Physics  
Case Western Reserve University, Cleveland, Ohio
- 6/90 to 5/94 Research Assistant  
Department of Physics  
Case Western Reserve University, Cleveland, Ohio
- 8/88 to 5/90 Teaching Assistant  
Department of Physics,  
Case Western Reserve University, Cleveland, Ohio
- 1/87 to 8/88 Research Assistant  
Byrd Polar Research Center,  
*The Ohio State University*, Columbus, Ohio

### ***Current Professional Memberships***

- AVS – The Science and Technology Society (formerly The American Vacuum Society)  
Member: MEMS and NEMS Technical Group  
Member: Thin Films Division

Institute of Electrical and Electronic Engineers (IEEE)  
Member: Electron Devices Society

### **Honors**

2018 *Esprit de Corps Award*: Case School of Engineering  
2017 *Fellow*: American Vacuum Society  
2013 *Faculty Research Award*: Case School of Engineering  
2012 *Faculty Research Award*: Department of Electrical Engineering and Computer Science  
2010 *Faculty Service Award* : Department of Electrical Engineering and Computer Science  
2010 *Best Poster Award*: Fall 2010 Material Research Society Meeting  
2010 *Graduate Teaching Award*: Case School of Engineering  
2009 *John S. Diekhoff Award for Excellence in Graduate Mentoring*: CWRU  
2008 *Member*: Eta Kappa Nu  
2007 *Faculty Fellow*: NASA Glenn Faculty Fellows Program  
2007 *Senior Member*: IEEE  
2006 *Faculty Fellow*: NASA Faculty Fellows Program  
2006 *Outstanding Teacher Award*: Case School of Engineering  
2004 *NASA Group Technical Achievement Award*: NASA Glenn Research Center  
2000 *Who's Who in Science and Engineering*  
1993 *2<sup>nd</sup> Place – Student Poster Competition*: 15<sup>th</sup> Symposium on Applied Surface Analysis, AVS, Cleveland OH, June 9-11, 1993  
  
1989 *Distinguished Graduate Teaching Award*: Case Western Reserve University  
1988 *Honorable Discharge*: Ohio Army National Guard, Rank: Sergeant (6 years of service)  
1987 *President's Scholarship Award*: The Ohio State University  
1986 Phi Kappa Phi  
1985 Beta Gamma Sigma  
1985 Gold Key National Honor Society

### **CWRU Teaching and Mentoring Award Nominations**

*Carl F. Wittke Award for Excellence in Undergraduate Teaching*: 2006, 2010, 2017, 2018  
*Bruce Jackson Award for Excellence in Undergraduate Mentoring*: 2018  
*John S. Diekhoff Award for Excellence in Graduate Teaching*: 2009  
*John S. Diekhoff Award for Excellence in Graduate Mentoring*: 2009, 2017

### **Professional Activities**

2018 *Chair* – IEEE Sensors Council Chapter – Cleveland Section  
2018 *Chair* - AVS MEMS and NEMS Technical Group  
2018 *Technical Program Committee* – AVS 65<sup>th</sup> International Symposium  
2018 *Technical Program Committee* - 6th Annual IEEE International Conference on Wireless for Space and Extreme Environments (WISEE 2018)  
2018 *Technical Program Committee* – Design, Testing, Integration and Packaging 2018  
2017 *Technical Program Committee* – AVS 64<sup>th</sup> International Symposium  
2017 *Senior Topical Editor* – IEEE Sensors Letters  
2017 *Technical Program Committee* - 5th Annual IEEE International Conference on Wireless for Space and Extreme Environments (WISEE 2017)  
2017 *Technical Program Committee* – Design, Testing, Integration and Packaging 2017  
2017 *Chair* - AVS MEMS and NEMS Technical Group  
2016 *Advisory Committee* – 2016 Denise Denton Emerging Leaders Workshop

2016 *Technical Program Committee Track 8 Co-Chair and multiple Session Chairs* – 2016 IEEE Sensors Conference

2016 *Chair* - AVS MEMS and NEMS Technical Group

2016 *Technical Program Committee* – AVS 63rd International Symposium

2016 *Technical Program Committee* – Design, Testing, Integration and Packaging 2016

2015 *Technical Program Committee* – 2015 IEEE Sensors Conference

2015 *Technical Program Committee* – Design, Testing, Integration and Packaging 2015

2014 *Technical Program Committee* – 2014 IEEE Sensors Conference

2014 *Technical Program Committee* – AVS 61<sup>st</sup> International Symposium

2014 *Technical Program Committee* – Design, Testing, Integration and Packaging 2014

2013 *International Advisory Board* – 10<sup>th</sup> International Conference on Medical Applications of Novel Biomaterials and Nano-biotechnology at the 6<sup>th</sup> Forum on New Materials

2013 *Session Chair* – 2013 IEEE Sensors Conference

2013 *Technical Program Committee* – 2013 IEEE Sensors Conference

2013 *Technical Program Committee* – AVS 60<sup>th</sup> International Symposium

2013 *Technical Program Committee* – Design, Testing, Integration and Packaging 2013

2012 *Member* – Ohio Board of Regents Ohio Commercialization Task Force Industry Forum

2012 *Technical Program Committee* – AVS 59<sup>th</sup> International Symposium

2012 *Technical Program Committee* – 2012 IEEE Sensors Conference

2012 *Session Chair* – 2012 IEEE Sensors Conference

2011 *Student Assistance Coordinator* – 2011 International Conference on Silicon Carbide and Related Materials.

2011 *Program Selection Committee Member*, AVS 58<sup>th</sup> International Symposium

2011 *Technical Program Committee* – IEEE EnergyTech 2011

2011 *Technical Program Committee* – Design, Testing, Integration and Packaging 2011

2010 *Technical Program Committee* – Design, Testing, Integration and Packaging 2010

2009 *IEEE Senior Member Selection Committee Member* - Spring 2009

2009 *Vice Chair* – Cleveland Chapter IEEE MTT/APS (Antenna and Propagation Soc.)

2009 *Program Selection Committee Member*, AVS 56<sup>th</sup> International Symposium

2008 *Program Committee Member*: Society of Photographic Instrumentation Engineers (SPIE) Photonics West: MOEMS-MEMS 2009

2008 *Vice Chair* – Cleveland Chapter IEEE MTT/APS (Antenna and Propagation Soc.)

2008 *Organizing Committee Member and AVS Representative*: 1<sup>st</sup> International Conference on NanoManufacturing (NanoMan 2008)/4<sup>th</sup> International Conference on Technical Advances of Thin Films and Surface Coatings (Thinfilms 2008).

2008 *Program Selection Committee Member*, AVS 55<sup>th</sup> International Symposium

2007 *Vice Chair* – Cleveland Chapter IEEE MTT/APS (Antenna and Propagation Soc.)

2007 *Program Committee Member*: Society of Photographic Instrumentation Engineers (SPIE) Photonics West: MOEMS-MEMS 2008

2007 *Program Selection Committee Member*, AVS 54<sup>th</sup> International Symposium

2006 *Program Selection Committee Member*, AVS 53<sup>rd</sup> International Symposium

2006 *Program Committee and Session Chair*: SPIE Photonics West: MOEMS-MEMS 2007

2005 *Chair*, AVS MEMS and NEMS Technical Group

2005 *Program Selection Committee Member*, AVS 52<sup>nd</sup> International Symposium

2004 *Program Selection Committee Member and Session Chair*, AVS 51<sup>st</sup> International Symposium

2004 *Organizing Committee*: The Northeast Ohio Nanoscience and Nanotechnology Research Symposium

2004 *Vice Chair*: AVS MEMS and NEMS Technical Group of AVS

2003 *Program Selection Committee Member and Session Chair*, AVS 50<sup>th</sup> International Symposium

- 2003 *Session Co-Chair: The 12<sup>th</sup> International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers 2003).*
- 2002 *Chair, AVS Science of MEMS Technical Group*
- 2002 *Program Selection Committee Member and Session Chair, AVS 49<sup>th</sup> International Symposium*
- 2001 *Chair, AVS Science of MEMS Technical Group*
- 2001 *Program Selection Committee Chairman and Session Chair, AVS 48<sup>th</sup> International Symposium/International Vacuum Congress-15/International Conference on Solid Surfaces-11.*
- 2000 *Chair, AVS Science of MEMS Technical Group*
- 2000 *Program Selection Committee Chairman and Session Chair, AVS 47<sup>th</sup>/Nano-6 International Symposium*
- 1999 *Session Chair, MRS Fall Meeting 1999*
- 1999 *Program Selection Committee Member and Session Chair, AVS 46<sup>th</sup> International Symposium*
- 1987 *President, OSU Chapter of Toastmasters International*

### ***Service Activities***

Reviewer for the following refereed journals:

1. *Journal of Microelectromechanical Systems*
2. *Journal of Micromechanics and Microengineering*
3. *Sensors and Actuators A*
4. *Sensors and Actuators B*
5. *Journal of Vacuum Science and Technology B*
6. *Thin Solid Films*
7. *Journal of Applied Physics*
8. *Biomedical Microdevices*
9. *Journal of Wide Bandgap Semiconductors*
10. *Journal of Crystal Growth*
11. *Nanotechnology*
12. *IEEE Transactions on Electron Devices*
13. *Microelectronics Reliability*
14. *Sensors and Materials*
15. *Journal of Materials Research*
16. *IEEE Sensors Journal*
17. *Solid State Electronics*
18. *Diamond and Related Materials*
19. *Surface and Coatings Technology*
20. *Journal of Mechanical Engineering Science*
21. *Journal of Physics D*
22. *Measurement Science and Technology*
23. *IEEE Transactions on Biomedical Engineering*
24. *Journal of Microlithography, Microfabrication and Microsystems*
25. *Crystal Growth and Design*
26. *Journal of the Electrochemical Society*
27. *Materials Characterization*
28. *Physica Solidi A*
29. *Applied Physics Letters*
30. *Optical Materials*
31. *Superlattices and Microstructures*

32. *Journal of Electroceramics*
33. *Electron Device Letters*
34. *Applied Surface Science*
35. *Microelectronic Engineering*
36. *Nanotechnology*
37. *Superficies y Vacío*
38. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*
39. *Healthcare Technology Letters*
40. *ACS Applied Materials and Interfaces*
41. *Microsystems and Nanoengineering*
42. *Microsystems Technologies*

Proposal Review Panelist for the following funding agencies:

*American Association for the Advancement of Science*  
*National Institutes of Health*  
*National Science Foundation*  
*National Aeronautics and Space Administration*  
*U.S. Department of State*  
*University of California Energy Institute*  
*Army Research Office*  
*State of Kentucky*  
*American Chemical Society Petroleum Research Fund*  
*Swiss National Science Foundation*

***Book Chapters (advisee names underlined)***

19. C.A. Zorman, “Materials Aspects of MEMS and NEMS”, in *The Springer Handbook of Nanotechnology – 4<sup>th</sup> Edition*, B. Bhushan, ed., Springer, Berlin, 2017, pp. 163-190.
18. D.J. Young, C.A. Zorman, and P. X.-L. Feng, "MEMS/NEMS Devices and Applications", in *The Springer Handbook of Nanotechnology – 4<sup>th</sup> Edition*, B. Bhushan, ed., Springer, Berlin, 2017, 395-429.
17. A. Hess-Dunning and C.A. Zorman, “Electrical Interfaces for Recording, Stimulation and Sensing”, in *Implantable Biomedical Microsystems: Design Principles and Applications, 1<sup>st</sup> Edition*, Elsevier, 2015, Chapter 2, pp. 13-38.
16. C.A. Zorman and A.C. Barnes, “Silicon Carbide BioMEMS”, in *Silicon Carbide Biotechnology: A Biocompatible Semiconductor for Advanced Biomedical Devices and Applications*”, Elsevier, 2011, Chapter 10, pp. 351-376.
15. C. Zorman, R. Roberts and L. Chen, “Additive Processes for Semiconductors and Dielectric Materials, in *MEMS Materials and Processes Handbook*, Springer-Verlag, Berlin, 2011, Chapter 2, pp. 37-136.
14. D.J. Young, C.A. Zorman, M. Mehregany, "MEMS/NEMS Devices and Applications", in *The Springer Handbook of Nanotechnology – 3<sup>rd</sup> Edition*, B. Bhushan, ed., Springer-Verlag, Berlin, 2010, Chapter 12, pp. 359-388.
13. C.A. Zorman and M. Mehregany, “Materials Aspects of MEMS and NEMS”, in *The Springer Handbook of Nanotechnology – 3<sup>rd</sup> Edition*, B. Bhushan, ed., Springer-Verlag, Berlin, 2010, Chapter 11, pp. 333-358.

12. C.A. Zorman and R.J. Parro, "Micro- and Nanomechanical Structures for Silicon Carbide MEMS and NEMS", in *Silicon Carbide – Volume 1: Growth, Defects and Novel Applications*, Wiley-VCH, Weinheim, 2010, Chapter 17, pp. 411-452.
11. D.J. Young, C.A. Zorman, M. Mehregany, "MEMS/NEMS Devices and Applications", in *The Springer Handbook of Nanotechnology – 2<sup>nd</sup> Edition*, B. Bhushan, ed., Springer-Verlag, Berlin, 2007, Chapter 15, pp 415-442.
10. C.A. Zorman and M. Mehregany, "Materials Aspects of MEMS and NEMS", in *The Springer Handbook of Nanotechnology – 2<sup>nd</sup> Edition*, B. Bhushan, ed., Springer-Verlag, Berlin, 2007, Chapter 10, pp. 299-322.
9. C.A. Zorman and M. Mehregany, "Materials for Microelectromechanical Systems", in *The MEMS Handbook - 2<sup>nd</sup> Edition, Vol. 2 – MEMS Design and Fabrication*. M. Gad-el-Hak, ed., CRC Press, Boca Raton, FL, 2006, pp. 2-1 to 2-26.
8. C.A. Zorman, X.A. Fu, and M. Mehregany, "Deposition Techniques for SiC MEMS", in *SiC MEMS*, Imperial College Press, 2006, Chapter 2, pp. 18-45.
7. S. Rajgopal, C.A. Zorman, D. Young and M. Mehregany, "Reliability and MEMS", Chapter 15.4, CRC Handbook of Mechanical Engineering – 2<sup>nd</sup> Edition, F. Kreith and Y. Goswami, eds., CRC Press, Boca Raton FL, 2004, pp. 15-68 to 15-82.
6. D.J. Young, C.A. Zorman, M. Mehregany, "MEMS/NEMS Devices and Applications", in *The Springer Handbook of Nanotechnology*, B. Bhushan, ed., Springer-Verlag, Berlin, 2004, Chapter 8, pp. 225-252.
5. C.A. Zorman and M. Mehregany, "Materials Aspects of MEMS and NEMS", in *The Springer Handbook of Nanotechnology*, B. Bhushan, ed., Springer-Verlag, Berlin, 2004, Chapter 7, pp. 203-224.
4. C.A. Zorman and M. Mehregany, "Micromachining of SiC", in *Silicon Carbide – Recent Major Advances*, W.J. Choyke, H. Matsunami, and G. Pensl, eds., Springer-Verlag, Berlin, 2003, pp. 671-695.
3. R.F. Davis, T. Gehrke, K.J. Linthicum, P. Rajagopal, A.M. Roskowski, T.S. Zheleva, E.A. Preble, C. Zorman, M. Mehregany, U. Schwartz, J. Schuck, and R. Rober, "Pendeo-epitaxy of GaN and AlGaN Thin Films on 6H-SiC(0001) and Si(111) Substrates", in *Vacuum Science and Technology: Nitrides as Seen by the Technology, 2002*, T. Paskova and B. Monemar, eds., Research Signposts, Kerala, India, 2003, Chapter 10, pp. 183-195.
2. C.A. Zorman and M. Mehregany, "Materials for Microelectromechanical Systems", in *The MEMS Handbook*, M. Gad-el-Hak, ed., CRC Press, Boca Raton, FL, 2001, Chapter 15, pp. 15-1 to 15-26.
1. M. Mehregany and C.A. Zorman, "MEMS for Harsh Application Environments" in *Microengineering Aerospace Systems*, H. Helvajian, ed., The Aerospace Press, El Segundo, CA, 1999, Chapter 4, pp. 119-144.

***Refereed Journal Publications (advisee names underlined)***

122. X.Q. Zheng, J. Lee, S. Rafique, M.R. Karim, L. Han, H. Zhao, C.A. Zorman and P.X.-L. Feng,  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> NEMS Oscillator for Real Time Middle Ultraviolet (MUV) Light Detection" *IEEE Electron Device Letters*, vol. 39, pp. 1230-1233, (2018).

121. Y. Sui, S. Ghosh, C. Miller, D. Pappas, R.M. Sankaran, and C. Zorman, "Tunable resistivity in ink-jet printed electrical structures on paper by plasma reduction of particle-free, stabilizer-free silver ink", *Journal of Vacuum Science and Technology A*, vol. 36, pp. 051302 (2018).
120. X.-Q. Zheng, J. Lee, S. Rafique, L. Han, C.A Zorman, H. Zhao, P. X.-L. Feng, "Free-Standing  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Thin Diaphragms", *Journal of Electronic Materials*, vol. 47, pp 973–981 (2018).
119. S. Ghosh, D.R. Boris, S.C. Hernández, C.A. Zorman, S.G. Walton, and R.M. Sankaran, "Correlating charge fluence with nanoparticle formation during in situ plasma synthesis of nanocomposite films.", *Plasma Processes and Polymers* vol. 14, e1700079, <https://doi.org/10.1002/ppap.201700079>, (2017).
118. X-Q Zheng, J. Lee, S. Rafique, L. Han, C A. Zorman, H. Zhao, P. X.-L. Feng, "Ultrawide Bandgap  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Nanomechanical Resonators with Spatially Visualized Multimode Motion", *ACS Applied Materials and Interfaces*, vol. 9, pp. 43090-43097 (2017).
117. R. Yang, J. Lee, S. Ghosh, H. Tang, R.M. Sankaran, C.A. Zorman, P.X.-L. Feng, "Tuning Optical Signatures of Single- and Few-Layer MoS<sub>2</sub> by Blown-Bubble Bulge Straining up to Fracture", *ACS Nano Letters*, vol. 17, pp 4568–4575 (2017).
116. H. Zamani, J. Lee, S. Rajgopal, C.A. Zorman, and P.X.-L. Feng, "3C-SiC Microdisk Mechanical Resonators with Multimode Resonances at Radio Frequencies", *Journal of Micromechanics and Microengineering*, vol. 27, pp. 074001 (2017).
115. S. Ghosh, E. Klek, C.A. Zorman and R.M. Sankaran, "Microplasma-induced In-Situ Formation of Patterned, Stretchable Electrical Conductors", *ACS Macro Letters*, vol. 6, pp. 194-199, (2017).
114. S. Rafique, L. Han, J. Lee, X.-Q. Zheng, C.A. Zorman, P. X.-L. Feng, and H. Zhao, Synthesis and Characterization of Ga<sub>2</sub>O<sub>3</sub> Nanosheets on 3C-SiC-on-Si by Low Pressure Chemical Vapor Deposition", *Journal of Vacuum Science and Technology B*, vol. 35, p.011208, (2017).
113. S. Rafique, L. Han, C.A. Zorman, and H. Zhao, "Synthesis of Wide Bandgap  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Rods on 3C-SiC-on-SiC", *Crystal Growth and Design*, vol. 16, pp. 511–517, (2016).
112. S. Ghosh, E. Ostrowski, R. Yang, D Debnath, P.X.-L. Feng, C.A. Zorman, and R.M. Sankaran, "Atmospheric-Pressure Plasma Reduction of Metal Cation-Containing Polymer Films to Produce Electrically Conductive Nanocomposites by an Electrodifusion Mechanism", *Plasma Chemistry and Plasma Processing*, vol. 36, pp. 295-307, (2016).
111. R. Yang, Z. Wang, J. Lee, C.A. Zorman and P.X.L. Feng, "High frequency torsional-mode nanomechanical resonators enabled by very thin nanocrystalline diamond diaphragms", *Diamond and Related Materials*, vol. 54, pp. 19-25 (2015).
110. D.S. Howe, J. Dunning, C. Zorman, S.L. Garverick and K.M. Bogie, "Battery-Powered, High-Voltage Stimulation Circuits for a Wound Healing Device" *Annals of Biomedical Engineering*, vol. 43, pp. 306-313 (2015) doi: 10.1007/s10439-014-1134-1.
109. A. de Leon, A.C. Barnes, P. Thomas, J. O'Donnell, C.A. Zorman, R.C. Advincula, "Transfer Printing of Self-folding Polymer-Metal Bilayer Particles", *ACS Applied Materials and Interfaces*, vol. 6, pp 22695-22700 (2014).
- 108 J.L. Jordan, R.N. Simons and C.A. Zorman, "Contactless Radio Frequency Probes for High Temperature Characterization of Microwave Integrated Circuits", *Electronics Letters*, vol. 50, pp. 817-819 (2014).



107. A.E. Hess-Dunning, R.L. Smith and C.A. Zorman, "Polynorbornene as an Enabling Structural Material for Polymer-based BioMEMS", *Journal of Applied Polymer Science*, vol. 131, paper # 40969 (2014) doi: 10.1002/app.40969, *Featured on Cover*.
106. A.E. Hess-Dunning, D.J. Tyler, J.P. Harris, J.R. Capadona, C. Weder, S.J. Rowan, and C.A. Zorman, "Microscale Characterization of a Mechanically Adaptive Polymer Nanocomposite with Cotton-Derived Cellulose Nanocrystals for Implantable BioMEMS", *Journal of Microelectromechanical Systems*, vol. 23, pp. 774-784 (2014).
105. S. Ghosh, R. Yang, M. Kaumeyer, C.A. Zorman, S. J. Rowan, P.X.-L. Feng, and R.M. Sankaran, "Fabrication of Electrically Conductive Metal Patterns at the Surface of Polymer Films by Microplasma-Based Direct Writing", *ACS Applied Materials and Interfaces*, vol. 6, pp. 3099-3104 (2014)
104. X-A. Fu, J. Trevino, M. Mehregany, C.A. Zorman, "Doped Polycrystalline 3C-SiC Films With Low Stress for MEMS Part II: Characterization Using Micromachined Structures", *Journal of Micromechanics and Microengineering*, vol. 24, pp. 065001-065009 (2014).
103. X-A. Fu, J. Trevino, M. Mehregany, C.A. Zorman, "Doped Polycrystalline 3C-SiC films with Low Stress for MEMS Part I: Deposition Conditions and Film Properties", *Journal of Micromechanics and Microengineering*, vol. 24, pp. 035013-035020 (2014).
102. A.E. Hess, K.A. Potter, D.J. Tyler, C.A. Zorman, J.R. Capadona, "Environmentally-controlled Microtensile Testing of Mechanically-Dynamic Polymer Nanocomposites for *Ex Vivo* Characterization", *Journal of Visualized Experiments*, vol. 78, e50078, doi: 10.3791/50078 (2013).
101. A.L. Falk, B.B. Buckley, G. Calusine, W.F. Koehl, V. Dobrovitski, A. Politi, C.A. Zorman, P.X.L. Feng and D. Awschalom, "Polytype Control of Spin Cubits in Silicon Carbide", *Nature Communications*, vol. 4, article # 1819 (2013).
100. J. Du and C.A. Zorman, "A Polycrystalline SiC-on-Si Architecture for Capacitive Pressure Sensing Applications beyond 400°C: Process Development and Device Performance", *Journal of Materials Research*, vol. 28, pp. 120-128 (2013).
99. J.R. Capadona, D.J. Tyler, C.A. Zorman, S.J. Rowan, and C. Weder, "Mechanically adaptive nanocomposites for neural interfacing", *MRS Bulletin*, vol. 37, pp. 581-589 (2012).
98. R.A. Smith, A.J. Fleischman, W.H. Fissell, and C.A. Zorman, "A Low-Cost Automated Streaming Potential Measurement System" *Journal of the Association of Laboratory Automation*, vol. 17, pp. 125-133 (2012). Highlighted Paper
97. S. Rajasekhara, B. Neuner III, C. A. Zorman, G. Ferro, G. Shvets, P. J. Ferreira, D. Kovar, "The influence of impurities and planar defects on the optical infrared properties of silicon carbide films", *Applied Physics Letters*, vol. 98, pp. 191904 (2011).
96. A. Barnes, A. Hess and C. Zorman, "Development of a packaging system for clinical evaluation of a nanocomposite-based neural electrode array fabricated from a chemoresponsive polymer substrate", *Journal of the Surface Mount Technology Association*, vol. 24, pp. 17-25 (2011). Also appearing in *Proceedings of the Technical Conference - 2010 Surface Mount Technology Association International Conference*, Orlando, Florida, October 24 - 28, 2010, pp. 309-317.
95. J.P. Harris, A.E. Hess\*, S.J. Rowan, C. Weder, C.A. Zorman, D.J. Tyler, J.R. Capadona, "In vivo deployment of mechanically adaptive nanocomposites for intracortical microelectrodes", *Journal of Neural Engineering* \*co-first author vol. 8, paper # 046010 (2011).

94. X. Fu, J. Dunning, M. Mehregany and C.A. Zorman, “Low Stress Polycrystalline SiC Thin Films Suitable for MEMS Applications”, *Journal of the Electrochemical Society*, vol. 158, pp. H675-H680 (2011).
93. R. Smith, K. Goldman, W. Fissell, A. Fleischman, C. Zorman, S. Roy, “Removal of Endotoxin from Aqueous Solutions Using Micromachined Silicon Nanoporous Membranes” *Journal of Micromechanics and Microengineering*, vol. 21, pp. 54029-54036 (2011).
92. A.E. Hess, D. Sabens, H.B. Martin, and C.A. Zorman, “Diamond-on-polymer microelectrode arrays fabricated using a chemical release transfer process”, *Journal of Microelectromechanical Systems*, vol. 20, pp. 867 – 875 (2011).
91. A.E. Hess, J.R. Capadona, K. Shanmuganathan, L. Hsu, S.J. Rowan, C. Weder, D.J. Tyler and C.A. Zorman, “Development of a stimuli-responsive polymer nanocomposite toward biologically-optimized MEMS-based neural probes”, *Journal of Micromechanics and Microengineering*, vol. 21, pp. 54009-54017 (2011)
90. R.A. Smith, A.J. Fleischman, W.H. Fissell, C.A. Zorman, S. Roy, “A system to measure minute hydraulic permeability of nanometer scale devices in a non-destructive manner”, *Measurement Science and Technology*, vol. 22, no. 4, pp. 45802-45811 (2011).
89. N. Ferrell, J. Groszek, L. Li, R. Smith, R. Butler, C. Zorman, S. Roy, and W. Fissell, “The basal lamina secreted by MDCK cells has size- and charge-selective properties”, *American Journal of Physiology - Renal Physiology*, vol. 300, no. 1, F86-F90 (2011).
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***Refereed Conference Proceedings Papers (advisee names underlined)***

137. I. McAdams, H. Kenyon, D. Bourbeau, M. Damaser, C.A. Zorman and S. Majerus, "Low Cost, Implantable Wireless Sensor Platform for Neuromodulation Research" to be presented at the *2018 Biomedical Circuits and Systems Conference*, Cleveland Ohio, October 17-20, 2018.
136. X.-Q. Zheng, J. Lee, S. Rafique, M. Rezaul Karim, L. Han, H. Zhao, C.A. Zorman, and P.X.-L. Feng, "Towards Real-Time Middle Ultraviolet (MUV) Light Detection By Beta Gallium Oxide ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) NEMS Oscillator", presented at the *18<sup>th</sup> Solid-State Sensors, Actuators and Microsystems Workshop (Hilton Head 2018)*, Hilton Head SC, USA, June 3-7, 2018.
135. S.J.A. Majerus, H. Chong, D. Ariando, C. Swingle, J. Potkay, K. Bogie, and C.A. Zorman, "Vascular Graft Pressure-Flow Monitoring Using 3D Printed MWCNT-PDMS Strain Sensors", presented at *The 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Honolulu, HI, USA, July 17-21, 2018.
134. I. McAdams, S. Majerus, C. Zorman and M.S. Damaser, "A Conductance-Based Sensor to Estimate Bladder Volume in Felines", presented at *The 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Honolulu, HI, USA, July 17-21, 2018.
133. Y. Sui, H. Chong, K. Shara, and C. Zorman, "Characterizing the Resonant Behavior and Quality Factors of 3C-SiC Diaphragms Using Frequency Analysis and the Ring-Down Technique", in *Technical Digest of the 17th IEEE International Conference on Nanotechnology (IEEE NANO 2017)*, Pittsburgh PA, July 25-28, 2017, pp. 811-815.
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***Abstracts of Conference Presentations (advisee names underlined)***

78. T. Liu, Y. Sui, H.A.B. Mustafa, O. Akkus, C.A. Zorman and R.M. Sankaran, "Plasma enhanced chemical film conversion (PECFC): A metal-free, low-temperature approach to synthesizing atomically-thin films", to be presented at the *2018 Materials Research Society Fall Meeting and Exhibit*, Boston MA, November 25-30, 2018.
77. Y. Sui, R.M. Sankaran, and C.A. Zorman, "A Novel Inkjet Printing Technology Based on Plasma Conversion of Metal-Salt Based Inks for the Fabrication of Microfabricated Sensors", to be

- presented at the *AVS 65<sup>th</sup> International Symposium and Exhibition*, Long Beach CA, October 21-26, 2018.
76. Y. Sui, R.M. Sankaran and C.A. Zorman, “A Novel, Low-Temperature, Ink-jet Printing Technology Based on Non-thermal Plasma Conversion of Metal-Salt Based Inks” presented at The 8<sup>th</sup> International Conference on Plasma Nanoscience (iPlasmaNano-IX 2018), New Buffalo MI, August 26-29, 2018, pp. 8. <http://www.iplasmanano.org>. **Invited Talk**
  75. H. Chen, V. Pashaei, W. Liao, C.N. Arutt, H. Jia, M.W. McCurdy, C.A. Zorman, R.A. Reed, R.D. Schrimpf, M.L. Alles, and P.X.-L. Feng, “Ion Radiation Effects in Silicon Carbide (SiC) Crystal Probed by Multimode Diaphragm Resonators”, presented at the *AVS 64<sup>th</sup> International Symposium and Exhibition*, Tampa FL, October 29-November 3, 2017, Abstract # MN+2D-WeM3.
  74. Y. Sui, H. Chong, K. Shara, and C.A. Zorman, “Characterizing the Resonant Behavior and Quality Factors of 3C-SiC Diaphragms Using Frequency Analysis and the Ring-Down Technique”, presented at the *AVS 64<sup>th</sup> International Symposium and Exhibition*, Tampa FL, October 29-November 3, 2017, Abstract # MN+2D-WeM2.
  73. Y. Sui, S. Ghosh, C. Miller, M. Sankaran, and C. Zorman, “Tunable Resistivity in Inkjet Printed Circuit by Plasma Reduction of Particle-free, Stabilizer-free Ink”, presented at the *AVS 64<sup>th</sup> International Symposium and Exhibition*, Tampa FL, October 29-November 3, 2017, Abstract # MN+E
  72. X. Zheng, J. Lee, S. Rafique, L. Han, C.A. Zorman, H. Zhao and P. Feng, “Ultra-Wide Bandgap  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Nanomechanical Resonators”, presented at the International Conference on Silicon Carbide and Related Materials, Washington DC, September 17–22, 2017, Paper FR.E1.2M+NS-MoA8.
  71. C.A. Zorman, “Integration of Process –Incompatible Materials for Microfabricated Polymer-based Neural Interfaces”, in Program of the 11<sup>th</sup> ASME International Conference on Micro and Nanosystems, Cleveland OH, August 6-9, 2017, Page 28. **Keynote Address**.
  70. Y. Sui, H. Chong, K. Shara and C. Zorman, “The Resonant Behavior of MEMS-based Single Crystalline and Polycrystalline 3C-SiC Diaphragms” presented at the 11<sup>th</sup> ASME International Conference on Micro and Nanosystems, Cleveland OH, August 6-9, 2017, Paper # DETC2017-68534 and page 113 of the program.
  69. X.Q. Zheng, J. Lee, S. Rafique, L. Han, C. A. Zorman, H. Zhao and P. X. Feng, “Very Thin Suspended  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Nano Diaphragms for Mechanical Resonator and Ultraviolet Sensing Applications”, presented at the *59<sup>th</sup> Electronic Materials Conference*, South Bend IN, June 28-30, 2017, Paper # A.6.
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44. H. Martin, D. Sabens, A.E. Hess, and C.A. Zorman, "Diamond-on-polymer Microelectrode Arrays as Flexible Electrochemical Sensors", presented at the *2010 MRS Fall Meeting*, Boston MA, November 29 - December 3, 2010, Abstract #A8.4.
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42. H. Martin, J.M. Halpern, D.M. Sabens, A.E. Hess, C.A. Zorman and H.J. Chiel, "Mechanically-flexible Diamond Electrodes for Implantable Neural Devices", presented at the *2010 European MRS Spring Meeting*, Strasbourg, France, June 7-9, 2010. *Invited Talk*
41. D. Tyler, J. Harris, C. Zorman, C. Weder, S. Rowan, and J. Capadona, "Effects of Soft Neural Interfaces on Cortical Response", presented at the *2010 MRS Spring Meeting*, San Francisco, CA, April 8-10, 2010. *Invited Talk*

40. H.B. Martin, J.M. Halpern, D.M. Sabens, A.E. Hess, and C.A. Zorman, “Mechanically-flexible diamond electrodes for implantable sensors” presented at the *2009 Annual Meeting of the American Institute of Chemical Engineering*, Nashville TN, November 8-13, 2009, Abstract # 154b
39. J. Harris, J. Capadona, K. Shanmuganathan, A. Hess, J. Dunning, S. Rowan, C. Zorman, C. Weder, and D. Tyler, “Mechanical Stiffness Contributes to Cordical Tissue Response”, presented at the *39th Annual Meeting of the Society for Neuroscience (Neuroscience 2009)*, Chicago, IL, October 21, 2009. Abstract #K22 – 836.6
38. D. Sabens, A.E. Hess, C.A. Zorman and H.B. Martin, “Mechanically-flexible Electrode Arrays based on Selectively-grown Diamond Thin Film Patterns and Temperature-Sensitive Polymer Substrates”, presented at the *20<sup>th</sup> European Conference on Diamond*, (Diamond 2009), Athens, Greece, October 6-10, 2009. Abstract # O81.
37. C. Weder, J.R. Capadona, K. Shanmuganathan, J.P. Harris, D.J. Tyler, C. Zorman, and S.J. Rowan, “Mechanically adaptive polymer nanocomposites”, in *Abstract Book TNT 2009 - Trends in Nanotechnology Conference*, Barcelona Spain, September 7-11, 2009, pp. 75-76. Keynote Speaker
36. D. Sabens, A. Hess, C.A. Zorman and H. Martin, “Mechanically flexible Electrode Arrays based on Selectively Grown Diamond Thin Film Patterns and Temperature Sensitive Polymer Substrates” presented at the *New Diamond and NanoCarbons Conference 2009*, Traverse City MI, June 7-11, 2009.
35. R. Hardesty, M. Gratzl, D. Sheth, G. Suresh, J. Yang, and C. Zorman, “BioMEMS Microelectrode Array to Monitor Molecular Transport at Multiple Single Cells and Small Cell Clusters in Parallel”, *60<sup>th</sup> Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy*, Chicago IL, March 8-13, 2009, Abstract # 1960-3.
34. V. Duzhko, M.J. Kelley, J. Du, C. A. Zorman and K. D Singer, “Directed Assembly of Self-Assembled Organic Nanostructures for Advanced Optoelectronic Device Architectures”, *2008 MRS Spring Meeting*, Boston MA, December 1-4, 2008. Abstract G11.9.
33. R.A. Smith, K. Goldman, A.J. Fleischman, W.H. Fissell, C.A. Zorman, and S. Roy, “Single stage 3-LOG Endotoxin reduction to AAMI Standard From heavily contaminated supply water”, presented at the *41st Annual Meeting of the American Society of Nephrology*, Philadelphia PA, November 4–9, 2008.
32. J.P. Harris, J.R. Capadona, K. Shanmuganathan, A. Hess, J. Dunning, S.J. Rowan, C. Zorman, C. Weder, and D.J. Tyler, “Cortical Tissue Response to a Mechanically-Dynamic Polymer Nanocomposite”, presented at the *38th Annual Meeting of the Society for Neuroscience (Neuroscience 2008)*, November 15-19, 2008, Washington, DC, Poster # 674.1/PP19.
31. J. Capadona, K. Shanmuganathan, J. Harris, A. Hess, J. Dunning, C. Zorman, D. Tyler, S. Rowan, and C. Weder, “Bio-inspired Mechanically-dynamic Polymer Nanocomposites for Intercordical Microelectrode Substrates”, presented at the *214<sup>th</sup> Meeting of the Electrochemical Society*, Honolulu HI, October 12-17, 2008. Abstract #1459.
30. A. Hess, J. Dunning, D. Tyler and C.A. Zorman, “Development of Microfabricated Peripheral Nerve Electrodes Made from Liquid Crystal Polymer and Polynorborene”, presented at the *38<sup>th</sup> Annual Neural Interfaces Conference*, Cleveland OH, June 16-18, 2008.
29. R. Parro, M.C. Scardelletti, N.C. Varaljay, S. Zimmerman, and C.A. Zorman, “Amorphous SiC as a Structural Layer in Microbridge-based RF MEMS Switches for Use in Software-Defined Radio”, presented at the *2007 International Semiconductor Device Research Conference*, College Park MD, December 12-14, 2007.

28. A. Eldridge, C.A. Zorman, A. Dubnisheva, W.H. Fissell, A.J. Fleischman, and S. Roy, "Characterization of poly(ethylene glycol) films on silicon carbide for biomedical microdevices", *BMES Annual Fall Meeting*, Los Angeles CA, September 26-29, 2007.
27. G. Shvets, D. Korobkin, Y.A. Urzhumov, and C. Zorman, "Super-Lensing and Sub-Wavelength Antennas in Mid-IR Using Silicon Carbide", Abstract # G16.00004, presented at the *2006 March Meeting of the American Physical Society*, Baltimore MD, March 13-17, 2006.
26. H.D. Espinosa, B. Peng, N. Moldovan, T.A. Friedmann, X. Xiao, D.C. Mancini, O. Auciello, J. Carlisle and C.A. Zorman, "A Comparison of Mechanical Properties of Three MEMS Materials - Silicon Carbide, Ultrananocrystalline Diamond, and Hydrogen-Free Tetrahedral Amorphous Carbon (Ta-C)", presented at the *2005 MRS Spring Meeting*, San Francisco CA, March 28 – April 1, 2005.
25. R. Rosenblum, C. Zorman, A. Fleischman, and S. Roy, "Optimization of Chemical Mechanical Polishing of Polysilicon for Nanoporous Membrane Fabrication", in *Abstracts – Research ShowCase 2004*, Case Western Reserve University, Cleveland, Ohio, April 2, 2004, pg. 67.
24. C. Kovach, and C. Zorman, "The Center for Micro and Nano Processing", in *Abstracts – Research ShowCase 2004*, Case Western Reserve University, Cleveland, Ohio, April 2, 2004, pg. 364.
23. J. Du, D.J. Young, C.A. Zorman and W.H. Ko, "Single Crystal SiC Capacitive Pressure Sensor at 400°C" in *Abstracts – Research ShowCase 2004*, Case Western Reserve University, Cleveland, Ohio, April 2, 2004, pg. 137.
22. R. Panday, R. Hous, X.A. Fu, C.A. Zorman, M. Mehregany, T. Lisby, S.A. Nikles, and K. Najafi, "Mechanical Characterization and Design of Flexible Silicon Carbide Microstructures", in *Abstracts – Research ShowCase 2004*, Case Western Reserve University, Cleveland, Ohio, April 2, 2004, pg. 150.
21. J. Dunning, X.A. Fu, S. Rajgopal, C.A. Zorman and M. Mehregany, "Characterization of Polycrystalline SiC Thin Films for MEMS Applications, in *Abstracts – Research ShowCase 2004*, Case Western Reserve University, Cleveland, Ohio, April 2, 2004, pg. 139.
20. C.A. Zorman and M. Mehregany, "Silicon carbide as a material for nanoelectromechanical systems", in *Abstracts – Research ShowCase 2003*, Case Western Reserve University, Cleveland, Ohio, April 4, 2003, pp. 303.
19. J. Dunning, X.A. Fu, R. Jezeski, C.A. Zorman, and M. Mehregany, "Development of a high-throughput LPCVD process for silicon carbide MEMS", in *Abstracts – Research ShowCase 2003*, Case Western Reserve University, Cleveland, Ohio, April 4, 2003, pp. 303.
18. R.F. Davis, T. Gehrke, K.J. Linthicum, T.S. Zheleva, E.A. Preble, P. Rajagopal, C.A. Zorman and M. Mehregany, "Pendeo-epitaxy and Defect Reduction in III-Nitrides Thin Films and Heterostructures with Significant Induced Polarization" presented at the *National Radio Science Meeting – URSI 2002*, Boulder CO, January 9-12, 2002, Paper D2-2.
17. A.J. Fleischman, C.A. Zorman, and M. Mehregany, "Growth and Characterization of Doped 3C-SiC Films for Micro- and Nanoelectromechanical Systems", in *Technical Program of the 49<sup>th</sup> International Symposium of the American Vacuum Society*, Denver CO, November 3-8, 2002, p. 122 and [www.avs.org](http://www.avs.org).
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15. J.M. Melzak, D.A. Greer, S. Rajgopal, K.S. Leboutitz, C.A. Zorman and M. Mehregany, "Control of Residual Stress in Thick Sputtered Metal Films", in *Abstracts of the 47<sup>th</sup> International Symposium of the American Vacuum Society*, Boston, MA, October 2-6, 2000, p. 162.
14. J.J. McMahon, J. Melzak, C.A. Zorman, J. Chung\*, and M. Mehregany, "Comparison of *In situ* Boron-doped and *In situ* Phosphorus-doped Polysilicon Films For Microelectromechanical Systems", in *Abstracts of the 47<sup>th</sup> International Symposium of the American Vacuum Society*, Boston, MA, October 2-6, 2000, p. 212.
13. M. Mehregany, C. Zorman, and S. Guo, "Silicon Carbide Microelectromechanical Systems", in *Abstracts of the 26th International Conference on Metallurgical Coatings and Thin Films*, San Diego, CA, April 10 - 14, 2000, p. 17. *Invited Talk*.
12. S. Rohmfeld, M. Hundhausen, L. Ley und C. Zorman, "Bestimmung von Verspannungen in 3C-SiC mit Ramaspektroskopie", presented at *Deutsche Physikalische Gesellschaft E-Verhandlungen 1999*, University of Ulm, Germany, [http://dpg.rz.uni-ulm.de/archive/1999/hl\\_20.html](http://dpg.rz.uni-ulm.de/archive/1999/hl_20.html).
11. R.F. Davis, O. H. Nam, T. Gehrke, K.J. Linthicum, T.S. Zheleva, P. Rajagopal, D.B. Thomson, C.A. Zorman, and M. Mehregany, "Lateral and Pendeo-epitaxial overgrowth and defect reduction of GaN films, *Technical Program - 41<sup>st</sup> Electronic Materials Conference*, Santa Barbara, CA, June 30 – July 2, 1999, p. 9. *Invited Talk*.
10. C.H. Wu, C.A. Zorman, and M. Mehregany, "Growth of polycrystalline SiC films on SiO<sub>2</sub> and Si<sub>3</sub>N<sub>4</sub> by APCVD", in *Abstracts of the 26th International Conference on Metallurgical Coatings and Thin Films*, San Diego, CA, April 12 - 15, 1999, p. 39.
9. M. Mehregany and C.A. Zorman, "SiC MEMS: Opportunities and challenges for applications in harsh environments", in *Abstracts of the 26th International Conference on Metallurgical Coatings and Thin Films*, San Diego, CA, April 12-15, 1999, p. 11. *Invited Talk*.
8. M. Mehregany and C.A. Zorman, "Materials, Process, and Integration Issues in SiC MEMS", *Book of Abstracts – 45<sup>th</sup> International Symposium of the American Vacuum Society*, Baltimore MD, November 2 - 6, 1998, p. 5.
7. A.A. Yasseen, C.A. Zorman, and M. Mehregany, "Patterning of SiC films grown at heteroepitaxial temperatures on Si substrates using microfabricated molds", *Technical Program - 40th Electronics Materials Conference*, Charlottesville, VA, June 24-26, 1998. p. 36.
6. N. Rajan, C.A. Zorman, M. Mehregany, R. DeAnna, and R.J. Harvey, "Effect of MEMS-compatible thin film hard coatings on the erosion resistance of silicon micromachined atomizers", in *Abstracts of the 25th International Conference on Metallurgical Coatings and Thin Films*, San Diego, CA, April 27-May 1, 1998, p. 141.
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4. J.F. Klemic, J.M. Sirota, C.A. Zorman, and M. Mehregany, "Optical and IR transmission of micromachined single crystal 3C-silicon carbide thin films for micro-optomechanical applications", in *Abstracts of the 25th International Conference on Metallurgical Coatings and Thin Films*, San Diego, CA, April 27-May 1, 1998, p.70.
3. C.A. Zorman and M. Mehregany, "Silicon Carbide MEMS", *Final Program of the 8th Advanced Aerospace Materials and Processes Conference and Exposition (AEROMAT)*, Williamsburg, Va, May 12-15, 1997, p. 21.

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1. D. Krus, G. Mearini, C. Zorman, and R.W. Hoffman, "The tensile properties, structure, and composition of thin aluminum/alumina multilayer films", *Bulletin of the American Physical Society*, 39, p. 749, March 1994.

### **Trade Publications**

4. R.G. DeAnna, S. Roy, C.A. Zorman, and M. Mehregany, "Modeling of SiC lateral resonant devices", *MST News*, November 2000, pp. 37-38.
3. R. DeAnna, S. Roy, C.A. Zorman, and M. Mehregany, "Silicon Carbide Lateral Resonant Devices – MEMS Modeling Using ANSYS", *Softwords*, vol. 15, 2<sup>nd</sup> Quarter 2000, pp. 1-3.
2. M. Mehregany and C.A. Zorman, "Silicon carbide microsensors for harsh environment applications", in *Technical Digest - Sensors Expo 99*, Cleveland, OH, September 14-16, 1999, pp. 463-470.
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### **U.S Government Public Domain Technical Reports**

3. C. Zorman, G. Derosé and R. Hoffman, "Development and testing of a curved mica X-ray focusing spectrometer for extended X-ray absorption fine structure studies", *U.S. Air Force Technical Report*, PL-TR-93-3018, pp. 199-210, (1993).
2. C. Zorman and R. Hoffman, "Ion beam analysis techniques applied to polymer samples", *U.S. Air Force Technical Report*, PL-TR-93-3018, pp. 163-179, (1993).
1. G.A. Derosé, H. Jiang, P.D. Haaland, W.W. Adams, T.J. Bunning, R.W. Hoffman and C.A. Zorman, "An X-ray absorption fine structure study of ordering in polythiophene thin films", *U.S. Air Force Technical Report*, WL-TR-93-4107, (1993).

### **Technical Short Courses**

5. A. Abramson, M. Sankaran, and C. Zorman, "Nanotechnology 101", taught at the *Nano-App Summit 2005*, Cleveland, Ohio, October 17-19, 2005.
4. A. Abramson, C.A. Zorman, D. Smith, M. Tabib-Azar, and F. Ernst, "Introduction to Nanotechnology", taught at *The Ohio Aerospace Institute*, August 25-26, 2003.
3. C. Zorman, "Test Microstructures for Material Properties Extraction", taught at the *Workshop on Design and Modeling of BioMEMS*, The Cleveland Clinic Foundation, June 20, 2000.
2. J. Sniegowski, S. Montague, and C.A. Zorman, "Polycrystalline Silicon and Silicon Carbide as Materials for MEMS", taught at the *Fall 1999 Meeting of the Materials Research Society*, Boston, MA, November 28 – December 3, 1999.
1. M. Mehregany and C. Zorman, "Emerging Materials for Micromachined Sensors and Actuators - Silicon Carbide MEMS", taught at the *9th International Conference on Solid State Sensors and Actuators*, Chicago, IL, June 16-19, 1997.

***Invited Talks and Other Presentations (advisee names underlined)***

112. H. Chen, V. Pashaei, W. Liao, C.A. Arutt, H. Jia, M.W. McCurdy, C.A. Zorman, R.A. Reed, R.D. Schrimpf, M.L. Alles, and P. X.-L. Feng, “Probing Energetic Ion Radiation Effects in Silicon Carbide (SiC) Crystal by Using A Multimode Resonating Diaphragm”, *The 41<sup>st</sup> Spring Symposium of the American Vacuum Society – Michigan Chapter*, May 25, 2017.
111. C.A. Zorman and R.M. Sankaran, “Plasma-based Direct-write Patterning Processes for Additive Microfabrication”, presented at *The 41<sup>st</sup> Spring Symposium of the American Vacuum Society – Michigan Chapter*, May 25, 2017. (Invited Talk)
110. K. Sirk, A.C. Barnes and C.A. Zorman, “Characterization of MEMS Silicon Carbide Diaphragm Multimode Frequency Analysis for High Sensitivity Mass Sensor Applications”, *Research ShowCase 2016*, Case Western Reserve University, Cleveland OH, April 15, 2016.
109. Z. Zhang, C.A. Zorman and M. Gratzl, “Electrochemical Micro pH-Stat for Point-of-Care Enzyme Assays”, *Research ShowCase 2016*, Case Western Reserve University, Cleveland OH, April 15, 2016.
108. C. Zorman, R.M. Sankaran, P.X.-L. Feng and J. Maia, “SNM 1246715: A Versatile Microplasma-based Patterning Technology for Large-Scale, High Throughput Nanomanufacturing”, presented at the *2015 NSF Nanoscale Science and Engineering Grantees Conference*, Arlington VA, December 9-10, 2015.
107. S. Rafique, L. Han, C.A. Zorman, H. Zhao, “Synthesis of Wide Bandgap  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Nanorods on 3C-SiC-on-Silicon”, presented at the *2015 AVS Ohio Chapter Meeting*, Cleveland, OH, October 10, 2015.
106. S. Majerus, P. Wang, W. Ko, C.A. Zorman, M.S. Damaser, “Chronic Biocompatibility Evaluation Of Multi-Layer, Non-Hermetic Packaging Approach For Implantable Medical Microsystems”, presented at the *2015 AVS Ohio Chapter Meeting*, Cleveland, OH, October 10, 2015.
105. S. Ghosh, E. Ostrowski, E. Kleik, R. Yang, P. X.-L. Feng, C. Zorman, and R. M. Sankaran, “Atmospheric-pressure Microplasma Enhanced Direct-write Technology for Fabricating Flexible Electronics”, presented at the *2015 AVS Ohio Chapter Meeting*, Cleveland, OH, October 10, 2015.
104. C. Zorman and A.Hess-Dunning, “Fabrication of Polymer-based Neural Interfaces from Process-Incompatible Materials”, presented at the *2015 AVS Ohio Chapter Meeting*, Cleveland, OH, October 10, 2015 (Invited).
103. Y. Liu, P. Wang, W. Ko and C.A. Zorman, “Development of Micropackaging Technology for Implantable Pressure Sensor based on Multilayered PDMS-based Coatings”, presented at the *2015 Polymer Initiative of Northeast Ohio*, Cleveland Ohio, June 12, 2015.
102. P. Thomas, A. de Leon, A. Barnes Andrew, J. O’Donnell, C.A. Zorman, R.C. Advincula, “Transfer-Printing of Self-folding polymer-metal bilayer film”, presented at the *30th International Conference of the Polymer Processing Society*, June 8-12, 2014, Cleveland OH, Paper # S07-679.
101. S. Ghosh, A. Barnes, R. Yang, P.X.L. Feng, C.A. Zorman, and R.M. Sankaran, “Soft-plasma Based Micro-patterning of Metals on Polymers: A Novel Direct Write Technology Enabling Single Step Fabrication of Metal Interconnects”, *2014 Annual Meeting of The Electrostatics Society of America*, University of Notre Dame, Notre Dame, IN, June 17-19, 2014, Paper J4
100. P. Thomas, A. de Leon, A. Barnes, J. O’Donnell, C. Zorman, R. Advincula, “Effect of release kinetics on the final structure of self-folding polymer-metal bilayer”, *246<sup>th</sup> American Chemical Society National Meeting and Exposition*, Indianapolis IN, September 8-12, 2013.

99. J. O'Donnell, A. de Leon, A. Barnes, P. Thomas, C. Zorman, R. Advincula, "Transfer Printing of Self-folding polymer-metal bilayer.", *246<sup>th</sup> American Chemical Society National Meeting and Exposition*, Indianapolis IN, September 8-12, 2013.
98. C. Zorman, M. Sankaran, P.X-L. Feng, and J. Maia, "A Versatile Microplasma-Based Patterning Technology for Large-Scale, High Throughput Micro- and Nanomanufacturing", Workshop on Nano and Micro Manufacturing, Dearborn, MI, May 22-23, 2013.
97. M. LaBarbera, M.C. Scardelletti, and C.A. Zorman, "Design and Fabrication of an Amorphous Silicon Carbide MEMS Wireless Capacitive Pressure Sensing Platform for Harsh Environments", *Research ShowCase 2013*, Case Western Reserve University, Cleveland OH, April 12, 2013.
96. D. Howe, J.L. Dunning, J.K. Graebert, S.L. Garverick, C.A. Zorman, K.M. Bogie "A Wearable Stimulation Device for Pre-clinical Evaluation of Electrotherapy", *Research ShowCase 2013*, Case Western Reserve University, Cleveland OH, April 12, 2013.
95. A. Hess, D. Tyler and C.A. Zorman, "Microfabricated Intracortical Probes Based on a Stimuli-Responsive Polymer Nanocomposite with Mechanically-Adaptive Behavior", *Research ShowCase 2013*, Case Western Reserve University, Cleveland OH, April 12, 2013.
94. A. Barnes, P.X.L. Feng and C.A. Zorman, "Square Silicon Carbide Diaphragm for Micromechanical Resonator Devices", *Research ShowCase 2013*, Case Western Reserve University, Cleveland OH, April 12, 2013.
93. J. Nguyen, J. Harris, A. Hess, C. Weder, S. Rowan, C. Zorman, D.J. Tyler and J. Capadona, "Mechanically-Adaptive Polymer Implants Attenuate Chronic Neuroinflammatory Response", presented at the 2012 Society for Biomaterials Conference, New Orleans, LA, October 4-6, 2012, Paper # 98 (designated "Outstanding Student Abstract).
92. C. Zorman, "The Microfabrication Laboratory: A Prototyping Facility for Flexible Microsystems: *Prototyping and Pilot Manufacturing for Flexible Electronics Industry Workshop and Networking Event*, Cleveland OH, May 2, 2012, *Invited Talk*.
91. C. Zorman, "A Microfabricated Neural Electrode Array Technology for Long-Term Implant Applications" presented at the *NSF Workshop on Micro, Nano, BioSystems: Building on the Past and Planning for the Future*, Arlington VA, March 29-31, 2012, *Invited Talk*.
90. P. Feng and C.A. Zorman, "Multifunctional Nanodevices via Electron- and Ion-Beam Patterning", presented at the *55<sup>th</sup> Annual May Conference of the Cleveland Sections of Society for Applied Spectroscopy, American Chemical Society – Analytical Topics Group, and The American Vacuum Society*, June 1, 2011, John Carroll University, University Heights, OH.
89. C.A. Zorman, "Integration of Process-Incompatible Materials for Microfabricated Polymer-based Neural Interfaces", presented at *The 38<sup>th</sup> Annual Symposium of the American Vacuum Society – Michigan Chapter*, May 12, 2011, Wayne State University, Detroit MI.
88. A.E. Hess, K. Shanmuganathan, J. Harris, J.R. Capadona, L. Hsu, S.J. Rowan, C. Weder, D.J. Tyler, C.A. Zorman, "Fabrication of Mechanically-Dynamic, Chemo-Responsive Polymer Nanocomposite Microdevices for Neural Interfacing," presented at *Society for Biomaterials - Biomaterials Day*, November 6, 2010, Cleveland, Ohio.
87. C. Zorman and A. Hess, "'Development of New Materials and Processes for Mechanically-flexible, Microfabricated Neural Electrode Arrays for Long-Term Implant Applications", presented at the *Department of Chemical Engineering Seminar, University of Louisville*, October 15, 2010, *Invited Talk*.

86. C. Zorman, "Building a Lifelong Network of Colleagues from Within: Perspectives on Effective Mentoring of Graduate Students", *The 9<sup>th</sup> Departmental Retreat, Department of Physiology and Biophysics*, Case Western Reserve University, October 8, 2010, *Invited Talk*.
85. J. Stanton, D. Sheth, M. Gratzl, and C.A. Zorman, "Vacuum Assisted Soft Lithographic Patterning of PDMS for Microfluidic Applications", presented at *Research ShowCase 2010*, Case Western Reserve University, April 15, 2010.
84. K. Kortepeter, R. Triolo, D. Tyler, C. Zorman, S. Garverick and S. Iveljic, "Advanced Platform Technology (APT) Center of Excellence", presented at *Research ShowCase 2010*, Case Western Reserve University, April 15, 2010.
83. A. Hess, D. Sabens, H. Martin, and C.A. Zorman, "Microfabrication of Flexible Diamond Microelectrode Arrays on Polymer Substrates", presented at *Research ShowCase 2010*, Case Western Reserve University, April 15, 2010.
82. J. Harris, J.R. Capadona, R.H. Miller, C. Zorman, S.J. Rowan, D.J. Tyler, "Pliant Polymer Microprobes and Cortical Tissue Response", presented at *Research ShowCase 2010*, Case Western Reserve University, April 15, 2010.
81. C.A. Zorman, "MEMS as an enabling technology for biomedical engineering" *Case School of Engineering Seminar Series – Department of Biomedical Engineering*, November 13, 2009. *Invited Talk*
80. R. Hardesty, D. Sheth, G. Suresh, J. Yang, C.Zorman and M. Gratzl, "BioMEMS microelectrode array to monitor molecular transport at multiple single cells and small cell clusters in parallel", *Research Day and 40<sup>th</sup> Anniversary Celebration*, Department of Biomedical Engineering, Case Western Reserve University, Cleveland, Ohio 44106, October 22, 2009.
79. J. Harris, J. Capadona, A. Hess, J. Dunning, K. Shanmuganathan, S. Koppaka, S. Rowan, C. Weder, C. Zorman, and D. Tyler, "Tissue response to mechanically dynamic intracortical microelectrodes", *Research Day and 40<sup>th</sup> Anniversary Celebration*, Department of Biomedical Engineering, Case Western Reserve University, Cleveland, Ohio 44106, October 22, 2009.
78. J.P Harris, J.R. Capadona, K. Shanmauganathan, A. Hess, J. Dunning, S.J. Rowan, C.A. Zorman, C. Weder, and D.J. Tyler, "Pliant polymer microprobes for intracortical electrodes", *Biomedical Engineering Society (BMES) Annual Meeting*, Pittsburgh PA, October 7-10, 2009, Poster # PS 10A-162.
76. A. Hess, J. Dunning, J. Harris, J. Capadona, D. Tyler, and C.A. Zorman, "Fabrication and Evaluation of Mechanically Dynamic Microsystems from a Bio-inspired Polymer Nanocomposite", presented at *Research ShowCase 2009*, Case Western Reserve University, April 16, 2009.
75. R. Triolo, D. Tyler, C. Zorman, M. Damaser, G. Pinault, and S. Iveljic, "Advanced Platform Technology (APT) Center - Research & Development Thrust Areas" , presented at *Research ShowCase 2009*, Case Western Reserve University, April 16, 2009.
74. A. Chabanov, F. Capasso, C. Zorman, G. Shvets, M. Spencer, "NIRT: Optics on a Nanoscale Using Polaritonic and Plasmonic Materials" "2008 NSF Nanoscale Science and Engineering Grantees Conference, Arlington VA, December 2-5, 2008.
73. C. Zorman, "Silicon Carbide as a Material for Biomedical Microsystems", presented at the Department of Materials Science and Engineering/Department of Electrical Engineering and Computer Science joint seminar, Case Western Reserve University, November 25, 2008

72. R. Parro, M.C. Scardelletti, N.C. Varaljay, and C.A. Zorman, "The Effect of Substrate Material and Metallization Layers on the Mechanical Properties of Micromachined Amorphous Silicon Carbide Structures", presented at the *AVS 55<sup>th</sup> International Symposium* Boston MA, October 19-24, 2008.
71. A. Hess, J. Dunning, J. Harris, J.R. Capadona, K. Shanmuganathan, S. Rowan, C. Weder, D. Tyler and C.A. Zorman, "Microfabrication of MEMS-based Neural Probes from a Bio-inspired, Mechanically Dynamic Polymer Nanocomposite", presented at the *AVS 55<sup>th</sup> International Symposium*, Boston MA, October 19-24, 2008.
70. J. Harris, J.R. Capadona, K. Shanmuganathan, S.J. Rowan, C. Weder, A. Hess, J. Dunning, C.A. Zorman, and D.J. Tyler "Cordical Response to Polyvinyl Acetate- Tunicate Whisker Polymer Nanocomposite (PVAc-TW)", presented at *Research Showcase 2008*, Case Western Reserve University, Cleveland OH April 16-17, 2008.
69. D. Sheth, G. Suresh, J. Yang, C. Zorman, and M. Gratzl "MEMS Devices for Parallel Experimentation on Single Cells and Small Cell Clusters to Rapidly Obtain Biostatistical Data", presented at *Research Showcase 2008*, Case Western Reserve University, Cleveland OH April 16-17, 2008.
68. A. Hess, J. Dunning, D.J. Tyler, K. Polasek, N. Brill, C.A. Zorman "Development of Microfabricated, Mechanically Flexible, Peripheral Nerve Electrode Arrays, presented at *Research Showcase 2008*, Case Western Reserve University, Cleveland OH April 16-17, 2008.
67. R. Smith, K. Goldman, A. Fleischman, W. Fissell, C. Zorman, and S. Roy "Endotoxin Removal Using Micromachined Silicon Nanoporous Membranes for Medical Grade Water Applications" presented at *Research Showcase 2008*, Case Western Reserve University, Cleveland OH April 16-17, 2008.
66. C. Zorman, "Opportunities and Challenges in the Development, Fabrication and Characterization of Polymer MEMS/NEMS", presented at the DARPA/MTO Workshop on Materials and Technologies for 21<sup>st</sup> Century MEMS and NEMS, Miami FL, January 8<sup>th</sup>, 2008. *Invited Talk*.
65. C. Zorman, "Development of New Materials and Processes for Mechanically-flexible, Microfabricated Neural Interfaces" , Electrical Engineering Distinguished Lecture Series, Department of Electrical Engineering, University of South Carolina, November 27, 2007, *Distinguished Lecturer and Invited Talk*
64. B. Hanrahan, M. McCarthy, C. Zorman, and R. Ghodssi, "Wear in MEMS-Based Microball Bearings," *AVS 54th International Symposium*, Seattle, WA, October 14 - 19, 2007.
63. G. Shvets, Y.A. Urzhumov, D.V. Korobkin, B. Neuer III, and C.A. Zorman, "Optical properties of sub-wavelength hole arrays in SiC membranes", SPIE Optics and Photonics 2007, San Diego CA, August 26-30, 2007, Paper # 6638-12. *Invited Talk*
62. A. Hess, J. Dunning, D. Tyler and C.A. Zorman, "A Polynorborene-based Microelectrode Array for Neural Interfacing", Neural Engineering and Rehabilitation Lectures, Cleveland, Ohio, June 8, 2007.
61. R. Smith, A. Fleischman, C.A. Zorman and S. Roy, "An automated nanofluidic flow measurement system", Ohio Nanotechnology Summit, April 24-25, 2007.
60. A. Hess, J. Dunning, D. Tyler and C.A. Zorman, "Development of FINE Electrode Structures Based on Micromachined Polymer Substrates", *Research Showcase 2007*, Case Western Reserve University, Cleveland, Ohio, April 11-12, 2007.

59. R. Smith, A. Fleischman, C.A. Zorman and S. Roy, “An automated nanofluidic flow measurement system”, presented at *Research ShowCase 2007*, Case Western Reserve University, Cleveland, Ohio, April 11-12, 2007.
58. C. Zorman, “Development of a Flat Interface Nerve Electrode Technology Using Mechanically-flexible Substrates and MEMS Fabrication Techniques”, Neural Prosthetics Seminar, Department of Biomedical Engineering, Case Western Reserve University, March 9, 2007.
57. C. Zorman, “Development of mechanically-flexible microdevices for long-term medical implant applications”, Department Seminar, Department of Electrical Engineering and Computer Science, Case Western Reserve University, March 13, 2007.
56. C. Zorman “Development of liquid crystal polymer and polynorbornene as structural materials in microfabricated neural electrodes”, Department Seminar, Department of Electrical Engineering and Computer Science, The Pennsylvania State University, April 5, 2007.
55. W.T. Chang, C. Zorman and M. Mehregany, “Characterization of APCVD and LPCVD Based Polycrystalline 3C-Silicon Carbide Resonators”, presented at the *AVS 53<sup>rd</sup> International Symposium*, San Francisco CA, November 12-17, 2006.
54. K. Bogie, D. Howe, J. Dunning, S.L. Garverick, and C.A. Zorman, “Integrated surface electrical stimulation device for wound therapy applications”, *Advanced Technology Applications for Combat Casualty Care 2006*, St Petersburg, Florida August 2006.
53. C.A. Zorman, “Poly-SiC Micro- and Nanoelectromechanical Systems”, presented at the NSF ECS Division Workshop to Enhance Diversity, Tuskegee University, Tuskegee AL, June 13-15, 2006.
52. H.I. Kuo, R. Parro, J. Guo, D. Young, M. Litt, C.A. Zorman and W. Ko, “CNT Reinforced Epoxy for Micro Strain Sensor Packaging”, presented at *Research ShowCase 2006*, Case Western Reserve University, Cleveland, Ohio, April 5-6, 2006.
51. D. Howe, J. Dunning, S. Garverick, C.A. Zorman and K. Bogie, “Integrated Surface Stimulation Device for Therapeutic Applications” presented at *Research ShowCase 2006*, Case Western Reserve University, Cleveland, Ohio, April 5-6, 2006.
50. W.T. Chang, M. Mehregany and C.A. Zorman, “Characterization of Single Crystal and Polycrystalline SiC Resonators, presented at *Research ShowCase 2006*, Case Western Reserve University, Cleveland, Ohio, April 5-6, 2006.
49. J. Du, N. Singh, J. Summers, M. Scardelletti, and C.A. Zorman, “Development of Amorphous SiC Thin Films for MEMS Applications” presented at *Research ShowCase 2006*, Case Western Reserve University, Cleveland, Ohio, April 5-6, 2006.
48. V. Keesara, A. Hess, and C.A. Zorman, “Process Development and Evaluation of Polynorbornene as a Structural Material in Multilayered Flexible Devices” presented at *Research ShowCase 2006*, Case Western Reserve University, Cleveland, Ohio, April 5-6, 2006.
47. A.J. Fleischman, A. Dubnisheva, R.S. Butler, R. Rosenblum, C.A. Zorman and S. Roy, “Mechanical Properties of Polysilicon Thin Films using Micromachined Membranes and a Design of Experiments Methodology”, Presented at the *AVS 52<sup>nd</sup> International Symposium and Exposition*, Boston MA, October 30 – November 4, 2005.
46. J. Du and C.A. Zorman, “Capacitive Pressure Sensing Devices Made from Low-stress Polycrystalline SiC Films” presented at the *Mid-Atlantic MEMS Alliance Spring Symposium*, Baltimore MD, April 18<sup>th</sup>, 2005.

45. J. Du, W.H. Ko, M. Mehregany, and C.A. Zorman, “Capacitive Pressure Sensing Devices Made from Low-stress Polycrystalline SiC Films”, presented at *Research ShowCase 2005*, Case Western Reserve University, Cleveland, Ohio, April 2, 2005.
44. J. Dunning, J. Trevino, X.A. Fu, M. Mehregany, and C.A. Zorman, “Development of a High-throughput Polycrystalline SiC Thin Film Deposition Process for MEMS Applications”, presented at *Research ShowCase 2005*, Case Western Reserve University, Cleveland, Ohio, April 2, 2005.
43. R. Smith, A. Fleischman, C.A. Zorman and S. Roy, “Characterization of Liquid Flow Through Suspended Nanoporous Silicon Membranes”, presented at *Research ShowCase 2005*, Case Western Reserve University, Cleveland, Ohio, April 2, 2005.
42. C.A. Zorman, “SiC for MEMS and NEMS”, seminar presentation - Department of Mechanical Engineering, University of Maryland Baltimore County, March 11<sup>th</sup>, 2005.
41. C.A. Zorman, “A Brief Introduction to Nanotechnology”, The 1<sup>st</sup> Annual Ohio Nanotechnology Summit, *Wright Patterson Air Force Base*, Dayton Ohio, March 2-3, 2005.
40. G. Shvets, C. Zorman, Y. Urzhumov, D. Korobkin, and V. Mariupolskaya, “Band Engineering Using Electrostatic Resonances: Applications to Super-lensing” presented at the Plasmonic Nanophotonic Session of the 35<sup>th</sup> Winter Colloquium on the Physics of Quantum Electronics, Snowbird UT, January 5, 2005.
39. J. Trevino, X.A. Fu, S. Rajgopal, M. Mehregany, and C.A. Zorman, “Deposition and Characterization of Nitrogen-doped Polycrystalline SiC Films for MEMS Applications”, presented at the 51<sup>st</sup> AVS International Symposium, Anaheim CA, November 15, 2004.
38. C.A. Zorman, “Advanced Processing Techniques for Silicon Carbide Micro- and Nanoelectromechanical Systems”, Seminar - Department of Mechanical Engineering *Columbia University*, April 30<sup>th</sup>, 2004.
37. C.A. Zorman, “Advanced Processing Techniques for Silicon Carbide Micro- and Nanoelectromechanical Systems”, Seminar - Department of Mechanical Engineering, *The Ohio State University*, April 23<sup>th</sup>, 2004.
36. C.A. Zorman, “Silicon Carbide Micro- and Nanoelectromechanical Systems”, presented at a meeting of the *Cleveland Engineering Society*, Cleveland, Ohio, March 31, 2004.
35. C.A. Zorman, “Silicon Carbide Micro- and Nanoelectromechanical Systems”, presented at a meeting of the *Northeast Ohio Chapter – Society of Applied Spectroscopy*, Cleveland, Ohio, March 25, 2004.
34. C.A. Zorman, “An Overview of MEMS and NEMS Research in the Department of Electrical Engineering and Computer Science at CWRU” presented as part of the *Functional Electrical Stimulation Center Seminar Series*, MetroHealth Medical Center, Cleveland, Ohio, March 10, 2004.
33. R. Rosenblum, S. Roy, A. Fleischman, and C. Zorman, “Optimization of Chemical Mechanical Polishing of Polysilicon for Nanoporous Membrane Fabrication”, presented at *The Northeast Ohio Nanoscience and Nanotechnology Research Symposium*, Case Western Reserve University, February 17, 2004.
32. C.A. Zorman, “Silicon Carbide for Nanoelectromechanical Systems”, presented at *The Northeast Ohio Nanoscience and Nanotechnology Research Symposium*, Case Western Reserve University, February 17, 2004.
31. C.A. Zorman, “Silicon Carbide for MEMS and NEMS”, presented at *The Solar Circle Seminar Series*, *NASA Glenn Research Center*, Cleveland, Ohio, September 23, 2003.



30. L.A. Ferrara, A.J. Fleischman, C.A. Zorman, E.C. Benzel, S. Roy, "In Vivo Biocompatibility Assessment of MEMS Materials for a Spine Fusion Monitoring System", presented at 4<sup>th</sup> Annual *BioMEMS and Nanotech World Conference – BioMEMS and Nanotech World – 2003*, Washington DC, August 25-26, 2003.
29. R. Rosenblum, C.A. Zorman A.J. Fleischman, and S. Roy, "Optimization of Chemical Mechanical Polishing for Nanoporous Membrane Fabrication", presented at 4<sup>th</sup> Annual *BioMEMS and Nanotech World Conference –BioMEMS and Nanotech World – 2003*, Washington DC, August 25-26, 2003.
28. L.A. Ferrara, S. Roy, A. Fleischman, C. Zorman, and E.C. Benzel, "In vivo biocompatibility testing of MEMS materials for a spinal implant system: a caprine model", presented at the 10<sup>th</sup> *International Meeting on Advanced Spine Techniques*, Rome Italy, July 10-12, 2003.
27. L. Jiang, R. Chueng, M. Hassan, A. Harris, J. Hedley, J. Burdess, C. A. Zorman and M. Mehregany, "Fabrication of SiC Micro-electro-mechanical Systems (MEMS) Using One Step Dry Etching", presented at the 47<sup>th</sup> *International Conference on Electron, Ion and Photon Beam Technology and Nanofabrication*, Tampa FL, May 27-30, 2003.
26. C.S. Kovach and C.A. Zorman, "Opportunities for Device Prototyping, Process Development, and Materials Evaluation at the Center for Micro and Nano Processing at Case Western Reserve University", presented at *The 46<sup>th</sup> Annual Society of Vacuum Coaters Technical Conference*, San Francisco, CA, May 3-8, 2003.
25. C.A. Zorman, "Silicon Carbide for MEMS and NEMS", presented at *The Spring 2003 Technical Meeting of the MEMS Alliance, University of Maryland, College Park MD*, April 11, 2003.
24. S. Roy, J. Moran, C.A. Zorman, J. Melzak, P. Abel, M. Freas, G. Kotzar, and A.J. Fleischman, "Biocompatibility of microsystems materials", presented at *BioMEMS and Biomedical Nanotech World 2002*, Columbus, OH, USA (2002).
23. J. Melzak and C. Zorman, "Silicon Carbide MEMS Structures for High Temperature Resistor Arrays", presented at the *Advanced IR Scene Projection Technologies Workshop and Ladar Scene Projection Planning Meeting*, Air Force Research Laboratory, Eglin Air Force Base, FL, November 6-7, 2002.
22. T. Seyller, N. Sieber, T. Stark, L. Ley, C.A. Zorman and M. Mehregany, "Stacking Rearrangement at 6H-SiC(0001) surfaces during thermal hydrogenation", presented at the 21<sup>st</sup> *European Conference on Surface Science/7<sup>th</sup> International Conference on Nanometer-Scale Science and Technology*, Malmo, Sweden, June 21-28, 2002.
21. L. Han, C.A. Zorman, and W.H. Ko, "Acoustic response measurement of a circular plate using an accelerometer", presented at *The 8<sup>th</sup> International Congress on Sound and Vibration*, Hong Kong, July 2-6, 2001.
20. M. Mehregany, C.A. Zorman, S. Roy, and A.J. Fleischman, "Emerging Biotechnology: BioMEMS," presented at the *Cleveland World Trade Conference and Exhibit*, Cleveland, OH, June 1, 2001.
19. C.A. Zorman, "Silicon Carbide Microelectromechanical Systems" presented at *Walter Schottky Institut, Technische Universitat Munchen*, June 13, 2001.
18. C.A. Zorman, "Fabrication Techniques for Silicon Carbide MEMS" presented at *Institut fur Technische Physik, University of Erlangen-Nurnburg*, Erlangen Germany, June 11, 2001.
17. C.A. Zorman, "Silicon Carbide Microelectromechanical Systems", presented at the *California Institute of Technology, Department of Physics-Solid State Sciences Seminar Series*, Pasadena CA, February 26, 2001.

16. C.A. Zorman, "Silicon Carbide Microelectromechanical Systems", presented at *The Ohio State University, Biomedical Engineering Center*, Columbus, Ohio, February 13, 2001.
15. R.F. Davis, T. Gehrke, K.J. Linthicum, P. Rajagopal, E.A. Preble, C.A. Zorman, and M. Mehregany, "Pendeo-epitaxial Growth of GaN and Related Materials on 6H-SiC(0001) and Si(111) Substrates and Their Characterization, presented at the *12<sup>th</sup> American Conference on Crystal Growth and Epitaxy*, Vail CO, August 13-18, 2000. *Invited Talk*
14. M. Mehregany and C.A. Zorman, "Making MUSiC with MEMS: A Multiuser SiC Surface Micromachining Process", presented at *The Glennan Microsystems Initiative Microbreakfast Speaker Series*, Cleveland OH, August 2000.
13. C. Deeb, X. Milhet, H. Kahn, A.H. Heuer, C. Zorman, and M. Mehregany, "Low temperature formation of thermally stable electrical contacts to SiC", presented at *the 2000 Gordon Conference on High Temperature Materials, Processes and Diagnostics*, Plymouth NH, July 23-28, 2000.
12. C. Koch, J. Spence, C. Zorman, M. Mehregany, P. Pirouz, and J. Chung, "Partial Dislocation Kinks in SiC", *Presented at Extended Defects in Semiconductors 2000 – EDS 2000*, Brighton, UK, July 18-22, 2000.
11. S. Roberson, D. Wiff, K. Kornegay, M. Mehregany, and C. Zorman, "Silicon Carbide for High Temperature and High Shock Environments", presented at the *National Aerospace and Electronics Conference*, Dayton, Ohio, October 10-12, 2000.
10. C.A. Zorman and M. Mehregany, "High Temperature MEMS", presented at *the 2000 Gordon Conference on High Temperature Materials, Processes and Diagnostics*, July 23-28, 2000, Plymouth, NH. *Invited Talk*
9. C.A. Zorman, "Test Structures for Materials Properties Extraction", presented at the *Workshop on Design and Modeling of BioMEMS*, June 21, 2000, Cleveland, Ohio.
8. C.A. Zorman and M. Mehregany, "Silicon Carbide Micromachining and RF MEMS", presented at the *NSF/ARO/DARPA/NRL Workshop on RF Micromachining and MEMS Technology for Wireless Communications Systems*, December 1-2, 1999, Washington DC.
7. M. Mehregany and C.A. Zorman, "Micromachined SiC devices for harsh environment applications", presented at *Sensors Expo 99*, Cleveland, OH, September 14-16, 1999.
6. M. Mehregany and C. Zorman, "SiC MEMS: Opportunities and Challenges for Applications in Military Systems", presented at *DARPA Workshop on MEMS for Harsh Environments*, October 23-24, 1998, Washington DC.
5. A. Heuer, M. Mehregany, and C.A. Zorman, "MEMS for Harsh Environments" presented at the *1998 DSRC Workshop*, July 18, 1998, La Jolla, CA.
4. C. Zorman, "Silicon Carbide MEMS", *Department of Electrical Engineering and Applied Physics Colloquia Series*, Case Western Reserve University, Cleveland OH, March 6, 1997. *Invited Talk*
3. C. Zorman, "Annealing of Diamond and Diamondlike Carbon Films – *An Ion Beam Analysis Study*", *Department of Physics, Ohio University*, April 1994.
2. C. Zorman, "Annealing of Diamond and Diamondlike Carbon Films – *An Ion Beam Analysis Study*", *Department of Physics, Westminster College*, March 16, 1994.
1. C. Zorman, J.S. Shaio, S. Heidger and R.W. Hoffman, "The composition and physical properties of thin a-C:N and a-C:N:H films", presented at *the 15<sup>th</sup> Symposium on Applied Surface Analysis*, Cleveland OH, June 9-11, 1993.

***Patents Awarded (advisee names underlined)***

6. D. Tyler, Y. Xu, A. Hess-Dunning, and C. Zorman, “Interconnect Devices, Systems, and Methods for Bridging Electronic Devices”, U.S. Patent # 9,486,619, Issued November 8, 2016
5. K. Bogie, S.L Garverick, C.A. Zorman, and D.S. Howe, “Integrated surface stimulation device for pain management and wound therapy” U.S. Patent # 9,320,907, Issued: April 26, 2016.
4. M. Mehregany, C.A. Zorman, X.A. Fu and J. Dunning, “Composition comprising silicon carbide”, U.S. Patent # 8,153,280, Issued: April 10, 2012.
3. M. Mehregany, C.A. Zorman, X.A. Fu and J. Dunning, “Silicon carbide and other films and method of deposition”, U.S. Patent # RE42887 E1, Issued: November 1, 2011.
2. M. Mehregany, C.A. Zorman, X.A. Fu and J. Dunning, “Silicon carbide and other films and method of deposition”, U.S. Patent # 7,261,919, Issued: August 28, 2007.
1. M. Mehregany, N. Rajan, and C.A. Zorman, “Method for Molding High Precision Components”, U.S. Patent # 6,136,243, Issued: October 24, 2000.

***Published Patent Applications (advisee names underlined)***

6. C.J.Miller, S. Ghosh, Y. Sui, R.M. Sankaran, and C.A. Zorman, “Printing Electrical Structures Having Tunable Resistivity”, U.S. Provisional Patent # 747-013PR. Filing Date: April 13, 2017.
5. K.M. Bogie, S.L. Garverick, C.A. Zorman, and D.S. Howe, “Integrated Surface Stimulation Device for Wound Therapy and Infection Control”, U.S. Patent Application #: 20160287868. Publication Date: October 6, 2016.
4. E.D. Burwell, A.C. Barnes, C.A. Zorman, P. X.-L. Feng, and M.R. Sankaran, “Apparatus for Direct-Write Sputter Deposition and Method Therefor”, U.S. Patent Application #: 20160115585 Publication Date: April 28, 2016.
3. A.H. Resnick, U. Hopfer, and C.A. Zorman, “Microperfusion Tissue Interrogator”. U.S. Patent Application #: 20150147771. Publication Date: May 28, 2015.
2. W.H. Ko, S. Lachman, C.A. Zorman, and L. Bu. “Biocompatible Packaging Suitable for Long-term Implantation and Method of Formation”, U.S. Patent Application #: 20130316180. Publication Date: November 28, 2013.
1. H. Martin, C.A. Zorman, A.E. Hess, D.M. Sabens, C.C. Hayman, and J.M. Halpern, “Diamond apparatus and method of manufacture”, U.S. Patent Application #: 12/796,659. Publication Date: June 8, 2010.

***Research Grants and Contracts (Awarded)***

- 2017 K. Bogie (PI), C.A. Zorman, D. Shire, D. Keicher and M. Essien “Development of a flexible implanted stimulator to prevent pressure ulcers in SCI”, DOD-Army-Research, CDMRP, 9/30/17 – 8/31/20, \$1,800,000.
- 2017 K. Bogie (PI), C.A. Zorman, “Toward smart personalized electrotherapy for enhanced healing of ischemic wounds”, Department of Veterans Affairs, 3/1/17 - 1/31/21, \$967,100

- 2017 M. Damaser, (PI), D. Bourbeau, C.A. Zorman, “Conscious ambulatory bladder monitoring to understand neural control of lower urinary tract function”, National Institute of Health SPARC OT2, 2/1/17 to 1/31/19, \$207,612.
- 2016 C.A. Zorman (PI), “Development of Novel Polymer-based Structures for Microfabricated Devices”, Department of Veterans Affairs, 7/01/16 to 6/30/17, \$49,995
- 2015 C.A. Zorman (PI), “Intergovernmental Personnel Act (IPA) between VA and CWRU”, Department of Veterans Affairs, 9/1/15 – 8/31/16, \$30,645.
- 2015 C.A. Zorman (PI), “Development of Novel Polymer-based Structures for Microfabricated Devices”, Department of Veterans Affairs, 7/01/15 to 6/30/16, \$49,995
- 2014 C.A. Zorman (PI), “Intergovernmental Personnel Act (IPA) between VA and CWRU”, Department of Veterans Affairs, 7/1/14 – 6/30/15, \$24,478
- 2014 C.A. Zorman (PI), P.X.L. Feng, M. Sankaran, J. Maia, “A Versatile Microplasma-based Patterning Technology for Large-Scale, High Throughput Nanomanufacturing”, NSF, REU Supplement to the Parent Grant, 6/28/14, \$10,000
- 2014 C. Zorman (PI), “Development of Novel Polymer-based Structures for Microfabricated Devices”, Department of Veterans Affairs, 3/15/14 to 3/14/15, \$34,995
- 2013 C. Zorman (PI) “Microsystem Technology Demonstrators for the Advanced Platform Technology Center”, Department of Veterans Affairs, 9/28/13 to 9/27/14, \$12,925
- 2013 C.A. Zorman (PI), P.X.L. Feng, M. Sankaran, J. Maia, “A Versatile Microplasma-based Patterning Technology for Large-Scale, High Throughput Nanomanufacturing”, NSF, REU Supplement to the Parent Grant, 6/28/13, \$10,000
- 2012 C. Zorman (PI), “Development of Polymer-based Structures for Microfabricated Neuro-interface Devices”, Department of Veterans Affairs, Period: 12/15/12 to 12/14/13, Award: \$34,995.
- 2012 C.A. Zorman (PI), P.X.L. Feng, M. Sankaran, J. Maia, “A Versatile Microplasma-based Patterning Technology for Large-Scale, High Throughput Nanomanufacturing”, NSF, Period: 9/15/12 to 9/14/17, Award: \$1,198,381
- 2012 W.H. Ko (PI), C. Zorman and P.X.L. Feng, “Micropackage Technology for Biomedical Implantable Systems”, NIH-R21, Period: 1/01/12 to 12/31/13, Award: \$389,572. Portion: 25%.
- 2011 C. Zorman (PI), “Development of Polymer-based Structures for Microfabricated Neuro-interface Devices”, Department of Veterans Affairs, Period: 12/15/11 to 12/14/12, Award: \$34,995.
- 2011 C. Zorman (PI), “Design and Fabrication of an Amorphous Silicon Carbide MEMS Wireless Capacitive Pressure Sensing Platform Technology for Harsh Environments”, NASA, Period: 8/15/11 to 8/14/14, Award: \$90,000.
- 2010 A. Fleischman (PI) and C.A. Zorman, “Multi-User Biosensor Integrated Platform”, Ohio Department of Development 3<sup>rd</sup> Frontier Program, Period: 5/26/10 to 3/31/14, Award: \$2,672,894. Portion: 14%
- 2010 M. Damaser (PI), J. Alberts, and C.A. Zorman, “Clinically Applied Rehabilitation Engineering (CARE) Project”, Ohio Department of Development 3<sup>rd</sup> Frontier Program, Period: 5/26/10 to 12/31/14, Award: \$3,000,000. Portion: 43%
- 2010 C. Zorman (PI), “Microdevices for Neural Interfacing”, Department of Veterans Affairs, Period: 4/20/10 to 4/19/11, Award: \$34,994.

- 2009 C. Zorman (PI), “Microdevices for Neural Interfacing”, Department of Veterans Affairs, Period: 4/20/09 to 4/19/10, Award: \$34,994.
- 2008 C. Zorman (PI), and D. Tyler, “A Microfabricated Neural Electrode Array Technology for Long-Term Implant Applications – Graduate Student Supplement”, NSF, Period: 9/01/08 to 8/31/09, Award: \$51,006. Portion: 100%.
- 2007 C. Zorman (PI), “Development of Novel Nano-enabled Polymer-based Structures for Microfabricated Neural Electrode Devices”, Department of Veterans Affairs, Period: 10/1/07 to 9/30/08, Award: \$34,994.
- 2007 C. Zorman (PI), and D. Tyler, “A Microfabricated Neural Electrode Array Technology for Long-Term Implant Applications – Graduate Student Supplement”, NSF, Period: 9/01/07 to 8/31/08, Award: \$47,856. Portion: 100%.
- 2007 C. Zorman (PI), “Comprehensive Characterization of the Mechanical Properties and Hermetic/Chemical Inertness of Sputtered and PECVD SiC”, NASA, Period: 9/1/07 to 8/31/11, Award: \$90,000. Portion: 100%
- 2007 A. Chabanov (PI – U.Texas San Antonio), F. Capasso (Harvard), C. Zorman, G. Shvets (U. Texas – Austin), M. Spencer (Cornell), “NIRT: Optics on a Nanoscale Using Polaritonic and Plasmonic Materials”, NSF, Period: 7/1/07-6/30/11, Award: \$1,376,996. Portion: 15%.
- 2007 C. Zorman (PI) and B. Grey, “2007 Library Opportunity Fund Award”, CWRU, 3/15/07, Award: \$6,992. Portion: 100%
- 2006 C. Zorman (PI), “Development of Novel Nano-enabled Polymer-based Structures for Microfabricated Neural Electrode Devices”, Department of Veterans Affairs, Period: 9/1/06 to 8/31/07, Award: \$55,000.
- 2006 C. Zorman (PI), and D. Tyler, “A Microfabricated Neural Electrode Array Technology for Long-Term Implant Applications”, NSF, Period: 9/15/06 to 8/31/11, Award: \$240,000. Portion: 90%.
- 2006 D. Tyler (PI), C. Weder, S. Rowan, C. Zorman, and D. Taylor, “Stimulus-responsive, mechanically-dynamic nanocomposite for cortical electrodes”, NIH-R21, Period: 8/1/06 to 7/31/08, Award: \$424,875. Portion: 10%.
- 2006 C. Zorman (PI), “Mechanical Characterization of Silicon Carbide Thin Films Deposited by Plasma Enhanced Chemical Vapor Deposition”, NASA, Period: 1/1/06 to 9/30/07, Award: \$2,549.
- 2005 C. Zorman (PI), “Development of Novel Nano-enabled Polymer-based Structures for Microfabricated Neural Electrode Devices”, Department of Veterans Affairs, Period: 9/1/05 to 8/31/06, Award: \$49,772.
- 2005 C. Zorman (PI), “Development of Novel Nano-enabled Polymer-based Structures for Microfabricated Neural Electrode Devices”, Department of Veterans Affairs, Period: 9/1/05 to 8/31/06, Award: \$13,952.
- 2005 R. Triolo (PI), D. Tyler, K. Kilgore, and G. Creasey, “Rehabilitation Engineering Platform Technology Center of Excellence”, Department of Veterans Affairs, Period: 1/01/05 to 12/31/10, Award: \$4,250,000. Participation Level: Faculty Investigator. Portion: 5%.
- 2005 A. Pisano (PI – UC Berkeley), R. Maboudian (UC Berkeley), R.T. Howe (Stanford), B.J. Wijesundara (UC Berkeley), M. Mehregany, C.A. Zorman, S. Garverick, “SiC TAPS Sensors for Extreme Harsh Environments”, DARPA, Period: 1/1/05 to 12/31/07, Total Award: \$5,000,000, Case Award (Zorman – co-PI): \$1,695,000. Portion: 10%.

- 2004 C. Zorman (PI), "Development of a Silicon Carbide-based Wafer Bonding Process Using Standard Bonding Techniques" Zin Technologies, Period: 6/1/04 to 9/30/04, Award: \$4,744.
- 2003 M. Mehregany (PI) and C.A. Zorman, "SiC Etching Equipment to Support the Ohio Center for Advanced Propulsion and Power (OCAPP)", State of Ohio/Third Frontier Program, Period: 12/15/03 to 3/14/07, Award: \$350,000. Portion: 5%.
- 2003 M. Mehregany (PI), S. Garverick, and C.A. Zorman, "Propulsion 21: Active Combustion Control", NASA, Period: 8/1/03 to 7/31/04, Award: \$975,000. Portion: 10%.
- 2002 C.A. Zorman (PI) and M. Mehregany, "Polycrystalline Silicon Carbide Micro- and Nanoelectromechanical Systems", The National Science Foundation, Period: 8/1/03 to 7/31/07, Award: \$300,000. Portion: 80%.
- 2002 M. Roukes (PI - Caltech), C. Lieber (Harvard), C.A. Zorman and M. Mehregany, "Large-scale Integration of Microwave Frequency Nanoelectromechanical Systems (LSI-NEMS)" DARPA Period: 6/26/02 to 3/26/06, Total Award: \$5,239,852, CWRU Award (Zorman – PI) Total: \$435,407. Portion: 90%.
- 2002 C. Zorman (PI), "MEMS Exchange Fabrication Services", Corporation for National Research Initiatives, Period: 5/02 to 12/03, Award: \$30,000.
- 2002 S. Roy (PI – Cleveland Clinic), A. Fleischman (Cleveland Clinic), C. Zorman, N. Nemeth (NASA Glenn Research Center) and D. Jacqmin (NASA GRC), "Controlled-Release Microsystems for Pharmacological Agent Delivery", NASA - John Glenn Biomedical Engineering Consortium. Period: 5/1/02 to 7/30/05. Award Total: \$688,000. CWRU subcontract (Zorman – PI) total: \$165,186. Portion: 100%.
- 2002 C. Zorman (PI), J.C. Angus, A.H. Heuer and K. Kash, "Critical Instrumentation for Micro- and Nanosystems Research at CWRU", The CWRU Provost's Opportunity Fund, Period: 7/02-6/03, Award: \$250,000. Portion: 100%
- 2001 C.A. Zorman (PI), "Fabrication of Silicon Carbide-based Micromirror Devices for Optical Applications", NASA Glenn Research Center, Period: 10/1/01 to 7/30/03, Award: \$30,000.
- 2001 C.A. Zorman (PI), "Biocompatibility of MEMS Materials and Devices", Biomec, Inc, Cleveland, Ohio, Period: 8/15/01 to 10/31/01, Award: \$17,429.
- 2000 C.A. Zorman (PI) and J.M. Melzak, "Biocompatibility of MEMS Materials", Biomec, Inc, Cleveland OH, Period: 7/00 to 11/00, Award: \$42,253.
- 1998 M. Mehregany (PI) and C.C. Liu "Glennan Microsystems Initiative", NASA/State of Ohio/Industry, Period: 8/98 to 12/04, Award amount (Case): ~\$5,700,000. Various subcontracts awarded to C. Zorman as a PI or co-PI listed below:
- C.A. Zorman (PI), "MUSiC Development and Service", Period: 11/00 to 10/01, Award: \$25,000.
- C.A. Zorman (PI) and C.C. Liu, "Operational Support of Microfabrication Laboratory and Electronics Design Center Facilities", Period: 11/00 to 10/01, Award: \$240,000. Portion: 50%.
- C.A. Zorman (PI), C.C. Liu and M. Mehregany, "Operational Support of Microfabrication Lab and Electronics Design Center Facilities", Period: 12/01 to 11/02, Award: \$100,000. Portion: 33%.
- M. Mehregany (PI), and C.A. Zorman, "MUSiC Development and Service", Period: 12/01 to 11/02, Award: \$200,000. Portion: 50%.

C.A. Zorman (PI) and M. Mehregany, "Development of LPCVD Processes for MUSiC Fabrication", Period: 7/15/03 to 2/28/04, Award: \$120,000. Portion: 50%.

M. Mehregany (PI) and C.A. Zorman, "Multi-range Pressure Sensor Arrays for Harsh Environments", Period: 7/15/03 to 2/28/04, Award: \$150,000. Portion: 30%.

M. Mehregany (PI) and C.A. Zorman, "SiC Microsystems", Period: 8/02 to 1/03, Award: \$28,013. Portion: 10%.

## ***Advising and Teaching***

### **Ph.D Advisees**

15. Claude Abraham, Department of Electrical Engineering and Computer Science, PhD Candidate, advisor
14. Jonathan Grgat, Department of Electrical Engineering and Computer Science, PhD Candidate, advisor.
13. Hao Chong, Department of Electrical Engineering and Computer Science, PhD Candidate, advisor.
12. Yongkun Sui, Department of Electrical Engineering and Computer Science, PhD Candidate, advisor.
11. Guangxi (Anthony) Wu, “Analyses and Applications of Thermoelectric Modules: Electrically Parallel and Serial Structures”, Department of Electrical Engineering and Computer Science, May 2016, co-advisor.
10. Michael LaBarbera, Department of Electrical Engineering and Computer Science, PhD Candidate, advisor.
9. Maximillian Scardelletti, “Development of a High Temperature Silicon Carbide Capacitive Pressure Sensor System Based on a Clapp-Type Oscillator Circuit”, Department of Electrical Engineering and Computer Science, August 2016, advisor.
8. Andrew Barnes, “Characterization of High-Aspect Ratio, Thin Film Silicon Carbide Diaphragms Using Multimode, Resonance Frequency Analysis”, Department of Electrical Engineering and Computer Science, January 2015, advisor.
7. Disha Sheth, “Multielectrode platform for measuring oxygenation status in multicellular tumor spheroids Department of Biomedical Engineering”, August 2011, co-advisor
6. Allison Hess, “Integration of Process-Incompatible Materials for Microfabricated Polymer-Based Neural Interfaces”, Department of Electrical Engineering and Computer Science, May 2011, advisor.
5. Ross Smith, “Biomedical Applications Employing Microfabricated Silicon Nanoporous Membranes”, Department of Electrical Engineering and Computer Science, August 2010, advisor
4. Jiangang Du, “Development of Polycrystalline and Amorphous SiC Thin Films for Membrane-based MEMS Devices”, Department of Electrical Engineering and Computer Science, August 2007, advisor.
3. Wen-Teng Chang, “Energy Dissipation in MEMS-Based Flexural-Mode Lateral Resonators Made From Single Crystalline and Polycrystalline 3C-SiC Films”, Department of Electrical Engineering and Computer Science, August 2006, advisor.
2. Hung-I Kuo, “Fabrication and Applications of 3C-Silicon Carbide on Insulator Wafers by the Grow-A-Substrate Method”, Department of Electrical Engineering and Computer Science. August 2002, co-advisor.
1. Chien-Hung Wu, “Growth and Characterization of SiC for MEMS Pressure Sensors”, Department of Materials Science and Engineering, Case Western Reserve University, Cleveland, Ohio, January 2001, co-advisor.

### **MS Advisees (Thesis Option)**



32. Peter Sords, Department of Electrical Engineering and Computer Science, advisor
31. Huan Chen, "Version Control Graphical Interface for Open OnDemand", Department of Electrical Engineering and Computer Science, August 2018, co-advisor.
30. Zhehao Zhang, "Palladium Voltammetric Microelectrode as pH Sensor in Micro Electrochemical Cell", Department of Biomedical Engineering, August 2017, co-advisor.
29. Shixiong Li, MS Candidate, Department of Electrical Engineering and Computer Science, Expected graduation date – January 2019, advisor
28. Ian McAdams, MS Candidate, Department of Electrical Engineering and Computer Science, Expected graduation date – January 2019, advisor
27. Kristina Collins, "Towards a Canfield Joint for Deep Space Optical Communications", Department of Electrical Engineering and Computer Science, August 2018, advisor
26. Christopher Miller, "An Additive Printing Process for Conductive Structures Based on Low Pressure Argon Plasma Treatment of Silver Nitrate-Based Inks", Department of Electrical Engineering and Computer Science, August 2017, advisor.
25. Edwin Burwell, "A Microplasma-Based Sputtering System for Direct-Write, Micropatterning of Metal Structures" Department of Electrical Engineering and Computer Science, January 2016, advisor
24. Daniel Zula, MS candidate, Department of Electrical Engineering and Computer Science, Expected graduation date – May 2017, advisor.
23. Jennifer Jordan, "Contactless Radio Frequency Probes for High Temperature Characterization of Microwave Integrated Circuits", Department of Electrical Engineering and Computer Science, August 2014, advisor.
22. Di Sun, "Characterization of Medical Grade Poly-Dimethylsiloxane as Encapsulation Materials for Implantable Microelectromechanical Systems", Department of Electrical Engineering and Computer Science, May 2014, co-advisor.
21. Michael LaBarbera, Long-Term, High Temperature Mechanical Stability of PECVD Amorphous Silicon Carbide for use as Structural Material in Harsh Environment MEMS, Department of Electrical Engineering and Computer Science, May 2014, advisor.
20. Nathan Schatt, "Finite Element Modeling of Ultrasonic Wire Bonding on Poly-vinyl Acetate Substrates", Department of Electrical Engineering and Computer Science, May 2014, advisor.
19. Patrick Rawlinson, "The Mechanical Properties of Submicron-Thick, Large-Area 3C-SiC Diaphragms", Department of Electrical Engineering and Computer Science, May 2011, advisor.
18. Shem Lachhman, "Roller-Cast Poly-Dimethylsiloxane as a Non-Hermetic Encapsulant for MEMS Packaging", Department of Electrical Engineering and Computer Science, January 2012, advisor.
17. Seraina Murphy, "Development of Molding Fabrication Technique For MEMS-Based Polyvinyl Acetate-Nanocomposite Intracortical Probes", Department of Electrical Engineering and Computer Science, August 2011, advisor.
16. Russell Smith, "Oxygen Plasma Surface Activation of Polynorbornene for Bonding to Glass with Applications to Microfluidic Systems", Department of Electrical Engineering and Computer Science, May 2011, advisor.
15. Andrew Barnes, "Development of a Wire Bonding Process for Microsystems Fabricated from Polyvinyl Acetate – Nanocomposite", Department of Electrical Engineering and Computer Science, May 2011, advisor.
14. David Karnick, "Miniaturization of Folded Slot Antennas Through Inductive Loading And Thin Film Packaging", Department of Electrical Engineering and Computer Science, May 2011, advisor

13. John Stanton, "Design and Fabrication of a Microfluidic Electrochemical pH-Stat", Department of Electrical Engineering and Computer Science, May 2010, advisor.
12. Rocco Parro, "The Mechanical Properties of Amorphous Silicon Carbide Films Deposited by PECVD And RF Sputtering for Application as a Structural Layer in Microbridge-Based RF MEMS", Department of Electrical Engineering and Computer Science, May 2010, advisor.
11. Allison Hess, "Design and Fabrication of Polynorbornene- and Liquid Crystal Polymer-Based Electrode Arrays for Biomedical Applications", Department of Electrical Engineering and Computer Science, May 2008, advisor.
10. Ross Smith, "Development of an Automated Data Acquisition System for Investigation of Fluid Flow at the Nanometer Scale", Department of Electrical Engineering and Computer Science, May 2007, advisor.
9. James Summers, "Development of Amorphous Silicon Carbide Films Deposited by Dual-Precursor PECVD for Use in Microbridge-based Electrostatic Actuators", Department of Electrical Engineering and Computer Science, January 2007, advisor.
8. Neha Singh, "Evaluation of Amorphous PECVD Silicon Carbide Thin Films for MEMS Applications Using Trimethylsilane as the Precursor", Department of Electrical Engineering and Computer Science, August 2006, advisor.
7. Varun Keesara, "Development of Multi-layered, Flexible Electrode Structures Based on Neural Electrode Designs Fabricated from Biaxial Liquid Crystal Polymer and Polynorbornene", Department of Electrical Engineering and Computer Science, May 2006, advisor.
6. Jacob Trevino, "Development of Low-Stress, Heavily Doped, Poly-SiC Films for MEMS applications" Department of Electrical Engineering and Computer Science, May 2006, advisor.
5. Hung-Yi Hsu, "Reagentless pH-Stat for 20 $\mu$ L Samples", Department of Electrical Engineering and Computer Science, August 2005, co-advisor.
4. Jeremy Dunning, "Development of Low-stress, Undoped Poly-SiC Films in a Large-Scale LPCVD Furnace Using Gas Flow and a Controlling Parameter", Department of Electrical Engineering and Computer Science. May 2005, advisor.
3. Robert Wisner, "Fabrication and Electrical Testing of Vertically-actuated Polycrystalline Silicon Carbide Micromechanical Resonators", Department of Electrical Engineering and Computer Science. August 2002, co-advisor.
2. Ravi Burla, "Nickel Wire Bonding for High Temperature SiC Devices and for Pre-release Wire Bonding Process", Department of Electrical Engineering and Computer Science, Case Western Reserve University, Cleveland, Ohio, January 2001, co-advisor.
1. Jay Mitchell, "Characterization of Mechanical Properties of Thin Films of Cubic Silicon Carbide Deposited onto Silicon" Department of Mechanical and Aerospace Engineering, Case Western Reserve University, August 2000, co-advisor.

#### **MS Advisees (Project Option)**

6. Bhoomija Prasad, "Energy Dissipation in MEMS Flexural Mode Resonators", Department of Mechanical and Aerospace Engineering, May 2018, advisor.

5. Xuyang Liu, "Modeling of a Microplasma-Based Sputtering System with Comsol Multiphysics", Department of Electrical Engineering and Computer Science, May 2016, advisor.
3. Josip Brnada, "A Method of Providing a Supplemental Power Supply in a Solid State Lamp", Department of Electrical Engineering and Computer Science, January 2014, advisor.
2. Matthew Krueger, "Design Control and Automation of a Chemical Vapor Deposition System", Department of Electrical Engineering and Computer Science, January 2007, advisor.
1. Li Chen, "Fabrication of SiC Nanomechanical Elements", Department of Materials Science and Engineering, May 2003, co-advisor.

### **Sponsored Undergraduate Research**

2. Erika Klek, "A Versatile Microplasma-based Patterning Technology for Large-Scale, High Throughput Nanomanufacturing", Department of Electrical Engineering, The Ohio State University, NSF REU Research Fellow, Summer 2015 and Summer 2016.
1. Jonathan Ward, "Design and Testing of Microelectromechanical Systems", Department of Electrical Engineering and Computer Science. CWRU SOURCE Summer Program, June 2005. Award Amount: \$3,000.

### **International Undergraduate Outreach**

5. Mondhita Diewvilai	Chulalongkorn University, Thailand	Intern	Summer 2010
4. Time Tuangsintanakul	Chulalongkorn University, Thailand	Intern	Summer 2009
3. Kuntapas Kungsuwam	Chulalongkorn University, Thailand	Intern	Summer 2009
2. Apipon Methajittipun	Chulalongkorn University, Thailand	Intern	Summer 2008
1. Nonthapat Pulsiri	Chulalongkorn University, Thailand	Intern	Summer 2008

### **K-12 Outreach**

11. Holly Sirk	Beaumont School	Intern	Summer 2015
10. Michael D'Arcy	Euclid High School	Intern	Summer 2013
9. Michael D'Arcy	Euclid High School	Intern	Summer 2012
8. Michael D'Arcy	Euclid High School	Intern	Summer 2011
7. Sharon Wong	Solon High School	Intern	Summer 2010
6. Sharon Wong	Solon High School	Intern	Summer 2009
5. Jill Wollenburg	Andrews-Osbourne Academy	Senior Project Intern	Spring 2009
4. Sharon Wong	Solon High School	Intern	Summer 2008
3. Sloan Zimmerman	Solon High School	Intern	Summer 2007
2. Cassie Miller	Andrews School for Girls	Senior Project Intern	Spring 2007
1. Sloan Zimmerman	Solon High School	Intern	Summer 2006

### **Sponsored Senior Projects**

Spring 2012	Derrick Sharp	Department of Electrical Engineering and Computer Science
Fall 2010	Kevin Greene	Department of Electrical Engineering and Computer Science
Fall 2010	Mark DeAmbrosio	Department of Electrical Engineering and Computer Science

Fall 2010	Margaret Robson	Department of Electrical Engineering and Computer Science
Fall 2009	Maria D'Augstino	Department of Electrical Engineering and Computer Science
Spring 2009	Ryan Gjoraas	Department of Electrical Engineering and Computer Science
Spring 2009	Surya Baktiono	Department of Electrical Engineering and Computer Science
Spring 2009	Josip Brnada	Department of Electrical Engineering and Computer Science
Spring 2008	Michael Lekas	Department of Electrical Engineering and Computer Science
Spring 2008	Samuel Crescenze	Department of Electrical Engineering and Computer Science
Spring 2008	John Stanton	Department of Electrical Engineering and Computer Science
Spring 2008	Brendan O'Donnell	Department of Electrical Engineering and Computer Science
Fall 2007	Odeon Okojie	Department of Electrical Engineering and Computer Science
Fall 2007	Rajiv Shahani	Department of Electrical Engineering and Computer Science
Fall 2007	Farhan Bakly	Department of Electrical Engineering and Computer Science
2006-2007	Thomas Sanders	Department of Physics – Major: Engineering Physics
2004-2005	Justin Thrall	Department of Physics – Major: Engineering Physics
2004-2005	Kevin Wissner	Department of Electrical Engineering and Computer Science
2004-2005	Aaron Elias	Department of Electrical Engineering and Computer Science

### Advisee Awards

2013	Michael LaBarbera	EECS	Graduate Student Research Award (for outstanding poster at Research ShowCase 2013)
2012	Michael LaBarbera	EECS	Graduate Dean's Instructional Excellence Award
2011	Michael LaBarbera	EECS	NASA Graduate Student Research Program Fellowship
2011	Michael LaBarbera	EECS	Keithley Fellowship Award
2010	Allison Hess	EECS	Best Poster Award – Fall 2010 MRS Meeting
2010	David Karnick	EECS	Lewis Educational/Research Collaborative Internship
2010	Maria D'Agostino	EECS	W. Bruce Johnson Memorial Award (best Sr. project)
2010	John Stanton	EECS	Best Poster Award, <i>Research ShowCase 2010</i>
2009	John Stanton	EECS	Lewis Educational/Research Collaborative Internship
2008	Allison Hess	EECS	Young Investigator Award – 55 <sup>th</sup> AVS Inter. Symposium
2008	Michael Lekas	EECS	1 <sup>st</sup> Prize - Best Senior Project Award
2008	Sam Crescenze	EECS	1 <sup>st</sup> Prize - Best Senior Project Award
2008	John Stanton	EECS	1 <sup>st</sup> Prize – Best Senior Project Award
2008	Brendon O'Donnell	EECS	1s Prize – Best Senior Project Award
2007	Rocco Parro	EECS	NASA Graduate Student Research Program Fellowship
2007	Rocco Parro	EECS	Lewis Educational/Research Collaborative Internship
2007	Rocco Parro	EECS	Graduate Dean's Instructional Excellence Award
2007	Thomas Sanders	Physics	Dayton C. Miller Prize for Best Senior Thesis in Physics
2005	Aaron Elias	EECS	3 <sup>rd</sup> Place – Philips Senior Project Award
2005	Kevin Wissner	EECS	3 <sup>rd</sup> Place – Philips Senior Project Award

## ***Teaching Activities***

### *AY 2017/2018*

EECS 322/415: Fall 2017  
EECS 321: Spring 2018

### *AY 2016/2017*

EECS 322/415: Fall 2016  
EECS 321: Spring 2017  
EECS 600 Special Topics in Wearable Computing Technology, Graduate Course: Spring 2017

### *AY 2015/2016*

EECS 322/415: Fall 2015  
EECS 321: Spring 2016  
EECS 434: Spring 2016

### *AY 2014/2015*

EECS 322/415: Fall 2014  
EECS/EMAE 424: Fall 2014  
EECS 434: Spring 2015

### *AY 2013/2014*

EECS 322/415: Fall 2013  
ENGR 210: Spring 2014

### *AY 2012/2013*

EECS 322/415: Fall 2012  
ENGR 210: Spring 2013  
EECS/EMAE 424: Spring 2013

### *AY 2011/2012*

EECS 322/415: Fall 2011  
EECS 321: Spring 2012  
ENGR 210: Spring 2012

### *AY 2010/2011*

EECS 322/415: Fall 2010  
EECS 321: Spring 2011  
ENGR 210: Spring 2011

### *AY 2009/2010*

EECS/EMAE 424: Fall 2009  
EECS 321: Spring 2010  
ENGR 210: Spring 2010

### *AY 2008/2009*

EECS 322/415: Fall 2008  
EECS 321: Spring 2009  
EECS 434: Spring 2009

### *AY 2007/2008*

ENGR 210: Fall 2007

EECS 322/415: Fall 2007  
EECS 321: Spring 2008

*AY 2006/2007*

EECS/EMAE 424: Fall 2006  
ENGR 210 *Introduction to Circuits and Instruments*, Undergraduate course: Fall 2006  
EECS 322/415: Fall 2006  
EECS 321: Spring 2007

*AY 2005/2006*

EECS 322/415: Fall 2005  
EECS 321: Spring 2006

*AY 2004/2005*

EECS 322/415: Fall 2004  
EECS/EMAE 424: Fall 2004  
EECS 321: Spring 2005

*AY 2003/2004*

EECS 322/415 *Integrated Circuits and Electronic Devices/Integrated Circuit Technology I*,  
Undergraduate/graduate course (common lectures only): Fall 2003  
EECS/EMAE 424 *Introduction to Nanotechnology*, Graduate course: Fall 2003  
EECS 321: Spring 2004

*AY 2002/2003*

EECS 527 *Advanced Sensors – Theory and Design*, Graduate course: Fall 2002  
EECS 321 *Semiconductor Devices*, Undergraduate course: Spring 2003

*AY 2000/2001*

EEAP 322/415 *Integrated Circuits and Electronic Device/Integrated Circuit Technology I*,  
Undergraduate/graduate course (common lectures with EEAP 424): Fall 2000  
EEAP 434 *Microfabricated Silicon Electromechanical Systems*, Graduate course: Spring 2001

### ***University Service***

2017-2018 CWRU Intellectual Property Policy Review Committee  
2017-2018 President's Advisory Committee on Promotion and Tenure  
2017-2018 Case School of Engineering Dean's Search Committee  
2016-2017 Case School of Engineering Appointments Committee  
2014-2017 Senator: CWRU Faculty Senate  
2013-2014 Case School of Engineering Budget Committee  
2012-2013 CWRU Faculty Senate *ad-hoc* Committee on Appointments  
2010-2012 Case School of Engineering Strategic Hiring Committee  
2010-2011 EECS Graduate Committee - Chair  
2009-2010 ECE Graduate Committee - Chair  
2008-2009 ECE Graduate Committee - Chair  
2007-2008 ECE Graduate Committee - Chair  
2006-2007 Nanotechnology Executive Committee – Case Western Reserve University  
2005-2006 Nanotechnology Planning Committee – Case Western Reserve University  
2005-2006 ECE Curriculum Committee (EE Representative)  
Committee Chair – 2006  
2003-2004 ECE Graduate Committee (EE Representative)  
2003-2005 Case School of Engineering Research Committee (EECS Representative)  
Committee Chair - 2005  
2002-2018 ECE Undergraduate Advising  
2002-2003: Sophomores  
2003-2004: Juniors  
2004-2005: Seniors  
2005-2006: Sophomores  
2006-2007: Juniors  
2007-2008: Seniors  
2008-2009: Sophomores  
2009-2010: Juniors  
2010-2011: Seniors  
2011-2012: Sophomores  
2012-2013: Juniors  
2013-2014: Seniors  
2014-2015: Sophomores  
2015-2016: Juniors  
2016-2017: Seniors  
2017-2018: Seniors  
2018-2019: Sophomores

### ***Thesis and Dissertation Committee Service***

71.	S. Amponsah	MS	Electrical Engineering and Computer Science	Summer 2018
70.	A. van den Akker	MS	Electrical Engineering and Computer Science	Summer 2018
69.	D. Sastry	PhD	Biomedical Engineering	In Progress
68.	H. Jia	PhD	Electrical Engineering and Computer Science	Spring 2018
67.	X-Q. Zheng	PhD	Electrical Engineering and Computer Science	In Progress
66.	T. Liu	PhD	Chemical and Biomolecular Engineering	In Progress
65.	J.R. Toth	PhD	Chemical and Biomolecular Engineering	In Progress
64.	S. Rajgopal	PhD	Electrical Engineering and Computer Science	In Progress

63.	S. Rafique	PhD	Electrical Engineering and Computer Science	Fall 2017
62.	Z. Zhang	MS	Biomedical Engineering	Spring 2017
61.	B. Kowalski	PhD	Materials Science and Engineering	Spring 2017
60.	S. Ghosh	PhD	Chemical and Biomolecular Engineering	Spring 2017
59.	L. Han	PhD	Electrical Engineering and Computer Science	Spring 2017
58.	R. Yang	PhD	Electrical Engineering and Computer Science	Fall 2016
57.	J. Lee	PhD	Electrical Engineering and Computer Science	Fall 2016
56.	J. Zhou	MS	Electrical Engineering and Computer Science	Spring 2016
55.	M. DeLibero	MS	Electrical Engineering and Computer Science	Spring 2016
54.	A. de Leon	PhD	Macromolecular Science and Engineering	Fall 2015
53.	C. Heinert	MS	Chemical and Biomolecular Engineering	Spring 2015
52.	H. Zamani	PhD	Electrical Engineering and Computer Science	Spring 2015
51.	Y. Xu	MS	Biomedical Engineering	Fall 2014
50.	Y. Zheng	PhD	Electrical Engineering and Computer Science	Fall 2014
49.	S. Majerus	PhD	Electrical Engineering and Computer Science	Spring 2014
48.	R. Wei	MS	Electrical Engineering and Computer Science	Spring 2014
47.	A. Joi	PhD	Chemical Engineering	Summer 2013
46.	D. Howe	PhD	Electrical Engineering and Computer Science	Spring 2013
45.	S. Koppaka	PhD	Biomedical Engineering	Spring 2013
44.	I. Kolb	MS	Biomedical Engineering	Fall 2012
43.	B. Hemphill	MS	Biomedical Engineering	Fall 2012
42.	A. Ongkodjojo Ong	PhD	Electrical Engineering and Computer Science	Fall 2012
41.	P. Zhao	MS	Electrical Engineering and Computer Science	Fall 2012
40.	R.C. Roberts	PhD	Electrical Engineering and Computer Science	Summer 2012
39.	N. Mahanta	PhD	Mechanical and Aerospace Engineering	Spring 2012
38.	S. Ehret	MS	Electrical Engineering and Computer Science	Spring 2012
37.	G. McCallum	PhD	Electrical Engineering and Computer Science	Summer 2011
36.	A. Kibler	PhD	Biomedical Engineering	Spring 2011
35.	K. Speer	PhD	Electrical Engineering and Computer Science	Spring 2011
34.	R. Zhang	MS	Electrical Engineering and Computer Science	Fall 2010
33.	D. Tian	MS	Electrical Engineering and Computer Science	Fall 2010
32.	D. Sabens	PhD	Chemical Engineering	Fall 2010
31.	A. Narayanaswamy	MS	Electrical Engineering and Computer Science	Spring 2010
30.	A. Iyengar	PhD	Mechanical and Aerospace Engineering	Spring 2010
29.	D. Stalter	MS	Electrical Engineering and Computer Science	Spring 2010
28.	M. Lekas	MS	Electrical Engineering and Computer Science	Summer 2009
27.	N. Mahanta	MS	Mechanical and Aerospace Engineering	Summer 2009
26.	F.-H. Lin	MS	Electrical Engineering and Computer Science	Summer 2009
25.	C.-H. Lin	MS	Electrical Engineering and Computer Science	Summer 2009
24.	F. Azizi	PhD	Electrical Engineering and Computer Science	Spring 2009
23.	T.-H. Kao	PhD	Biomedical Engineering	Spring 2009
22.	D. Howe	MS	Electrical Engineering and Computer Science	Summer 2008
21.	X. Yan	PhD	Electrical Engineering and Computer Science	Summer 2008
20.	I.E. Pehlivanoglu	MS	Electrical Engineering and Computer Science	Fall 2007
19.	J. Shen	PhD	Chemical Engineering	Summer 2007
18.	C. Anupongongarch	MS	Electrical Engineering and Computer Science	Summer 2007
17.	P. Huang	MS	Electrical Engineering and Computer Science	Spring 2007
16.	J. Guo	PhD	Electrical Engineering and Computer Science	Spring 2007
15.	V. Thelander	MS	Materials Science and Engineering	Fall 2006
14.	L. You	PhD	Electrical Engineering and Computer Science	Fall 2006



13.	X. Yu	PhD	Electrical Engineering and Computer Science	Spring 2006
12.	D.-H. Liu	MS	Electrical Engineering and Computer Science	Spring 2006
11.	L. Chen	PhD	Civil Engineering	Summer 2005
10.	M. Smiechowski	PhD	Chemical Engineering	Summer 2005
9.	M. Crane	MS	Electrical Engineering and Computer Science	Fall 2005
8.	P. Kaul	MS	Mechanical and Aerospace Engineering	Fall 2005
7.	J. Du	MS	Electrical Engineering and Computer Science	Spring 2005
6.	S. Sidhu	MS	Electrical Engineering and Computer Science	Spring 2005
5.	W.T. Chang	MS	Electrical Engineering and Computer Science	Spring 2004
4.	B. Quach	MS	Electrical Engineering and Computer Science	Summer 2003
3.	A. Swann	MS	Chemical Engineering	Summer 2003
2.	S. Lei	PhD	Electrical Engineering and Computer Science	Spring 2001
1.	H. Lu	MS	Electrical Engineering and Computer Science	Fall 2000