

**CHRISTOS G. CHRISTODOULOU**  
**IEEE Fellow**

University of New Mexico  
Electrical and Computer Engineering Department  
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**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 with an option in solid state electronics.-1979

**RESEARCH INTERESTS:** Wireless Communications, numerical techniques in electromagnetics, smart antennas, neural network and machine learning applications in electromagnetics, Reconfigurable antennas, RF/Photonic antennas.

**WORK EXPERIENCE**

July 05-present	Professor, University of New Mexico
Jan 99-July2005	Professor and Chair of EECE 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
1990-May 96	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
Aug. 1979 to Dec. 84	Research and Teaching Assistant, Instructor at North Carolina State University.
Summer 81	NASA Langley Research Center

**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.
- Member of the IEEE, Electromagnetic Compatibility Society.
- Member of the IEEE, Engineering in Medicine and Biology Society
- ASEE Member
- Member of HKN and Tau Beta Pi

**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)

## **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, n0. 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
- 31) Dogariu A., G.D. Boreman, C. G. Christodoulou, and D. Kotter, "Dipole-on-Dielectric Model for Infrared Lithographic Spiral Antennas", *Optics Letters*, pp. 309-311, March 1996.
- 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.
- 35) Liu Youcheng, C. G. Christodoulou and N.E. Buris, "Analysis of Frequency Selective Surfaces on Ferrite Substrates", *Journal of Electromagnetic Waves and Applications*, vol. 11, pp. 593-607, 1997.
- 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.
- 38) Hestand R. and C. G. Christodoulou, "Optimizing a Coplanar Waveguide-Fed Aperture Coupled Patch Antenna for Ease of Manufacturing and Elimination of Back Radiation Problems", *Microwave and Optical Technology Letters*, pp. 391-396, Dec. 1998.
- 39) El Zooghby A., C.G. Christodoulou and M. Georgiopoulos, "Neural Network-based Adaptive Beamforming for one and two Dimensional Antenna Arrays", *IEEE Transactions on Antennas and Propagation*, Dec. 1998.
- 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.
- 43) Dean R. N., Jr., P.C. Nordine and C. G. Christodoulou, "3-D Helical THz Antennas", *Microwave and Optical Technology Letters*, pp. 106-111, Jan. 20, 2000
- 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.
- 45) Christodoulou C.G., P.F. Wahid, R.M. Mahbub, and M.C. Bailey, "Design of a Series-fed Foldable Microstrip Array Antenna", *IEEE Transactions on Antennas and Propagation*, vol. 48, No. 8, pp. 1264-1267, Aug. 2000.
- 46) Gomez-Tagle, M. T. Chryssonallis and C.G. Christodoulou, "FDTD analysis of finite-sized li phased arrays of stacked microstrip Arrays", *Electrical Engineering, Springer-Verlag*, vol. 83, no. 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
- 48) Qian J., R. P. Joshi, K. H. Schoenbach., M. Laroussi, Edl Schamiloglu, and C . G. Christodoulou , "Percolative Model Of Electric Breakdown In Liquid Dielectrics", *IEEE Special Issue on Trans. Plasma Science*, vol. 30, no. 5, pp. 1931-1938, Oct. 2002
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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
- 60) Tzeremes G., P. Kirawanich, C. G. Christodoulou, and N. E. Islam, "Transmission lines as radiating elements in aperture interactions for electromagnetic topology simulations", *IEEE Antennas and Wireless Propagation Letters*, vol. 3, no. 15, pp. 283-286, 2004.
- 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.
- 63) Joler M., C. Christodoulou, E. Schamiloglu, and J. Gaudet, "Effects of Dielectric Width Extension in a Parallel-Plate Blumlein Line", *Microwave and Optical Technology Letters*, Aug. no. 5, 220-225, 2005.
- 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.
- 65) Patnaik A., D. Anagnostou, C. G. Christodoulou, and J. Lyke, "Neurocomputational Analysis of a Multiband Reconfigurable Planar Antenna", *IEEE Transactions on Antennas and Propagation*, Nov. 2005.
- 66) Martinez Ramon M., N. Xu, and C. G. Christodoulou, "Beamforming using Support Vector Machines", *IEEE Antennas and Wireless Propagation Letters*, vol 4., pp. 439-442, 2005.
- 67) Song B., P. K. L. Yu, R. L. Cruz, B. D. Rao, and C. G. Christodoulou, "Cross-layer Design for High QoS Indoor Wireless Networks Using Multiple Antenna Systems", *ST Journal of Research on Networked Multimedia*, vol. 2, no. 1, pp. 93-106, Nov. 2005.
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- 74) Seokwoo Jeon, Daniel J. Shir, Yun Suk Nam, Robert Nidetz, Matthew Highland, David G. Cahill, John A. Rogers, Mehmet F. Su, Ihab F. El-Kady, Christos G. Christodoulou, and Gregory R. Bogart, “Molded transparent photopolymers and phase shift optics for fabricating three dimensional nanostructures”, *Optics Express*, Vol. 15, Issue 10, pp. 6358-6366, May 2007.
- 75) Seokwoo Jeon, Daniel J. Shir, Matthew Highland, David G. Cahill, Mehmet F. Su, Ihab F. El-Kady, Christos G. Christodoulou, Gregory R. Bogart, Alex Hamza and John A. Rogers, “Three Dimensional Nanofabrication With Elastomeric Phase Masks”, *J. Phys.Chem. B.*( Feature article), pp 12945 – 12958, Oct. 2007.
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- 91) J. Costantine, C. G. Christodoulou, C. T. Abdallah, and S. E. Barbin, , " Optimization and Complexity Reduction of Switch-Reconfigured Antennas using Graph Models" , *IEEE Antennas and Wireless Propagation Letters*, 2009.
- 92) J. B. Lai and C. G. Christodoulou, "A Very High Sensitivity RF Pulse Profile Measurement System", *IEEE Transactions on Instrumentation and Measurement*, 2009.
- 93) J. H. Kim, C. G. Christodoulou, Z. Ku, C.-Y. Lin, Y.-C. Xin, N. A. Naderi, L. F. Lester, J. P. Kim, "Quantum-dot mode locked laser integrated bowtie antenna", *IEEE Antennas and Wireless Propagation Letters*, 2009
- 94) M. B. Higgins, M. E. Morris, M. Caldwell, C. G. Christodoulou, "Measurement and Modeling of Transfer Functions for Lightning Coupling into the Sago Mine", *IEEE Transactions on Electromagnetic Compatibility*, 2009.
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- 96) Jeong-Phill Kim, *Member, IEEE*, Sangho Nam, Junghoon Kim, and C. G. Christodoulou,

“Network Analysis and Modeling of Aperture-Coupled Back-to-Back Microstripline-to-Vertically Mounted Slotline Coupler ,” submitted to the *IEEE Transactions on Microwave Theory and Techniques*.

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- 220) C. G. Christodoulou, "Reconfigurable multifunctional Antennas", EUCAP, Berlin, March 2009 (**invited talk**).
- 221) C.-Y. Lin, N. A. Naderi, F. Chiragh, J. H. Kim, C. G. Christodoulou and L. F. Lester, "31% DC to RF Differential Efficiency Using Monolithic Quantum Dot Passively Mode-Locked Lasers", CLEO, Baltimore, Maryland , May-June 2009,.
- 222) J. Costantine, C. G. Christodoulou, "Analyzing Reconfigurable Antenna Structure Redundancy Using Graph", IEEE AP URSI Symposium, Charleston, South Carolina, June 2009.

- 223) Y. Tawk and C. G. Christodoulou, "A Cellular Automata Reconfigurable Microstrip Antenna Design", IEEE AP URSI Symposium, Charleston, South Carolina, June 2009.
- 224) J.H. Kim, C. G. Christodoulou, Z. Ku, C.-Y. Lin, N. A. Naderi, L. F. Lester and J. P. Kim, "A Bowtie Slot Antenna coupled to a Quantum-Dot Mode Locked Laser", IEEE AP URSI Symposium, Charleston, South Carolina, June 2009.
- 225) Serhat Altunc, Carl E. Baum, C. G. Christodoulou, Edl Schamiloglu, C. J. Buchenauer, "Electromagnetic Lens for Cancer Treatment", IEEE AP URSI Symposium, Charleston, South Carolina, June 2009.
- 226) N. R. Devarapalli, C. G. Christodoulou, C. E. Baum, E. Schamiloglu, "Rectangular waveguide edge wall aperture array for high power", IEEE AP URSI Symposium, Charleston, South Carolina, June 2009.
- 227) T. D. Atwood, M. Martinez-Ramon, C. G. Christodoulou, "Robust Support Vector Machine Spectrum Estimation in Cognitive Radio", IEEE AP URSI Symposium, Charleston, South Carolina, June 2009.
- 228) T. D. Atwood, M. Martinez-Ramon, C. G. Christodoulou, "Parametric Spectral Occupancy Estimation Using Signal Autocorrelation Functions", IEEE AP URSI Symposium, Charleston, South Carolina, June 2009.
- 229) M. Joler and C. G. Christodoulou, "On the Development of a Self-Recoverable Antenna System", IEEE AP URSI Symposium, Charleston, South Carolina, June 2009.
- 230) C. G. Christodoulou, "Reconfigurable Antennas in Cognitive Radio that can Think for Themselves?", Third IEEE International Symposium on Microwave, Antenna, Propagation and EMC Technologies (MAPE) for Wireless Communications, Beijing, China, October 2009 (Keynote speaker)
- 231) M. Martínez-Ramón, T. Atwood, S. Barbin, and C. G. Christodoulou, "Signal classification with an SVM-FFT approach for feature extraction in cognitive radio", SBMO/IEEE MTT-S Conference, in Belem, Brazil, Nov. 2009, pp. 286-289
- 232) J. Costantine, S. Barbin, and C. G. Christodoulou, "Analyzing Capacitor-Based Reconfigurable Antennas Using Graph Models", SBMO/IEEE MTT-S Conference, in Belem, Brazil, Nov. 2009, pp. 807-810

## **PATENTS**

G.D. Boreman, I. Codreanu, C. Fumeaux, M. Gritz, C. Christodoulou, " *Wavelength-tunable coupled antenna uncooled infrared (IR) sensor*", US Patent 6,310,346 (2001)

G.D. Boreman, A. Dogariu, C. Christodoulou, C. Fumeaux, " *Polarization-tunable antenna-coupled infrared detector*", US Patent 6,037,590 (2000)

Anagnostou, and C. Christodoulou (at UNM), " *Reconfigurable Multifrequency Antennas with RF MEMS Switch*"- a provisional patent.

## **BOOKS:**

- “*Neural network applications in electromagnetics*”, Christodoulou and Georgiopoulos, Artech House, Jan. 2001
- “*Antennas: Fundamentals and Concepts*”, Christodoulou and Wahid, SPIE, August 2001
- “*Support Vector Machines for Adaptive Antenna Array Processing and Electromagnetics*”, Martinez-Ramon and Christodoulou, Morgan & Claypool, October 2006.
- “*Radio Wave Propagation and Adaptive Antennas for Wireless Communication Links: Terrestrial, Atmospheric and Ionospheric*”, Blaunstein and Christodoulou, John Wiley, October 2006.

## **BOOK CHAPTERS:**

- 1) “Adaptive Interference Cancellation with Neural Networks” in *Wireless Personal Communications: Emerging Technologies for Enhanced Communications*, The Kluwer International Series in Engineering and Computer Science., by El Zooghby A. H., C. G. Christodoulou, and M. Georgiopoulos, 1998
- 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.
- 3) “Applications of Neural Networks in Smart Antennas for Mobile Communications”, by C. G. Christodoulou, M. Georgiopoulos and A.H. El Zooghby, in *Applied Computational Intelligence*, Mary Lou Lou Padgett Nicolaos B. Karayiannis (edts). CRC Press, LLC, Jan. 2000.
- 4) “Antenna Radiation Patterns ” in *John Wiley Encyclopedia of Electrical and Electronics Engineering*, by M. Chryssomallis and C. G. Christodoulou , 2001
- 5) “Finite Difference Time Domain Methods: Numerical Methods of Antenna Design” in *Handbook on Antennas in Wireless Communications*, by Atef Elsherbeni , C. G. Christodoulou, and Javier Gomez Tagle. CRC Press, chapter 7, 2001
- 6) “Antennas for Mobile Communications”, in *Wiley Encyclopedia of Telecommunications*, editor John Proakis, John Wiley & Sons, Inc., by M. Chryssomallis and C. G. Christodoulou, April 2003.
- 7) “Antenna Radiation Patterns ” in *John Wiley Encyclopedia of of RF and Microwave Engineering*, by M. Chryssomallis and C. G. Christodoulou , 2004
- 8) “Antennas” in *John Wiley Encyclopedia of of RF and Microwave Engineering* , by C. G. Christodoulou and P. F. Wahid, 2004
- 9) “Comparison of Kernel Method for Smart Antenna Array Processing”, in *Kernel methods in bioengineering, communications and image processing*, C. Christodoulou, M. Martínez-Ramón, edited by G. Camps-Valls, J. L. Rojo- Álvarez, M. Martínez-Ramon. Idea Group, 2006.
- 10) “Smart Antennas: Arrays, Adaptive Arrays and Algorithms”, in *Modern Antenna Handbook*, by C. G. Christodoulou and J. Tsoulos, Wiley Interscience, 2008.

11) "Neural Networks for Antennas", in *Modern Antenna Handbook*, by C. G. Christodoulou and A. Patnaik, Wiley Interscience, 2008.

12) M. Martínez-Ramón, A. Navia-Vázquez, R. Jordán and C. G. Christodoulou, "Kernel Methods for Smart Antennas"

#### **SHORT COURSES:**

"*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, Monterey 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.

#### **Ph.D STUDENTS SUPERVISION (as Major Advisor )**

- 1) **Cam Nguyen** - "Computer-aided Nonlinear Analysis of Microwave and Millimeter Wave Amplifiers and Mixers" (Fall 90) - He is currently a full professor at Texas A & M University- **Also an IEEE Fellow**
- 2) **Timothy Durham** - "Integral Equation Analysis of Composite Bodies of Revolution and Arbitrary Surfaces with Application to Cavity-Backed Antennas" (Fall 1992) - He is currently with Harris Corporation, Melbourne, FL.
- 3) **Youcheng Liu** - "Frequency Selective Surfaces on Ferrite Substrates" - (Spring 1996). He is currently with DME, Orlando, FL.
- 4) **Gregory Turner** - "FDTD Analysis of Periodic Phase Array Antennas", December 1997. He is currently with Harris Corporation, Melbourne, FL.
- 5) **Ahmed EL Zooghby** - "Neural network-based Adaptive Array Antennas for Cellular and Mobile Satellite Communications", May 1999. Currently, with Qualcomm, San Diego.
- 6) **T. Gomez-Tagle** - "FDTD analysis of finite array microstrip antennas of arbitrary shape and orientations", August 1999. Currently with Intel at

Austin.

- 7) **Madjid Khodier** - “Analysis and Design of Broadband Antennas for the Double Quantum Well Terahertz Detector”, Dec. 2001. Currently at the University of Jordan.
- 8) **George Tzeremes** - “Smart RF/Photonic Antennas for Ultra-High Capacity Wireless Communications”, Dec. 2004. Currently with the European Space Agency in Amsterdam
- 9) **Dimitrios Anagnostou** - “Re-configurable Fractal Antennas with RF-MEMS Switches and Neural Networks”, Spring 2005. Professor, at South Dakota School of Mines
- 10) **Miroslav Joler** - “Analysis of Parallel-Plate Blumlein Line for Compact Pulsed-Power Systems”, Spring 2006. Professor at University of Rijeka, Croatia
- 11) **Luke Feldner** - “Reconfigurable RF MEMS Antenna Arrays and Electrically Small Antennas”, Fall 2006. Currently with Sandia National Labs.
- 12) **Matthew Higgins** - “Models for Electromagnetic Coupling of Lightning onto multiconductor cables in underground cavities”, May 2008 – Currently with Sandia National Labs.
- 13) **Mehmet Su** - “Proximity Field Nanopatterning for Large Area 3D Photonic Nanostructures: Forward and Inverse Problem Modeling”, August 2008. Currently a PostDoc Fellow at UNM.
- 14) **Jesse Lai** - “Investigation into the Use of High-Efficiency Switched Mode Class E Power Amplifiers for High Dynamic Range, Pulse Mode Applications”, Dec 2008 – Currently with Sandia National Labs.
- 15) **Naga Devarapalli** - “Rectangular Waveguide Narrow-Wall Longitudinal Aperture Antenna Arrays for High Power Applications”, Aug. 2009- Currently a Post Doc Fellow at UNM
- 16) **Tom Atwood** - “RF Channel Characterization for Cognitive Radio using Machine Learning Algorithms”, Dec. 2009 – Currently with Sandia National Labs
- 17) **Joseph Costantine** - “Design, Optimization and Analysis of Reconfigurable Antennas”, Dec. 2009. Currently a Post Doc Fellow at UNM.

**Phd students in Progress:**

- 18) Nan Xu
- 19) Jung Kim
- 20) Eyad Talal Al Zuraiqi
- 21) Youssef Tawk
- 22) Prasanth Kumar
- 23) Timothy Buckley
- 24) Michael Pace
- 25) Mohammad Hussein

## **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 **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 Supression 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.

## **In Progress**

- 56) Julie Lawrance
- 57) Manuel Rivera
- 58) María Elizabeth Zamudio Moreno
- 59) Rachael Milton

## **AWARDS and HONORS**

IEEE Fellow, 2002  
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 , 1989.  
Outstanding Teacher, Electrical Engineering, 1990.  
Outstanding Teacher, College of Engineering, 1990.  
Outstanding Researcher, Electrical Engineering, 1992.  
Outstanding Researcher, Electrical and Computer Engineering, 1994.  
Outstanding Advisor, Electrical and Computer Engineering, 1995.  
Outstanding Advisor, College of Engineering, 1995.  
UCF Teaching Incentive Award, 1994  
UCF Teaching Incentive Award, 1997  
Excellence in Graduate Teaching Award, Electrical and Computer Engineering, 1998  
Excellence in Graduate Teaching Award, College of Engineering 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)

### **IEEE Distinguished Lecturer, 2007-2009**

Board of Directors for GWEC (Global Wireless Education Consortium) 2002-2006  
*Associate Editor*, for IEEE Transactions on Antennas and Propagation, 2001-2007  
*Associate Editor* for the Antennas and Propagation Magazine 2000-now  
*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-now)  
*Member of the Editorial board* of the International Journal of Signal and Imaging systems Engineering (2008-now)  
*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.

Gave several seminar talks

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 (Finance Chairman).

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, Measurements, and Informatics) 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 for 1986

Chair of EM group (ECE Department). 1985-1993.

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)

Acting Chair (summer 94)

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 Co-ordinator 1998.

Member of ECE Graduate Committee 1997-1998.

### **College Level**

Tau Beta Pi Advisor 2007-now

Member of the Dean's Advisory committee. 1989-1991.

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.

Chair of search committee for Chemical and Nuclear Engineering Department Chair, 2001

SOE undergraduate recruiting committee 2005-2006

### **University Level**

Faculty Senate Steering Committee.1989-1990

Assistant Marshall for December 1989 Commencement.

Senate (new programs and curriculum Committee) 92-94

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  
Faculty Senate Undergraduate Committee (at UNM) 1999-2001  
Faculty Senate Teaching Enhancement Committee (at UNM) 1999-2002  
Faculty Senate Academic Freedom and Tenure Committee