

CHRISTOS G. CHRISTODOULOU

Jim and Ellen King Dean of Engineering and Computing
Distinguished Professor of Electrical and Computer Engineering
IEEE Fellow

Dean
School of Engineering and Computing
University of New Mexico
Albuquerque, N.M. 87131
Tel: (505) 269-4117
christos@unm.edu

EDUCATION Ph.D. Electrical Engineering- May 1985, North Carolina State University
M.S. Electrical Engineering - Dec. 1981, North Carolina State University
B.S. Physics and Math- May 1979, American University in Cairo

RESEARCH INTERESTS: Wireless Communications, numerical techniques in electromagnetics, smart antennas, neural network and machine learning applications in electromagnetics, Cognitive Radio, Reconfigurable antennas, RF/Photonic antennas, and high power microwave antennas.

SYNOPSIS: Christos Christodoulou received his Ph.D. degree in Electrical Engineering from North Carolina State University in 1985. He served as a faculty member in the University of Central Florida, Orlando, from 1985 to 1998, and in 1999, he joined the Electrical and Computer Engineering Department at the University of New Mexico, where he served as the Chair of the Department from 1999 to 2005. He is one of the founders of COSMIAC (Research Center for Space Electronics at UNM) and served as a director of the center from 2012 to 2014. From 2009 to 2011 he received an Intergovernmental Personnel Act (IPA) assignment with the Air Force Philips Research Laboratory (AFRL) to help with their in-house telecommunication research. Between 2014 to 2017 he served as the Associate Director of Research for the School of Engineering at the University of New Mexico, and in 2017 became the Dean of the School.

He is an IEEE Fellow, a member of Commission B of the U.S. National Committee (USNC) for URSI, an NRC Research Advisor under the National Academies/AFRL Program, and a Distinguished Professor at UNM. He is the recipient of several teaching and research awards and has been inducted in the Alumni Hall of Fame for the Electrical and Computer Engineering Department, at North Carolina State University, in 2016.

He was appointed as an IEEE AP-Society Distinguished Lecturer (2007-2010) and served as an associate editor for the IEEE Transactions on Antennas and Propagation for several years. Since 2013 he has been serving as the series editor for Artech House Publishing company for the area of Antennas and Propagation.

He has given numerous keynote and invited talks all over the world, published over 570 papers in journals and conferences, written 17 book chapters, co-authored 9 books, and has several patents. Over his academic career he has served as the major advisor for 34 Ph.D., 75 M.S. Students, 9 Post Doctoral Fellows, and received over \$50M in funding as a PI and Co-PI from several federal agencies and industry.

He was one of the architects of the Educational Partnership Agreement between the Air Force Research Lab (in Albuquerque) and UNM. This agreement has allowed the enhancement of research collaboration between UNM and AFR and the mutual sharing of research facilities and collaborative space. He was also a member of the White Sands Missile Range Academic Partnership Initiative with the University. This agreement allows UNM and the Army Research Office to collaborate on future research issues related to ongoing activities at White Sands Missile Range.

Over the years at UNM, he has managed to establish some very strong collaborations with local companies and national labs, such as Xilinx, Northrop Grumman, Raytheon, Honeywell, Boeing, Sandia National Labs, and Los Alamos National Lab.

In 2015, he established the first School of Engineering collaboration with the New Mexico Small Business Assistance Program (NMSBA) run by Sandia National Laboratories. Funds are provided annually to the School of Engineering to fund faculty members to assist small companies in Albuquerque and rural NM with developing their products.

Finally, he has served in the board of directors for GWEC (Global Wireless Education Consortium in the US) from 2002-2006, in the UNM Economic Development Council (2007-now), the New Mexico Bioscience Authority Board of Directors (2017-now), and New Space (aerospace) NM Advisory Team – (2018 - now).

PROFESSIONAL EXPERIENCE

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|----------------------|---|
| July 2017- now | Dean , School of Engineering and Computing, University of New Mexico |
| April 2014- present | Associate Dean for Research, School of Engineering, University of New Mexico |
| Jan 2012- April 2014 | Director for COSMIAC, University of New Mexico |
| Jan 2009-June 2011 | Intergovernmental Personnel Act (<u>IPA</u>) assignment with the Air Force Philips Research Laboratory (AFRL) |
| July 2005- present | Professor, University of New Mexico |
| Jan 99- July2005 | Professor and Chair of ECE Department, University of New Mexico |
| Fall 96 - Fall 98 | Professor, University of Central Florida |
| Fall 93- Fall 95 | Associate Chair, ECE Department, University of Central Florida |
| Summer 1994 | Acting Chair, ECE Department, University of Central Florida |
| Summer 1993 | Acting Chair, ECE Department, University of Central Florida |
| 1993-1996 | Director of Honors Program, College of Engineering, Central Florida |
| 1990-1996 | Associate Professor at the University of Central Florida |
| Summer 90 | Research Fellow, NASA Langley Research Center |
| 1985-1990 | Assistant Professor at the University of Central Florida |

PROFESSIONAL MEMBERSHIP

Fellow Member of the IEEE
Member of International Union of Radio Science (URSI) Commission B.
Member of the IEEE, Antennas and Propagation Society.
Member of the IEEE, Microwave Theory and Techniques Society.
ASEE Member
Member of HKN and Tau Beta Pi
Member of the UNM Economic Development Council- (2017 – now)
Member of the NM Bioscience Authority Board of Directors – (2017- now)
New Space NM Advisory Team – (2018 - now)

UNIVERSITY ACTIVITIES

Courses Taught

- 1) Introduction to Electrical Engineering
- 2) Principles of Electrical Engineering
- 3) Electrical Circuits and Devices
- 4) Electric Networks
- 5) Engineering Honors Seminar
- 6) Basic Electromagnetics
- 7) Microwave Engineering (New course at UNM)
- 8) Antennas I
- 9) Antennas II
- 10) Fiber Optics
- 11) Advanced Electromagnetics

- 12) Microwave Solid State Devices
- 13) Numerical Techniques in Electromagnetics (new course at UNM)
- 14) RF Electronics (new course at UNM)

CONSULTING ACTIVITIES

Martin Marietta (Orlando)
MITRE Corporation (Massachusetts).
Sy Corporation (Alabama)
SeaSpace Corp. (California)
Virtual EM (Michigan)
E-systems (Tampa)
Lockheed-Martin (Texas)
Air Force Philips Research Lab
K&W Wireless
TPL
Bluecom Systems

PUBLICATIONS

Journals

- 1) Christodoulou C.G. and J.F. Kauffman, "On an Algorithm for the Analysis of the radiation Patterns of Dual Reflector and Segmented Reflector Antennas", *IEEE Transactions on Antennas and Propagation*, vol. AP-33, pp. 1101-1108, October 1985
- 2) Christodoulou C.G. and J.F. Kauffman, "On the Scattering of Electromagnetic Waves from Infinite Rectangular Conducting Grids", *IEEE Transactions on Antennas and Propagation*, vol. AP-34, pp. 144-154, February 1986.
- 3) Christodoulou C.G. and R.J. Middelveen, "On the Application of the Secant Method to the Spectral Iterative Approach", *Applied Computational Electromagnetics Society Journal*, vol. 3, No. 1, pp. 103-119, Spring 1988.
- 4) Christodoulou C.G., P.K. Kwan, R. Middelveen and P. F. Wahid, "Scattering from Stacked Gratings and Dielectrics for Various Angles of Wave Incidence", *IEEE Transactions on Antennas and Propagation*, vol. 36, pp. 1435-1442, October 1988.
- 5) Christodoulou C.G., S.X. Yin and J.F. Kauffman, "Effects of the Schottky Impedance of Wire Contact-Points on the Reflection Properties of a Mesh", *IEEE Transactions on Antennas and Propagation*, vol. 36, pp. 1714-1721, December 1988.
- 6) Christodoulou C.G., R.J. Middelveen and J.F. Kauffman, "Scattering from Periodic strip gratings Via the Secant-Spectral Iterative Method", *IEEE Transactions on Antennas and Propagation*, vol. 37, pp. 407-410, March 1989.
- 7) Yin S.X., C.G. Christodoulou and M. Hamid, "Radiation Pattern of a Test Reflector Antenna from Near Field Measurements over the Focal Region of a coupled Lens or Offset Reflector", *IEEE Transactions on Antennas and Propagation*, vol. 37, pp. 794-796, June 1989.
- 8) Shi X. and C.G. Christodoulou, "Microwave Properties of Cascaded Arbitrarily Oriented Metallic Gratings and of Gratings Cascaded with Lossy Dielectric Slabs", *Journal of Electromagnetic Waves and Applications*, vol. 4, No. 6, pp. 521-531, 1990.
- 9) Dunn D.S, G.L. Dunn and C.G. Christodoulou, "A Simple X-Band Waveguide-to-Microstrip E-Probe Transition", *Microwave and Optical Technology Letters*, vol. 3, no. 5, pp. 172-175, May 1990.

- 10) Uhing J., Thomas S. and C.G. Christodoulou, "A Statistical Approach for Calculating the Concatenated Connector Loss in Fiber-Optic Links", *Microwave and Optical Technology Letters*, vol. 3, no. 8, pp. 290-294, August 1990.
- 11) Burns H.N., C.G. Christodoulou and G.D. Boreman, "Design of a Pulsed Laser Rangefinder Receiver", *Optical Engineering Journal*, vol. 30, no. 3, pp. 323-329, March 1991.
- 12) Murphy R.A., C.G. Christodoulou and R.L. Phillips, "Electromagnetic Scattering from a Finite Cylinder with Complex Permittivity", *Journal of Electromagnetic Waves and Applications*, vol. 5, No. 9, pp. 983-996, 1991.
- 13) Nguyen Cam and C.G. Christodoulou, "On the Analysis of Microwave MESFET Mixers", *Microwave and Optical Technology Letters*, vol. 4, no. 8, pp. 307-311, July 1991.
- 14) Johnson E.G. and C.G. Christodoulou, "Electromagnetic Scattering by Aperiodic Strip Gratings", *Journal of Electromagnetic Waves and Applications*, vol. 6, No. 2, pp. 219-234, 1992.
- 15) P.F. Wahid, C.G. Christodoulou, and K.A. Rutkowski, "Radiated Fields of Microstrip Patch at Arbitrary Angular Positions", *Microwave and Optical Technology Letters*, vol. 5, no. 1, pp. 7-10, Jan. 1992.
- 16) Nguyen Cam and C.G. Christodoulou, "An Efficient Implementation of the Harmonic Balance Technique for Solving Nonlinear Microwave Problems", *International Journal of Infrared and Millimeter Waves*, vol. 13, no. 5, May 1992
- 17) Durham T. E. and C.G. Christodoulou, "Electromagnetic Radiation From Structures Consisting of Combined Body of Revolution and Arbitrary Surfaces", *IEEE Transactions on Antennas and Propagation*, pp. 1061-1067, Sept. 1992.
- 18) Murphy R.A., C.G. Christodoulou, and R.L. Phillips, "Bistatic Scattering from a Finite Lossy Cylinder", *Microwave and Optical Technology Letters*, vol. 6, no. 1, pp. 76-81, Jan. 1993.
- 19) Christodoulou C. G. and W. S. Arceneaux, "On the Evaluation of an Indoor Far-field Conductive Chamber", *Journal of Electromagnetic Waves and Applications*, vol. 7, No. 2, pp. 247-262, 1993.
- 20) Christodoulou C.G. and J. C. Schmidt, "Some Focusing Properties of Chirped Gratings at Microwave Frequencies", *Microwave and Optical Technology Letters*, vol. 6, no. 8, pp. 507-512, June 1993.
- 21) Christodoulou C.G. and C.D. Cook, "Analysis of Electrically Small Hyperbolic Subreflectors Utilizing the Geometrical Theory of Diffraction", *Journal of Electromagnetic Waves and Applications*, vol. 7, No. 7, pp. 987-1004, 1993.
- 22) Christodoulou C.G., "Electromagnetic Scattering from Skew-Symmetric Metallic Grids", *Journal of Electromagnetic Waves and Applications*, vol. 6, no. 13, pp. 777-782, October 1993.
- 23) Ho C.S, J. J. Liu, M. Georgiopoulos, G. L. Heileman, and C.G. Christodoulou, "Analog Circuit Design and Implementation of an Adaptive Resonance Theory (ART) Neural Network Architecture", *International Journal of Electronics*, vol. 76, no. 2, pp. 271-291, 1994.
- 24) Durham T. E. and C.G. Christodoulou, "A Method for Treating Junctions between Bodies of Revolution and Arbitrary Surfaces", *IEEE Transactions on Antennas and Propagation*, vol. 42., no. 2, pp. 213-219, Feb. 1994.
- 25) Christodoulou C. G, and F. N. Grey, "Scattering from Metallic Gratings made of Various Conductivity Profile", *Journal of Electromagnetic Waves and Applications*, vol. 8, No. 2, pp. 205-220, 1994.
- 26) Christodoulou, C. G., J. Huang, M.G. Georgiopoulos, and J.J. Liou, "On the Application of a Neural Network in the Design of Cascaded Gratings", *Microwave and Optical Technology Letters*, vol. 8, no. 4, pp. 171-175, March 1995.

- 27) Christodoulou, C. G., J. Huang, M.G. Georgiopoulos, and J.J. Liou, "Design of Gratings and Frequency Selective Surfaces Using ARTMAP Neural Networks", *Journal of Electromagnetic Waves and Applications*, vol. 9, No 1-2, pp. 17-36, Feb. 1995.
- 28) Durham T. E. and C.G. Christodoulou, "Integral Equation Analysis of Dielectric Bodies of Revolution in the Presence of Arbitrary Surfaces", *IEEE Transactions on Antennas and Propagation*, vol. 43., no. 7, pp. 674-680, July 1995.
- 29) Buris N.E, C.G. Christodoulou, and J.F. Kauffman, "Focal Region Fields of Distorted Reflectors", *IEEE Transactions on Antennas and Propagation*, vol. 43, no. 12, pp. 1478-1482, Dec. 1995.
- 30) Ho C.S, J. J. Liu, M. Georgiopoulos, and C.G. Christodoulou, "A Mixed Analog/Digital VLSI Design and Simulation of an Adaptive Resonance Theory (ART) Neural Network Architecture", *Computer Simulation*, vol. 66, n. 1, pp. 31-39, Jan. 1996
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- 32) Ely J., C. G. Christodoulou, "Optimizing Spiral Antenna Performance with Conductive Plane Backing and Choice of Dielectric Material", *Microwave and Optical Technology Letters*, vol. 12, no.4, pp. 183-187, July 1996.
- 33) Boreman G. D., A. Dogariu, C. G. Christodoulou, and D. Kotter, "Modulation Transfer Function of Antenna-Coupled Infrared Detector Arrays", *Applied Optics*, July 1996.
- 34) Rubelj M., P. F. Wahid, and C. G. Christodoulou, "A Microstrip Antenna Array for Direct Broadcast Satellite Receivers", *Microwave and Optical Technology Letters*, vol. 15, no. 2, pp. 68-72, June 1997.
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- 36) Gomez-Tagle J. and C.G. Christodoulou, "Bandwidth Enhancement for Stacked Concentric Ring Microstrip Antennas", *IEEE Transactions on Antennas and Propagation*, vol. 45, no. 11, pp. 1626-1635, Nov. 1997
- 37) El Zooghby A., C. G. Christodoulou, and M. Georgiopoulos, "Performance of Radial Basis Function Networks for Direction of Arrival Estimation with Antenna Arrays", *IEEE Transactions on Antennas and Propagation*, vol. 45, no. 11, pp. 1611-1617, Nov. 1997.
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- 40) Christodoulou C.G., J. Gomez Tagle, J. Zalewski and M. Machura, "Applying MPI to Electromagnetic Field Calculations", *Informatica*, vol. 22, pp. 485-490, 1998
- 41) Turner G. M. and C.G. Christodoulou, "FDTD Analysis of Periodic Phased Array Antennas", *IEEE Transactions on Antennas and Propagation*, pp. 661-667, April 1999.
- 42) El Zooghby A., C.G. Christodoulou and M. Georgiopoulos, "A Neural-Network-based Linearly Constrained Minimum Variance Beamformer", *Microwave and Optical Technology Letters*, pp. 451-455, June 1999.
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- 44) El Zooghby A., C.G. Christodoulou and M. Georgiopoulos, "A Neural Network-based Smart Antenna for Multiple Source Tracking", *IEEE Transactions on Antennas and Propagation*, vol. 48, no. 5, pp. 768-776, May 2000.
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- 46) Gomez-Tagle, M.T. Chryssonallis and C.G. Christodoulou, "FDTD analysis of finite-sized linear phased arrays of stacked microstrip Arrays", *Electrical Engineering, Springer-Verlag*, vol. 83, no. 3, pp. 123-128, 2001.
- 47) Joler M. and C. G. Christodoulou, "Laboratories Accessible Through the Internet", *IEEE Microwave Theory and Techniques Magazine*, vol. 2, pp. 99-103., Dec. 2001.
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- 51) Khodier M. and C.G. Christodoulou, "A Proposed Stacked Microstrip Antenna Structure for Bandwidth Enhancement", *Microwave and Optical Technology Letters*, vol. 36, No. 1, pp. 26-28, Jan. 2003.
- 52) Gomez-Tagle J. and C. G. Christodoulou, "FDTD Analysis of Finite Phased Arrays of Stacked Microstrip Antennas", *IEEE Transactions on Antennas and Propagation*, vol. 51, no. 8, pp. 2057-2062, Aug. 2003
- 53) C. Christodoulou (editor), "*Applied Computational Electromagnetics Society Journal*". Volume 18, Number 2. Special Issue on Neural Network Applications in Electromagnetics, July 2003
- 54) Tzeremes G., T.S. Liao, P.K. L. Yu, and C. G. Christodoulou, "Computation of Equivalent Circuit Models of Optically Driven CPW Fed Slot Antennas for Wireless Communications", *IEEE Antennas and Wireless Propagation Letters*, vol. 2, no. 10, pp. 140-142, 2003.
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- 56) Karr B. A., T.E. Durham, M.T. Chryssomallis, J.A. Kralovec, G.K. Gothard and C.G. Christodoulou, "Integral Equation Analysis and Investigation of a Broadband Cavity-Backed Array Antenna", *IEEE Transactions on Antennas and Propagation*, vol. 52, no. 7, pp. 1913 – 1916, July 2004.
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- 59) Tzeremes G., H. Tanner, T.S. Liao, and C.G. Christodoulou, "Wireless Communication with "Smart" Photonic Antennas using Transmission Power Control", *IEEE Antennas and Wireless Propagation Letters*, 2004, vol. 3, no. 13, pp. 232-235, 2004
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- 61) Patnaik A., D. Anagnostou, C.G. Christodoulou, and James C. Lyke, "Modeling frequency reconfigurable antenna array using neural networks", *Microwave and Optical Technology Letters*, February 2005.
- 62) Kirawanich, P., G. Tzeremes, C.G. Christodoulou, S. Joe Yakura, and N.E.Islam, "Electromagnetic Wave Penetrating Through Apertures; Comparison of Electromagnetic Topology Technique with FDTD Method", *IEEE Antennas and Wireless Propagation Letters*, vol. 4, pp. 151 – 154, 2005.
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- 64) Khodier M. M. and C. G. Christodoulou, "Linear Array Geometry Synthesis with Minimum Sidelobe Level and Null Control using Particle Swarm Optimization", *IEEE Transactions on Antennas and Propagation*, vol. 53, no. 8, pp. 2674-2679, Aug. 2005.
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6. ***“Radio Propagation and Adaptive Antennas for Wireless Communication Networks”***,
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7. ***“Antenna Design for Cognitive Radio”***, Tawk, Costantine and Christodoulou, Artech House,
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8. ***“Introduction to Radio Engineering”***, Blaunstein, Christodoulou, Sergeev, CRC Press, to
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- 2) “Antennas” in *John Wiley Encyclopedia of Electrical and Electronics Engineering*, by C. G. Christodoulou and P. F. Wahid, vol. 1, pp. 563-572, 1999.
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- 4) “Antenna Radiation Patterns” in *John Wiley Encyclopedia of Electrical and Electronics Engineering*, by M. Chryssomallis and C. G. Christodoulou , 2001
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- “*Neural Network Applications in Antennas*”, IEEE APS/URSI Symposium Atlanta , June 1998.
- “*Smart Antennas* ”, IEEE Conference on Antenna and Propagation for Wireless Communications, Waltham, MA, Nov. 2000.
- “*Phased Arrays and Multibeam Antennas for Wireless* “, IEEE Conference on Phased Arrays Systems and Technology 2003, Waltham. MA, Oct. 2003.
- “*Phased Arrays and Multibeam Antennas for Wireless* “, IEEE Conference on Antennas and Propagation, Monterrey CA, June 2004.
- “Applications of Artificial Neural Networks to Antenna Design and Analysis”, IASTED Conference on Antennas, Propagation, and Radar, Banff, Canada, July 2004
- “*Neural Networks and their Applications to Electromagnetic Modeling*”, IEEE/ACES Conference, Hawaii, April 2005.
- “*Antenna Design and Challenges in Cognitive Radio*”,_IEEE Conference on Antennas and Propagation, Chicago, July 2012
- “*Antennas in Cognitive Radio Applications*”, European Conference on Antennas and Propagation, April 2013, Sweden

GRANTS AWARDED (over \$60M)

Ph.D STUDENTS SUPERVISION (as Major Advisor)

- | | | |
|--------------------------------|---|--|
| 1) Cam Nguyen | Computer-aided Nonlinear Analysis of Microwave and Millimeter Wave Amplifiers and Mixers. | Fall 1990 (UCF)- Currently a professor at Texas A&M. |
| 2) Timothy Durham | Integral Equation Analysis of Composite Bodies of Revolution and Arbitrary Surfaces with Application to Cavity-Backed Antennas. | Fall 1992 (UCF)- He is with Harris Corporation, Melbourne, FL. |
| 3) Youcheng Liu | Frequency Selective Surfaces on Ferrite Substrates. | Spring 1996 (UCF) -with DME, Orlando, Florida |
| 4) Gregory Turner | FDTD Analysis of Periodic Phase Array Antennas | Fall 1997 (UCF) -with Harris Corporation, Melbourne, FL. |
| 5) Ahmed EL Zooghby | Neural network-based Adaptive Array Antennas for Cellular and Mobile Satellite Communications | Spring 1999 (UCF) - with Qualcomm, San Diego. |
| 6) T. Gomez-Tagle | FDTD analysis of finite array microstrip antennas of arbitrary shape and orientations. | Summer 1999 (UCF)- with Apple |
| 7) Madjid Khodier | Analysis and Design of Broadband Antennas for the Double Quantum Well Terahertz Detector | Fall 2001 (UNM) – Professor, Jordan University of Science and Technology |
| 8) George Tzeremes | Smart RF/Photonic Antennas for Ultra-High Capacity Wireless Communications | Fall 2004 – with the European Space Agency (ESA), Netherlands. |
| 9) Dimitrios Anagnostou | Re-configurable Fractal Antennas with RF-MEMS Switches and Neural Networks | Spring 2005- Associate Professor, Harriot Watt University, UK. |
| 10) Miroslav Joler | Analysis of Parallel-Plate Blumlein Line for Compact Pulsed-Power Systems | Spring 2006 – Professor at the University of Rijeka, Croatia. |
| 11) Luke Feldner | Reconfigurable RF MEMS Antenna Arrays and Electrically Small Antennas | Fall 2006 – with Sandia National Labs |
| 12) Matthew Higgins | Models for Electromagnetic Coupling of Lightning onto multiconductor cables in underground cavities | Spring 2008 –with Sandia National Labs |
| 13) Mehmet Su | Proximity Field Nanopatterning for Large Area 3D Photonic Nanostructures: Forward and Inverse Problem Modeling | Summer 2008 – With Stellar Science, Ltd- Albuquerque. |
| 14) Jesse Lai | Investigation into the Use of High-Efficiency Switched Mode Class E Power Amplifiers for High Dynamic | Fall 2008- with Sandia National Labs |

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|----------------------------------|---|---|
| | Range, Pulse Mode Applications. | |
| 15) Naga Devarapalli | Rectangular Waveguide Narrow-Wall Longitudinal Aperture Antenna Arrays for High Power Applications. | Summer 2009- Professor at IIT, Ropar, India. |
| 16) Tom Atwood | RF Channel Characterization for Cognitive Radio using Machine Learning Algorithms. | Fall 2009 - with Sandia National Labs |
| 17) Joseph Costantine | Design, Optimization and Analysis of Reconfigurable Antennas. | Fall 2009 – Professor, American University in Beirut, Lebanon. |
| 18) Junghoon Kim | A Compact RF/Photonic Antenna using a Quantum Dot Mode Locked Laser as a Source. | Fall 2010 – with Lam Research Corporation, CA. |
| 19) Nan Xu | Applications of Support Vector Machines in Electromagnetic Problems. | Spring 2011 – with Google, San Diego. |
| 20) Youssef Tawk | Analysis, Design and Implementation of Front-End Reconfigurable Antenna Systems. | Spring 2011 – Professor, American University in Beirut, Lebanon, Beirut, Lebanon. |
| 21) Prasanth Kumar | Electromagnetic Pulse Technology: Biological and Terahertz Applications | Spring 2011 – with Lam Research Corporation, CA. |
| 22) Ben Pulford | LOCSET Phase Locking: Operation, Diagnostics, and Applications | Fall 2011 – With Air Force Research Lab – Kirtland. |
| 23) Eyad T. Al Zuraiqi | Neural Network Field Programmable gate Array (FPGA) Controllers for Reconfigurable Antennas | Spring 2012 – Professor, Yarmouk University, Jordan. |
| 24) Cecil Richard Compeau | An Ultrawideband Dual-Linear Polarization Feed for Solar Microwave Observation | Fall 2013 – Professor at Texas State University |
| 25) Julie Lawrance | Metal Plate Lenses for High Power Microwave Applications Including a Novel HPM Zoom Antenna | Fall 2014 - With Air Force Research Lab – Kirtland. |
| 26) Timothy Buckley | Wireless Communication System for Data transfer and Wireless Power Transmission | Fall 2014 – with the Buckley Institute of Technology, Denver, Co. |
| 27) Derek Doyle | Analysis, Implementation and Considerations for Liquid Crystals a Reconfigurable Antennas Solution (LiCRAS) | Fall 2015 - With Air Force Research Lab-Kirtland |
| 28) Chris Woerhle | Liquid Crystal Phase Shifters for Space Applications | Fall 2015 - with Sandia National Labs |

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|------------------------|---|---------------------------|
| 29) Elizabeth Zamudio | Aluminum Zinc Oxide (AZO) Optimization Process for Use in Optically Transparent Antennas | Spring 2017 – with Intel |
| 30) Hamide Seidfaraji | High Power Microwave Metamaterial Based Passive and Active Devices | Fall 2017 – with Space X |
| 31) Firas Ayoub | Antennas for W/V band Applications | Spring 2018- UNM |
| 32) Xuyuan Pan | A Narrow-wall Complementary-split-ring Slotted-waveguide-antenna for High-power-microwave Applications | Fall 2018 – with Motorola |
| 33) Nicholas Tarasenko | Design and Implementation of a 72 & 84 GHz Terrestrial Propagation Experiment; Exploitation of NEXRAD Data to statistically Estimate Rain Attenuation at 72 GHz | Spring 2019 |
| 34) Shu Wang | Advanced Parallel Algorithms in Computational Electromagnetics | Summer 2020- with NVidia |

Current PhD students

- 35) Arjun Gupta
- 36) Monica Jaramillo
- 37) David Hensley
- 38) Grant Heileman
- 39) Daniel Guillette
- 40) Marios Patriotis
- 41) Jayakrishnan Vijayamohanan
- 42) Jesse Olson
- 43) Ralph Gesner
- 44) Oameed Noakoasteen
- 45) Julie Smith
- 46) Zachary Bergstedt
- 47) Jason Urvanejo

M.S. THESES (Chair)

Completed

- 1) “The Secant-Corrector Spectral Iterative Method for Analyzing Scattering from Planar Periodic Structures”, by **Robert Middleveen**, Spring 86.
- 2) “Design of Two-Layer, Capacitively Coupled, Microstrip Patch Antenna Element for Broadbanding Applications”, by **Robert Cock**. Fall 86.
- 3) “Electromagnetic Scattering from Stacked Gratings”, by **Kwan Pok**, Fall 86.
- 4) “Automated Q-Factor Measurements Via a Network Analyzer”, by **Fadi Ayoub**, Summer 86
- 5) “Optical Interferometric Formation of a Phased Array Antenna Footprint”, by **Jack Sherwood**, Spring 88
- 6) “Microwave Spectral Properties of cascaded Rotating Metallic gratings”, by **X. Shi**, Spring 89.

- 7) "Analysis and design of a Pulsed GaAs Laser Rangefinder Receiver", by **Hoyt N. Burns**, Spring 89.
- 8) "RF Imaging Methodology for Characterization of Complex Low Observable Test Specimens", by **Phillip Hermann**, Summer 89.
- 9) "Design and Analysis of a Rectangular Waveguide-to-Microstrip E-probe Transition", by **Daniel S. Dunn**, Fall 89.
- 10) "Electromagnetic Scattering by an Aperiodic Stip Grating", by **Eric G. Johnson**, Fall 89.
- 11) "A Statistical Approach for Estimating the Loss Contribution of Concatenated Connectors in Fiber-Optic Links", by **James G. Uhing**, Spring 1990.
- 12) "Analysis of Electrically Small Hyperboloid Subreflector", by **David Cook**, Spring 1990.
- 13) "A Circular Array of Microstrip Patches", by **Kim Rutkowski**, Summer 90.
- 14) "Plane Wave Analysis and Evaluation of an Indoor Far Field Conductive Chamber", by **Wally S. Arseneaux**, Fall 1990.
- 15) "Electromagnetic Scattering from a finite Cylinder with Complex Permittivity at Arbitrary Orientation", by **Robert A. Murphy**, Fall 1990.
- 16) "Power Amplifier Design with GaAs MESFET", by **Sophia Chen**, May 91.
- 17) "Analysis of Coherent Interference Suppression", by an Adaptive Linear Array Antenna", by **Michelle Morisson**, May 91.
- 18) "Millimeter-wave, High Range Resolution Target Generation Using a Programmable Microwave Phase Shifter", by **Frank St. John**, May 1991.
- 19) "Multipath Propagation of Pulse Signals in Airborne application systems", by **Paul Watson**, April 1, 1992.
- 20) "Electromagnetic Focusing Properties of Chirped Gratings", by **Jeff C. Schmidt**, July 17, 1992.
- 21) "Scattering from Metallic Gratings made of Various Conductivity Profiles", by **Frank E. Grey**, Fall 92.
- 22) "Analysis of a Broadband Microstrip Dipole Antenna", by **Mary-Beth Selby**, Fall 93.
- 23) "A Standardized Method of Specifying and Analyzing Square Spiral Microstrip Antennas", **Jay Ely**, Spring 95.
- 24) "Design of a two-layer microstrip microstrip array antenna for DBS Applications", **Charles Stroupe**, Spring 95.
- 25) "Analysis of Planar Antennas Structures Using the Finite Element Method", **Rue Hestand**, Summer 95
- 26) "FDTD Analysis of Microstrip Antennas on Ferrite Substrates", by **Tamara Spreckic**, Summer 95.
- 27) "Mitigation of Magnetic Fields from Panelboards from 60 Hz Line Currents and its Harmonics", by **Patrick Hannan**, Summer 96.
- 28) "Cavity Model Analysis of Microstrip Ring Antennas using Green's Functions", by **Javier Gomez-Tagle**, Summer 96.
- 29) "A Bistatic Radar System as a Wind Profiler at KSC", by **Steve Vergenz**, Summer 1997.

- 30) "FDTD Analysis of stacked microstrip patch antennas", **Sue Hwang**, Fall 1997
- 31) "Interface Development and Modification of CBS3DS Radar Cross Section Analysis Tool Using FEMAP Finite Element Modeler and MATLAB Plotting", **Matthew Telep**, Fall 97.
- 32) "Design of a Foldable Series-fed Antenna for Radiometric Applications", **Riad Mahbub** , Summer 98.
- 33) "Antenna Synthesis using Neural Networks", **Shaheed Reza**, Summer 98.
- 34) "Analysis of the Effects of Cone Angle on a Cavity Backed Log-Periodic Array Antenna", **Brian Karr**, Fall 98.
- 35) "Automatic target recognition using neural networks", **Sameh W. Tawadrous**, Fall 99.
- 36) "A Procedure for Locating and Identifying Buried Unexploded Ordnance Using Curve Fitting Techniques and Neural Network Pattern Classification", **David Clark**, Fall 2001.
- 37) " Remotely Controlled Measurements, Devices, and Simulations Convenient for Real-time Multi-user Collaboration", **Miroslav Joler**, Fall 2001
- 38) "The Use of Weibull Statistical Model For Describing Multipath Phenomena in Mobile Communications", **George Tzeremes**, Spring 2002.
- 39) "Fractal Antennas with RF MEMS", **Dimitris Anagnostou**, Fall 2002.
- 40) "Crystal Oscillator Designed using Current Conveyors", **Gavin Corcoran**, Fall 2002.
- 41) "Application of Chalcogenide Materials to RF Antenna Design", **David Vreeland**, Sum. 2003.
- 42) "A New Approach in Designing High Efficiency RF Medium to High Power Class E Amplifiers" **Greg Wouters**, Fall 2003
- 43) "Determination of Antenna Type and Orientation Through the Use of ARTMAP Neural Networks", **Kevin Rock**, Spring 2004
- 44) "A Low Loss RF MEMS Ku-Band Integrate Switched Filter Bank", **Isak Reines**, Summer 2004
- 45) "Design of an L-band Phase-locked Loop Microwave Synthesizer", **Jeff Bach**, Summer 2004.
- 46) "Design, Analysis and Optimization of the Cactus Antenna", **Vassiliki Zachou**, Fall 2005
- 47) "Using the Transfer Matrix Approach in Modeling Photonic Bandgap Materials ", **Miena Armanius**, Spring 2006
- 48) "Mind Bending Light Benders: High Performance Computing Applications in Photonic Band Gap Material Simulations", **Mehmet Su**, Spring 2006
- 49) "Investigating the Lifetime of RF MEMS Ohmic Switches using a Lifetime Test Station", **Andrew Carton**, Summer 2006.
- 50) "Improvement of the electromagnetic enhancement in SERS", **Chao Zhang**, Summer 2007.
- 51) "Analysis and Design of Reconfigurable Multi-Band Stacked Microstrip Patch Antennas (MSAs) for Wireless Applications", **Mahmoud A. Alayesh**, Fall 2007

- 52) "Modeling of Metallic Nano Particle Antennas for SERS-Sensing Applications", **Bo Yin** ,
Fall 2008
- 53) "Analysis, Design and Implementation of a Reconfigurable Fractal Volumetric Left-handed Metamaterial",
Teofilo De La Mata , Fall 2008
- 54) "FPGA Controlled Reconfigurable Antenna", **Severn Shelley**, Fall 2009.
- 55) "Polarization Diverse Tracking Antenna with High Sensitivity" , **Michael Pace**, Fall 2009.
- 56) "The Fundamental Resonant Frequency and Radiation Characteristics of Wide Angle Conical Antennas",
Julie Lawrance, Fall 2010
- 57) "Failure Detection and Correction in Switch Reconfigurable Antenna Arrays", Manuel Rivera, Fall 2010
- 58) "Reconfigurable Filtenna for Cognitive Radio Applications", **María Elizabeth Zamudio Moreno**, Fall 2011
- 59) "A Deployable Bottom Fed Conical Log-Spiral Antenna Design for Cubesat Applications",
Anthony Ernest, Spring 2012
- 60) "Photonic Generation of Microwave Signals: A Quantum Dot Mode Locked Laser as a Microwave Source",
George Atmatzakis, Summer 2012.
- 61) "S band Narrow-wall Slotted Waveguide Antenna For High-power Applications", **Xuyuan Pan**, Spring 2013
- 62) " An Approach for In-situ Scan Impedance Characterization of Phased Arrays", **Thomas Christian** , Spring
2013
- 63) "Realization of Temperature Compensated Aluminum Nitride Microresonator Filters with Bandwidth Beyond
 k^2 Limit, **Janet Nguyen**, Summer 2013.
- 64) "Contributions towards a Coherent Chaotic Oscillator at 100 MHz and 70GHz Antennas for Automotive Radar
Systems", **Firas Ayoub**, Summer 2013
- 65) "Randomly Spaced Smart Antennas", **Maialen Ciaurriz**, Fall 2013
- 66) "Broadband PIFA Rectenna Design for a Multi-source Energy Harvesting Device", **Jillian Erickson**, Fall
2013
- 67) "Millimeter Wave Propagation Impairments, Models, and On-ground Experimentation",
Christopher Romero, Fall 2013
- 68) "Analysis, Design and Implementation of Liquid Crystals for Circular Polarized Microwave Applications",
Christopher Woerlhe, Fall 2013
- 69) "Explosive Safety with Regards to Electrostatic Discharge", **Francis Martinez**, Spring 2014
- 70) "Examining 3D Printed Antennas for Space Based Applications", **Kathreen Belvin**, Spring 2015.
- 71) "FPGA Implementation of a Real Time Cyclostationary Feature Detector for OFDM Signals", **Sean Hamlin**,
Spring 2016.
- 72) " Rain Attenuation Effects on Signal Propagation at W/V-Band Frequencies", **Nadine Maroun Daoud**, Fall
2016.

73) “Characterization of Wideband U-Slot Patch Antennas Through Characteristic Modal Analysis and Coupled Mode Theory”, **Tyler Cruz Lapointe**, Spring 2018.

74) “Design and fabrication of Peel off and Stick Antennas”, **Jayakrishnan Vijayamohan**, Summer 2019.

75) “Validation of Gaseous Absorption & Cloud Attenuation Models Utilizing a 72 GHz Terrestrial Link”, **Ralph Gesner**, Fall 2019.

Current MS students

75) Erica Whitefield

76) Jordan Keely

77) Ian Chavez

M.S PROJECT Students (Completed)

Constantia Lambrinos

Derek Lamppa

Deanna Fernandez

David Vigliano

Stacy L. Kerns

Phillip Mazzei

Raymond Renfrow

Brett Stephens

Colin George

Grant Heileman

Sarah Belchak

Post Doctoral Fellows

Y. Xian

Amalendu Patnaik

Joseph Costantine

Youssef Tawk

M. Su

Eyad AL Zuraiqi

Yanshi Huang

Hyun Ju Connor

Yong Shi

Shuang Feng

Firas Ayoub

Russel Landry

AWARDS and HONORS

Distinguished Professor- University of New Mexico

IEEE Fellow, 2002

IEEE Outstanding Engineering Educator 2012 (Albuquerque Section)

National Member of the National Research Council

Gardner-Zemke Professor (Teaching award) 2008-2010

Outstanding Senior Teacher 2009 (UNM- School of Engineering)

Lawton-Ellis Service award- 2007

Outstanding Senior Researcher 2006 (UNM- School of Engineering)

Outstanding Teacher, Electrical Engineering , UCF, 1989.

Outstanding Teacher, Electrical Engineering, UCF, 1990.

Outstanding Teacher, College of Engineering, UCF, 1990.

Outstanding Researcher, Electrical Engineering, UCF, 1992.

Outstanding Researcher, Electrical and Computer Engineering, UCF, 1994.

Outstanding Advisor, Electrical and Computer Engineering, UCF, 1995.

Outstanding Advisor, College of Engineering, UCF, 1995.

UCF Teaching Incentive Award, 1994
UCF Teaching Incentive Award, 1997
Excellence in Graduate Teaching Award, Electrical and Computer Engineering, UCF, 1998
Excellence in Graduate Teaching Award, College of Engineering, UCF, 1998
NASA Summer Faculty Fellowship, 1990
Senior Member IEEE, Oct. 1990.
The Price Waterhouse Up and Comer Award in Education in Central Florida (April 1990).
Outstanding Engineer of the Year (91) for the AP/MTT Chapters of the IEEE Orlando Section
Elected Member in Commission B of the International Union of Radio Science, 91 .
General Chair for the International IEEE Symposium on Antennas/URSI 1999, Orlando, Florida.

PROFESSIONAL ACTIVITIES AND RECOGNITION

(Local, National, and International)

Executive Committee-Global Engineering Deans' Council, 2010-present

STC board of Directors

IEEE Fellow

Series Editor for Artech House for the area of Antennas and Propagation, 2013-present

Chair, Awards and Fellows Committee – IEEE Antennas and Propagation Society, 2011-2013

IEEE Distinguished Lecturer, 2007-2010

John Kraus Antenna APS Award 2010

Selected as NRC Research Advisor under the National Academies/AFRL Program to advise Faculty members or researchers from anywhere in the world.

Keynote Speaker - Third IEEE International Symposium on Microwave, Antennas and Propagation

EMC Technologies (MAPE) for Wireless Communications, Beijing, China, October 2009

Board of Directors for GWEC (Global Wireless Education Consortium) 2002-2006

Antennas and Propagation Series Editor for Artech House (2013-now)

Associate Editor, for IEEE Transactions on Antennas and Propagation, 2001-2007

Associate Editor for the Antennas and Propagation Magazine 2000-2011

Associate Editor for the Antennas and Wireless Propagation Letters 2007-now

Associate Editor for the Inter. Journal of RF and Microwave Computer-Aided Engineering (2003-2009)

Member of the Editorial board of the International Journal of Signal and Imaging systems Engineering (2008-now)

Editor of a Special Issue on "Reconfigurable Systems" in the IEEE Proceedings 2015.

Editor of a Special Issue on "Synthesis and Optimization Techniques in Electromagnetics and Antenna System Design", IEEE Transactions on Antennas and Propagation, 2007.

Editor on ACES Special Issue on "Neural Network Applications in Electromagnetics", July 2003.

Member of the Technical Committee Program – IMOC, Brazil 2005 and 2007

Member of the Technical Committee Program – HUT-ICCE, Hanoi-Vietnam 2007 and 2008

Member of the Technical Committee Program MAPE 2007, Hangzhou, China 2007.

Member of the International advisory Committee -IEEE Workshop on Anti-counterfeiting, Security and Identification, Xiamen, China 2007.

Member of the International board of Advisors for the International Workshop on Imaging Systems and Techniques, Chania, Greece, September 2008

Member of the Technical Committee Program – LAPC, UK-2007 and 2008

Member of Technical Program Committee for the JOINT IAPR INTERNATIONAL WORKSHOPS ON Structural and Syntactic Pattern Recognition, and Statistical Techniques in Pattern Recognition December, 2008 – Orlando, Florida, USA

Member of the International Board of Directors, Imaging Systems and Techniques, Shenzhen, China, May 2009

Reviewer for IEEE Transactions on Antennas and Propagation

Reviewer for IEEE Transactions on Microwave Theory and Techniques

Reviewer for IEEE Transaction on Vehicular Communications

Reviewer for Journal of Applied Optics

Reviewer for Journal of Electromagnetic Waves and Applications

Reviewer for Inter. Journal of RF and Microwave Computer-Aided Engineering

Reviewer for Radio Science

Reviewer for Advances in Engineering Research Journal

Reviewer for Applied Computational Electromagnetics Society Journal
Reviewer for NSF
Reviewer for the Electronics and Telecommunications Research Institute Journal
Served in several Technical Program Committees for the IEEE AP-S International Symposia and URSI Radio Science Meetings
Chaired **several** Technical Sessions for the IEEE Antennas and Propagation Symposia for the last 30 years.
Secretary for IEEE AP/MTT in 1987 (Orlando Chapter).
Vice-chair for IEEE AP/MTT (Orlando Chapter) in 1988.
Chair for IEEE AP/MTT in 1989 (Orlando Chapter).
Local Arrangements person for IEEE AP/MTT Orlando Chapter in 94-95.
Vice-Chair for IEEE AP/MTT Orlando Chapter 95-96.
IEEE Microwaves Theory and Techniques Steering committee member, 1995 Symposium, in Orlando
Secretary for IEEE Orlando Section 95-96.
Treasurer for IEEE Orlando Section 96-97.
Vice-Chair for IEEE Orlando Section 97-98.
Chair for IEEE AP/MTT for 1995-1996 (Orlando Chapter).
Technical Committee Vice-chair for 1996 IEEE SouthCon in Orlando, Florida.
Member of the International Program Committee (3 members) for the Croatian Symposium KoREMA (Croatian Society for Communications, Computing, & Electronics) in 1996.
Technical Committee Chair, for IEEE SoutEastCon '98, Orlando, Florida.
Local arrangements Chair for BETECH 98, Orlando Florida.
Technical Committee Member for the 1998 IEEE APS/URSI Symposium, Atlanta, GA
General Chair of IEEE APS/URSI 1999 Symposium in Orlando, Florida, 1999
Co-Chair of the IEEE APS Conference on Antennas and Propagation for Wireless Communications, Waltham, Massachusetts, Nov. 2000.
IEEE student Advisor for 2000-2001 at UNM
Conference Chair , IASTED Antennas propagation and Radar Conference, Banff , Canada 2004
Technical Program Committee Co- Chair of IEEE APS/URSI/AMEREM Symposium in Albuquerque, NM, 2006.

COMMITTEE SERVICE

Departmental Level

IEEE student Advisor - UCF (1986)
Chair of EM group (ECE Department). 1985-1993- UCF
Member of the undergraduate committee. 1989-1990 -
Member of the executive committee , 1990-1995
Member of the personnel committee , 1991-1992
Member of the EE Chairman's evaluation committee 1991
Chair of EE and CPE undergraduate committees (1993,1994)
Chair of EE undergraduate committee (fall 94-present)
ECE administrative committee (1994-1995).
Member of the ECE Space committee (1994-present)
Member of the ECE Chair's search committee.(1994-1995).
Acting Chair (summer 93) - UCF
Acting Chair (summer 94) - UCF
Member of the ECE personnel committee 96-97
Chair of the ECE Recruiting Committee 96-97
Member of computer engineering search committee (software), Summer 97.
ECE Seminar Series Coordinator 1998.
Member of ECE Graduate Committee 1997-1998.

College Level

Tau Beta Pi Advisor 2007-2012.
Chair of search committee for Chemical and Nuclear Engineering Department Chair, 2001
SOE undergraduate recruiting committee 2005-2006

Member of the Dean's Advisory committee. 1989-1991. - UCF
Member of the ad-hoc college committee on PE issue.
College Honors and Awards Committee 1991-1992.
College Strategic planning Committee 92-93
College Personnel Committee(alternate) 92-94
College Undergraduate committee 93-present
Director of the Honors Program, College of Engineering (1993-1996).
College Personnel Committee (1994-1995).
Chair of the COE Strategic Planning Committee. (1994-1995).
TIP committee 1995-1996.
College recruiting committee (1996-1997).
College search committee for a STAC director (1996)
Chair of the COE Professional Excellence Program (PEP) committee 96-97.
Chair of the COE Professional Excellence Program (PEP) committee 97-98.
College Research Committee 1997-1998.

University and State Level Committees

Member of the UNM Economic Development Council- (2017 – now)
Member of the NM Bioscience Authority Board of Directors – (2017- now)
New Space NM Advisory Team – (2018 - now)
Member of the UNM Presidential Award of Distinction review committee - 2017
Member of the committee on Globalization, Technology, Innovation, and National Security
Faculty Senate Undergraduate Committee (at UNM) 1999-2001
Faculty Senate Teaching Enhancement Committee (at UNM) 1999-2002
Faculty Senate Academic Freedom and Tenure Committee
VPR search Committee 2014-2015
AFRL-UNM Advisory committee 2011-now
Faculty Senate Steering Committee.1989-1990 - UCF
Assistant Marshall for December 1989 Commencement. - UCF
Senate (new programs and curriculum Committee) 92-94 -UCF
Senate Faculty representative for summer 1992 graduation ceremony.
SACS student developmental services committee (1994).
University LEADS program committee (1994-1995).
University Strategic Planning Task Force II Committee - (Academic Review Subcommittee) (1995-1996).
New programs and curriculum Committee 96-97
Faculty Senate (1997-1999).
Budget and Finance Committee 1997-1998