

### Education

1988	Ph.D. Physics	University of California, Santa Barbara
1979	B.S. Physics	University of California, Santa Barbara

### Experience

1986–2014	Senior Scientist	HRL Laboratories
1983-1986	Research Assistant	University of California, Santa Barbara
1981-1983	Teaching Assistant	University of California, Santa Barbara

### Areas of Research

2008 to present	Artificial impedance surfaces
2007 to present	Novel antenna designs
2003 to present	Surface-wave propagation and applications
2001 to 2007	Microwave regeneration of diesel particulate filters
1999 to 2002	Satellite distribution of digital cinema
1996 to 2002	Wireless communications
1995 to 2002	Traveling-wave tubes for digital communication
1992 to 1995	Flywheel energy storage
1990 to 1994	High-power microwave generators
1986 to 1993	Free-electron lasers

### Publications and Intellectual Property

12 refereed journal papers (5 as 1<sup>st</sup> author)  
20 conference proceedings papers (16 as 1<sup>st</sup> author)  
55 conference presentations (36 as 1<sup>st</sup> author)  
45 U.S. patents (29 as 1<sup>st</sup> inventor)  
17 U.S. patents pending

### Awards

- HRL *Distinguished Inventor* 1998, 2003, 2007, 2008, 2009, 2011
- 2001 Outstanding performance award for Boeing's Digital Cinema project
- 1993 HRL Team *Achievement Award*.
- 1990 Hughes Missile Systems Group *High Performance Team Award*
- Howard Hughes Fellowship, 1986-1988
- U.S. Army Technical Fellowship, 1986

### Professional Memberships

- Senior Member, IEEE Antennas and Propagation Society

### References

Kevin Geary	Dept. Manager	HRL Laboratories	310-317-5271
Emil Martinsek	Laboratory Director, retired	HRL Laboratories	937-510-3375
Leslie Momoda	Vice President	HRL Laboratories	310-317-5077
Daniel Sievenpiper	Professor	UC San Diego	858-822-6678
Joseph Santoru	Chief Scientist	DirecTV	310-503-0187
David Whelan	Vice President	The Boeing Company	562-797-3100

---

## Refereed Journal Papers

1. Jonathan Fan, Woon-Hong Yeo, Yewang Su, Yoshiaki Hattori, Woosik Lee, Sung-Young Jung, Huanyu Cheng, Yihui Zhang, ZhuangJian Liu, Leo Falgout, Mike Bajema, Todd Coleman, D. J. Gregoire, Ryan Larson, Yonggang Huang, and John Rogers, *Fractal Design Concepts for Stretchable Electronics*, Nature Communications 2014
2. D. J. Gregoire, 3D Conformal Metasurfaces, *IEEE Antennas and Wireless Propagation Letters*, **12**, pp. 2333-2336, December 2013
3. D. J. Gregoire, C. R. White and J. S. Colburn, *Direct measurement of artificial magnetic conductors*, **Invited paper** to the AMTA corner in the IEEE Antennas and Propagation Magazine, vol.54, no.2, pp.251-259, April 2012
4. D. J. Gregoire, C. R. White, J. S. Colburn, *Wideband Artificial Magnetic Conductors Loaded with Non-Foster Negative Inductors*, *IEEE Antennas and Wireless Propagation Letters*, **10**, 2011, pp. 1586-1589
5. D. J. Gregoire, A. Kabakian, *Surface-Wave Waveguides*, *Antennas and Wireless Propagation Letters*, IEEE, **10**, 2011, pp. 1512-1515
6. J. Santoru, R. Schumacher and D. J. Gregoire, *Plasma- Anode Electron Gun*, *J. Appl. Phys.* **76**, 5629-5635, 1994
7. J. Santoru and D. J. Gregoire, *Electromagnetic-wave absorption in highly collisional plasmas*, *J. Appl. Phys.* **74**, 3736-3743, 1993
8. D. J. Gregoire and R. J. Harvey, *The electromagnetic-wiggler harmonic amplifier FEL*, *Nucl. Instr. Meth.* **A318**, 741-744, 1992
9. R.J. Harvey, F.A. Dolezal and D. J. Gregoire, *Harmonic amplifier FEL*, *Nucl. Instr. Meth.* **A318**, 736-740, 1992
10. Amir, L.R. Elias, D. J. Gregoire, R.J. Hu, J.P. Kotthaus, G. Ramian, and A. Stern, *Observation of power instability and multimode behavior in the UCSB free-electron laser*, *Optical Instabilities*, Cambridge University Press, 249-252, 1986
11. Amir, L.R. Elias, D. J. Gregoire, R.J. Hu, J.P. Kotthaus, G. Ramian, and A. Stern, *Observation of power instability and multimode behavior in a far-infrared free-electron laser*, *Appl. Phys. Lett.* **47**, 1251-1253, 1985
12. L. Elias, J. Gallardo and D. J. Gregoire, *Incoherent emission of an electron beam in a free-electron laser rectangular waveguide*, *J. Appl. Phys.* **58**, 1432-1438, 1985

## Conference Proceedings Papers

1. R. G. Quarfoth, A. M. Patel and D. J. Gregoire, *Ka-Band Electronically Scanned Artificial Impedance Surface Antenna*, IEEE AP-S/URSI proceedings, 2016
2. D. J. Gregoire, A. M. Patel, R. G. Quarfoth, *A Design for an Electronically-Steerable Holographic Antenna with Polarization Control*, IEEE AP-S/URSI proceedings, 2015
3. D. J. Gregoire, J. S. Colburn, A. M. Patel, R. G. Quarfoth and D. S. Sievenpiper IEEE AP-S/URSI proceedings, *A Low Profile Electronically-Steerable Artificial-Impedance-Surface Antenna*, Proceedings ICEAA-IEEE APWC 2014
4. D. J. Gregoire, J. S. Colburn, A. M. Patel, R. G. Quarfoth and D. S. Sievenpiper, *An Electronically-Steerable Artificial-Impedance-Surface Antenna*, IEEE AP-S/URSI proceedings, 2014
5. D. J. Gregoire, J. S. Colburn and C. R. White, *Cavity-backed-slot antenna loaded with non-Foster negative inductors*, **Invited paper**, IEEE AP-S/URSI proceedings, 2013
6. D. J. Gregoire, *Impedance modulation patterns for artificial impedance surface antennas*, **Invited paper**, IEEE AP-S/URSI proceedings, 2013
7. D. J. Gregoire, *3D artificial impedance surfaces for conformal antennas*, 2012 Antennas applications symposium proceedings, pp. 312-326
8. D. J. Gregoire and A. V. Kabakian, *Surface-wave waveguides*, IEEE AP-S/URSI proceedings, 2012
9. D. J. Gregoire, C.R. White and J.S. Colburn, *'AAMC-loaded cavity-backed slot antennas*, IEEE AP-S/URSI proceedings, 2012
10. D. J. Gregoire, *3D conformal artificial impedance surfaces*, IEEE AP-S/URSI proceedings, 2012

11. D. J. Gregoire, C.R. White and J.S. Colburn, *Wideband Artificial Magnetic Conductors Loaded with Non-Foster Negative Inductors*, 2012 IEEE International workshop on Antenna Technology, Tucson, AZ, March 2012, **Best Poster Award**.
12. D. J. Gregoire, C.R. White and J.S. Colburn, *Direct measurement of artificial magnetic conductors*, Proc. Antenna Measurement Techniques Association 33<sup>rd</sup> annual symposium, 2011. **Best Paper Award**
13. D. J. Gregoire, C.R. White and J.S. Colburn, *Non-Foster metamaterials*, Proc. Antennas Appl. Symposium 2011, pp. 1-15
14. D. J. Gregoire and J.S. Colburn, *Artificial impedance surface antennas*, Proc. Antennas Appl. Symposium 2011, pp. 460-475
15. C.R. White, J.S. Colburn, and D. J. Gregoire, *Active artificial magnetic conductors*, IEEE AP-S/URSI proceedings, 2011
16. D. J. Gregoire, C.R. White, J.S. Colburn and G. Johnson, *Variable UHF-band artificial magnetic conductors*, Proc. Antennas Appl. Symposium 2010, pp. 150-165
17. D. J. Gregoire and J.S. Colburn, *Artificial impedance surface antenna design and simulation*, Proc. Antennas Appl. Symposium 2010, pp. 288-303
18. Izadpanah, H.; D. J. Gregoire; Dolezal, F.A.; Ng, W.; Yap, D.; Tangonan, G.; , *An integrated fiber optics/broadband wireless access demonstrator for the next generation Internet (NGI) network extension*, . International Topical Meeting on Microwave Photonics, pp.172-174, 2000
19. Hossein Izadpanah, D. J. Gregoire, Jim Schaffner, and H. P. Hsu, *MM-Wave Wireless Access Technology For The Wideband Wireless Local Loop Applications*, IEEE RAWCON 1998 Conference Proceedings, pp. 5-8
20. D. J. Gregoire, R.J. Harvey and B. Levush, *Theory and simulation of the harmonic amplifier free-electron laser*, SPIE Proc. **1552**, 118-126, 1991

#### **Conference Presentations (without Papers).**

1. D. J. Gregoire, G. Holland, C.White, J. Colburn, A.Lai and D. Sievenpiper, *Surface-Wave Networks for Communication and Power Transmission* , IEEE AP-S/URSI, 2013
  2. A. V. Kabakian and D. J. Gregoire, *Transformation Electromagnetics for Tensor Surface-Wave Waveguides* , IEEE AP-S/URSI, 2013
  3. C.R. White, J.S. Colburn, *Active artificial magnetic conductors*, IEEE AP-S/URSI, 2011
  4. D. J. Gregoire, C.R. White, J.S. Colburn and G. Johnson, *Variable UHF-band artificial magnetic conductors*, Antennas Appl. Symposium 2010
  5. D. J. Gregoire and J.S. Colburn, *Artificial impedance surface antenna design and simulation*, Antennas Appl. Symposium 2010
  6. D. J. Gregoire, F. Dolezal et al, *A mm-wave broadband wireless access technology demonstrator for the next generation inter net network extension* , Broadband Wireless Access Systems Conference Proceedings, Dec 2000
  7. D. J. Gregoire, H. Izadpanah et al. *An Integrated Fiber optics/Broadband Wireless Demonstration for the NGI Network Extension* , Microwave Photonics MWP 2000, 11-13 Sept. 2000, Oxford, UK.
  8. D. J. Gregoire, F. Dolezal et al, *A mm-wave broadband wireless access technology demonstrator for the next generation internet network extension* , Broadband Wireless Access Systems Conference Proceedings, San Francisco, CA, Dec 2000
  9. D. J. Gregoire and Xiaoling Zhai, *Exploiting 2-1/2 D TWT simulations to maximize the efficiency of the Hughes 8815HR TWT*, IEEE International Conference on Plasma Sciences, Monterey, CA, June 1999
  10. J. Schaffner, H. Izadpanah, D. J. Gregoire, H.P. Hsu. H. Xu, R. Boyle, and T. Rappaport, *Millimeter wave wireless technology and testbed development*, Wireless Communicaions Conference, p. 175, Nov. 1998
  11. H. Izadpanah, D. J. Gregoire, J. Schaffner, J. Pikulski, H. Wang, G. Tangonan and H. P. Hsu, *Microwave and MM-Wave Wireless Access Technology*, Raytheon RF Technology Symposium, June 1998
  12. H. Izadpanah, D. J. Gregoire, J. Schaffner, and H. P. Hsu, *MM-Wave Wireless Access Technology For The Wideband Wireless Local Loop Applications*, RAWCON, August 1998
-

13. D. J. Gregoire and W. L. Menninger, *TWT simulation, GATOR and collector optimization for the Hughes' 8815HR TWT*, IEEE International Conference on Plasma Sciences, Raleigh, NC, June 1998
  14. D. J. Gregoire and W. L. Menninger, *TWT simulation, GATOR and collector optimization for the Hughes' 8815HR TWT*, Microwave Vacuum Electron Device Conference, Monterey, CA, May 1998
  15. D. J. Gregoire and W. L. Menninger, *Simulation of Intermodulation Products in Traveling-Wave Tubes*, Vacuum Electronics Annual Review Abstract Book 6, p. 11, January 1998, Naval Research Laboratory
  16. D. J. Gregoire and W. L. Menninger, *Calculation and Measurement of Intermodulation Products in TWTs*, IEEE International Conference on Plasma Sciences, San Diego, CA, May 1997
  17. D. J. Gregoire, Robin Harvey and Frank Dolezal, *Flywheel Energy Storage*, Second Annual GMHE-Wide Advanced Composite Materials Workshop, Tucson, AZ, November 1994
  18. D. J. Gregoire, F.A. Dolezal, R.J. Harvey, R.E. Hoover and S.J. Marble, *Advanced composite flywheel design*, Advanced Structural Composite Workshop sponsored by GMH/EOS, El Segundo, CA, November, 1993
  19. D. J. Gregoire and J.N. Matossian, *Performance Characteristics of a Broad-Beam, Low-Energy, Atomic-Ion Plasma Source*, IEEE International Conference on Plasma Sciences, Vancouver, B.C., Canada, June 1993
  20. J. Butler, D.M. Goebel, P.W. Sumner and D. J. Gregoire, *PASOTRON™ Amplifier Experiments*, IEEE International Conference on Plasma Sciences, Vancouver, B.C., Canada, June 1993
  21. J.N. Matossian, D. J. Gregoire and J.D. Williams, *Broad-beam, low-energy magnetically filtered atomic-ion plasma source*, Annual Meeting of the American Physical Society, Division of Plasma Physics, Seattle, WA, Nov. 1992
  22. D. J. Gregoire and J. Santoru, *Electromagnetic-Wave Absorption by a Plasma-Filled Enclosure*, Annual Meeting of the American Physical Society, Division of Plasma Physics, Tampa, FL, October 1991
  23. R.J. Harvey, F.A. Dolezal and D. J. Gregoire, *Harmonic amplifier FEL*, 13th Int'l. Free-Electron Laser Conference, Santa Fe, NM, Aug. 1991
  24. D. J. Gregoire and R.J. Harvey, *The Electromagnetic-Wiggler Harmonic Amplifier FEL*, 13th Int'l. Free-Electron Laser Conference, Santa Fe, NM, Aug. 1991
  25. D. J. Gregoire, R.J. Harvey and B. Levush, *Theory and Simulation of the Harmonic Amplifier Free-Electron Laser*, SPIE Conference on Short-Wavelength Sources, San Diego, CA, July 1991
  26. R.J. Harvey, F.A. Dolezal, D. J. Gregoire and B. Levush, *Comparison of experiment and theory for signal growth and priming in an FEL*, SPIE Conference on Short-Wavelength Sources, San Diego, CA, July 1991
  27. D. J. Gregoire and J. Santoru, *Electromagnetic-Wave Absorption and Scattering by a Plasma-Filled Enclosure*, IEEE International Conference on Plasma Sciences, Williamsburg, VA, June 1991
  28. D. J. Gregoire and R.J. Harvey, *Theory and Simulation of the Harmonic Amplifier Free-Electron Laser (HARP/FEL)*, IEEE International Conference on Plasma Sciences, Williamsburg, VA, June 1991
  29. R.J. Harvey, F.A. Dolezal, D. J. Gregoire and B. Levush, *Longitudinal-Mode Competition and Priming in an FEL*, IEEE International Conference on Plasma Sciences, Williamsburg, VA, June 1991
  30. J. Santoru, D. J. Gregoire and R.W. Schumacher, *Electromagnetic-Wave Absorption In Unmagnetized Plasmas*, Annual Meeting of the American Physical Society, Division of Plasma Physics, Cincinnati, OH, October, 1990
  31. D. J. Gregoire, J. Santoru and R.W. Schumacher, *Electromagnetic-Wave Absorption By Inhomogeneous Collisional Plasmas*, IEEE International Conference on Plasma Sciences, Oakland, CA, May 1990
  32. J. Santoru, D. J. Gregoire and R.W. Schumacher, *Electromagnetic-Wave Absorption In A Plasma-Loaded Rectangular Waveguide*, IEEE International Conference on Plasma Sciences, Oakland, CA, May 1990
  33. J.Santoru, R.W. Schumacher, H.E. Gallagher and D. J. Gregoire, *Electromagnetic-Wave Propagation In Unmagnetized Plasmas*, Annual Meeting of the American Physical Society, Division of Plasma Physics, Anaheim, CA, 1989
  34. D. J. Gregoire and L.R. Elias, *Channeling Radiation Measurements with the UCSB 5-MeV Accelerator*, 9th Int'l. Free-Electron Laser Conference, Williamsburg, VA, September 1987
  35. J. Santoru, R.W. Schumacher, A.J. Palmer, R.J. Harvey, F.A. Dolezal and D. J. Gregoire, *Plasma-Anode E-Gun*, IEEE International Conference on Plasma Sciences, Arlington, VA, 1987
  36. A.J. Palmer, R.J. Harvey, R.W. Schumacher, F.A. Dolezal, D. J. Gregoire and J. Santoru, *Plasma-Anode E-Gun*, Annual Meeting of the American Physical Society, Division of Plasma Physics, 1986
-

## Patents

1. *Low cost, 2D, electronically-steerable, artificial-impedance-surface antenna*, US Patent No. 9,466,887, issued 10/11/2016
2. *Two-dimensionally electronically-steerable artificial impedance surface antenna*, US Patent No. 9,455,495, issued 09/27/2016
3. *Polarization independent active artificial magnetic conductor*, US Patent No. 9,379,488, issued 06/28/2016
4. *Circularly polarized scalar impedance artificial impedance surface antenna*, US Patent No. 9,312,602, issued 04/12/2016
5. *Removable surface-wave networks for in-situ material health monitoring*, US Patent No. 9,041,408, issued 05/26/2015
6. *Electromagnetically operational micro-truss structure*, US Patent No. 9,013,364; issued 04/21/2015
7. *Conformal Surface-wave feed*, US Patent No. 8,994,609; issued 03/31/2015
8. *Conformal antennas for mitigation of structural blockage*, US Patent No. 8,982,011; issued 03/17/2015
9. *Wideband adaptable artificial impedance surface*, US Patent No. 8,976,077; issued 03/10/2015
10. *Artificial magnetic conductors*, US Patent No. 8,957,831; issued 02/17/2015
11. *Dielectric artificial-impedance surface antenna*, US Patent No. 8,830,129; issued 09/09/2014
12. *Variable-emissivity material*, US Patent No. 8,801,217; issued 07/22/2014
13. *Apparatus and method for onboard performance monitoring of exhaust gas particulate filter*, US Patent No. 8,650,857, issued 02/18/2014
14. *Inductively heated particulate matter filter regeneration control system*, US Patent No. 8,292,987, issued 10/23/2012
15. *Large-scale atmospheric plasma generation*, US Patent No. 8,124,013; issued 02/28/2012
16. *Method of production of an electrically adaptable resistive coating for remediation of a diesel particulate filter*, US Patent No. 8,112,989; issued 02/14/2012
17. *Adaptive spectral surface*, US Patent No. 8,106,850, issued 01/31/2012
18. *Resistive heater geometry and regeneration method for a diesel particulate filter*, US patent No. 8,043,658, issued 10/25/2011
19. *Wireless zoned particulate matter filter regeneration control system*, US patent No. 8,029,582, issued 10/04/2011
20. *Variable emissivity material*, US Patent No. 8,017,217, issued 09/13/2011
21. *System and method of surface wave imaging to map pressure on a surface*, US Patent No. 8,009,276, issued 08/30/2011
22. *System and method for surface decontamination using electromagnetic surface waves*, US Patent No. 7,931,858 issued 4/26/2011
23. *Microwave Mode shifting Antenna System for Regenerating Particulate Filters*, US Patent No. 7,931,727, issued 4/26/2011
24. *Multiple-band detector using frequency selective slots*, US Patent No. 7,923,688, issued 4/12/2011
25. *Multi-band sub-wavelength IR detector having frequency selective slots and method of making the same*, US Patent No. 7,923,689, issued 4/12/2011
26. *Microwave receiver front end assembly and array*, US Patent No. 7,835,600, issued 11/16/2010
27. *System and method of surface wave imaging to detect ice on a surface or damage to a surface*, US Patent No. 7,719,694, issued 5/18/2010
28. *Sub-wavelength low-noise infrared detectors*, US Patent No. 7,531,805, issued 5/12/2009

29. *Exhaust gas filter apparatus capable of regeneration of a particulate filter and method*, US Patent No. 7,513,921, issued 4/7/2009
30. *Surface-wave control of large-scale adaptive-surface sensor arrays*, US Patent No. 7,307,589, issued 12/29/2005
31. *Diesel particulate filter system with meta-surface cavity*, US Patent No. 7,303,603, issued 12/04/2007
32. *Diesel particulate filter using micro-wave regeneration*, US Patent No. 7,303,602, issued 12/04/2007
33. *Predistortion Modulator*, US Patent No. 7,263,136, issued 08/28/2007
34. *Uniform Microwave Heating Method and Apparatus*, US Patent No. 7,208,710, issued 4/7/2007
35. *Meta-surface waveguide for uniform microwave heating*, US Patent No. 7,091,457 issued 11/12/2004
36. *Method and Apparatus for Large-Scale Diamond Polishing*, Patent No. 6,652,763, Nov. 25, 2003
37. *Wideband wireless access local loop based on millimeter wave technology*, US Patent No. 6,560,213, issued May 6, 2003
38. *High Speed Flywheel*, US Patent No. 5,816,114, issued October 6, 1998
39. *Flywheel with expansion-matched, self-balancing hub*, US Patent No. 5,732,603, issued March 31, 1998
40. *Method of manufacturing a flywheel having reduced radial stress*, US Patent No. 5,695,584, December 9, 1997
41. *Flywheel having reduced radial stress*, US Patent No. 5,692,414, issued December 2, 1997
42. *Corona source for producing corona discharge and fluid waste treatment with corona discharge*, US Patent No. 5,655,210, August 5, 1997
43. *Corona Discharge Ignition System*, US Patent No. 5,649,507, July 22, 1997
44. *Corona source for producing corona discharge and fluid waste treatment with corona discharge*, US Patent No. 5,549,795, August 27, 1996
45. *Cavity resonator incorporating waveguide filter*, US Patent No. 5,243,618, September 7, 1993