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Education

Ph.D. Electrical Engineering, Michigan State University, 1990.
M.S. Electrical Engineering, Michigan State University, 1987.
B.S. Electrical Engineering, Michigan State University, 1985.

Professional Experience

Professor, Electrical and Computer Engineering Department, Tufts University,
September 2006 – present

Chair, Electrical and Computer Engineering Department, Tufts
University, September 1, 2007 – August 31, 2012

Professor, Electrical and Computer Engineering Department, Northeastern
University, June 2006 – Dec. 2006

Associate Professor, Electrical and Computer Engineering Department, Northeastern
University, July 1998 – June 2006.

Assistant Professor, Electrical and Computer Engineering Department, Northeastern
University, Boston, Massachusetts. September 1993 - June 1998.

Post-Doctoral Fellow, T.J. Watson Research Center, IBM Corporation, Yorktown
Heights, New York. January 1991 - June 1993.

Research Associate, Michigan State University, East Lansing, Michigan. July 1990 -
January 1991.

Research Assistant, Michigan State University, East Lansing, Michigan. 1985 - 1990.

Engineering Intern, General Electric Company, Nela Park, Cleveland, OH. Summers
1984-5.

Honors and Awards

National Research Council's Plasma Science Committee (2007-2010)
Distinguished Research Fellow, Northeastern University (2004 - 2006)
University Excellence in Teaching Award, Northeastern University (2001)
National Science Foundation CAREER Award Recipient (1997-2001)
College of Engineering Teaching Award, Northeastern University (1997)
General Electric Foundation Master Teacher
IBM First Invention Plateau Award (1993)
IBM First Patent Application Award (1992)
IBM Graduate Studies Fellowship (1989)
Dean's Distinguished Fellowship, Michigan State University (1985-88)

Professional Societies

Member of HKN Honor Society (1994-) --Faculty Advisor to the GB Chapter (1994-99)
Senior Member of the Institute of Electrical and Electronics Engineers (1985-)
Member of the American Vacuum Society and American Institute of Physics (1991-)
Member of the American Society for Engineering Education (1998-)

Peer-Reviewed Journal Publications and Proceedings (ResearcherID: E-7359-2011)

1. "Spatially Adjustable Microplasma Generation in Periodic 3D Metamaterials Using Microwave Radiative Power Transfer," Hyunjun Kim, Stephen Parsons, and Jeffrey Hopwood, *Plasma Sources Science and Technology* **27**, 015010 (2018).
<https://doi.org/10.1088/1361-6595/aaa2ee>
2. "Millimeter wave plasma formation within 2D photonic crystal," Stephen Parsons and Jeffrey Hopwood, *IEEE Electron Device Letters*, 38(11) 1602-1605, November 2017. DOI: 10.1109/LED.2017.2750486
3. "Spatially-resolved modeling and measurements of metastable argon atoms in argon-helium microplasmas," A. Hoskinson, J. Gregorio, J. Hopwood, *J. Appl. Phys.* 121, 153302 (2017). doi: <http://dx.doi.org/10.1063/1.4981922>
4. "Microwave plasma formation within a 2D photonic crystal," S. Parsons, J. Gregório, and J. Hopwood, *Plasma Sources Science and Technology* 26 055002 (2017).
<https://doi.org/10.1088/1361-6595/aa62ed>
5. "Reconfigurable photonic crystal using self-initiated gas breakdown," J. Gregório, S. Parsons, and J. Hopwood, *Plasma Sources Science and Technology*, 26(2) 02LT03 (2017) 5pp. <http://dx.doi.org/10.1088/1361-6595/26/2/02LT03>
6. "Laser excitation dynamics of argon metastables generated in atmospheric pressure flows by microwave frequency microplasma arrays," W. T. Rawlins ; K. L. Galbally-Kinney ; S. J. Davis ; A. R. Hoskinson ; J. A. Hopwood, *Proc. SPIE 9729, High Energy/Average Power Lasers and Intense Beam Applications IX*, 97290B (March 17, 2016); doi:10.1117/12.2212888.

7. "Argon metastable production in argon-helium microplasmas," Alan R. Hoskinson, Jose Gregorio, Jeffrey Hopwood, Kristin Galbally-Kinney, Steven J. Davis, and Wilson T. Rawlins, *J. Appl. Phys.* **119**, 233301 (2016). DOI: 10.1063/1.4954077
8. "Microwave Harmonic Generation and Nonlinearity in Microplasmas" J. Gregório, S. Parsons, and J. Hopwood, *Plasma Sources Science and Technology*, **25** (2016) 035018. doi:10.1088/0963-0252/25/3/035018
9. "Plasma Generation by Dielectric Resonator Arrays" Stephen Dennison, Adam Chapman, Wei Luo, Michael Lanagan, and Jeff Hopwood, *Plasma Sources Science and Technology* **25** (2016) 03LT02 (6pp). doi:10.1088/0963-0252/25/3/03LT02
10. "Gas breakdown and plasma impedance in split-ring resonators." A. R. Hoskinson, S. Parsons, and J. Hopwood, *Eur. Phys. J. D* **70**(2), 1-5 (2016) DOI: 10.1140/epjd/e2016-60445-x4Jan2016.
11. "Deposition and Characterization of ZnO films using Microplasma at Atmospheric Pressure," H C Thejaswini, Basavaraju Agasanapura and Jeffrey Hopwood, *Thin Solid Films* **603**, 328-333 (2016). DOI: 10.1016/j.tsf.2016.02.048
12. "Electron confinement and heating in microwave-sustained argon microplasmas," A.R. Hoskinson, J. Gregorio, S. Parsons, and J. Hopwood, *Journal of Applied Physics* **117**, 163301 (2015). doi:10.1063/1.4919416
13. "Optically pumped microplasma rare gas laser," W. T. Rawlins, K. L. Galbally-Kinney, S. J. Davis, A. R. Hoskinson, J. A. Hopwood, and M. C. Heaven, *Optics Express* **23**(4), 4804-4813 (2015). DOI:10.1364/OE.23.004804
14. "Gas heating and plasma expansion in pulsed microwave-excited microplasmas" A. R. Hoskinson, A. Yared and J. Hopwood, *Plasma Sources Science and Technology* **24**, 055002 (2015). doi:10.1088/0963-0252/24/5/055002
15. "Modeling of microplasmas from GHz to THz," J. Gregorio, A.R. Hoskinson, and J. Hopwood, *J. Appl. Phys.* **118**, 083305 (2015). doi: 10.1063/1.4928468
16. "Microplasmas Ignited and Sustained by Microwaves," J. Hopwood, A.R. Hoskinson, and J. Gregorio, *Plasma Sources Sci. Technol.* **23** 064002 (2014).
17. "Metamaterials for Remote Generation of Spatially Controllable Two Dimensional Array of Microplasma," P.K. Singh, J. Hopwood, and S. Sonkusale, *Sci. Rep.* **4**, 5964; DOI:10.1038/srep05964 (2014).
18. "Laser excitation dynamics of argon metastables generated in atmospheric pressure flows by microwave frequency microplasma arrays," W. T. Rawlins, K. L. Galbally-Kinney, S. J. Davis, A. R. Hoskinson, J. A. Hopwood, *Proc. SPIE* **8962**, High Energy/Average Power Lasers and Intense Beam Applications VII, 896203 (March 3, 2014); doi:10.1117/12.2040083
19. "Deposition and Characterization of Diamond-like Carbon Films by Microwave Resonator Microplasma at One Atmosphere," H C Thejaswini, Alan R Hoskinson,

- Basavaraju Agasanapura, Michael Grunde and Jeffrey Hopwood, *Diamond and Related Materials* **48** 24-31 (2014). doi: 10.1016/j.diamond.2014.06.004
20. “Spatially-resolved spectroscopy and electrical characterization of microplasmas and switchable microplasma arrays,” A. R. Hoskinson and J. Hopwood, *Plasma Source Science and Technology*, **23** (2014) 015024.
 21. “Investigation of Instabilities in Microstrip-Sustained Microplasma,” Chen Wu and Jeffrey Hopwood, *IEEE Trans. Plasma Sci.* **42**(6), 1629-1635 (2014). DOI: 10.1109/TPS.2014.2320410
 22. “Time-resolved microplasma electron dynamics in a pulsed microwave discharge,” S. Monfared, A.R. Hoskinson, and J. Hopwood, *J. Phys. D: Appl. Phys.* **46** (2013) 425201.
 23. “Low-Voltage Switchable Microplasma Arrays Generated Using Microwave Resonators,” Alan R. Hoskinson, Pramod K. Singh, Sameer Sonkusale, and Jeffrey Hopwood, *IEEE Electron Device Letters* **34**(6), 804-806 (2013). 10.1109/LED.2013.2257659
 24. “Plasma Etching of Silk Fibroin: Experiments and Models,” Jayasri Narayanamoorthy, Konstantinos Tsioris, Fiorenzo G. Omenetto, and Jeffrey Hopwood, *Plasma Processes and Polymers* **10**(5), 451-458 (2013). doi: 10.1002/ppap.201200082
 25. “A two-dimensional array of microplasmas generated using microwave resonators,” Alan Hoskinson and Jeffrey Hopwood, *Plasma Sources Science and Technology* **21** 052002 (2012). doi:10.1088/0963-0252/21/5/052002 (2012 Highlight Article)
 26. “Instability control in microwave-frequency microplasma,” Naoto Miura and Jeffrey Hopwood, *European Physical Journal D* **66**(5), 143-152 (2012). doi: 10.1140/epjd/e2012-20739-7
 27. “Internal structure of 0.9 GHz microplasma,” Naoto Miura and Jeffrey Hopwood, *Journal of Applied Physics* **109**, 113303 (2011). doi:10.1063/1.3592269
 28. “Stable linear plasma array at atmospheric pressure,” Chen Wu, Alan R Hoskinson, Jeffrey Hopwood, *Plasma Sources Science and Technology* **20**, 045022 (2011). doi:10.1088/0963-0252/20/4/045022
 29. “Rapid transfer-based micro patterning and dry etching of silk microstructures,” Konstantinos Tsioris, Hu Tao, Mengkun Liu, Jeffrey A. Hopwood, David L. Kaplan, Richard D. Averitt, and Fiorenzo G. Omenetto, *Advanced Materials* **23**(17), 2015–2019 (2011) DOI: 10.1002/adma.201004771
 30. “Low-power microwave-generated helium microplasma for molecular and atomic spectroscopy,” Alan Hoskinson, Jeffrey Hopwood, Neil W. Bostrom, Jeffrey A. Crank and Christopher Harrison, *Journal of Analytical Atomic Spectrometry* **26**(6), 1258 – 1264 (2011) DOI: 10.1039/c0ja00239a

31. "Spatially resolved argon microplasma diagnostics by diode laser absorption," Naoto Miura and J. Hopwood, *Journal of Applied Physics* **109**(1) 013304 (2011).
doi:10.1063/1.3531557
32. "Microplasmas: scientific challenges & technological opportunities," K. H. Becker, H. Kersten, J. Hopwood and J. L. Lopez, *The European Physical Journal D - Atomic, Molecular, Optical and Plasma Physics, editorial*, **60**(3) 437-439, (2010).
DOI: 10.1140/epjd/e2010-00231-4
33. "Circular array of stable atmospheric pressure microplasmas," C. Wu, Z.-B. Zhang, A. R. Hoskinson, J. Hopwood, *European Physical Journal D*, **60**(3), 621-625 (2010).
DOI: 10.1140/epjd/e2010-00211-8
34. "Argon microplasma diagnostics by diode laser absorption," N. Miura, J. Xue, and J. Hopwood, *IEEE Trans. Plasma Science* **38**, 2458-64 (2010).
35. "Linear arrays of stable atmospheric pressure microplasmas," Zhi-Bo Zhang and Jeffrey Hopwood, *Appl. Phys. Lett.* **95**, 161502 (2009).
36. "Metastable Helium Density Probe for Remote Plasmas," Naoto Miura and Jeffrey Hopwood, *Rev. Sci. Instruments* **80**(11), 113502 (2009).
37. "Microwave Frequency Effects on Microplasma," J. Xue and J. Hopwood, *IEEE Transactions on Plasma Science*, Vol. 37(6), 816-822 (2009).
38. "Microplasma Trapping of Particles," J. Xue and J. Hopwood, *IEEE Transactions on Plasma Science*, Vol. 35(5), 1574-1579 (2007).
39. "On-wafer Tunable Deposition Rates using Ionized Physical Vapor Deposition," D. Mao, L. Wang, and J. Hopwood, *Plasma Processes and Polymers*, Vol. 4, 19-26 (2007).
40. "A microfabricated atmospheric-pressure microplasma source operating in air," J. Hopwood, F. Iza, S. Coy, and D. Fenner, *Journal of Physics D: Applied Physics*, Vol. 38, 1698-1703 (2005).
41. "Split-ring Resonator Microplasma: Microwave Model, Plasma Impedance and Power Efficiency," F. Iza and J. Hopwood, *Plasma Sources - Science and Technology (Institute of Physics)*, Vol.14, 397-406 (2005).
42. "Self-organized filaments, striations and other non-uniformities in non-thermal atmospheric microwave excited microdischarges," Felipe Iza and Jeffrey A. Hopwood, *IEEE Transactions on Plasma Science*, Vol. 33(2) 306-307 (2005).
43. "Physical mechanisms for anisotropic plasma etching of cesium iodide," Xiaoji Yang and Jeffrey A. Hopwood, *Journal of Applied Physics*, Vol. 96(9), 4800-4806 (2004).
44. "Ultrahigh frequency microplasmas from 1 Pascal to 1 Atmosphere," J. Hopwood and F. Iza, *Journal of Analytical Atomic Spectrometry*, Vol. 19, 1145-1150 (2004).

45. "Ionized Physical Vapor Deposition of Titanium Nitride: A Deposition Model," D. Mao and J. Hopwood, *Journal of Applied Physics*, Vol. 96(1), 820-828 (2004).
46. "Rotational, vibrational, and excitation temperatures of a microwave-frequency microplasma," F. Iza and J. Hopwood, *IEEE Transactions on Plasma Science*, Vol. 32(2), 498-504 (2004).
47. "Application-driven development of plasma source technology," J. Hopwood and T. Mantei, *Journal of Vacuum Science and Technology A*, Vol. 21(5) pp. S139-44, (2003) (*invited, 50th Anniversary Special Issue*).
48. "Langmuir probe diagnostics of a microfabricated inductively coupled plasma-on-a-chip," O. Minayeva and J. Hopwood, *Journal of Applied Physics*, Vol. 94(5), pp. 2821-28, (2003).
49. "Microfabricated inductively coupled plasma-on-a-chip for molecular SO₂ detection: a comparison between global model and optical emission spectrometry," O. Minayeva and J. Hopwood, *Journal of Analytical Atomic Spectrometry* (Royal Society of Chemistry), Vol. 18, 856-863 (2003).
50. "Low-power microwave plasma source based on a microstrip split-ring resonator," F. Iza and J. Hopwood, *IEEE Transactions on Plasma Science*, Vol. 31(4), pp. 782-787 (2003).
51. "Emission spectroscopy using a microfabricated, inductively coupled plasma-on-a-chip," O. Minayeva and J. Hopwood, *Journal of Analytical Atomic Spectrometry* (Royal Society of Chemistry), Vol. 17(9), 1103-1107 (2002).
52. "Influence of operating frequency and coupling coefficient on the efficiency of microfabricated inductively coupled plasma sources," F. Iza and J. Hopwood, *Plasma Sources Science and Technology* 11, 229-235 (2002). {17}
53. "Plasma Etching of Cesium Iodide," X. Yang, J. Hopwood, S. Tipnis, V. Nagarkar, and V. Gaysinskiy, *Journal of Vacuum Science and Technology A*, 20(1), 132-137 (2002).
54. "Ionized Physical Vapor Deposition of Titanium Nitride: A Global Plasma Model," K. Tao, D. Mao, and J. Hopwood, *Journal of Applied Physics*, 91(7), 4040-4048 (2002).
55. "Ionized Physical Vapor Deposition of Titanium Nitride: Plasma and Film Characterization," D. Mao, K. Tao, and J. Hopwood, *Journal of Vacuum Science and Technology. A*, 20(2) 379-387 (2002).
56. "Fabrication and Characterization of a Micromachined 5 mm Inductively Coupled Plasma Generator," J. Hopwood, O. Minayeva, and Y. Yin, *Journal of Vacuum Science and Technology B*, 18(5), 2446-51 (2000).

57. "A Microfabricated Inductively Coupled Plasma Generator," J. Hopwood, *IEEE/ASME Journal of Microelectromechanical Systems* 9(3), 309-13 (2000).
58. "Miniaturized Inductively Coupled Plasma Sources," Y. Yin, J. Messier, and J. Hopwood, *IEEE Transactions on Plasma Science* 27(5), 1516-24 (1999).
59. "Ionized Titanium Deposition into High Aspect Ratio Vias and Trenches," G. Zhong and J. Hopwood, *Journal of Vacuum Science and Technology B* 17(2), 405-409 (1999).
60. "Ionized Physical Vapor Deposition of Integrated Circuit Interconnects," J. Hopwood, *Physics of Plasmas* 5(5), 1624-1631 (1998). (Invited) {46}
61. "Radial uniformity of an external-coil ionized physical vapor deposition source," M. Dickson, G. Zhong, and J. Hopwood, *Journal of Vacuum Science and Technology B* 16(2), 523-531 (1998).
62. "Creating 3D Circuits Using Transferred Films," P. Sailer, P. Singhal, J. Hopwood, D. Kaeli, P.M. Zavracky, K. Warner and D.P. Vu, *IEEE Circuits and Devices* 13(6), 27-30 (1997).
63. "Axially-resolved study of highly ionized physical vapor deposition," M. Dickson and J. Hopwood, *Journal of Vacuum Science and Technology A* 15(4), 2307-12 (1997).
64. "Quenching of electron temperature and electron density in ionized physical vapor deposition," M. Dickson, F. Qian, and J. Hopwood, *Journal of Vacuum Science and Technology A* 15(2), 340-4 (1997).
65. "Inductively coupled plasma for polymer etching of 200 mm wafers," N. Forgotson, V. Khemka, and J. Hopwood, *Journal of Vacuum Science and Technology B* 14(2), 732-7 (1996).
66. "Mechanisms for highly ionized magnetron sputtering," J. Hopwood and F. Qian, *Journal of Applied Physics* 78 (2), 758-65, 15 July 1995.
67. "Planar rf induction plasma coupling efficiency," J. Hopwood, *Plasma Sources Science and Technology* 3, 460-4 (1994).
68. "Deposition of diamond-like carbon in a planar rf induction plasma," D.L. Pappas and J. Hopwood, *J. of Vacuum Science and Technology A* 12(4), 1576-82 (1994).
69. "Metal ion deposition from ionized magnetron sputtering discharge," S.M. Rossnagel and J. Hopwood, *J. of Vacuum Science and Technology B* 12(1), 449-53 (1994).
70. "Magnetron sputter deposition with high levels of metal ionization," S.M. Rossnagel and J. Hopwood, *Applied Physics Letters* 63(24), 3285-7, 13 Dec 1993.
71. "Ion bombardment energy distributions in a radio frequency induction plasma," J. Hopwood, *Applied Physics Letters* 62(9), 940-2, 1 March 1993.

72. "Electromagnetic fields in an rf induction plasma," J. Hopwood, C.R. Guarnieri, S.J. Whitehair, and J.J. Cuomo, *Journal of Vacuum Science and Technology A* 11(1), 147-51, (1993).
73. "Langmuir probe measurements in an rf induction plasma," J. Hopwood, C.R. Guarnieri, S.J. Whitehair, and J.J. Cuomo, *Journal of Vacuum Science and Technology A* 11(1), 152-6, (1993).
74. "Review of inductively coupled plasmas for plasma processing," J. Hopwood, *Plasma Sources Science and Technology* 1(2), 109-116, (1992), *invited*.
75. "Neutral gas temperatures in a multipolar electron cyclotron resonance plasma," J. Hopwood and J. Asmussen, *Applied Physics Letters* 58(22), 2473-5, 3 June 1991.
76. "Charged particle densities and energy distributions in a multipolar ECR microwave plasma etching source," J. Hopwood, D.K. Reinhard, and J. Asmussen, *Journal of Vacuum Science and Technology A* 8(4), 3103-12, Jul/Aug 1990.
77. "Electric fields in a microwave-cavity electron-cyclotron-resonant plasma source," J. Hopwood, R. Wagner, D.K. Reinhard, and J. Asmussen, *Journal of Vacuum Science and Technology A*, 8(3), 2904-8, May/June 1990.
78. "A 915 MHz/2.45 GHz ECR plasma source for large area ion beam and plasma processing," J. Asmussen, J. Hopwood, and F.C. Sze, *Review of Scientific Instruments* 61(1), 250-2, Jan/Feb 1990.
79. "Experimental conditions for uniform anisotropic etching of silicon with a microwave ECR plasma," J. Hopwood, D.K. Reinhard and J. Asmussen, *Journal of Vacuum Science and Technology B* 6(6), 1896-9, Nov/Dec 1988.
80. "Plasma etching with a microwave cavity plasma disk source," J. Hopwood, M. Dahimene, D.K. Reinhard, and J. Asmussen, *Journal of Vacuum Science and Technology B* 6(1), 268-71, Jan/Feb 1988.

Literature Citations

Google Scholar: 5300⁺ citations (*h-index*: 35)
 Web of Science: 3200⁺ (*h-index*: 28)

Book

1. *Ionized Physical Vapor Deposition*, J. Hopwood, *ed. and co-author* (Academic Press, San Diego, 2000), ISBN 0-12-533027-8.

Book Chapters

1. "Plasma Assisted Deposition," J. Hopwood, in *Handbook of Nanophase Materials*, A. Goldstein, *ed.*, Chapter 6, pp. 141-197 (Marcel Dekker, New York, 1997). ISBN 0-8247-9469-9

2. "Plasma Physics," J. Hopwood, in *Ionized Physical Vapor Deposition*, Chapter 7, p. 181-207 (Academic Press, San Diego, 2000). ISBN 0-12-533027-8.
3. "The Role of Ionized Physical Vapor Deposition in Integrated Circuit Fabrication," J. Hopwood, in *Ionized Physical Vapor Deposition*, Chapter 1, pp. 1-7 (Academic Press, San Diego, 2000). ISBN 0-12-533027-8.

Reports

"Plasma: at the frontier of scientific discovery," Report of the Panel on Frontiers of Plasma Science, U.S. Department of Energy, Office of Fusion Energy Sciences, 2017.

U.S. Patents

1. "Resonant radio frequency wave coupler apparatus using higher modes," J. Asmussen and J. Hopwood, U.S. Patent 5,081,398 (January 12, 1992).
2. "Radio frequency induction plasma processing system utilizing a uniform-field coil," J.J. Cuomo, C.R. Guarnieri, J. Hopwood, and S.J. Whitehair, U.S. Patent 5,280,154 (January 18, 1994).
3. "Apparatus for enhanced inductive coupling to plasmas with reduced sputter contamination," J.J. Cuomo, C.R. Guarnieri, and J. Hopwood, U.S. Patent 5,433,812 (July 18, 1995).
4. "Method for enhanced inductive coupling to plasmas with reduced sputter contamination," J.J. Cuomo, C.R. Guarnieri, and J. Hopwood, U.S. Patent 5,622,635 (April 22, 1997).
5. "Monolithic miniaturized inductively coupled plasma source," J. Hopwood, U.S. Patent No. 5,942,855 (August 24, 1999).
6. "Method of coating edges with diamond-like carbon," J. Hopwood and D. L. Pappas, U.S. Patent 6,077,572 (June 20, 2000). International Patent Application PCT/US98/12270.
7. "Low power plasma generator," J. Hopwood and F. Iza, US Patent 6,917,165, (July 12, 2005).
8. "Method of preparing electrical contacts used in switches," R. Morrison, N. McGruer, and J. Hopwood, US Patent 7,256,669 (August 14, 2007).
9. "Nano-Particle Trap Using a Microplasma," J. Hopwood, U.S. Patent 7,728,253 (June 1, 2010).
10. "Microplasma Generator and Methods Therefor," J. Hopwood, U.S. Patent 9,006,972. (April 14, 2015) International Publication Number WO 2010/129277 A2.

11. "Microplasma Generating Array," Hopwood; Jeffrey, Wu; Chen, Hoskinson; Alan R., Sonkusale; Sameer, U.S. Patent 9,460,884. (October 4, 2016) International Publication Number WO 2013/016497 A2.
12. "Optically pumped microplasma," Rawlins; W. Terry, Davis; Steven J., Galbally-Kinney; Kristin, Hopwood; Jeffrey, Hoskinson; Alan, U.S. Patent 9,647,414 (May 9, 2017).

International Patents

13. "High frequency induction plasma treatment system and method," J.J.Cuomo, C.R. Guarnieri, J. Hopwood, and S.J. Whitehair, Japanese Patent JP5275383A2, (Issued October 22, 1993).
14. "Improved resonant radio frequency wave coupler apparatus using higher modes," J. Asmussen and J. Hopwood, European Patent EP 0 450 061 B1, (Issued January 3, 1996).
15. "Radio frequency induction plasma processing system utilizing a uniform-field coil," J.J.Cuomo, C.R. Guarnieri, J. Hopwood, and S.J. Whitehair, European Patent EP 0 553 704 B1 (Issued April 3, 1996).
16. "Plasma device and Plasma Processing Method," J.J. Cuomo, C.R. Guarnieri, J. Hopwood, and S.J. Whitehair, Japanese Patent JP8153702A2 (Issued June 11, 1996).
17. "Apparatus and method for enhanced inductive coupling to plasmas with reduced sputter contamination," J.J. Cuomo, C.R. Guarnieri, and J. Hopwood, European Patent EP 0 607 797 B1 (Issued June 18, 1997).

Invited Conference Papers and Seminars

1. "Peering inside microplasmas sustained by microwaves, millimeter waves and beyond," J. Hopwood, 69th Gaseous Electronics Conference, Bochum, Germany, October 10-14, 2016.
2. "Microplasmas: a lot of physics in a very small package," Plasma Science and Fusion Center Symposium, MIT, Cambridge MA, December 13, 2013.
3. "Microplasma generation by pulsed and continuous microwave power," J. Hopwood, 4th International Symposium on Plasma Nanoscience, Asilomar CA, August 25-29, 2013.
4. "Microplasmas in the GHz: Why Bother?," J. Hopwood, Seventh International Workshop on Microplasmas, Beijing, China, May 19-24, 2013.
5. "Microplasmas excited by microwave frequencies," J. Hopwood, MIPSE University of Michigan, Ann Arbor, Michigan, January 30, 2013.

6. "Cold atmospheric microplasma arrays for processing of flexible materials," Jeffrey Hopwood, Alan Hoskinson, Chen Wu, Naoto Miura, AVS International Symposium, Tampa, FL, October 29-November 1, 2012.
7. "One- and Two-dimensional Microplasma Arrays," Jeffrey Hopwood, Alan Hoskinson, Chen Wu, Naoto Miura, SCiX, Kansas City, MO, October 1, 2012. Invited Session.
8. "Spatially-resolved diagnostics of 1-GHz microdischarges," J. Hopwood and N. Miura, invited talk, 64th Gaseous Electronics Conference, Salt Lake City, UT, November 15-18, 2011.
9. "Can microplasma really be useful for plasma processing," J. Hopwood, invited talk, 18th International Colloquium on Plasma Processes, Nantes, France, July 5-8, 2011
10. "Atmospheric Processing Enabled by Microplasma Arrays," J. Hopwood, SEMICON Korea 2011, Invited talk S.4, Seoul Korea, January 27, 2011.
11. "High-density Plasmas: Past, Present, and Future," J. Hopwood, Invited Seminar, Seoul National University, January 28, 2011.
12. "Cold microplasmas at one atmosphere: Simulation and Characterization," American Physical Society, 51st Annual Meeting of the Division of Plasma Physics, Invited Talk GI2.4, Atlanta, Georgia, November 3, 2009.
13. "Microplasmas at one atmosphere: Physics and applications," J. Hopwood, Colloque de Plasma-Quebec, University of Montreal, Quebec, May 25-26, 2009.
14. "Frequency scaling of microplasmas from 450 MHz to 1.8 GHz," J. Hopwood and J. Xue, Fundamentals and Applications of Microplasmas (IWM-5), San Diego, CA, March 1-6, 2009.
15. "Developing and Applying Micro ICP Systems," 2008 Winter Conference on Plasma Spectrochemistry, Temecula, CA, January 10, 2008
16. "Developing Microplasmas for Applications in Analytical Chemistry," Society of Applied Spectroscopy, New England Chapter, Natick, MA, December 11, 2007.
17. "Trapping and Analysis of Nanoparticles using Microplasmas Powered by Cell Phone Technology," J. Hopwood and Jun Xue, Pittsburgh Conference on Analytical Chemistry (PITTCON 2007), Chicago, Illinois, February 28, 2007.
18. "How Plasma is Changing the World: The Microelectronic Revolution," J. Hopwood, Presentation to Members of the US Congress and Staff, B-338 Rayburn Office Building, Washington, DC. Invited by the Coalition for Plasma Science, January 30, 2007.
19. "Microwave Excited Microplasmas for Sensors and Chemical Analysis," J. Hopwood, 2006 Gordon Research Conference on Plasma Processing Science, Mount Holyoke College, South Hadley, Massachusetts, July 16-21, 2006.

20. "Microplasma-on-a-chip excited by UHF and microwave frequency", J. Hopwood, Proceedings of the 6th International Conference on Reactive Plasmas/23rd Symposium on Plasma Processing, pg. 15-16, Matsushima/Sendai, Japan, January 24-27, 2006.
21. "Operating Analytical Plasmas at the Sub-watt Level," J. Hopwood, Pittsburgh Conference on Analytical Chemistry (PITTCON 2006), Orlando Florida, presented March 12-16, 2006.
22. "Microplasma Physics and Applications," J. Hopwood, MIT Plasma Science and Fusion Center Seminar Series, Cambridge, Massachusetts, February 18, 2005.
23. "Integrating Microplasmas into Microanalytical Systems," J. Hopwood, Pittsburgh Conference on Analytical Chemistry (**PITTCON 2005**), Orlando, Florida, February 28-March 4, 2005.
24. "Inductively coupled and capacitively coupled UHF microdischarges," J. Hopwood, **2nd International Workshop on Microplasmas**, Stevens Institute of Technology, Hoboken, NJ, October 6-8, 2004.
25. "Challenges for Ionized Physical Vapor Deposition," J. Hopwood and D. Mao, **IEEE International Conference on Plasma Science**, Baltimore, Maryland, June 28-July 1, 2004.
26. "Microfabricated Inductively Coupled and Capacitively Coupled Plasma Generators," Jeffrey A. Hopwood, **PITTCON 2004**, Symposium on Microplasma: The Next Frontier of Plasma Spectrochemistry, Chicago, Illinois, March 7-12, 2004.
27. "Inductively Coupled and Capacitively Coupled Microdischarges Operating in the UHF Band," Jeffrey A. Hopwood, **2004 Winter Conference on Plasma Spectrochemistry**, Ft. Lauderdale, Florida, January 5-11, 2004.
28. "Microplasma Discharges," J. Hopwood, presented at the **National Academy of Sciences**, Plasma Science Committee, Beckman Conference Center, Irvine, California, September 27, 2003
29. "Prospects and Progress for Ionized Physical Vapor Deposition," J. Hopwood, presented to the Workshop on Sputtering at the **2003 International Symposium of the AVS**, Baltimore, Maryland, November 2, 2003.
30. "Comparison of low power, portable plasma generators," J. Hopwood, F. Iza and O. Minayeva, **Proceedings of the Seventh International Symposium on Sputter and Plasma Processes**, pp. 318-320, Kanazawa Institute of Technology, Kanazawa, Japan, June 11-13, 2003, ISSN 0917-2440.
31. "Microplasma Generation: Design, Performance and Application," J. Hopwood, F. Iza, and O. Minayeva, **Fourth International Conference on Microelectronics and Interfaces**, Santa Clara, California, March 3-6, 2003.
32. "Design and Microfabrication of Miniature ICP Sources," J. Hopwood, The Third International Workshop on Basic Aspects of Non-equilibrium Plasmas Interacting with

- Surfaces (**BANPIS-2003**), Awaji Yumebutai International Conference Center, Hyogo, Japan, February 7-8, 2003.
33. "Micromachined Inductively Coupled Plasma Generators: Applications and Scaling Laws," J. Hopwood, **24th Dry Process Symposium**, University of Tokyo, Tokyo, Japan, October 10-11, 2002, *Proceedings of the International Symposium on Dry Process*, p. 63-67 (Instit. of Electrical Engr. of Japan, 2002). ISBN 4-9900915-5-8.
 34. "Microfabricated Inductively Coupled Plasma Generator as an Optical Emission Source," J. Hopwood, **29th FACCS** (Federation of Analytical Chemistry and Spectroscopy Societies), Providence, Rhode Island, October 13-17, 2002.
 35. "Microfabricated inductively coupled plasma for microspectrometers," J. Hopwood, **NY-Nanotech 2002**, Rensselaer Polytechnic Institute, Troy, New York, August 6-8, 2002.
 36. "Microfabricated ICP Discharges," J. Hopwood, **Gordon Conference on Plasma Processing Science**, Tilton, New Hampshire, July 21-26, 2002.
 37. "A microfabricated inductively coupled plasma source and its applications," J. Hopwood, **16th Europhysics Conference on Atomic & Molecular Physics of Ionized Gases / 5th International Conference on Reactive Plasmas (ESCAMPIG-16 / ICRP-5 Joint Meeting)**, Grenoble, France, July 14-18, 2002.
 38. "Micro ICP Discharges," J. Hopwood, **2002 Winter Conference on Plasma Spectrochemistry**, Scottsdale, Arizona, January 6-12, 2002.
 39. "Plasma-on-a-chip: Microfabricated plasma generators," J. Hopwood, **Center for Plasma Aided Manufacturing Seminar Series**, University of Wisconsin-Madison, Madison, WI, February 23, 2001.
 40. "A Surface-Micromachined Miniature Inductively Coupled Plasma Generator," J. Hopwood, **47th International Symposium of the American Vacuum Society**, Boston, MA, October 2-6, 2000. Conference Abstracts p. 24
 41. "Microfabrication of Inductively Coupled Plasma Reactors," J. Hopwood and Y. Yin, **IEEE International Conference on Plasma Science**, New Orleans, LA, June 4-8, 2000. IEEE Conference Record Abstracts ISBN 0-7803-5983-6, p. 151.
 42. "What are the Limits of Ionized Physical Vapor Deposition?" J. Hopwood, **Materials Research Society Spring Meeting** 2000, San Francisco, CA, April 24-28, 2000.
 43. "Extending Sputtering Technology to ULSI Circuits using Ionized Physical Vapor Deposition," J. Hopwood, **Upstate New York Chapter of the American Vacuum Society Session on Thin Film Processing Technology**, State University of New York-Albany, September 16-18, 1998.
 44. "Ionized Physical Vapor Deposition of Ti and Al," J. Hopwood and G. Zhong, presented at the **1998 IEEE International Conference on Plasma Science**, Raleigh, North Carolina, June 1, 1998. IEEE Conference Record Abstracts ISBN 0-7803-4793-5, p. 143.

45. "Ionized Physical Vapor Deposition of ULSI Integrated Circuit Interconnects," J. Hopwood, presented at the **Engineering Research Center for Plasma Aided Manufacturing Seminar Series**, University of Wisconsin-Madison, Madison, Wisconsin, April 17, 1998.
46. "Challenges for Plasma Processing of Deep Submicron Integrated Circuits," presented at the **MIT Plasma Science and Fusion Center's Spring Seminar Series**, Cambridge, Massachusetts, March 6, 1998.
47. "Plasma-based Deposition of Metal Interconnects for Ultra-large Scale Integrated Circuits," J. Hopwood, *Bull. Am. Phys. Soc.* **42**(10), 2026 (1997). Presented at the **Division of Plasma Physics Meeting**, American Physical Society, Pittsburgh, PA, November 17-21, 1997. (Invited Tutorial)
48. "Physics of Ionized Physical Vapor Deposition," J. Hopwood, presented at the **44th National Symposium of the American Vacuum Society**, San Jose, CA, October 20-24, 1997.
49. "Ionized Sputter Deposition," J. Hopwood, **Symposium on ULSI Multilevel Interconnection Process Technology**, Tokyo, Japan, July 5, 1996. Proceedings of the Japan Technology Transfer Association, *Sputtering and Plasma Processes*, Vol. 11, No. 3, pg. 51-53, (1996).
50. "Inductively coupled plasma and ion sources: History and state-of-the-art," J. Hopwood, **1994 IEEE International Conference on Plasma Science**, Santa Fe, New Mexico, June 6-8, 1994, IEEE Conference Record Abstracts, ISBN 0-7803-2006-9, pp. 84-85.
51. "High density reactors for large-area plasma processing," J. Hopwood, **Plasma Physics Research Institute Seminar**, Lawrence Livermore National Laboratory, Livermore, California, August 31, 1993.
52. "Novel reactive etch processing," J. Hopwood, The American Vacuum Society **Topical Symposium on Advances in Sputter and Plasma Processing**, Pittsburgh, PA, June 9-11, 1992.

Selected Conference Papers, Symposia, and Proceedings (Contributed)

1. "Self-initiated microwave plasma formation and interaction within a 2D photonic crystal," Stephen Parsons, José Gregório, and Jeffrey Hopwood. 2017 IEEE International Conference on Plasma Science, May 22-25, 2017, Atlantic City, New Jersey, USA
2. "Resonant characteristics in 7x7 microwave plasma discharge array based on microstrip split ring resonator," Hyunjun Kim, Stephen Parsons, and Jeffrey Hopwood. 2017 IEEE International Conference on Plasma Science, May 22-25, 2017, Atlantic City, New Jersey, USA.

3. "Studying permittivity and electric field for plasma generation by dielectric resonator arrays," S. Dennison, J. Hopwood, A. Chapman, 2017 IEEE International Conference on Plasma Science, May 22-25, 2017, Atlantic City, New Jersey, USA.
4. "Gas Breakdown and Plasma Generation by Dielectric Resonator Arrays," Jeffrey Hopwood, Stephen Dennison, Adam Chapman, Wei Luo, and Michael Lanagan, 2016 IEEE International Conference on Plasma Science, Banff, Canada (June 2016).
5. "Argon microplasmas from 0.5 to 14 GHz," A.R. Hoskinson, J. Gregório, S. Parsons, and J. Hopwood, 2015 International Workshop on Microplasma, Newark, NJ (May 2015)
6. "Electron confinement and heating in microwave-sustained microplasmas," J. Gregório, A.R. Hoskinson, S. Parsons, and J. Hopwood, 2015 International Workshop on Microplasma, Newark, NJ (May 2015).
7. "Microplasma deposition of challenging thin films at atmospheric pressure," J. Hopwood, HC Thejaswini, 2015 Gaseous Electronics Conference, Honolulu, HI (2016).
8. "Study of microplasmas from GHz to THz," J. Gregorio, A.R. Hoskinson, S. Parsons, and J. Hopwood, 2015 Gaseous Electronics Conference, Honolulu, HI (2015)
9. "Metamaterials for Wireless Generation of Microplasma Array," P Singh, J. Hopwood, S. Sonkusale, META15, 6th International Conference on Metamaterials, Photonic Crystals and Plasmonics, New York, NY August 4-7, 2015.
10. "Optically Pumped Microplasma Rare-Gas Laser," W.T. Rawlins, K.L. Galbally-Kinney, S.J. Davis, A.R. Hoskinson, J.A. Hopwood, M.C. Heaven, 17th Annual Directed Energy Symposium, Anaheim, CA, March 2015.
11. "Ignition dynamics in microwave-generated microplasmas," A. R. Hoskinson, A. Yared, and J. Hopwood, IEEE International Conference on Plasma Science, Washington, DC, no. 3P-49, May 2014.
12. "Laser Excitation Dynamics of Argon Metastables Generated in Atmospheric Pressure Flows by Microwave Frequency Microplasma Arrays," W.T. Rawlins, K.L. Galbally-Kinney, S.J. Davis, A.R. Hoskinson, J.A. Hopwood, SPIE Photonics West 2014, San Francisco CA, 2 February 2014.
13. "Microplasma Based Harmonic Generation," Stephen Parsons, Alan Hoskinson, and Jeffrey Hopwood, 66th Gaseous Electronics Conference, Princeton, NJ USA, Sept 30- Oct 4, 2013.
14. "Investigation of instabilities in microstrip-sustained microplasma," Chen Wu and Jeffrey Hopwood, 66th Gaseous Electronics Conference, Princeton, NJ USA, Sept 30- Oct 4, 2013.
15. "Time-resolved microplasma excitation temperature in a pulsed microwave discharge," Jeffrey Hopwood, Shabnam Monfared, and Alan R. Hoskinson, 66th Gaseous Electronics Conference, Princeton, NJ USA, Sept 30- Oct 4, 2013.

16. "Spectroscopic Characterization of a Two-Dimensional Array of Microwave-Generated Microplasmas." A. R. Hoskinson, J. Hopwood, IEEE Pulsed Power and Plasma Science - 2013, San Francisco, CA, June 16-21, 2013.
17. "A Logic-Controllable Array of High-Density Microplasmas," A. R. Hoskinson, P. K. Singh, S. Sonkusale, J. Hopwood, IEEE Pulsed Power and Plasma Science - 2013, San Francisco, CA, June 16-21, 2013.
18. "Generation of Energetic Species by RF Microplasma Arrays," W.T. Rawlins, S. Lee, D.B. Fenner, S.J. Davis, A.R. Hoskinson, S. Monfrated, J.A. Hopwood, 65th Gaseous Electronics Conference, Austin, Texas, October 22-25, 2012.
19. "Film deposition using a non-thermal microwave-generated microplasma at atmospheric pressure," Alan R. Hoskinson, Michael Grunde, Mical Nobel, and Jeffrey Hopwood, IEEE International Conference on Plasma Science, Edinburgh, UK July 8-12, 2012.
20. "Two-dimensional arrays of microwave-generated microplasmas," A. R Hoskinson, C. Wu, and J. Hopwood, IEEE International Conference on Plasma Science, Edinburgh, UK July 8-12, 2012.
21. "Generation of Energetic Species by RF Microplasma Arrays," W.T. Rawlins, S. Lee, D.B. Fenner, S.J. Davis, J.A. Hopwood, A.R. Hoskinson, Gordon Research Conference on Plasma Processing Science, Smithfield, RI, July 22-27, 2012.
22. "Plasma Electron and Photon Coupling in Linear Microplasma Arrays," C. Wu, A. Hoskinson, J. Hopwood, Gordon Research Conference on Plasma Processing Science, Smithfield, RI, July 22-27, 2012.
23. A. Hoskinson, C. Wu and J. Hopwood, "Electrical Modeling of Strongly-Coupled Microstrip Resonator Arrays for Microplasma Generation," IEEE International Conference on Plasma Science, Chicago, IL, June 26-30, 2011.
24. N. Miura and J. Hopwood, "Atmospheric argon microplasma diagnostics by spatially resolved optical absorption spectroscopy," 6th International Workshop on Microplasmas, Paris, France, April 3-6, 2011.
25. "Scaling microplasma arrays for material processing," Chen Wu, Naoto Miura, Jun Xue, Alan Hoskinson, Michael Grunde, Kevin Morrissey, and Jeffrey A. Hopwood, 2010 Gaseous Electronics Conference, Paris France, October 4-8, 2010.
26. "Argon Microplasma Diagnostics by Diode Laser Absorption," N. Miura, J. Xue, and J. Hopwood, AVS International Symposium (PS2-TuM-10), San Jose, CA, November 10, 2009.
27. "Linear Microplasma Array using Strongly-Coupled Resonators," J. Hopwood and Z. Zhang, 2009 AVS International Symposium (PS2-TuM-12), San Jose, CA, November 10, 2009.

28. "Coupled Mode Theory: A Path to Stable Microplasma Arrays," J. Hopwood and Z. Zhang, 2010 Gaseous Electronics Conference (XF1), Saratoga Springs, NY, October 23, 2009
29. "Argon microplasma diagnostics by diode laser absorption," N. Miura, J. Xue, and J. Hopwood, 2010 Gaseous Electronics Conference (FT3), Saratoga Springs, NY, October 20, 2009
30. "The Effect of Excitation Frequency on Microplasmas," J. Xue and J. Hopwood, 2008 AVS Symposium, Boston, MA October 19-24, 2008.
31. "Metastable Probe in Remote Helium Plasma," N. Miura and J. Hopwood, 2008 AVS Symposium, Boston, MA, October 19-24, 2008
32. "A high aspect ratio parylene micro-stencil for large scale micro-patterning for MEMS applications," Selvapraba Selvarasah, Shih-Hsien Chao, Chia-Ling Chen, Daisheng Mao, Jeffrey Hopwood, Stephen Ryley, Ahmed Busnaina, Mehmet R. Dokmeci, Proceedings of the SEM Annual Conference and Exposition on Experimental and Applied Mechanics 2007 Volume 1, 2007, Pages 228-234.
33. "A High Aspect Ratio, Flexible, Transparent and Low-Cost Parylene-C Shadow Mask Technology for Micro Patterning Applications," S. Selvarasah, S. H. Chao, C. L. Chen, D. Mao, J. Hopwood, S. Ryley, A. Khademhosseini, A. Busnaina, and M. R. Dokmeci, Proceedings of the 14th International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers '07), Lyon, France, June 10-14 2007, p. 533-536 (40% acceptance rate) {2}
34. "Particle Trapping by Dusty Microplasmas," J. Hopwood and Jun Xue, 2006 IEEE International Conference on Plasma Science, Traverse City, Michigan, June 4-8, 2006. IEEE Conference Record (ISBN1-4244-0124-0), p. 296.
35. "Microplasma Trapping of Nanoparticles," J. Hopwood and J. Xue, Proceedings of the 3rd International Workshop on Microplasmas, Griefswald, Germany, May 9-11, 2006. pp 48-51. *Acceptance rate for short lectures: 20%*
36. "Atmospheric Microplasma-on-a-chip Operating in Air," J. Hopwood and F. Iza, AVS 52nd International Symposium, Boston, MA, November 2, 2005.
37. "Frequency and Dimensional Scaling of Microplasmas Generated by Microstrip Transmission Lines," I.Rodriquez, J. Xue, and J. Hopwood, AVS 52nd International Symposium, Boston, MA, November 1, 2005.
38. "Atmospheric Microplasma Source Based on a Microstrip Split-Ring Resonator," F. Iza and J. Hopwood, 2nd International Workshop on Microplasmas, Stevens Institute of Technology, Hoboken, NJ, October 6-8, 2004.
39. "Atmospheric Microplasma Source Based on a Microstrip Split-ring Resonator," Iza F. and Hopwood J., *Gordon Research Conference on Plasma Processing Science*, Plymouth, NH, August 15-20, 2004.

40. "Low-power microwave plasma source for microsystems," F. Iza and J. Hopwood, presented at the 30th IEEE International Conference on Plasma Science, Cheju, Korea, June 2-5, 2003.
41. "Scaling of Microwave Plasma Sources," J. Hopwood, NSF Grantees Conference, Jan. 6-9, 2003, Birmingham, Alabama.
42. "Frequency, pressure, and dimensional scaling of microfabricated inductively coupled plasma sources," F. Iza and J. Hopwood, presented at the 29th IEEE International Conference on Plasma Science, Banff, Canada, May 26-30, 2002.
43. "Plasma Etching of Cesium Iodide," X. Yang, J. Hopwood, S. Tipnis, V. Nagarkar, and V. Gaysinskiy, presented at the AVS 48th Symposium, San Francisco, CA, October 28-November 2, 2001. Session PS2-TuM11.
44. "Efficiency of Microfabricated ICP Sources," F. Iza and J. Hopwood, presented at the AVS 48th Symposium, San Francisco, CA, October 28-November 2, 2001. Session PS1+MM-MoM4.
45. "Optical Emission Detection of SO₂ by Microfabricated Inductively Coupled Plasma (mICP)," O. Minayeva and J. Hopwood, presented at the 54th Gaseous Electronics Conference, State College, PA, October 9-12, 2001. Session JWP.074.
46. "Anisotropic Etching of Cesium Iodide," J. Hopwood and Xiaoji Yang, presented at the 28th IEEE International Conference on Plasma Science, Las Vegas, Nevada, June 17-22, 2001. IEEE Conference Record Abstracts ISBN 0-7803-7141-0, p. 475.
47. "Application of a microfabricated plasma source to gas analysis using optical emission spectroscopy," J. Hopwood, N. McGruer, O. Minayeva, and F. Li, presented at the 28th IEEE International Conference on Plasma Science, Las Vegas, Nevada, June 17-22, 2001. IEEE Conference Record Abstracts ISBN 0-7803-7141-0, p. 311.
48. "A Microfabricated Gas Analysis System," N. McGruer and J. Hopwood, Proceedings of the 2001 NSF Design, Service and Manufacturing Grantees and Research Conference, January 7-10, 2001, Tampa, FL.
49. "An SOI-based three-dimensional integrated circuit technology," J. Burns, L. McIlrath, J. Hopwood, C. Keast, D.P. Vu, K. Warner, and P. Wyatt, Proceedings of the IEEE International SOI Conference (2000), p. 20. {22}
50. "The Influence of High Density Plasma on TiN Films Deposited by Ionized Physical Vapor Deposition," D. Mao, J. Hopwood, and K. Tao, 47th International Symposium of the American Vacuum Society. Boston, Massachusetts, October 2-6, 2000. Session PS-MoM8; Conference Abstracts p. 7.
51. "Modeling and Experimental Verification of a Ti/Nitrogen/Ar Ionized Physical Vapor Deposition Tool," K. Tao, D. Mao, and J. Hopwood, 47th International Symposium of the American Vacuum Society. Boston, Massachusetts, October 2-6, 2000. Session PS-TuM11; Conference Abstracts p. 50.

52. "Optical Emission Study of a Microfabricated Inductively Coupled Plasma," O. Minayeva and J. Hopwood, 47th International Symposium of the American Vacuum Society. Boston, Massachusetts, October 2-6, 2000. Session MM-WeM5; Conference Abstracts p. 118.
53. "Scaling and Microfabricating a Low-Pressure Inductively Coupled Plasma Source," Y. Yin and J. Hopwood, 46th International Symposium of the American Vacuum Society, Seattle, Washington, October 25-29, 1999. Session MM+VT-ThA6; Conference Abstracts p. 198.
54. "Modeling and Experimental Characterization of a Ti/Nitrogen/Ar Ionized Physical Vapor Deposition Tool," K. Tao, D. Mao and J. Hopwood, 46th International Symposium of the American Vacuum Society, Seattle, Washington, October 25-29, 1999. Session PS-MoP11; Conference Abstracts p. 48.
55. "A miniaturized inductively coupled plasma source for applications in microelectromechanical systems," Y. Yin and J. Hopwood, presented at the 1998 IEEE International Conference on Plasma Science, Raleigh, North Carolina, June 2, 1998. IEEE Conference Record Abstracts ISBN 0-7803-4793-5, p. 181.
56. "Axially-resolved study of highly ionized magnetron sputtering," M. Dickson, F. Qian, and J. Hopwood, IEEE International Conference on Plasma Science, June 3-5, 1996, Boston, Massachusetts, IEEE Conference Record p.184, ISBN 0-7803-3322-5.
57. "Deposition of diamond-like carbon in a planar inductively coupled plasma," D.L. Pappas and J. Hopwood, 40th National Symposium of the American Vacuum Society, Orlando, Florida, November 11-15, 1993.
58. "Ionized magnetron sputter deposition for lining and filling vias and trenches," S.M. Rosnagel, J. Hopwood, J.E. Heidenreich, and M.S. Barnes, 40th National Symposium of the American Vacuum Society, Orlando, Florida, November 11-15, 1993.
59. "Electron energy distributions in a planar rf induction plasma," J. Hopwood, C.R. Guarnieri, J.J. Cuomo, 39th National Symposium of the American Vacuum Society, Chicago, Illinois, November 9-13, 1992.
60. "Electromagnetic measurements and modeling of a radio frequency induction plasma," J. Hopwood, C.R. Guarnieri, S.J. Whitehair, and J.J. Cuomo, 38th National Symposium of the AVS, Seattle, Washington, November 11-15, 1991.
61. "Radio frequency inductive plasma ashing of polymers," C.R. Guarnieri, J.A. Hopwood, S.J. Whitehair, and J.J. Cuomo, 38th National Symposium of the AVS, Seattle, Washington, November 11-15, 1991.
62. "Downstream characterization of a 20-cm diameter 915 MHz/2.45 GHz multipolar electron-cyclotron-resonant plasma source," F.C. Sze, J. Hopwood, and J. Asmussen, 1991 IEEE Intl. Conf. on Plasma Science, Williamsburg, VA, June 3-5, 1991. ISBN 0-7803-0147-1

63. "Influence of static magnetic field configuration and EM field pattern on ECR discharge performance," P. Mak, G. King, J. Hopwood, T. Grotjohn, and J. Asmussen, 1991 IEEE Intl. Conf. on Plasma Science, Williamsburg, VA, June 3-5, 1991. ISBN 0-7803-0147-1
64. "Optimization of microwave electric fields in ECR plasmas," J. Hopwood, R. Wagner, D.K. Reinhard, and J. Asmussen, 36th Nat'l. Symposium of the American Vacuum Society, Boston, Massachusetts, October 23-27, 1989.
65. "Performance of multipolar electron cyclotron resonant microwave cavity plasma sources," J. Hopwood, D.K. Reinhard, and J. Asmussen, 24th Microwave Power Symposium, Stamford, Connecticut, August 21-23, 1989.
66. "A 915 MHz/2.45 GHz ECR plasma source for large area ion beam and plasma processing," J. Asmussen, J. Hopwood, and F.C. Sze, International Conference on Ion Sources, Berkeley, CA, July 10-14, 1989.
67. "Characteristics of a multipolar ECR microwave cavity plasma etching source," J. Hopwood, D.K. Reinhard and J. Asmussen, 16th IEEE International Conference on Plasma Science, Buffalo, New York, May 22-26, 1989.
68. "Microwave plasma applicator design principles for low and high pressure applications," *invited paper*, J. Asmussen, J. Hopwood, D.K. Reinhard, and L. Mahoney, 23rd Microwave Power Symposium, International Microwave Power Institute, Ottawa, Canada, August 29-31, 1988.
69. "Microwave plasma oxidation and etching for integrated circuit processing," *invited paper*, G.T. Salbert, J. Hopwood, J. Asmussen, D.K. Reinhard, 23rd Microwave Power Symposium, Ottawa, Canada, August 29-31, 1988.
70. "Experimental conditions for uniform anisotropic etching of silicon with a microwave ECR plasma," J. Hopwood, D.K. Reinhard and J. Asmussen, 32nd International Symposium on Electron, Ion, and Photon Beams, Ft. Lauderdale, Florida, May 1988.
71. "A comparison of SF₆ and CF₄ etching by ECR plasmas," J. Hopwood, D.K. Reinhard, and J. Asmussen, Proceedings of the International Conference on ECR Ion Sources and Their Applications, p.503-509, East Lansing, Michigan, November 1987.
72. "Plasma etching with a microwave cavity plasma disk source," J. Hopwood, M. Dahimene, D.K. Reinhard, and J. Asmussen, 31st International Symposium on Electron, Ion, and Photon Beams, San Fernando, California, May 26-29, 1987.
73. "Electronic temperature measurements of helium microwave discharges," J. Hopwood, M. Kubinec, J. Asmussen and M.L. Brake, 39th Annual Gaseous Electronics Conference, Madison, Wisconsin, October 7-10, 1986.

External Research Funding

<u>Title</u>	<u>Dates</u>	<u>Sponsor</u>	<u>Amount</u>
Microplasmas for Reconfigurable Metamaterials	7/14-7/19	AFOSR MURI	\$1.1M
Diode Pumped Rare Gas Lasers	8/17-8/19	Army Research Office	\$128k
Mixing Efficiency of Microplasma	9/13-9/15	ONR/DARPA	\$642k
Diode-pumped Rare Gas Laser	7/13-6/18	Air Force SC00000957	\$303k
Solarvolt research	5/13-5/14	Solarvolt	\$100k
RF Microplasma for Energetic Spec Gen (PI) Phase II extension	9/12-8/14 through 9/16	AF/PSI Inc. STTR Phase II	\$188k \$209k
Frequency-modulated switchable 2D micro- plasma array (PI)	11/11-11/13	DARPA	\$942k
RF microplasma for singlet oxygen gen. (PI)	3/12-12/12	DOE STTR/PSI Inc.	\$47k
RF microplasma ozone generation (PI)	2/11-9/11	Air Force (STTR)/Phys Sci Inc.	\$33k
Instabilities in nonthermal atmospheric pressure plasma (PI, 100%)	07/09-07/12	Dept. of Energy +ARRA supplement	\$417k
Microplasma research	11/09-11/10	Schlumberger	\$20k
Nanoparticle Detection Using Microplasma (PI: 100%)	05/08-05/11	National Science Foundation	\$247k
Microplasma Research (PI: 100%)	02/08-02/09	Agilent Foundation	\$44k
Microplasma Research (PI: 100%)	1/07-1/08	Agilent Labs	\$42k
Highly doped silicon (PI: 50%)	4/05-12/07	Varian Semiconductor	\$120k
NER: Airborne nanoparticle detector based on a microplasma particle trap (PI:100%)	7/04-12/06 one-year extension	National Science Foundation	\$100k
Modeling Faraday Shields for ICP microplasma (PI:100%)	10/04-9/06	NSF SBIR Phase II Verionix, Inc. subaward	\$47k
Ionized physical vapor deposition (PI:100%)	4/04-4/06	Intel Corp., SRS Program	\$253k
Scaling Microwave Plasma Sources, (PI: 100%)	9/00-8/04	National Science Foundation	\$172k
Low pressure microplasma gas analyzer	9/03-12/03	NSF SBIR/Verionix, Inc.	\$12k
Investigation into the anisotropic etching of CsI(Na) Phase II SBIR (PI: 100%)	6/01-5/03	Radiation Monitoring Devices, Inc./Natl. Inst. Health	\$90k
A planning meeting for establishing an IUCRC for microcontamination control (co-PI: 25%)	10/01	National Science Foundation	\$10k
Etching of CsI scintillators, (PI: 100%) Phase II SBIR	4/00-8/01	Natl. Inst. Health/RMD, Inc.	\$91k
Micro Gas Analyzer (Co-PI: 50%)	9/99-9/03	NSF: XYZ-on-a-chip	\$472k
Microolithog. & plasma etching of CsI(Na)	2/99-6/99	Radiation Monitoring	\$20k

(PI: 100%)		Devices, Inc./Natl. Inst. Health	
Plasma etching of CsI (PI: 100%)	10/97-12/98	Radiation Monitoring Devices, Inc./Natl. Inst. Health	\$25k
The plasma physics of metal-nitride deposition of IC barrier layers using I-PVD" (PI: 100%)	8/97-7/01	National Science Foundation	\$270k
Research and education program based on a novel microplasma source (PI: 100%)	5/97-4/02	NSF CAREER Award	\$200k
High MEMS structures (co-PI: 50%)	4/97-7/97	MSSA Corporation	\$17k
Micromechanical linear displacement sensor: Phase I (co-PI: 50%)	6/96-10/96	SatCon Technology (NSF/SBIR)	\$20k
Three-dimensional computational sensors for advanced low-power visual processing (co-investigator, est. individual funding ~ \$300k)	6/96-4/99	DARPA/ US Army - Natick	\$4.99M
Research on plasma etching of vias for 3D microelectronics (co-PI: 33%)	4/96-9/96	Office of Naval Research (ONR)	\$59k
Deposition of a-C:H by inductively coupled plasma CVD (PI: 100%)	1/96-12/96	Gillette Company, Boston R&D	\$20k
Development and characterization of a high density metal deposition plasma source (PI: 100%)	9/95-9/96 Palo Alto, CA	Varian Associates	\$18k
Post-ionized sputter deposition (PI: 100%)	1/94-12/94	Gillette Company, Boston R&D	\$60k
Internal Competitive Funding			
1. Cold Plasma Thin Film Deposition of Photovoltaic Materials on Commodity Substrates (PI=100%)	9/08-9/09	Wittich Fund	\$33k

B.S. Honors Thesis Students

Jason Messier (1997), "Double Langmuir Probe Measurements of a Small Radio Frequency Induction Plasma"

Atiyah Ahsan (2010), "The nature of resonant coupling between microstrip resonators"

Undergraduate Research Assistants

Jason Messier, BSEE 1997

Matthew Maffucci, BSEE 2001

Sidney Rodrigues, BSEE 2001

David Williamson, BSEE 2000

David Esposito, BSEE 2004

Istvan Rodriguez, BSEE 2007

Chandler Downs, BSEE, 2008

Atiyah Ahsan, BSEE, 2010.

Michael Grunde, BSEE

Kevin Morrissey, BSEE 2013

Mical Nobel, BSCPE 2013

Alex Yared, BSEE 2016

Adam Chapman, BSEE 2017

Peter Wu, BSEE 2017

M.S. Thesis Students

Feng Qian (1995), "Diamondlike Carbon Film Deposition using Ionized Magnetron Sputtering"

Xianfeng Zhou (1997), "Bias Sputter Deposition in Vertical Interconnect Technology -- Experiment and Computer Simulation"

Michael E. Dickson (1997), "Design and Characterization of an Ionized Physical Vapor Deposition System"

Gang Zhong (1998), "Experimental Characterization for Ionized Physical Vapor Deposition of Aluminum and Titanium"

Yu Yin (2001), "Miniaturization of Inductively Coupled Plasma Sources"

Felipe Iza (2001), "Design, Fabrication and Modeling of Microfabricated Inductively Coupled Plasma Sources"

Maria Ko (2003), "Plasma-enhanced atomic layer deposition of ruthenium dioxide using ruthenocene"

Naoto Miura (2005), "Measurement of helium metastable atom density by modified electrostatic probes in remote plasma"

John Nwagbaraocha (2006), "Finite Element Modeling of Microfabricated Inductively Coupled Plasma Source with Faraday Shielding"

James Pringle (2008), "Feedback Controlled RF Source for Microplasma Production"

Jayasri Nayaramamoorthy, "Plasma Reactive Ion Etching of Silk Fibroin," January 2010

Zhi-bo Zhang, "Linear Arrays of Stable Atmospheric Pressure Microplasmas," May 2010.

Chen Wu, "Microwave structures for generating stable arrays of microplasmas," May 2011

Stephen Parsons, "Microplasma harmonic generation," Feb 2016

Stephen Dennison, "Dielectric resonator plasma generation," April 2017

Ph.D. Dissertation Students

Kai Tao (2001), "An Experimentally Verified Model for Ionized Physical Vapor Deposition of Titanium Nitride"

Olga Minayeva (2002), "mICP Reactor Design for Efficient Excitation of SO₂"

Xiaoji Yang (2003), "Plasma etching of CsI"

Neil Daisheng Mao (2003), “The Physical and Chemical Mechanisms of TiN Film Deposition of Integrated Circuit Barrier Layers using Ionized Physical Vapor Deposition”
 Felipe Iza (2004), "Atmospheric Microplasma Source Based on a Microstrip Split-Ring Resonator”
 Jun Xue (2010), “Microplasma Diagnostics and Applications”
 Naoto Miura (2012), “Design, modeling, and diagnostics of microplasma generation at microwave frequency”
 Chen Wu (2014), “Initiating and sustaining arrays of microplasmas: simulation and experiment”
 Stephen Parsons (August 2017), “Self-initiated plasma in photonic crystals”

Post doctoral appointees:

Hyunjun Kim, “*Electromagnetic interactions with plasma,*” 2016- (supported by AFOSR)
 José Gregório, “*Microplasma modeling,*” 2014-2016 (supported by DARPA/ONR)
 H C Thejaswini, “*Atmospheric pressure deposition,*” 2013-14 (supported by SolarVolt).
 Shabnam Monfared, “*Transient microplasma diagnostics,*” 2012-13 (supported by DoD subcontracts)
 Alan Hoskinson, “*Fundamentals of Microplasmas,*” 2009-2010, (Agilent, Schlumberger)
 Daisheng Mao, “*On-chip tunable deposition using IPVD,*” 2004-2006 (supported by Intel)

Publications and Invited Talks (related to teaching)

“Teaching in a Research Culture,” J. Hopwood, *Winner’s Circle Symposium*, Center for Effective University Teaching, Northeastern University, March 31, 2004. (Invited speaker and panelist)

“Teaching vs. Research – Rivalry or Synergy?” J. Hopwood, *Teaching Matters*, Vol. 10(2), pp. 4-5, Spring 2005.

Table of Courses Taught with Student Evaluation Ratings (1989-2017)

Period	Course	Title	Hrs	No. Enroll	<i>Student Ratings: (out of 5)</i>	
					Instructor Rating	Course Rating
	Tufts Univ.					
F’17	EN-1	Music and Engr	3	28	4.81	4.68
Sp’17	EE-21	Electronics w/Lab	4	44	4.89	4.76
F’16	EN-1	Music and Engr	3	27	4.92	4.77
Sp’16	EE-21	Electronics w/Lab	4	27	4.79	4.71
F’15	ES-93	Music and Engr	3	24	4.88	4.88
Sp’15	EE-21	Electronics w/Lab	4	34	4.78	4.61
F’14	ES-93a	Music and Engr	3	25	4.50	4.33
	ES-93b	Music and Engr	3	22	4.71	4.43
Sp’14	EE-21	Electronics w/Lab	4	31	4.75	4.65
F’13	ES-93	Music and Engr	3	31	4.38	4.23
F’12	ES-93	Music and Engr	3	24	4.5	4.0
Sp’12	EE-31	Jr. Design Proj	4	10	4.6	4.1
F’11	EN-73a	Music and Engr	2	20	4.91	4.76
F’11	EN-73b	Music and Engr	2	20	“	“
F’10	ES-3	Intro Electrical Sys	4	41	4.90	4.07

F'10	EN-73	Music and Engr	2	20	4.75	4.70
Sp'10	EE-113	Semicond. Dev	4	11	4.89	4.78
Sp'09	EE-251	Plasma Engr.	4	8	4.86	4.71
F'08	ES-3	Intro Electrical Sys	4	36	4.89	4.32
F'08	EN-73	Music and Engr	2	20	4.56	4.22
Sp'08	EE-113	Semicond. Dev.	4	5	4.67	4.67
F'07	ES-3	Intro Electrical Sys	4	24	4.59	4.09
Sp'07	EN-73	Music and Engr.	2	20	4.88	4.61
Sp'07	EE-194- PLA	Intro to Plasma Engineering	4	25	4.79	4.28

North-eastern University

					'Overall Instructor Effectiveness'	'Amount Learned'	
Sp'06	ECEG201	Semicond Dev.	4	34	4.9	4.6	
F'05	ECEU402	Electronics	4	40	4.9	4.8	
Sp'05	ECEG201	Semicond.Dev.	4	27	4.9	4.3	
F'04	ECEU402	Electronics	4	31	4.9	4.5	
Sp'04	ECEG243	IC Fabrication	4	22	4.9	4.1	
Sp'04	ECE U211/401	Intro to ECE Lab	1	101	4.0*	3.7*	*Team-taught
F'03	GE U110	Engng Design	4	31	4.8	4.2	
F'03	ECEG399	PhD Seminar	4	4	-	-	
W'03	ECE 3629	Plasma Proc.	4	18	4.8	4.2	
F'02	ECE 1341	Intro. Electronics	4	51	4.9	4.6	
F'02	ECE 1242	Electronics Lab	1	51	-	-	
F'02	ECE 1777	Honors Electrnc	1	5	-	-	
W'02	ECE 3626	IC Fabrication	4	14	*	*	
Sp'02	ECE1246	Circuits 2	4	54	4.8	4.6	
Sp'02	ECE 1241	Circuits Lab	1	54	-	-	
Sp'02	ECE 1777	Honors Ckts	1	11	-	-	
F'01	ECE 1341	Intro. Electronics	4	37	4.9	4.4	
F'01	ECE 1242	Electronics Lab	1	37	-	-	
W'01	ECE 3890	PhD Seminar	4	6	-	-	
F'00	GE 1103	Engng Design	4	32	4.7	4.4	
F'00	GE 1103	Engng Design	4	31	4.6	4.2	
F'00	GE 1001	Intro to Engr.	1	25	-	-	
Sp'00	ECE3626	IC Fabrication	4	5	4.8	4.2	
Sp'00	ECE1400	Special Topics	4	1	-	-	
W'00	ECE1400	Special Topics	4	1	-	-	
F'99	ECE3629	Plasma Proc.	4	8	4.7	4.5	
F'99	ECE1400	Special Topics	4	1	-	-	
F'99	ECE1777	Honor's Adjunct	1	1	-	-	
F'99	GE 1001	Intro to Engr.	1	32	-	-	
Sp'99	ECE3626	IC Fabrication	4	9	5.0	4.7	
W'99	100%	Research buy-out					
F'98	ECE1341	Electronics 1	4	18	4.93	4.67	
F'98	ECE1341	Electronics 1	4	16	4.80	4.40	
F'98	ECE1242	Electronics Lab	1	19	4.57	4.07	
F'98	ECE1242	Electronics Lab	1	15	4.50	4.44	
Sp'98	ECE1343	Electronic Design	4	17	4.86	4.43	
W'98	ECE1341	Electronics 1	4	41	4.60	4.17	
W'98	ECE1242	Electronics Lab	1	40	-	-	

F'97	ECE3629	Plasma Proc.	4	5	4.60	4.40	
Sp'97	ECE1308	Physical Electr.	4	4	-	-	
Sp'97	ECE1796	Honors Thesis	4	1	-	-	
W'97	ECE1243	Electronics Lab 2	1	21	-	-	
W'97	ECE1242	Electronics Lab 1	1	42	-	-	
F'96	ECE1242	Electronics Lab 1	1	42	[4.00]	[4.24]	<i>Internal assessment</i>
F'96	GE 1001	Intro to Engr.	1	30	-	-	
Sp'96	ECE1347	Electronics 2	4	17	4.93	4.29	
Sp'96	ECE1224	Electronics Lab 1	1	17	-	-	
Sp'96	ECE1777	Honors Electrnc	1	4	-	-	
W'96	ECE1347	Electronics 2	4	7	4.71	4.57	
W'96	ECE1224	Electronics Lab 1	1	6	-	-	
F'95	ECE3629	Plasma Proc.	4	3+2	-	-	
Sp'95	ECE1347	Electronics 2	4	27	4.95	4.60	
Sp'95	ECE1224	Electronics Lab 1	1	27	-	-	
W'95	ECE3388	Semicond.Dev.2	4	4+4	-	-	
F'94	ECE3384	Semicond.Dev.1	4	17	4.29	-	
Sp'94	ECE1215	Circuits 1	4	21	4.64	4.54	
W'94	ECE1346	Electronics 1	4	45	4.82	4.29	
F'93	ECE1346	Electronics 1	4	7	4.57	4.17	

-* no evaluations for sections with fewer than 5 enrolled or lab sections

At Michigan State University:

F'90 EE/PHY 850 Electrodynamics of Plasmas
 F'89 EE/PHY 850 Electrodynamics of Plasmas

Professional Courses

“Plasma Processing Technology” IEEE ICOPS Minicourse (June 8-9, 2006) Session I: *Basics-Vacuum and Plasma*. Session II: *Physical Vapor Deposition*. J. Hopwood, Traverse City, Michigan, (June 8-9, 2006).
 “Microplasma physics at 1 GHz and beyond,” IEEE ICOPS Minicourse, Banff, Canada (June 24, 2016).

Professional Service

Program Committee of the Thin Film Division of the American Vacuum Society (1995)

Program Vice Chair, National Symposium of the American Vacuum Society (1996)

Program Committee of the Thin Film Division of the American Vacuum Society (1997)

Executive Committee of the Thin Film Division of the American Vacuum Society (elected term: 1996-98)

Session Organizer for the IEEE Int'l. Conference on Plasma Science (1999)
 “Nonequilibrium plasma processing”

Executive Committee on Plasma Science and Applications of the IEEE NPSS
 (elected term: 2000-2002)

Session Organizer for the IEEE Int'l. Conference on Plasma Science (2000)
 “Nonequilibrium plasma processing”

Session Organizer for the IEEE Int'l. Conference on Plasma Science (2001)
“Nonequilibrium plasma processing”

Program Committee of the Plasma Science Division of the American Vacuum Society (2002)

Session Chairman: “Plasma Processes I,” Seventh International Symposium on Sputter and Plasma Processes, Kanazawa Institute of Technology, Kanazawa, Japan, June 11-13, 2003

Program Committee of the 2004 Gordon Research Conference on Plasma Processing Science

Discussion Leader at the 2004 Gordon Research Conference on Plasma Processing Science

Technical Area Coordinator for IEEE Int'l. Conference on Plasma Science (2006 and 2007)

Program Committee of the Plasma Science Division of the American Vacuum Society (2006, and 2007)

Member, NRC Plasma Science Committee (2007-2010) of The National Academies, Board on Physics and Astronomy

Chair-elect, Plasma Science and Technology Division of the American Vacuum Society (2007-8)

Chair, Plasma Science and Technology Division of the American Vacuum Society (2008-9)

Past-Chair, Plasma Science and Technology Division of the American Vacuum Society (2009-10)

Associate Editor, European Physical Journal D (Atomic, Molecular, Optical, and Plasma Physics) 2010 – 2015

Chair, International Scientific Committee of the International Workshop on Microplasmas (2013-2015).

Executive Committee on Plasma Science and Applications of the IEEE NPSS
(elected term: 2016-2018)

Current University Service (2017-18)

- *Tufts Faculty Senate (term ending 2018)*
- *Committee on Tenure and Promotion (term ending 2019)*
- *Faculty Research Awards Committee-FRAC (term ending 2018)*
- *Board of Advisors, CELT*
- *Curriculum Task Force, School of Engineering*
- *Transfer Credit Evaluator (ECE Department)*
- *Study Abroad Coordinator (ECE Department)*
- *Chair, Undergraduate Education Subgroup, SoE Strategic Plan*
- *Faculty Search Committee, Computer Engineering*