

Rafael A. Rodríguez Solís



Profile

Dr. Rafael A. Rodríguez Solís received a BSEE and a BScPE from the University of Puerto Rico at Mayagüez in 1990, a MS degree in electrical engineering from the University of Florida in 1993, and a PhD in electrical engineering from the Pennsylvania State University in 1997. He is currently a Professor of Electrical and Computer Engineering at the University of Puerto Rico, Mayagüez, where he serves as the Director of the UPRM Microwave and Millimeter-wave Systems Laboratory, UPRM PI for NOAA CREST, and the Director of the Institute for Research in Integrative Systems & Engineering (IRISE). He received a NSF CAREER award in 2001 to work in the characterization of wideband slot-like antennas, and a NASA Glenn Faculty Fellowship in Summer 2012 to work in the development of microwave and millimeter-wave antennas using polyimide aerogels. He worked in the development of tunable antennas with electroceramic materials with the NASA Tropical Center for Earth and Space Studies (TCESS), in the development of antennas for cross-well radar tomography laboratory applications for the NSF Center for Subsurface Sensing and Imaging Systems (CenSSIS), in the development of low cost electronically scanned antenna alternatives for the NSF Center for Adaptive Sensing of the Atmosphere (CASA), in the development of a laboratory-scale Soil-Bed for the detection of contaminants in soil for the Department of Energy Savannah River Laboratory, in the development of VO₂ based reconfigurable antennas with AFRL, and in the development of a weather radar network system for Western Puerto Rico. He currently works in the development of antennas for body-centric applications for ARO, in the development of weather nowcast services for renewable energy applications in UPRM OASIS, and in the development of multiband microwave sensors for small UAVs in NOAA CREST. Dr. Rodríguez Solís was named Outstanding Professor in Electrical Engineering by the UPRM Engineering Faculty in 2013 and 2001 and is a Senior Member of the IEEE Antennas and Propagation, Microwave Theory and Techniques, Geoscience and Remote Sensing, and Education Societies. He is also a member of the Antennas and Propagation Society Education committee, and served as General Co-Chair for the 2016 IEEE International Symposium on Antennas and Propagation, held in Fajardo, PR, in June 2016.

His research interests include wideband microwave and millimeter-wave antennas, reconfigurable, tunable and multiband antennas, and wideband and tunable microwave circuits.

Education

The Pennsylvania State University, University Park, PA - Ph.D., Electrical Engineering, 12/97

Dissertation: "Analysis and Design of a Microwave 3-D Frequency Independent Phased Array Using Folded Slots." Designed, analyzed, built and tested antenna array prototypes from 2 to 12 GHz.

University of Florida, Gainesville, FL - M.S., Electrical Engineering, 12/93

Thesis: "Improved Modeling of R.F. and Microwave BJTs and Circuit Simulation." Evaluated and improved new physics-based model for microwave bipolar transistors. Compared results with existing empirical model and measured data to demonstrate agreement.

University of Puerto Rico, Mayagüez, PR - B.S., Electrical Engineering, 06/90

Magna Cum Laude. Specialization in Communications and Electronics.

University of Puerto Rico, Mayagüez, PR - B.S., Computer Engineering, 06/90

Magna Cum Laude. Specialization in Hardware Systems.

Experience

Professor, University of Puerto Rico, Mayagüez, PR

01/98 to present

Professor - 07/2006

Tenure - 01/2003

Associate Professor - 07/2001

Assistant Professor - 01/1998

Research interests: Broadband microwave antennas and circuits, microwave/millimeter-wave antennas, numerical methods in electromagnetics.

Rafael A. Rodríguez Solís



National Science Foundation CAREER 2001 award: "Wideband Slot-Like Antennas and Enhancement of Applied Electromagnetics Education at UPRM"

UPRM PI for NOAA CREST

PI and Co-PI in 3 National Science Foundation Major Research Instrumentation projects.

Researcher in NSF ERC for Collaborative and Adaptive Sensing of the Atmosphere (CASA)

Center for Subsurface Sensing and Imaging Systems (CenSSIS) UPRM Education Thrust Leader

Researcher in CenSSIS

Researcher in UPRM NASA-PASSER program

Researcher in UPRM NASA Tropical Center for Earth and Space Studies (TCESS)

Director of UPRM Microwave and Millimeter-wave Systems Laboratory, 2000-present

Director of IRISE, 2012-present

President ECE Personnel Committee, 2009-2012

Coordinator for the ECE Applied Electromagnetics Area, 2000-2010

President, ECE Graduate Committee, (member 2001-2013, president 2013-present)

School of Engineering Graduate Committee, 2001-2006

UPRM Graduate Council, 2006-2009, 2016-present

Created INEL 6668 (Microwave Antenna Engineering), INEL 4087 (Introduction to Engineering Electromagnetics), and INEL 5627 (Antenna Theory and Design II) courses.

Created laboratory experiences for INEL 4151 (Electromagnetics I) and INEL 4152 (Electromagnetics II) courses that led to the creation of INEL 4156 Laboratory course

Revised INEL 5305 (Antenna Theory and Design) course

Graduated 24 M.S. students, advising 3 M.S. students, and 2 PhD students, member of graduate committee of 28 M.S. and 2 Ph.D. students, and advised 90 undergraduate students on 60 different undergraduate research projects.

Faculty advisor to student branch of UPRM IEEE Communications Society (2000-2010)

Faculty co-advisor to student branch of UPRM IEEE Electromagnetics Council

Member of the IEEE Antennas and Propagation Society Education Committee, 2009-present

Reviewer for IEEE Transactions on Antennas and Propagation

Reviewer for IEEE Antennas and Propagation Magazine

Panelist for the NSF-SBIR Program in 2003, 2005 and 2007

Panelist for NSF in 2005, 2010 and 2012

Panelist for NASA ESTO in 2016

General Co-Chair for the 2016 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting in Fajardo, PR

Director of the Institute for Research in Integrative Systems and Engineering (IRISE) (2012-present)

NASA Glenn Faculty Fellow, NASA Glenn Research Center, Cleveland, OH. 06/12 to 08/12
Developed microwave and millimeter-wave antennas using polyimide aerogels, and performed aerogels electrical characterization at X and Ka bands.

Visiting Scientist, BBN Technologies, Cambridge, MA. 06/99 to 08/99
Consulted on antennas and R.F. systems for wireless networks.

Rafael A. Rodríguez Solís



Independent Consultant, REMCOM, Inc., University Park, PA.

08/97 to 12/97

Modeled, designed and fabricated microwave circuit and antennas. Validated and tested electromagnetic simulators.

Engr. Technical Associate, BBN Systems and Technologies, Cambridge, MA.

08/96 to 08/97

Evaluated and recommended wireless LAN adapters and developed Linux device drivers.

Summer Intern, BBN Corporation, Cambridge, MA.

05/96 to 08/96

Integrated wireless IP-secure LAN using custom off the shelf components. Demonstrated integrated system to customers and upper management. Developed service offerings using the integrated system.

Summer Staff, MIT Lincoln Laboratory, Lexington, MA.

06/95 to 08/95

Developed computer model of complex phased array antenna system to investigate effects in the radiation pattern of random failures and excitation errors.

Graduate Assistant, University of Florida, Gainesville., FL.

08/91 to 08/93

Conducted laboratory sessions of a Computer Architecture course and a Microprocessors course and worked on the improvement of a physics-based model for microwave BJTs.

Engineer I, Telefónica Larga Distancia, San Juan, Puerto Rico.

05/90 to 08/91

Developed synchronization system for the network, prepared bid specifications, and in charge of network equipment acquisition.

Publications

Meador, Mary Ann B.; Wright, Sarah; Sandberg, Anna; Nguyen, Baochau N.; Van Keuls, Frederick W.; Mueller, Carl H.; **Rodríguez-Solis, Rafael**; Miranda, Felix A., "Low Dielectric Polyimide Aerogels as Substrates for Lightweight Patch Antennas," ACS Applied Materials & Interfaces, 2012, 4 (11), pp 6346–6353; DOI: 10.1021/am301985s.

Toro-Vazquez, Jonathan; **Rodríguez-Solis, Rafael**; Padilla, Ingrid; 'Estimation of Electromagnetic Properties in Soil Testbeds Using Frequency and Time Domain Modeling,' IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, vol. 5, no. 3., June 2012, pp.984-999. DOI: [10.1109/JSTARS.2012.2193610](https://doi.org/10.1109/JSTARS.2012.2193610)

M. F. Serrano-Guzmán, I. Padilla, and **R. Rodríguez**, "Bimodal detection of underground contamination in two dimensional systems," in Proceedings of SPIE, 2007, vol. 6540, p. 65401O. DOI: 10.1117/12.719285

J. G. Colom, R. Medina, and **R. Rodríguez**, "Design of Tunable Balanced Amplifier using Ferroelectric Materials," Integrated Ferroelectrics, vol. 56, 2003, pp. 1097-1106. DOI: 10.1080/10584580390259650

J. G. Colom, **R. A. Rodríguez-Solis**, J. Almodóvar, and M. Castañeda, "Design and Simulation of a Tunable Multilayer Lange Coupler," Integrated Ferroelectrics, vol. 42, 2002, pp. 313-321. DOI: 10.1080/10584580210837

J.K. Breakall and **R.A. Rodríguez Solís**, "A new design method for low sidelobe level log-periodic dipole antennas," Applied Computational Electromagnetics Society Journal, Nov. 1996, pp. 9-15.

Carlos Mulero-Hernandez and **Rafael A. Rodríguez Solís**; "Design of V-Band Substrate Integrated Waveguide Fed Aperture Coupled Microstrip Patch Array with Beam-Switching Capabilities," presented at the 2016 IEEE International Symposium on Antennas and Propagation in Fajardo, PR, 26 June - 1 July 2016.

Carlos Mulero Hernandez and **Rafael A. Rodríguez Solís**; "Design of V-Band SIW Fed Cavity Backed Aperture Coupled Microstrip Patch Array Element for Applications in Body Area Networks,"



presented at the 2016 IEEE International Symposium on Antennas and Propagation in Fajardo, PR, 26 June - 1 July 2016.

Carlos Mulero Hernandez and **Rafael A. Rodríguez Solís**; "Design of Vertical T-Junction Using H-Slot Aperture Coupling for Applications in 60 GHz Arrays," presented at the 2016 IEEE International Symposium on Antennas and Propagation in Fajardo, PR, 26 June - 1 July 2016.

Ruben Delgado, Carlos Mulero Hernandez and **Rafael A. Rodríguez Solís**; "Applying Design of Experiments to the Design of 60 GHz Antennas for Off-Body Communications," presented at the 2016 IEEE International Symposium on Antennas and Propagation in Fajardo, PR, 26 June - 1 July 2016.

Jayson Maldonado Vargas, **Rafael A. Rodríguez Solís**, Mohamed Elmansouri, Dejan Filipovic, "A UWB Cavity-Backed Compound Power-Archimedean Slot Spiral for Body Centric Wireless Communications Applications," 2015 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting, Vancouver, BC, 2015, pp. 1978-1979. DOI: 10.1109/APS.2015.7305378

Emmanuel Valentín, **Rafael A. Rodríguez Solís**, "Capacitively-Fed Modified Folded Slot Antenna for Body Area Network Applications," 2015 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting, Vancouver, BC, 2015, pp. 584-585. DOI: 10.1109/APS.2015.7304678

Emmanuel Valentín, **Rafael A. Rodríguez Solís**, "Design of a Small Rectangular Patch for Body Area Network Applications," 2015 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting, Vancouver, BC, 2015, pp. 2351-2352. DOI: 10.1109/APS.2015.7305564

Rodríguez-Solís, R.A.; Colom-Ustáriz, J.G.; Cruz-Pol, S.; León-Colón, L., "Microwave research at the University of Puerto Rico at Mayagüez," Microwave Symposium (IMS), 2014 IEEE MTT-S International, vol., no., pp.1,3, 1-6 June 2014. DOI: 10.1109/MWSYM.2014.6848677

Valentín, Emmanuel; **Rodríguez-Solis Rafael A.** "Characterization of a Cavity-Backed Capacitively-Fed Folded Slot Antenna using DOE Techniques," Antennas and Propagation Society International Symposium (APSURSI), 2014 IEEE, vol., no., pp.1499,1500, 6-11 July 2014. DOI: 10.1109/APS.2014.6905075

Maldonado, Jayson; **Rodríguez-Solis Rafael A.** "Analysis of a Cavity Backed Annular Slot Ring Antenna using Design of Experiment Techniques," Antennas and Propagation Society International Symposium (APSURSI), 2014 IEEE, vol., no., pp.1501,1502, 6-11 July 2014. DOI: 10.1109/APS.2014.6905076

Rodríguez-Solis, Rafael A.; Saade, Youssef M., "Cavity backed annular slot ring antenna with reconfigurable slots using VO₂," Antennas and Propagation Society International Symposium (APSURSI), 2013 IEEE, vol., no., pp.578,579, 7-13 July 2013. DOI: 10.1109/APS.2013.6710949

Rodríguez-Solis, Rafael A.; Pacheco, Hector L.; Miranda, Felix A.; Meador, Mary Ann B., "Slotted polyimide-aerogel-filled-waveguide arrays," Antennas and Propagation Society International Symposium (APSURSI), 2013 IEEE, vol., no., pp.238,239, 7-13 July 2013. DOI: 10.1109/APS.2013.6710780

Galvez, M.B.; Colom, J.G.; Chandrasekar, V.; Junyent, F.; Cruz-Pol, S.; **Rodríguez Solís, R.A.**; Leon, L.; Rosario-Colon, J.J.; De Jesus, B.; Ortiz, J.A.; Mora Navarro, K.M., "First observations of the initial radar node in the Puerto Rico TropiNet X-band polarimetric Doppler weather testbed," Geoscience and Remote Sensing Symposium (IGARSS), 2013 IEEE International, vol., no., pp.2337,2340, 21-26 July 2013. DOI: 10.1109/IGARSS.2013.6723287



Sharma, Pallavi; **Rodríguez-Solis Rafael A.** "Linear Array of 2x2 Dual-Polarized X-Band Microstrip Patch Sub Arrays for off-the-Grid Radar Array Antenna," 2012 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting in Chicago, IL, USA, July 8-13, 2012. DOI: 10.1109/AP.S.2012.6348683

Rodríguez-Solis, Rafael A.; Sepúlveda, Nelson, Pacheco, Héctor L., "Reconfigurable Slotted Microstrip Patch Using VO2," 2012 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting in Chicago, IL, USA, July 8-13, 2012. DOI: 10.1109/AP.S.2012.6348540

Trabal, J.M.; Colom-Ustariz, J.; Pablos-Vega, G.; Ortiz, J.; Castellanos, W.; Cruz-Pol, S.; Leon, L.; **Rodríguez-Solis, R.**; , "Low cost and minimal infrastructure Off-the-Grid XBand radar network development for the west coast of Puerto Rico," Radar Conference (RADAR), 2011 IEEE , vol., no., pp. 1026-1031, 23-27 May 2011. DOI: 10.1109/RADAR.2011.5960691

Sharma, P.; **Rodríguez-Solis, R.A.**; , "Dual-polarized X-band microstrip patch sub-array for Off-the-Grid radar array antenna," Antennas and Propagation (APSURSI), 2011 IEEE International Symposium on , vol., no., pp.577-579, 3-8 July 2011. DOI: 10.1109/AP.S.2011.5996774

Toro-Vazquez, Jonathan; **Rodríguez-Solis, Rafael**; Padilla, Ingrid; , "Frequency and time domain measurements using Cross Well Radar to develop testbeds for electromagnetic properties estimation," Geoscience and Remote Sensing Symposium (IGARSS), 2011 IEEE International , vol., no., pp.850-853, 24-29 July 2011. DOI: 10.1109/IGARSS.2011.6049264

Córdoba-Erazo, M.F.; **Rodríguez-Solis, R.A.**; , "Cavity-backed folded-slot antenna," Antennas and Propagation Society International Symposium (APSURSI), 2010 IEEE , vol., no., pp.1-4, 11-17 July 2010. DOI: 10.1109/AP.S.2010.5562099

Galvez, M.B.; Colom, J.; Chandrasekar, V.; Junyent, F.; Cruz-Pol, S.; **Rodríguez, R.**; , "Salient features of the radar nodes in the Puerto Rico tropical weather testbed," Geoscience and Remote Sensing Symposium, 2009 IEEE International, IGARSS 2009 , vol.3, no., pp.III-841-III-844, 12-17 July 2009. DOI: 10.1109/IGARSS.2009.5417900

A. Rivera Albino and **R.A. Rodríguez Solís**, "Design of Tapered Slot Antenna Array for Space Distributed Class-E Power Amplifier", 2009 IEEE Antennas and Propagation Society International Symposium, June 2009, pp. 1-4. DOI: 10.1109/AP.S.2009.5171479

V. J. Marrero Fontánez, **R. A. Rodríguez Solís**, "Dual-Polarized Antenna Array for X-Band Radar Application," 2007 IEEE Antennas and Propagation Society International Symposium, June 2007, pp. 2144-2147. DOI: 10.1109/AP.S.2007.4395951

V. J. Marrero Fontánez, **R. A. Rodríguez Solís**, "Dual-Polarized Aperture-Coupled Patch Antenna for X-Band Series-Fed Array," 2007 IEEE Antennas and Propagation Society International Symposium, June 2007, pp. 2148-2151. DOI: 10.1109/AP.S.2007.4395952

V. J. Marrero Fontánez, **R. A. Rodríguez-Solis**, "Low Cross-Polarization Antenna Array for CASA Student Test bed Radar," International Geoscience and Remote Sensing Symposium, 23-28 July 2007, pp. 2746 - 2749. DOI: 10.1109/IGARSS.2007.4423411

Maria F. Serrano-Guzmán, Ingrid Padilla and **Rafael Rodriguez**, "Two-dimensional detection of underground contamination and buried objects using cross-well radar", Proc. SPIE 6210, 62100R (2006); DOI:10.1117/12.665826

Amador-Perez, A.; **Rodríguez-Solis, R.A.**, "Analysis of a CPW Fed Annular Slot Ring Antenna using DOE," 2006 IEEE Antennas and Propagation Society International Symposium, Albuquerque, NM, July 2006, pp. 4301 - 4304. DOI: 10.1109/AP.S.2006.1711582



- D. A. Del Río, **R. A. Rodríguez-Solís**, D. S. Filipovic, "Ways to Improve the Radiation Pattern of a LPFSA," 2005 IEEE Antennas and Propagation International Symposium, July 2005, vol. 1B, pp. 410 - 413. DOI: 10.1109/APS.2005.1551579
- J. A. Torres-Rosario, S. Rondineu, **R. A. Rodríguez-Solís**, S. Hunt, Z. Popovic, "Adaptive Discrete Lens Antenna Array for Direction of Arrival Detection," 2005 IEEE Antennas and Propagation International Symposium, July 2005, vol. 4A, pp. 122 - 125. DOI: 10.1109/APS.2005.1552599
- C. Jaramillo-Henao, **R. A. Rodríguez-Solís**, D. Rosario-Román, D. González-Barreto, "Analysis of Concentric Slot-Ring Antenna Arrays using DOE and FDA," 2004 IEEE Antennas and Propagation International Symposium, June 2004, vol. 1, pp. 1074 - 1077. DOI: 10.1109/APS.2004.1329860
- Ileana Carrasquillo-Rivera, **R.A.R. Solís**, José G. Colom-Ustáriz, "Tunable and Dual-Band Rectangular Slot-Ring Antenna," 2004 IEEE Antennas and Propagation International Symposium, June 2004, vol. 4, pp. 4308 - 4311. DOI: 10.1109/APS.2004.1330304
- J.L. Salazar-Cerreño and **R.A. Rodríguez-Solís**, "Broadband Log-Periodic Normal Mode Helical Antenna," 2003 IEEE Antennas and Propagation International Symposium, June 2003, vol. 1, pp. 249-252. DOI: 10.1109/APS.2003.1217445
- N.D. López-Rivera and **R.A. Rodríguez-Solís**, "Input Impedance and Resonant Frequency Characterization of Folded Slot Antennas through DOE Techniques," 2003 IEEE Antennas and Propagation International Symposium, June 2003 vol. 2, pp. 545-548. DOI: 10.1109/APS.2003.1219295
- S. Rodríguez-Acosta, **R.A. Rodríguez-Solís**, and J.G. Colom Ustáriz, "Design and Characterization of a Tunable Aperture Coupled Microstrip Patch Antenna with Ferroelectric Films," 2003 IEEE Antennas and Propagation International Symposium, June 2003 vol. 4, pp. 536-539. DOI: 10.1109/APS.2003.1220328
- A.M. Castro-Vilaró and **R.A.R. Solís**, "Tunable Folded Slot Antenna with Ferroelectric Material," 2003 IEEE Antennas and Propagation International Symposium, June 2003 vol. 2, pp 549-552. DOI: 10.1109/APS.2003.1219296.
- I. Carrasquillo-Rivera, Z. Popovic, and **R.A.R. Solís**, "Tunable Slot Antenna Using Varactors and Photodiodes," 2003 IEEE Antennas and Propagation International Symposium, June 2003 vol. 4, pp. 532-535. DOI: 10.1109/APS.2003.1220327
- J. Colom-Ustáriz, **R. Rodríguez-Solís**, S. Vélez, and S. Rodríguez-Acosta, "Frequency Agile Microwave Components using Ferroelectric Materials," Proceedings of the SPIE 9th International Conference on Remote Sensing, vol. 4881, April 2003, pp. 280-286. DOI:10.1117/12.463043
- N.D. López-Rivera and **R.A. Rodríguez-Solís**, "Impedance Matching Technique for Microwave Folded-Slot Antennas," 2002 IEEE Antennas and Propagation International Symposium, June 2002, vol. III, pp. 450-453. DOI: 10.1109/APS.2002.1018249
- R.A. Rodríguez Solís**, Ana M. Medina, and Néstor López, "Microstrip Patch Antenna Encircled by a Trench," IEEE Antennas and Propagation International Symposium, July 2000, pp. 1620-1623. DOI: 10.1109/APS.2000.874544
- Jimenez, L.O.; O'Neill-Carrillo, E.; Frey, W.; **Rodriguez-Solis, R.**; Irizarry-Rivera, A.; Hunt, S, "Social and Ethical Implications of Engineering Design: A Learning Module Developed for ECE Capstone Design Courses," 36th Annual Frontiers in Education Conference, Oct. 2006, pp. 1-6. DOI: 10.1109/FIE.2006.322539
- J. G. Colom and **R. Rodríguez-Solís**, "Introduction To Electrical Engineering: A New Freshman Course At UPR-Mayagüez," 2003 ASEE Annual Conference and Exposition Proceedings, June 2003, Nashville, TN.

Rafael A. Rodríguez Solís



S. McKnight, G. Tadmor, M. Ruane, **R. Rodríguez-Solís** and G. Saulnier, "Creating "High-Tech Tools & Toys Lab" Learning Environments at Four Universities," 32nd ASEE/IEEE Frontiers in Education Conference, Nov. 2002, p. S3E-7. DOI: 10.1109/FIE.2002.1158701

J.G. Colom Ustáriz, **R.A. Rodríguez Solís**, and R.J. Luebbers, "Undergraduate Research using the Finite Difference Time Domain Method for Electromagnetics," 2001 ASEE Annual Conference and Exposition Proceedings, June 2001, Albuquerque, NM.

J.G. Colom Ustáriz, R.R. Barton, L.A. Carpenter, and **R.A. Rodríguez Solís**, "A Novel Graphical Technique for Selection of a Robust Design Point," 2001 ASEE Annual Conference and Exposition Proceedings, June 2001, Albuquerque, NM.

Presentations

Rodríguez Solís, Rafael A. "Microwave Research at the University of Puerto Rico at Mayaguez," National Center for Atmospheric Research, Boulder, CO, July 2014.

Rodríguez Solís, Rafael A. "Polyimide-based Aerogels for Microwave and Millimeter-Wave Antennas," NASA Glenn Research Center, Cleveland, OH, August 2012.

Sharma, Pallavi; **Rodríguez-Solis, Rafael A.**, "Dual-Polarized X-band Microstrip Patch Sub-array for Off-the-Grid Radar Array Antenna," 2011 Historically Black Colleges and Universities (HBCU)/Other Minority Serving Institutions (OMI's) Collaboration Conference, Ohio Aerospace Institute (OAI), Cleveland, Ohio, July 21st and 22nd 2011

María F. Córdoba, Erazo, **Rafael A. Rodríguez Solís**; "Cavity-backed Folded-Slot Antennas", 2009 Historically Black Colleges and Universities (HBCU)/Other Minority Serving Institutions (OMI's) Collaboration Conference, Ohio Aerospace Institute (OAI), Cleveland, Ohio, July 21st and 22nd 2009

A. Rivera Albino and **R.A. Rodríguez Solís**, "Design of Coplanar Waveguide Fed Tapered Slot Antenna Arrays for High Power Space Distributed Amplifier Applications, 32nd Annual Antenna Applications Symposium, Monticello, Ill, September 2008

M. F. Serrano, I. Y. Padilla, and **R. Rodriguez**, "Tomography of underground target elements using CWR," in AGU Fall Meeting Abstracts, 2007, vol. 1, p. 1454.

M. F. Serrano, I. Y. Padilla, and **R. Rodriguez**, "Electromagnetic Detection and Digital Visualization of Dnapl Contaminants in a Two-Dimensional Soilbed," in AGU Spring Meeting Abstracts, 2007, vol. 1, p. 9.

M. F. Serrano Guzman, I. Y. Padilla Cestero, **R. Rodríguez Solís**, and C. Rappaport, "Cross-Well Radar to Detect and Monitor DNAPLs," in 2005 Salt Lake City Annual Meeting, 2005.

R.A. Rodríguez Solís, "Printed Antenna Research at the UPRM Radiation Laboratory," Georgia Tech, Atlanta, GA, 2002.

J.G. Colom Ustáriz, **R.A. Rodríguez Solís**, "Design and Simulation of a Tunable Ferroelectric Lange Coupler," Ferroelectrics Workshop 2001, San Juan P.R.

Grants

NOAA CSC Earth System Sciences and Remote Sensing Technologies
NOAA NA16SEC4810008, \$15,500,000 (\$1,143,750 UPRM), Co-PI (UPRM PI)

CRISP Type 2: Interdependent Electric and Cloud Services for Sustainable, Reliable, and Open Smart Grids
NSF ACI 1541106, \$1,499,988, Co-PI

Rafael A. Rodríguez Solís



Hybrid Mechanical/Electronic Steerable Antenna Array
Puerto Rico Science, Technology, and Research Trust, \$150,000, Co-PI

NOAA CREST Center
NOAA NA11SEC4810004, \$437,212 (Y4, Y5, UPRM), Co-PI (UPRM PI)

Antennas for Body-Centric Wireless Communications
ARO 62882-RT-REP, \$552,146, PI

Reconfigurable Antennas Using Insulator to Metal Transition Devices
AFRL 10-S567-0014-02-C2, \$133,981, PI

MRI: Development of a Meteorological Radar Network for Puerto Rico's West Coast
NSF ECS-0821331, \$1,731,766, Co-PI

Detection, Fate, Transport and Remediation of Chlorinated Solvents in Low-Permeability Porous Media
DOE DE-FG09-07SR22571, \$900,000, Co-PI

MRI: Acquisition of Processing and Testing Equipment for the Integration of Materials Science and Engineering Research at the University of Puerto Rico at Mayagüez
NSF ECS-0722534, \$454,909, Co-PI

NSF Center for Collaborative and Adaptive Sensing of the Atmosphere (CASA),
NSF EEC 0313747, Senior Personnel

CAREER: Wideband Slot-like Antennas and Enhancement of Applied Electromagnetics Education at UPRM.
NSF ECS-0093650, \$584,346, PI

NSF Center for Subsurface Sensing and Imaging System (CenSSIS)
NSF EEC 9986821, Senior Personnel

Electroceramic Antennas and Devices
NASA Tropical Center for Earth and Space Studies, Senior Personnel

Acquisition of Microwave Instrumentation for the UPRM Radiation Laboratory.
NSF ECS-9977178, \$677,104, PI

Partnership for Space Science Education and Research.
NASA, \$794,993, Co-PI

Courses Taught at UPRM

INEL 3105 Electric Systems Analysis I
INEL 4102 Electric Systems Analysis II
INEL 4151 Electromagnetics I
INEL 4152 Electromagnetics II
INEL 4087 Introduction to Engineering Electromagnetics
INEL 5325 Communications System Design: Circuits and Antennas
INEL 5195 Capstone Design Project
INEL 5605 (5305) Antenna Theory and Design
INEL 5606 (5306) Microwave Engineering
INEL 5627 Antenna Theory and Design II
INEL 6668 (6068) Microwave Antenna Engineering
INEL 6601 (6216) Advanced Engineering Electromagnetics
INEL 6615 (6115) Active Microwave Circuits



Graduate Students Supervised

Rita Jakelyn Abad (MS, current)
Rubén Delgado (MS, current)
Carlos Wah González (PhD, current)
Daniel Mera (PhD, current)
Princesa Cloutier (MS, current)
Carlos Mulero (MS 2016, DoD) - PhD Student, University of Colorado, Boulder
Jayson Maldonado (MS 2015, DoD)
Emmanuel Valentín (MS 2015, DoD) - Ball Aerospace
Benjamín de Jesús (MS 2012, co-advisor, AFRL) - Honeywell
Jonathan Toro (MS 2012, CenSSIS/DoE) - PhD Student, University of Puerto Rico
Estefany Lancheros (MS 2012, CASA) - PhD Student, Universidad Politécnica de Cataluña
Pallavi Sharma (MS 2012, CASA) - Ph.D. Student, University of Illinois, Urbana-Champaign
José Cordero (MS 2011) - CEO Syfry, LLC
María Córdoba Erazo (MS 2009, PhD graduate University of South Florida) - Qorvo
Alexandra Litchfield Santana (MS 2009, CASA) - ITT
Alix Rivera Albino (MS 2009, CASA) Ph.D. graduate Arizona State University
Lillian Certuche (MS 2009, CenSSIS)
Pablo Lozada (MS 2008, CAREER) - Lockheed Martin
Víctor Marrero (MS 2007, CASA) - NASA, Goddard SFC
Antonio Amador (MS 2007, TCESS) - Lockheed Martin
Silvia Herrera (MS 2006, CASA) - Lockheed Martin
Juan Torres (MS 2006, CASA) - L-3 Communications
Carlos Jaramillo (MS 2005, CAREER, PhD graduate Michigan State University) - Space Systems LORAL
David Del Río (MS 2005, CAREER) - Lockheed Martin
Amada Castro (MS 2004, TCESS) - Raytheon
Ileana Carrasquillo (MS, 2004, CAREER) - Ball Aerospace
Néstor López, Ph.D. (MS 2003, CAREER, PhD graduate University of Colorado) - MIT Lincoln Laboratory
Jorge Salazar (MS 2003, CenSSIS, PhD graduate University of Massachusetts) - Assistant Professor, University of Oklahoma
Snaider Rodríguez (MS 2002, TCESS) - Instructor, Universidad Interamericana

Professional Courses

Design of Reflector Antennas
2009 IEEE Antennas and Propagation International Symposium, Charlotte, SC.

Introduction to Networking and Wireless Networks
CASA ERC, Mayagüez, PR, Jan. 2006

Practical Design of Microstrip Arrays and Reflectarrays
2003 IEEE Antennas and Propagation International Symposium, Columbus, OH.

Adaptive Antennas: The Future of Mobile Communications
2002 IEEE Antennas and Propagation International Symposium, San Antonio, TX.

Smart Antennas for Wireless Systems
2000 IEEE Antennas and Propagation International Symposium, Salt Lake City, UT.

Microwave Antenna Measurements.
California State University, Northridge, 1994.

Digital Transmission Systems.
Siemens Telecomunicazioni S.P.A., Santiago, Chile, 1991

Rafael A. Rodríguez Solís



Honors

2012 NASA Glenn Research Faculty Fellow, NSF CAREER Award (2001), Outstanding Electrical Engineering Professor (2013, 2001), GTE Fellow (1996-1997), PSU Graduate Engineering Education Fellow (1993-1996), National Science Foundation Fellowship and Ford Foundation Fellowship Honorable Mentions (1993), Commonwealth of Puerto Rico Economic Development Administration Fellow (1991-1993), Tau Beta Pi Honor Society.

Professional Organizations

Senior Member of the Microwave Theory and Techniques Society, Geoscience and Remote Sensing Society, Education Society, and the Antennas and Propagation Society of the Institute of Electrical and Electronic Engineers (IEEE). Member of the Education Committee of the Antennas and Propagation Society.

Languages

Completely fluent (speaking, reading and writing) in Spanish (first language) and English.

Citizenship

USA citizen.

Other Interests

Cycling, and playing saxophone.