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Curriculum Vitae

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EDUCATION

- B.A.: Spanish Language (specialization: business) - May 2005
University of Maryland, College Park (3.98 GPA)
- Ph.D.: Electrical Engineering - May 1985
University of Maryland, College Park (4.0 GPA)
- Thesis: *Generation of Microwave Radiation from Annular, Rotating
Electron Beams in Various Waveguide Geometries*
(Research Advisors: W. W. Destler and C. D. Striffler)
- M.S.: Electrical Engineering - December 1981
University of Maryland, College Park (4.0 GPA)
- B.S.: Electrical Engineering - May 1980
University of Maryland, College Park (3.97 GPA)
- B.S.: Mathematics - May 1980
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STUDENT AWARDS

- 1985 Pelczar Graduate Award for Excellence
- 1984/1985 National Nuclear and Plasma Sciences Society of
the IEEE Graduate Student Award
- 8/81 - 5/82 Dupont Outstanding Graduate Student Award
- 8/80 - 5/82 Graduate School Fellowship
- 5/80 Litton-Amecon Scholarship
- 8/76 - 5/80 Maryland State Senatorial Scholarship

EXPERIENCE

- 8/97 – now Professor
- 2/22 – now Director, ECE Honors Program
- 8/20 – now Director, Engineering Honors Program, Clark School
- 8/20 – now Faculty Advisor for HKN Honor Society, ECE Dept
- 8/06 – 7/11 Associate Chair for Undergraduate Education, ECE Dept
- 8/02 – 8/07 Associate Director for Education, IREAP
- 8/93 – 8/97 Associate Professor

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4/85 - 3/88 Research Associate
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2015 MagneMark, Inc.
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5/80 - 7/82 Electronics Engineer
7/78 - 5/80 Student Trainee
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8/79 - 5/80 Undergraduate Teaching Assistant

BOOKS

1. T. M. Regan, R. M. Briber, J. W. Dally, W. W. Destler, R. H. Esser, J. M. Fines, W. L. Fourney, L. L. Gasner, W. G. Lawson, I. K. Lloyd, P. A. Minderman, Jr., F. W. Mower, C. C. Stevens, C. D. Striffler, and R. Winblade, *Introduction to Engineering Design ENES 100, third edition*, (McGraw Hill College Custom Series: New York, 1996).
2. I. Mayergoyz and W. Lawson, *Basic Electric Circuit Theory - A One-Semester Course*, (Academic Press, 1996).
3. *Advanced Accelerator Concepts, Eight Workshop*, (AIP Conference Proceedings #472, 1999 Editors: W. Lawson, C. Bellamy, and D. F. Brosius).
4. W. Lawson, *Fundamental Electric and Digital Laboratory Manual, 7th Edition* (McGraw Hill College Custom Series: New York, 2008).

CONTRIBUTIONS TO EDITED BOOKS

1. A. Mondelli, D. Chernin, V. Granatstein, P. Latham, W. Lawson, and M. Reiser, "RF Frequency Scaling and Gyroklystron Sources for Linear Supercolliders," in *Lecture Notes in Physics 296 - Frontiers of Particle Beams*, (M. Month and S. Turner, eds., Springer-Verlag: New York, 1988) pp. 533-606.
2. M. Reiser, W. Lawson, A. Mondelli, and D. Chernin, "Frequency Scaling and Gyroklystron Sources for Linear Colliders with SLAC-type LINAC Structures," in *New Techniques for Future Accelerators II*, (M. Puglisi, S. Stipich, and G. Torelli, eds., Plenum Press: New York, 1989) pp. 65-129.

INVITED PUBLICATIONS

1. W. W. Destler, E. Chojnacki, R. F. Hoeberling, W. Lawson, A. Singh, and C. D. Striffler, "High Power Microwave Generation in Large-Orbit Devices," *IEEE Trans. Plasma Sci.* **16**, No. 2, pp. 71-89 (1988).
2. V. L. Granatstein and W. Lawson, "Gyro-Amplifiers as Candidate RF Drivers for Multi-TeV Linear Colliders," *IEEE Trans. Plasma Sci.* **24**, No. 3, pp. 648-664 (1996).
3. K. L. Felch, B. G. Danly, H. R. Jory, K. E. Kreischer, W. Lawson, B. Levush, and R. J. Temkin, "Characteristics and Applications of Fast-Wave Gyrodevices," *Proc. IEEE*, **87**, No. 5, pp. 752-781 (1999).
4. W. Lawson, J. P. Calame, G. S. Nusinovich, and B. Hogan, "Reflections on the University of Maryland's program investigating gyro-amplifiers as potential sources for linear colliders," *International Journal of Terahertz Science and Technology*, **10**, No 1, pp. 1-43 (2017).

REFEREED PUBLICATIONS

1. W. Lawson and C. D. Striffler, "A General Linear Growth Rate Formula for Large Orbit, Annular Electron Beams," *Phys. Fluids* **28**, pp. 2868-2877 (1985).
2. W. Lawson, W. W. Destler, and C. D. Striffler, "High Power Microwave Generation from a Large Orbit Gyrotron in Vane and Hole-and-Slot Conducting Wall Geometries," *IEEE Trans. Plasma Sci.* **PS-13**, pp. 444-453 (1985).
3. K. R. Chu, V. L. Granatstein, P. E. Latham, W. Lawson, and C. D. Striffler, "A 30 MW Gyroklystron Amplifier Design for High Energy Linear Accelerators," *IEEE Trans. Plasma Sci.* **PS-13**, pp. 424-434 (1985).
4. W. Lawson and C. D. Striffler, "A Linear Growth Rate Formalism for Large Orbit, Annular Electron Layers with Finite Thickness," *Phys. Fluids* **29**, pp. 1682-1694 (1986).
5. W. Lawson, J. Calame, V. L. Granatstein, J. Neilson, G. S. Park, and C. D. Striffler, "The Design of a High Peak Power Relativistic Magnetron Injection Gun," *Int. J. Electronics* **61**, pp. 969-984 (1986).
6. J. M. Baird and W. Lawson, "Magnetron Injection Gun (MIG) Design for Gyrotron Applications," *Int. J. Electronics* **61**, pp. 953-967 (1986).
7. W. Lawson and P. E. Latham, "The Design of a Small-Orbit / Large-Orbit Gyroklystron Experiment," *J. Appl. Phys.* **61**, pp. 519-528 (1987).
8. E. Chojnacki, W. W. Destler, W. Lawson, and W. Namkung, "Studies of Microwave Radiation from a Non-Relativistic Rotating Electron Beam in a Multiresonator Magnetron Cavity," *J. Appl. Phys.* **61**, pp. 1268-1275 (1987).
9. W. Lawson, "The Design of Low Velocity-Spread Cusp Guns for Axis-Encircling Beams," *Appl. Phys. Lett.* **50**, pp. 1477-1479 (1987).
10. H. Bluem, P. E. Latham, W. Lawson, and C. D. Striffler, "Single Particle Motion in a Large Orbit Gyrotron," *IEEE Trans. Microwave Theory Tech.* **MT-35**, pp. 946-955 (1987).
11. W. Lawson, "Magnetron Injection Gun Scaling," *IEEE Trans. Plasma Sci.* **16** (1988) 290.
12. W. Wang, W. Lawson, and V. L. Granatstein, "The Design of a Mode Selective Directional Coupler for a High Power Gyroklystron," *Int. J. Electronics* **65**, pp. 705-716 (1988).
13. A. Singh, W. Lawson, D. Goutos, W. R. Hix, C. D. Striffler, V. L. Granatstein, and W. W. Destler, "Beam Conditioning for Electron Energy Recovery Systems in Devices Employing Axis-Encircling Beams," *Int. J. Electronics* **65**, pp. 351-368 (1988).
14. J. Neilson, P. E. Latham, M. Caplan, and W. Lawson, "Determination of the Resonant Frequency in a Complex Cavity using the Scattering Matrix Formulation," *IEEE Trans. Microwave Theory Tech.* **37**, pp. 1165-1170 (1989).
15. W. W. Destler, K. Irwin, W. Lawson, J. Rodgers, Z. Segalov, E. Scannell, and S. Spang, "Intense-Beam Fundamental Mode Large-Orbit Gyrotron Studies," *J. Appl. Phys.* **66**, pp. 4089-4094 (1989).
16. M. E. Read, W. Lawson, A. J. Dudas, and A. Singh, "Depressed Collectors for High Power Gyrotrons," *IEEE Trans. Electron Dev. Part 2.* **37**, pp. 1579-1589 (1990).

17. W. Lawson, "Theoretical Evaluation of Non-Linear Tapers for a High Power Gyrotron," *IEEE Trans. Microwave Theory Tech.* **38**, pp. 1617-1622 (1990).
18. J. Calame and W. Lawson, "A Modified Method for Producing Carbon Loaded Vacuum Compatible Microwave Absorbers from a Porous Ceramic," *IEEE Trans. Electron Dev. Part 2.* **38**, pp. 1538-1543 (1991).
19. K. Irwin, W. W. Destler, W. Lawson, J. Rodgers, E. P. Scannell, and S. T. Spang, "Second Generation, High Power, Fundamental Mode Large-Orbit Gyrotron Experiments," *J. Appl. Phys.* **69**, pp. 627-631 (1991).
20. W. Lawson, J. Calame, B. Hogan, P. E. Latham, M. E. Read, V. L. Granatstein, M. Reiser, and C. D. Striffler, "Efficient Operation of a High Power X-Band Gyroklystron," *Phys. Rev. Lett.* **67**, pp. 520-523 (1991).
21. J. Calame, W. Lawson, V. L. Granatstein, P. E. Latham, B. Hogan, C. D. Striffler, M. E. Read, M. Reiser, and W. Main, "Experimental Studies of Stability and Amplification in Four Overmoded, Two-Cavity Gyroklystrons Operating at 9.87 GHz," *J. Appl. Phys.* **70**, pp. 2423-2434 (1991).
22. W. Lawson, M. E. Read, W. Wang, and M. Naiman, "An Evaluation of Directional Couplers for High Power Gyrotrons," *Int. J. Electronics* **72**, pp. 1135-1144 (1992).
23. W. Lawson, J. Calame, B. Hogan, M. Skopec, C. D. Striffler, and V. L. Granatstein, "Performance Characteristics of a High Power, X-Band, Two-Cavity Gyroklystron," *IEEE Trans. Plasma Sci.* **20**, pp. 216-223 (1992).
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25. W. Lawson and P. E. Latham, "The Scattering Matrix Formulation for Overmoded Coaxial Cavities," *IEEE Trans. Microwave Theory Tech.* **40**, pp. 1973-1977 (1992).
26. W. Lawson and V. Specht, "Design Comparison of Single-Anode and Double-Anode 300 MW Magnetron Injection Guns," *IEEE Trans. Electron Dev.* **40**, pp. 1322-1328 (1993).
27. W. Lawson, H. W. Matthews, M. K. E. Lee, J. P. Calame, J. Cheng, B. Hogan, P. E. Latham, V. L. Granatstein, and M. Reiser, "High Power Operation of a K-Band Second Harmonic Gyroklystron," *Phys. Rev. Lett.* **71**, pp. 456-459 (1993).
28. W. Lawson, "Theoretical Mode Conversion in Overmoded Non-linear Coaxial Waveguide Tapers," *IEEE Trans. Microwave Theory Tech.* **42**, pp. 127-131 (1994).
29. W. Lawson and W. W. Destler, "The Axially Modulated, Cusp-Injected, Large-Orbit Gyrotron Amplifier," *IEEE Trans. Plasma Sci.* **22**, pp. 895-901 (1994).
30. P. E. Latham, W. Lawson, and V. Irwin, "The Design of a 100 MW, Ku-Band Second Harmonic Gyroklystron Experiment," *IEEE Trans. Plasma Sci.* **22**, pp. 804-817 (1994).
31. H. W. Matthews, W. Lawson, J. P. Calame, M. K. E. Flaherty, B. Hogan, J. Cheng, and P. E. Latham, "Experimental Studies of Stability and Amplification in a Two-Cavity Second Harmonic Gyroklystron," *IEEE Trans. Plasma Sci.* **22**, pp. 825-833 (1994).

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33. P. E. Latham, W. Lawson, V. Irwin, B. Hogan, G. S. Nusinovich, H. W. Matthews, and M. K. E. Flaherty, "High Power Operation of an X-Band Gyrotwistron," *Phys. Rev. Lett.* **72**, pp. 3730-3733 (1994).
34. J. P. Calame, J. Cheng, B. Hogan, W. Lawson, C. D. Striffler, P. E. Latham, and V. Irwin, "Measurements of Velocity Ratio in a 90 MW Gyroklystron Electron Beam," *IEEE Trans. Plasma Sci.* **22**, pp. 476-485 (1994).
35. M. K. E. Flaherty, W. Lawson, B. Hogan, H. W. Matthews, and J. P. Calame, "Operation of a K-Band Second Harmonic Coaxial Gyroklystron," *J. Appl. Phys.* **76**, pp. 4393-4398 (1994).
36. W. Lawson, P. E. Latham, J. P. Calame, J. Cheng, B. Hogan, G. S. Nusinovich, V. L. Granatstein, and M. Reiser, "High Power Operation of First and Second Harmonic Gyrotwistrons," *J. Appl. Phys.* **78**, pp. 550-559 (1995).
37. W. Lawson, A. Grigoropolous, A. Liu, G. P. Saraph, J. Rodgers, and W. W. Destler, "Design of a High Efficiency, Low Voltage, Axially-Modulated, Cusp-Injected, Second Harmonic, X-Band Gyrotron Amplifier," *IEEE Trans. Plasma Sci.* **24**, pp. 678-686 (1996).
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40. W. Lawson, W. W. Destler, A. Fernandez, A. Liu, J. Rodgers, and J. Weinstein, "Design of an Efficient, Low Voltage, Third Harmonic, Large-Orbit Gyrotron Amplifier with a Vane-Resonator Output Cavity," *IEEE Trans. Electron Dev.* **43**, pp. 1021-1027 (1996).
41. W. Lawson, B. Hogan, M. K. E. Flaherty, and H. Metz, "Design and Operation of a Two-Cavity 3rd Harmonic Ka-Band Gyroklystron," *Appl. Phys. Lett.* **69**, pp. 1849-1851 (1996).
42. A. Liu, W. Lawson, A. Fernandez, J. Rodgers, and W. W. Destler, "Design of a Low-Voltage, Axially Modulated, Cusp-Injected, Third Harmonic, X-Band Gyrotron Amplifier Experiment," *IEEE Trans. Electron Dev.* **44**, pp. 2022-2028 (1997).
43. W. Lawson, A. Fernandez, T. Hutchings, and G. P. Saraph, "A Novel Hybrid Slow Wave / Fast Wave Traveling Wave Amplifier," *IEEE Trans. Plasma Sci.* **25**, pp. 1050-1054 (1997).
44. G. P. Saraph, V. L. Granatstein, and W. Lawson, "Design of a Single-Stage Depressed Collector for High Power, Pulsed Gyroklystron Amplifiers," *IEEE Trans. Electron Dev.* **45**, pp. 986-990 (1998).
45. M. R. Arjona and W. Lawson, "Design of a High Efficiency, Broadband, Second Harmonic, 250 kW, Ka-Band Amplifier," *IEEE Trans. Plasma Sci.* **26**, pp. 461-467 (1998).

46. M. Castle, J. Anderson, W. Lawson, and G. P. Saraph, "An Overmoded Coaxial Buncher Cavity for a 100 MW Gyrokystron", *IEEE Microwave and Guided Wave Letters*, **8**, pp. 302-304 (1998).
47. W. Lawson, J. Cheng, M. Castle, B. Hogan, V. L. Granatstein, M. Reiser, and G. P. Saraph, "High Power Operation of a Three-Cavity X-Band Coaxial Gyrokystron," *Phys. Rev. Lett.*, **81**, pp. 3030-3033 (1998).
48. M. R. Arjona and W. Lawson, "Design of a 7 MW, 95 GHz, Three-Cavity Gyrokystron," *IEEE Trans. Plasma Sci.*, **27**, pp. 438-444 (1999).
49. X. Xu, C. Liu, J. Anderson, J. Cheng, W. Lawson, B. P. Hogan, and V. L. Granatstein, "Development of an X-Band Advanced-Concept Input System for High-Power Gyrokystron," *IEEE Trans. Plasma Sci.*, **27**, pp. 520-530 (1999).
50. J. Cheng, X. Xu, W. Lawson, J. P. Calame, M. Castle, B. P. Hogan, and V. L. Granatstein, G. S. Nusinovich, and M. Reiser, "Experimental Studies of a High-Power, X-Band, Coaxial Gyrokystron," *IEEE Trans. Plasma Sci.*, **27**, pp. 1175-1187 (1999).
51. W. Lawson, M. R. Arjona, B. Hogan, and R. L. Ives, "The Design of Serpentine Mode Converters for High Power Microwave Applications," *IEEE Trans. Microwave Theory Tech.*, **48**, pp. 809-814, (2000).
52. W. Lawson, "Design of a 70 GHz Second-Harmonic Gyrokystron Experiment for Radar Applications," *IEEE Microwave and Guided Wave Letters*, **10**, pp.101-110 (2000).
53. M. Walter, G. S. Nusinovich, W. Lawson, V. L. Granatstein, B. Levush, and B. G. Danly, "Design of a Frequency-Doubling, 35 GHz, 1 MW Gyrokystron," *IEEE Trans. Plasma Sci.*,**28**, pp. 688-694 (2000).
54. M. R. Arjona and W. Lawson, "Design of a 34 GHz Second-Harmonic Coaxial Gyrokystron Experiment for Accelerator Applications," *IEEE Trans. Plasma Sci.*,**28**, pp. 700-705 (2000).
55. B. Danly, M. Blank, J. P. Calame, B. Levush, K. T. Nguyen, D. Pershing, K. L. Felch, B. G. James, P. Borchard, T. S. Chu, H. Jory, T. Hargreaves, R. B. True, W. G. Lawson, and T. M. Antonsen, Jr., "Development and Testing of a High-Average Power, 94 GHz Gyrokystron," *IEEE Trans. Plasma Sci.*,**28**, pp. 713-726 (2000).
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57. W. Lawson, R. L. Ives, M. Mizuhara, J. M. Neilson, and M. E. Read, "Design of a 10 MW, 91.4 GHz Frequency-Doubling Gyrokystron for Advanced Accelerator Applications," *IEEE Trans. Plasma Sci.*,**29**, pp. 545-558 (2001).
58. W. Lawson, "The Application of Scattering Matrices to Re-Entrant Cavities," *Int. J. Electronics*, **88**, pp. 1131-1140, (2001).
59. W. Lawson, "On the Frequency Scaling of Coaxial Gyrokystrons," *IEEE Trans. Plasma Sci.*,**30**, pp. 876-884 (2002).

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61. W. Lawson, H. Raghunathan, and M. Esteban, "Space-Charge Limited Magnetron Injection Guns for High-Power Gyrotrons," *IEEE Trans. Plasma Sci.*, **32**, pp. 1236-1241 (2004).
62. W. Lawson, M. Esteban, H. Raghunathan, B. Hogan, and K. Bharathan, "Bandwidth Studies of TE_{0n} - TE_{0(n+1)} Ripple-Wall Mode Converters in Circular Waveguide," *IEEE Trans. Microwave Theory Tech.* **53** (1), pp. 372-379 (2005).
63. W. Lawson, "The Design of a High-Power, High-Gain, Frequency-Doubling Gyroklystron," *IEEE Trans. Plasma Sci.*, **33**, pp. 858-865 (2005).
64. H. Raghunathan and W. Lawson, "The Design of Space-Charge Limited Magnetron Injection Guns with Control Electrodes for Gyroklystron Applications," *IEEE Trans. Plasma Sci.*, **33**, pp. 1366-1371 (2005).
65. K. Bharathan, W. Lawson, J. Anderson, E. S. Gouveia, B. Hogan, and I. Spassovsky, "Design and Cold-Testing of a Radial Extraction Output Cavity for a Frequency-Doubling Gyroklystron," *IEEE Trans. Microwave Theory Tech.*, **38**, no. 11, pp. 1301- 1307 (2006).
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68. S. Secules and W. Lawson, "Description and Mixed Methods Evaluation of a Novel Hardware-Based Introductory Programming Course," *ASEE Advances in Engineering Education*, December 2019 (online).
69. W. Lawson and W. Hawkins, "System for Detecting the Location of a Magnetized Marker in a Human Subject," in *IEEE Magnetics Letters*, vol. 12, pp. 1-5, 2021, Art no. 8103005, doi: 10.1109/LMAG.2021.3105082.
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INVITED PRESENTATIONS

1. W. Lawson, J. Calame, K. R. Chu, V. L. Granatstein, K. Ko, P. E. Latham, J. McAdoo, G. S. Park, J. L. Seftor, C. D. Striffler, P. Vitello, and F. J. Williams, "Design and Cold Testing of a High Peak Power X-Band Gyroklystron," *1985 Int. Conf. Infrared Millimeter Waves*, December 1985, p. 334.
2. C. D. Striffler, J. Calame, V. L. Granatstein, P. E. Latham, W. Lawson, G. S. Park, M. Reiser, and F. J. Williams, "A 100 MW Magnetron Injection Gun for a 10 GHz Gyroklystron," *1986 IEEE Int. Conf. Plasma Science*, May 1986, p. 82.

3. M. Reiser, D. Chernin, W. Lawson, and A. Mondelli, "Frequency Scaling and Gyroklystron Sources for Linear Colliders with SLAC-type LINAC Structures," *3rd Workshop of the INFN ELOISATRON PROJECT*, Erice Italy, May 1987.
4. W. Lawson, J. Calame, V. L. Granatstein, H. Heikkinen, K. Keene, P. E. Latham, C. D. Striffler, W. Wang, and D. Welsh, "Initial Operation of a High Peak Power X-Band Gyroklystron," *1987 Int. Conf. Infrared Millimeter Waves*, December 1987, p. 381.
5. W. Lawson, J. Calame, D. Welsh, B. Hogan, W. Main, P. E. Latham, C. D. Striffler, and V. L. Granatstein, "High Power Microwave Generation from a Two-Cavity Gyroklystron Experiment," *1990 Int. Conf. Infrared Millimeter Waves*, December 1990, p. 669.
6. W. Lawson, J. Calame, P. E. Latham, B. Hogan, V. L. Granatstein, M. Reiser, and C. D. Striffler, "Operation of a 20 MW, 1 μ s, X-Band Gyroklystron," *1991 IEEE Int. Conf. Plasma Science*, June 1991, p.183.
7. W. Lawson, J. Cheng, V. L. Granatstein, B. Hogan, P. E. Latham, W. Main, H. W. Matthews, G. Nusinovich, M. Reiser, V. Specht, C. D. Striffler, and S. Tantawi, "Gyroklystron Research for Application to TeV Linear Colliders," *Beams '92*, Washington DC, May 26, 1992. Book of Abstracts, p. 151.
8. W. Lawson, "Microwave Sources," presented at the Seventh Workshop on Advanced Accelerator Concepts, Lake Tahoe, California, October, 1996.
9. W. Lawson, J. Cheng, B. Hogan, X. Xu, M. Castle, J. P. Calame, V. L. Granatstein, and M. Reiser, "Experimental Results of a High Efficiency High Power X-Band Gyroklystron," *1998 IEEE Int. Conf. Plasma Science*, June 1998, p.261.
10. W. Lawson, "High Power Operation of the University of Maryland Coaxial Gyroklystron Experiment," presented at the 8th Workshop on Advanced Accelerator Concepts, Baltimore, MD, July, 1998.
11. W. Lawson, M. Walter, and V. L. Granatstein, "Design of a 100 kW, 70 GHz Second Harmonic Gyroklystron," *1999 Int. Conf. Infrared Millimeter Waves*, September 1999, p. TH-E1.
12. M. Blank, B.G. Danly, J. P. Calame, B. Levush, K. Nguyen, D.E. Pershing, J. Petillo, T.A. Hargreaves, R.B. True, A.J. Theiss, G.R. Good, K. Felch, B. James, P. Borchard, T.S. Chu, H. Jory, W. Lawson, T.M. Antonsen, Jr., and M. Garven, "High Average Power Gyroklystrons for Radar Applications," *1999 Int. Conf. Infrared Millimeter Waves*, September 1999, Plenary paper M-3.
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82. Wesley Lawson, Shuvra Bhattacharyya, Andrew Elby, Ayush Gupta, and Stephen Secules, “An application-driven introductory C programming language course for freshman using the Raspberry Pi - methods and results,” *Envisioning the Future of Undergraduate STEM Education (EnFUSE): Research and Practice*. Washington DC. April 27-29, 2016.
83. Wesley Lawson, Stephen Secules, Shuvra Bhattacharyya, Ayush Gupta, “An Application-based Learning Approach to C Programming Concepts and Methods for Engineers,” *2016 Annual ASEE Conference*, New Orleans, LA, June 26-29.
84. W. Lawson, S. Secules, and S. Bhattacharyya, “An Application-Based Freshman Introductory Programming Course Using the Raspberry Pi,” *2016 FYEE Conference*, Columbus, OH, July 31-Aug. 2.
85. W. Lawson, S. Secules, A. Elby, W. Hawkins, T. Dumitras, and S. Bhattacharyya, “Traditional versus Hardware-driven Introductory Programming Courses: a Comparison of Student Identity and Efficacy Beliefs,” *2017 Annual ASEE Conference*. Columbus, OH, June 25-28.
86. Lawson, W. G., Kouo, J. L., Murthy, V. (2019, June), *A STEM-based, Project-driven, Introductory Programming Class for Pre-service Teachers* Paper presented at 2019 ASEE Annual Conference & Exposition , Tampa, Florida. <https://peer.asee.org/32000>
87. Lawson, W. G. and Kouo, J. L. (2021, July 28), *Development, implementation, and evaluation of an asynchronous online electric circuits laboratory* Presented at 2021 ASEE Virtual Annual Conference & Exposition. Paper ID #32290.

PATENT APPLICATIONS

1. “Electrical Pulse generator to Create Magnetic Pulses for the Treatment of Pain,” R. E. Fischell and W. Lawson, submitted July 2014 to the USPTO.

CONTRACTS AND GRANTS

6/88 - 5/91	“Accelerator Research Studies - Task C” Co-Investigator	DE-AC05ER40216 Total Amount: \$2,222,000.00
6/91 - 5/94	“Accelerator Research Studies - Task C” Co-Principle Investigator (with V. L. Granatstein, M. Reiser, and C. D. Striffler)	DE-FG05-91ER40642 Total Amount: \$2,435,000.00
6/94 - 5/97	“Accelerator Research Studies - Task C”	DE-FG02-94ER40855

	Co-Principle Investigator (with V. L. Granatstein and M. Reiser)	Total Amount: \$2,380,000.00
5/94 - 5/97	“Advanced Microwave Devices - Task II” Co-Principle Investigator (with W. W. Destler)	F496209410432 Total Amount: \$260,433.00
6/97 - 5/03	“Accelerator Research Studies - Task B” Co-Principle Investigator (with V. L. Granatstein and M. Reiser)	DE-FG02-94ER40855 Total Amount: ~\$3,300,000.00
6/03 - 5/06	“Accelerator Research Studies - Task B” Co-Principle Investigator (with V. L. Granatstein and P. O’Shea)	Total Amount: ~\$1,985,000.00
12/97	H. P. Equipment Grant (with W. W. Destler)	Gift No. 37357 \$50,270.00
3/03 – 3/12	TREND-REU Program Director	NSF-PHY grant Total amount: \$823,830.00
12/08 – 11/11	Improving math sense-making Co-Principle Investigator	NSF-EEC grant Total Amount: ~\$499,991.00
09/13 - 08/17	An Application-Based Learning Approach to Introductory C Programming Language Courses	NSF-DUE grant Total Amount: ~\$199,354.00

TEACHING COURSE LOAD

Semester	Course Number	Enrollment	Evaluation
Fall 1988	ENEE 381	37	3.76
Spring 1989	ENEE 380	60	3.73
Fall 1989	ENEE 681	6	3.91
Fall 1989	ENEE 608D	17	-
Spring 1990	ENEE 304	40	3.83
Fall 1990	ENEE 680	24	3.40
Spring 1991	ENEE 302	46	3.59
Fall 1991	ENEE 380	45	3.60
Spring 1992	ENEE 482	11	3.72
Fall 1992	ENES 100	30	3.07
Fall 1992	ENEE 748K	10	3.37
Spring 1993	ENES 100	15	-
Fall 1993	ENEE 608D	12	-

Fall 1993	ENEE 780	5	3.87
Spring 1994	ENEE 204	120	3.47
Fall 1994	ENEE 204	86	3.38
Spring 1995	ENEE 381	44	3.54
Fall 1995	ENEE 780	3	3.73
Spring 1996	ENEE 482	7	?
Fall 1996	ENEE 114	86	3.08
Spring 1997	ENEE 114	130	2.76
Summer 1997	ENES 240	12	3.04
Fall 1997	ENEE 206	~125	3.41
Spring 1998	ENEE 748k	3	3.77
Spring 1998	ENEE 206	~125	3.28
Fall 1998	ENEE 204	~100	4.18?
Spring 1999	ENEE 380	~60	3.36
Summer 1999	ENEE 381	40	2.92
Fall 1999	ENEE 206	~100	3.77
Spring 2000	ENEE 204	~100	3.28
Fall 2000	ENEE 206	~80	3.22
Spring 2001	ENEE 204	> 140	3.19
Spring 2001	ENEE 206	> 130	3.23
Spring 2001	ENEE 698D	25	-
Summer 2001	ENEE 204	35	3.49
Fall 2001	ENEE 204	> 120	2.85
Fall 2001	ENEE 206	> 120	2.95
Spring 2002	ENEE 206	> 130	2.93
Summer 2002	ENEE 204	41	3.34
Fall 2002	ENEE 206	>130	3.21
Fall 2002	ENEE 489Z	10	3.58
Spring 2003	ENEE 482	18	3.27
Summer 2003	ENEE 204	41	3.27
Fall 2003	ENEE 204	55	3.35
Spring 2004	ENEE 482	18	3.27

Summer 2004	ENEE 204	25	3.05
Fall 2004	ENEE 206	~100	2.88
Spring 2005	ENEE 204	42	2.92
Fall 2005	ENEE 206	~70	2.98
Fall 2005	ENES 100	38	2.71
Spring 2006	ENEE 204	42	3.12
Spring 2006	ENEE 482	16	3.46
Summer 2006	ENEE 204	12	?
Summer 2006	ENEE 206	13	?
Fall 2006	ENES 100	37	2.96
Fall 2006	ENEE 206	70	3.18
Spring 2007	ENEE 204	~40	3.69
Spring 2007	ENES 100	43	3.14
Summer 2007	ENEE 204	14	?
Fall 2007	ENES 100	43	3.30
Fall 2007	ENEE 200	43	3.35
Spring 2008	ENEE 189W	39	
Spring 2008	ENEE 204	49	
Summer 2008	ENEE 204	22	
Fall 2008	ENES 100	44	
Fall 2008	ENEE 419W	13	
Winter 2009	ENEE 200	15	
Spring 2009	ENEE 204	52	
Summer 2009	ENEE 204	25	
Fall 2009	ENEE 200	82	
Winter 2010	ENEE 200	25	
Spring 2010	ENEE 132	30	
Spring 2010	ENEE 204	39	
Summer 2010	ENEE 204	18	
Fall 2010	ENEE 131	30	
Fall 2010	ENEE 200	125	
Winter 2011	ENEE 200	32	

Spring 2011	ENEE 204	39
Summer 2011	ENEE 204	17
Fall 2011	ENEE 200	64
Fall 2011	ENEE 205	82
Winter 2012	ENEE 200	48
Spring 2012	ENEE 131	40
Spring 2012	ENEE 132	15
Summer 2012	ENEE 205	13
Summer 2012	ENEE 200	14
Fall 2012	ENEE 200	47
Fall 2012	ENEE 200	60
Winter 2012	ENEE 200	30
Spring 2013	ENEE 205	57
Spring 2013	ENEE 200	62
Spring 2013	ENEE 381	47
Summer 2013	ENEE 205	16
Summer 2013	ENEE 200	12
Fall 2013	ENEE 131	41
Fall 2013	ENES 100	48
Winter 2014	ENEE131	14
Spring 2014	ENES100A	40
Spring 2014	ENEE205	63
Spring 2014	ENEE381	26
Spring 2014	ENEE148A	5
Summer 2014	ENEE 200	12
Summer 2014	ENEE 205	13
Fall 2014	ENES 100	40
Fall 2014	ENEE 148A	29
Winter 2015	ENEE 131	23
Spring 2015	ENEE 205	74
Spring 2015	ENEE 381H	14
Spring 2015	ENES 100A	40

Summer 2015	ENEE 205	14
Summer 2015	ENEE 200	10
Fall 2015	ENES 100	40
Fall 2015	ENEE 148A	23
Winter 2016	ENEE 131	29
Spring 2016	ENEE 205	73
Spring 2016	ENEE 381H	3
Summer 2016	ENEE 200	12
Summer 2016	ENEE 205	9
Fall 2016	ENEE 148A	20
Fall 2016	ENEE 490	5
Fall 2016	ENES 100	42
Winter 2017	ENEE 131	31
Spring 2017	ENEE 205	67
Spring 2017	ENEE 381	32
Spring 2017	ENEE 381H	4
Summer 2017	ENEE 200	21
Summer 2017	ENEE 205	6
Summer 2017	ENEE 131	14
Fall 2017	ENEE 380	36
Fall 2017	ENEE 380H	7
Fall 2017	ENES 100/A	40
Winter 2018	ENEE 131	20
Spring 2018	ENEE 205	59
Spring 2018	ENEE 380	30
Summer 2018	ENEE 200	11
Summer 2018	ENEE 205	10
Summer 2018	ENEE 131	6
Summer 2018	ENEE 381	9
Fall 2018	ENEE 142	2
Fall 2018	ENEE 205	53
Fall 2018	ENEE 490	17

Spring 2019	ENEE 205	62
Spring 2019	ENEE 381	33
Spring 2019	ENEE 381H	10
Spring 2019	ENEE 681	8
Summer 2019	ENEE 200	8
Summer 2019	ENEE 205	10
Summer 2019	ENEE 131	11
Summer 2019	ENEE 381	13
Fall 2019	ENES 100/A	40
Fall 2019	ENEE 380	47
Fall 2019	ENEE 380H	9
Fall 2019	ENEE 490	11
Winter 2020	ENEE 131	7
Spring 2020	ENEE 205	54
Spring 2020	ENEE 381	33
Spring 2020	ENEE 381H	6
Summer 2020	ENEE 131	13
Summer 2020	ENEE 200	22
Summer 2020	ENEE 200	23
Summer 2020	ENEE 205	13
Summer 2020	ENEE 381	14
Fall 2020	ENES 100	39
Fall 2020	ENEE 205	35
Fall 2020	ENEE 490	26
Fall 2020	ENEB 302	6
Fall 2020	ENEB 340	6
Fall 2020	ENES 480	18
Winter 2021	ENEE 131	16
Winter 2021	ENEE 200	22
Spring 2021	ENEE 205	47
Spring 2021	ENEE 381	35
Spring 2021	ENEE 381H	5

Spring 2021	ENEE 489L	19
Spring 2021	ENES 481	13
Summer 2021	ENEE 131	7
Summer 2021	ENEE 200	19
Summer 2021	ENEE 200	18
Summer 2021	ENEE 205	21
Summer 2021	ENEE 381	14
Fall 2021	ENES 100	39
Fall 2021	ENEE 490	13
Fall 2021	ENEB 302	4
Fall 2021	ENEB 340	4
Fall 2021	ENES 480	13
Winter 2022	ENEE 131	14
Winter 2022	ENEE 200	28
Spring 2022	ENEE 140	25
Spring 2022	ENEE 205	63
Spring 2022	ENEE 489L	17
Spring 2022	ENES 481	12
Summer 2022	ENEE 200	18
Summer 2022	ENEE 200	18
Summer 2022	ENEE 205	14
Summer 2022	ENEE 381	6
Fall 2022	ENEE 205	30
Fall 2022	ENEE 490	19
Fall 2022	ENEB 302	5
Fall 2022	ENES 480	20
Winter 2023	ENEE 131	8
Winter 2023	ENEE 200	24
Spring 2023	ENEE 205	60
Spring 2023	ENEE 381+H	36
Spring 2023	ENEE 396	3
Spring 2023	ENES 481	16

Summer 2023	ENEE 131	6
Summer 2023	ENEE 200	18
Summer 2023	ENEE 200	18
Summer 2023	ENEE 205	10
Summer 2023	ENEE 381	10
Fall 2023	ENEE 205	48
Fall 2023	ENEE 489L	9
Fall 2023	ENEB 302	5
Fall 2023	ENES 480	21
Fall 2023	ENEE 382	20
Winter 2024	ENEE 131	5
Winter 2024	ENEE 200	25
Spring 2024	ENEE 205	60
Spring 2024	ENEE 382	34
Spring 2024	ENEE 396	5
Spring 2024	ENES 481	18

COURSE DEVELOPMENT

FALL 1992 ENEE 748K - Passive and Low Power Microwave Devices
 FALL 1992 ENES 100 - Intro to Engineering Design
 FALL 1996 ENEE 114 - Programming Concepts for Engineering
 FALL 1997 ENEE 206 - Fundamental Electric and Digital Circuit Laboratory
 FALL 2002 ENEE 489Z - Introduction to RADAR systems
 FALL 2007 ENEE 200 – Social and Ethical Dimensions of Technology
 FALL 2008 ENEE 419W – Advanced op-amp lab
 SPRING 2008 ENEE 189W – Engineering Issues in Medicine
 SPRING 2010 ENEE 132 – Engineering in Modern Medicine
 FALL 2010 ENEE 131 – Technology Choices
 FALL 2011 ENEE 205 – Electric Circuits
 SPRING 2014 ENEE 205 – Electric Circuits *flipped course!*
 SPRING 2014 ENEE 148A - Programming Elements for Electrical Engineers
 SPRING 2018 ENEE 142 - Programming Elements for preservice STEM teachers
 FALL 2019 ENEB 340 – C Programming

SPRING 2020 ENEB 302 – Analog Circuits

SPRING 2021 ENEE 489L – Design of Active and Passive Microwave Devices

SPRING 2023 ENEE 396 – Leadership, Creativity and Service Learning

FALL 2023 ENEE 382 – Electromagnetics

PROFESSIONAL AWARDS

1999 RL Woods Award for Excellence in Microwave Sources (co-winner)

TEACHING AWARDS

2019 IEEE Outstanding Faculty Member (UM)

2011 Phillip Merrill Faculty

2009-present I-Course Instructor

2007-2012 Marquee Course Instructor

2005-present Keystone Professor

1999 Parent's Association 1999 Outstanding Faculty Award (Finalist)

1996 Certificate of Achievement (MAHE - Outstanding Faculty Member)

1991 E. Robert Kent Outstanding Teaching Award

1989 George Corcoran Memorial Award

1989 IEEE Outstanding Faculty Member (UM)

ACADEMIC ADVISING

Undergraduate: Electrical ~ 10 / year
College Honors ~ 25 / year
EE Honors ~ 20 / year

Graduate: Electrical ~ 1 / year

RESEARCH ADVISING

Undergraduate: M. K. E. Lee Spring 1992 - (Honors Thesis)

Masters: M. Skopec Graduated Fall 1989

H. W. Matthews Graduated Spring 1994

V. Specht Graduated Spring 1994

M. K. E. Flaherty Graduated Summer 1994

J. P. Anderson Graduated Spring 1997

J. Weinstein Graduated Spring 1997

B. Huebschman Graduated Fall 2002

	H. Raghunathan	Graduated Fall 2003
	K. Bharath	Graduated Summer 2004
	I. Stamatiou	Graduated Fall 2006
	S. Tiwari	Graduated Spring 2006
	P. Purohit	Graduated Spring 2006
	Wang, Hao	2011 - 2012
Ph. D.:	J. P. Calame	Graduated Spring 1991
	J. Cheng	Graduated Spring 1998
	M. Castle	Graduated Spring 2001
	S. Gouviea	Graduated Summer 2004

JOURNAL EDITOR

Guest Editor IEEE Trans. Plasma Sci. – April 2004

Guest Editor IEEE Trans. Plasma Sci. – June 2006

JOURNAL REFEREE

Journal of Applied Physics / Applied Physics Letters

IEEE Transactions on Plasma Science

IEEE Transactions on Electron Devices

Physics of Fluids Part B

International Journal of Electronics

SBIR Phase I and II contracts

PROGRAM REVIEWER FOR

Department of Energy

PANEL SESSION CHAIR

RF98 Workshop - Fast Wave Devices 1998

CONFERENCE SESSION CHAIR

IEEE ICOPS - Fast Wave Millimeter Wave Devices 1993, 1994, 1995

Advanced Accelerator Concepts Workshop, RF session 1994

IEDM Vacuum Electronics - Fast Wave Devices 1994, 1995

International Workshop on Pulsed RF Sources 1996

BEAMS 96 - High Power Microwaves 1996

ORGANIZING COMMITTEES

Advanced Accelerator Concepts Workshop	1994, 1998
EXCOM Member, IEEE PSAC	2003,2004
Chair, PSAC Awards Committee	2004

PROGRAM COMMITTEES

IEDM - Vacuum Electronics Sub-Committee	1994, 1995*
Particle Accelerator Conference	1995, 1997**
RF 2003 Workshop	2003

*1995 Chair of Vacuum Electronics Sub-Committee

**1997 Chair of RF Sub-Committee

STANDING DEPARTMENTAL COMMITTEES

Department Council	1989, 1990, 1992, 1993, 1996, 1997
Ph. D. Exam Panel	1989, 1990*,2016, 2017
Undergraduate Affairs	1990, 1991, 1992*, 1993*, 1995, 1996, 1997*, 1998, 1999, 2000, 2001, 2007*,2008*,2009* 2010 [†] , 2014, 2015, 2016, 2017, 2018, 2019, 2020*, 2021, 2022, 2023,2024
Academic Affairs	1991, 1992, 1993*, 1994, 1995, 2000, 2001, 2002, 2006 [†] , 2007 [†] , 2008 [†] , 2009 [†] , 2010 [†] , 2017, 2018, 2019, 2020, 2022, 2023,2024
PT Committee	1993, 1994, 1995
Salary Committee	1996, 1997
*Chair	[†] ex officio

AD-HOC DEPARTMENTAL COMMITTEES

EE Honors Program	1992
Promotion/Tenure	1992
Salary	1993
Curriculum Revision	1994*, 1995*

STATEWIDE COMMITTEES

ASE Continuous Review Committee	2009*
ASE ECE Faculty Disciplinary Committee	2007*, 2008*,2009*

UNIVERSITY COMMITTEES

Campus Senate 2002-2004, 2008, 2009, 2012-2015
Living Learning Oversight 2009 – 2015
STEM Elementary Education Faculty Fellows Group 2011-2012
Education Dean Review Committee 2012
I-Series oversight committee 2020, 2021,2022
Strategic Plan, Access & Student Services Subcommittee 2021

COLLEGE COMMITTEES

Undesignated Degree 1988 - 1995
Senior Faculty Teaching Award Committee 1992 - 1996
CQI Alumni Committee 1999
MATH curriculum 2000
Engineering Council 2015,2016

INSTITUTE COMMITTEES

IREAP Executive Committee 1990, 1994, 1998,1999,2003,2004,2006

PROFESSIONAL SOCIETIES

IEEE