

Curriculum Vitae

CHRISTOPHER S. RUF

Frederick Bartman Collegiate Professor of Climate and Space Science

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EDUCATION

Ph.D. 1987 Electrical and Computer Engineering, Univ. of Massachusetts at Amherst
B.A. 1982 Physics, Reed College, Portland, OR

PROFESSIONAL EXPERIENCE

Jul 2000 - present *Professor*, Climate and Space Dept.
University of Michigan, Ann Arbor, MI
May 2006 – Jun 2015 *Director*, Space Physics Research Laboratory
University of Michigan, Ann Arbor, MI
Sep 2000 – Dec 2000 *Guest Professor*, Department of Electromagnetic Systems
Technical University of Denmark, Lyngby, DK
Jan 1992 - Jun 2000 *Associate Professor*, Department of Electrical Engineering
Pennsylvania State University, University Park, PA
Jul 1988 - Dec 1991 *Member of Technical Staff*, Microwave Observational Systems
NASA Jet Propulsion Laboratory, Pasadena, CA
Jun 1987 - Jun 1988 *Visiting Professor and Research Engineer*,
Dept. Electrical and Comp. Eng., Univ. Massachusetts, Amherst, MA
Sep 1983 - May 1987 *Graduate Research Assistant*, Microwave Remote Sensing Lab
Dept. Electrical and Comp. Eng., Univ. Massachusetts, Amherst, MA

CURRENT RESEARCH ACTIVITIES

- Principal Investigator for NASA Earth Venture Cyclone Global Navigation Satellite System (CYGNSS) Mission: Constellation of small satellites with bistatic scatterometry GPS receivers for ocean surface wind measurements in tropical cyclones.
- Science and applications of remote sensing: Ocean surface wind speed and atmospheric precipitation retrieval in tropical cyclones using airborne and spaceborne passive microwave observations. Vicarious statistical calibration methods for microwave radiometry. Detection and mitigation of radio frequency interference. Measurement of non-thermal planetary emission.
- Instrumentation and technology development: Interferometric Fourier synthesis imaging. Spaceborne Application Specific Integrated Circuits. Digital microwave radiometry. Radio frequency interference detection and mitigation. Digitally generated thermal emission sources for polarimetric, spectrometer and spatial interferometer microwave radiometers.

TEACHING EXPERIENCE

Graduate level:	Inversion and Estimation Methods in Remote Sensing Mathematical Methods in Electromagnetics Theoretical Foundations of Microwave Remote Sensing Methods and Applications of Remote Sensing Atmospheric Radiative Transfer
Undergraduate level:	Electromagnetic Theory and Applications Introduction to Remote Sensing Radiowave Propagation and Communication Introduction to Earth Science Data Analysis and Matlab Applications Circuit Design & Linear Systems Theory and Applications

GRADUATE STUDENTS SUPERVISED

Bala Subramanya, M.S. 1993	Savyasachee Mathur, M.S. 1994
Justin Bobak, M.S. 1994, Ph.D. 1998	Shawn Beus, M.S. 1996
Sean Daisley, MS. 1997	Rajiv Dewan, M.S. 1998
Sandra Cruz-Pol, Ph.D. 1998	Jude Giampaolo, M.S. 1999
Hans Rosenberger, M.S. 1999	Haiping Zhang, M.S. 1999
Gozde Fidan, M.S. 2000	Jikang Li, M.S. 2002
Sandra Lindström, M.S. 2002	Chris Schwartz, M.S. 2004
Ying Hu, M.S. 2005	Shannon Brown, Ph.D. 2005
Hirofumi Kawakubo, M.S. 2007	Jinzheng Peng, Ph.D. 2008
Boon Lim, Ph.D. 2008	John Puckett, M.S. 2009
David Fenigstein, M.S. 2010	Sidharth Misra, Ph.D. 2011
Amanda Mims, M.S. 2012	Deepak Singh, M.S. 2013
Rachael Kroodsma, Ph.D. 2013	David Austerberry, M.S. 2015
John Xun Yang, Ph.D. 2015	David Chen, Ph.D. 2016
Mary Morris, Ph.D. 2016	Tianlin Wang, Ph.D. <i>in progress</i>
Rachel Norris, Ph.D. <i>in progress</i>	David Mayers, Ph.D. <i>in progress</i>
Rajeswari Balasubramaniam, Ph.D. <i>in progress</i>	

UNIVERSITY SERVICE

Department Executive Committee Member (2006-present)
 Ph.D. Qualifying Exam Committee Chair/Co-chair (2008 – 2009)
 Program Director and Academic Adviser, AOSS Masters of Engineering in Space Engineering (2004-2006)
 Faculty Advisor, U-M Amateur Radio Club (2003 –2006)
 Member, Oversight Committee for Graduate Certificate Program in Spatial Analysis, School of Natural Resources and Environment (2001-2007)
 Departmental Representative, EECS/AOSS/CEE Doctoral Program in Geoscience and Remote Sensing (2000-2009)
 Program Director and Academic Adviser, AOSS Masters of Engineering in Applied Remote Sensing and GeoInformation Systems (2000-2004)

PROFESSIONAL SERVICE

- Member, National Academy of Sciences Space Studies Board Committee on Earth Science and Applications from Space (2017-2019)
- Member, Climate Panel for the National Academy of Sciences Earth Science Decadal Survey (2016-2017)
- Member, Weather Panel for the National Academy of Sciences Earth Science Decadal Survey (2005-2006)
- Member, National Academy of Sciences Board of Physics and Astronomy Committee on the Scientific Uses of the Radio Spectrum, (2007-2009)
- Member, National Academy of Sciences Committee on Radio Frequency (2000-2003)
- Associate Editor, *IEEE Transactions on Geoscience and Remote Sensing* (2001-present)
- Editor in Chief, *IEEE Transactions on Geoscience and Remote Sensing* (2009-2012)
- Associate Editor, *AMS Journal of Atmospheric and Oceanic Technology* (2006-2008)
- Guest Editor for WindSat Special Issue, *IEEE Trans. Geosci. Remote Sens.* (2005-2006)
- Editor, *IEEE Geoscience and Remote Sensing Society Newsletter* (1997-2000)
- Guest Editor for *AGU Radio Science*, American Geophysical Union (1997-1998)
- Associate Editor, *AGU Radio Science*, American Geophysical Union (1992-1997)
- Microwave Sub-committee Co-chair, NASA Capabilities Roadmap Committee on Science Instruments and Sensors (2004-2005)
- Member, NASA Earth Science Technology Office Radar/Radiometry Working Group (2003-2004)
- Member of Technical Program Committee, Session Chairman for 2011 International Geoscience and Remote Sensing Symposium, Vancouver, BC, CANADA
- Member, IEEE GRSS Instrumentation and Future Technologies Committee (1996-present)
- Member, GRSS Tech. Comm. on Frequency Allocation in Remote Sensing (2002-present)
- Member of the Judith A. Resnik Technical Field Award Committee (2000 – 2003)
- Chairman, GRSS Technical Committee on Frequency Allocations in Remote Sensing, 2001-2003.
- Session Chairman for 2014 International Geoscience and Remote Sensing Symp. Quebec, CA
- Session Chairman for 2012 International Geoscience and Remote Sensing Symp. Munich, GE
- Session Chairman for 2011 International Geoscience and Remote Sensing Symp. Vancouver, CA
- Session Chairman for 2010 International Geoscience and Remote Sensing Symp. Honolulu, HI
- Session Chairman for 2009 International Geoscience and Remote Sensing Symp., Cape Town, S.A.
- Session Chairman for 2008 International Geoscience and Remote Sensing Symp., Boston, MA
- Member of Technical Program Committee, Session Chairman for 2007 International Geoscience and Remote Sensing Symposium, Barcelona, SPAIN
- Session Chairman, Member of Technical Program Committee for 2006 International Geoscience and Remote Sensing Symposium, Denver, CO
- Member of Technical Program Committee for 2005 International Geoscience and Remote Sensing Symposium, Seoul, Korea
- Session Chairman, Member of Technical Program Committee for 2004 International Geoscience and Remote Sensing Symposium, Anchorage, Alaska

Member of Technical Program Committee for Microwave Remote Sensing Conference, SPIE International Asia-Pacific Environmental Remote Sensing Symposium, 8-12 November 2004, Honolulu, HI.

Session chairman, Technical Program Committee Member – 2003 International Geoscience and Remote Sensing Symposium, Toulouse, France

Session chairman (2), Technical Program Committee Member – 2002 International Geoscience and Remote Sensing Symposium, Toronto, Canada

Technical Program Committee Member for SPIE 3rd International Asia-Pacific Environmental Remote Sensing Symposium on Remote Sensing of the Atmosphere, Ocean, Environment and Space, Hangzhou, China, October 2002.

Technical Program Committee Member – 2002 Second Microwave Radiometer Calibration Workshop, Barcelona, SPAIN, October 2002

Session chairman, Technical Program Committee Member – 2001 International Geoscience and Remote Sensing Symposium, Sydney, Australia

Session chairman, Technical Program Committee Member – 2000 International Geoscience and Remote Sensing Symposium, Honolulu, Hawaii

Technical Program Committee Member – 1999 International Geoscience and Remote Sensing Symposium, Hamburg, Germany

Scientific Steering Committee Member, 5th Specialist Meeting on Microwave Radiometry and remote Sensing of the Environment, Boston, MA, November 1996

PROFESSIONAL MEMBERSHIP

Fellow, Institute of Electrical and Electronics Engineers (IEEE)

Member, American Geophysical Union (AGU)

Member, American Meteorological Society (AMS)

Member, International Union of Radio Science (URSI), Commission F

AWARDS and RECOGNITION

1990: NASA Certificate of Recognition for *Sparse Aperture Interferometric Radiometer – Refining Two Dimensional Antenna Configuration*

1992: NASA Certificates of Recognition (2) for *Synthetic Aperture Interferometric Radiometer Image Reconstruction Error Analysis* and *Piezoelectric Reflecting Array for Reflector Surface Distortion Compensation*

1993: NASA Group Achievement Awards (2) for *TOPEX Microwave Radiometer* and *TOPEX Precision Orbit Determination*

1994: NASA Group Achievement Award for *TOPEX Joint Verification Team*

1997: IEEE Transactions on Geoscience and Remote Sensing Prize Paper Award for “*Retrieval of tropospheric water vapor scale height from horizontal turbulence structure,*” by Ruf and Beus, TGARS, **35**(2), 203-211, 1997.

1999: IEEE Judith A. Resnik Technical Field Award “*For contributions to the absolute calibration of spaceborne microwave radiometers*”

2001: IEEE Fellow, “*For contributions in the development, calibration and*

- remote sensing applications of microwave radiometers”*
- 2004: NASA Group Achievement Award for *Lightweight Rainfall Radiometer*
- 2007: IEEE Geoscience and Remote Sensing Symposium Prize Paper Award for “*Detection of RFI by its Amplitude Probability Distribution,*” by Ruf, Misra, Gross and De Roo, Proc. IGARSS 2006, Denver, CO, 31 Jul - 4 Aug 2006.
- 2010: NASA Group Achievement Award for *Genesis and Rapid Intensification Processes (GRIP) Airborne Earth Science Mission*
- 2011: NASA Certificate of Recognition for *180 GHz Interferometric Imager*
- 2012: NASA Group Achievement Award for *Aquarius Launch, Early Orbit Operations, and Commissioning*
- 2012: NASA Group Achievement Award for *Juno Proposal Team*
- 2014: IEEE Geoscience and Remote Sensing Society Outstanding Service Award
- 2015: NASA Group Achievement Award for *Hurricane and Severe Storm Sentinel Team*
- 2015: Best Reviewer, IEEE Geoscience and Remote Sensing Letters
- 2015: University of Michigan Ted Kennedy Family Faculty Team Excellence Award to the CYGNSS Team
- 2017: SmallSat Mission of the Year Award at 31st Annual American Institute of Aeronautics and Astronautics (AIAA) SmallSat Conference to the CYGNSS Team

STUDENT AWARDS

- 2007: Amanda Mims, Second Place, Student Poster Competition, Great Midwestern Regional Space Grant Meeting, W. Lafayette, IN, Sep. 6-7, 2007.
- 2008: Amanda Mims, Annual National Weather Association Meteorological Satellite Applications Award
- 2009: Sidharth Misra, First Place, Student Paper Competition, Geoscience and Remote Sensing Symposium, Cape Town, S.A., 13-17 July 2009.
- 2010: Amanda Mims, Third Place, Student Paper Competition, Geoscience and Remote Sensing Symposium, Honolulu, HI, 26-30 July 2010.

JOURNAL PUBLICATIONS (student advisees underlined, post-doctoral fellows in italics)

86. Ruf, C., R. Balasubramaniam, “Development of the CYGNSS Geophysical Model Function for Wind Speed,” IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens., doi: 10.1109/JSTARS.2018.2833075, 2018.
85. Ruf, C., S. Gleason, D. S. McKague, “Assessment of CYGNSS Wind Speed Retrieval Uncertainty,” IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens., doi: 10.1109/JSTARS.2018.2825948, 2018.
84. S. Gleason, S., S. Ruf, A. O’Brien, D. S. McKague, “The CYGNSS Level 1 Calibration Algorithm and Error Analysis Based On On-Orbit Measurements,” IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens., doi: 10.1109/JSTARS.2018.2832981, 2018.
83. *Bussy-Virat, C. D., C. S. Ruf, A. J. Ridley*, “Relationship between temporal and spatial resolution for a constellation of GNSS-R satellites,” IEEE J. Sel. Topics Appl. Earth Obs. Remote Sens., doi: 10.1109/JSTARS.2018.2833426, 2018.

82. Morris, M., and C. S. Ruf, "Determining Tropical Cyclone Surface Wind Speed Structure and Intensity with the CYGNSS Satellite Constellation," *J. Appl. Meteor. Climatol.*, **56**(7), 1847–1865, doi: 10.1175/JAMC-D-16-0375.1, 2017.
81. Clarizia, M., and C. Ruf, "Bayesian Wind Speed Estimation Conditioned on Significant Wave Height for GNSS-R Ocean Observations," *J. Atmos. Oceanic Technol.*, doi:10.1175/JTECH-D-16-0196.1, **34**(6), 1193-1202, 2017.
80. Morris, M., and C. S. Ruf, "Estimating Tropical Cyclone Integrated Kinetic Energy with the CYGNSS Satellite Constellation," *J. Appl. Meteor. Climatol.*, **56**, 235–245, doi: 10.1175/JAMC-D-16-0176.1, 2017.
79. Kroodsma, R.A., D.S. McKague and C.S. Ruf, "Vicarious Cold Calibration for Conical Scanning Microwave Imagers," *IEEE Trans. Geosci. Remote Sens.*, doi:10.1109/TGRS.2016.2615552, **55**(2), 816-827, 2017.
78. Chen-Zhang, D. D., C. S. Ruf, F. Ardhuin, and J. Park, "GNSS-R nonlocal sea state dependencies: Model and empirical verification," *J. Geophys. Res. Oceans*, **121**, doi:10.1002/2016JC012308, 2016.
77. Yang, J. X., D. S. McKague and C. S. Ruf, "Uncertainties in Radiometer Intercalibration associated with Variability in Geophysical Parameters," *J. Geophys. Res. Atmos.*, doi:10.1002/2016JD024937, 2016.
76. Clarizia, M. P., and C. S. Ruf, "On the Spatial Resolution of GNSS-Reflectometry," *IEEE Geosci. Remote Sens. Ltrs.*, doi:10.1109/LGRS.2016.2565380, 2016.
75. Chen, D. D., C. S. Ruf and S. T. Gleason, "Response time of mean square slope to wind forcing: An empirical investigation," *J. Geophys. Res. Oceans*, doi:10.1002/2016JC011661, 2016.
74. Clarizia, M. P., and C. S. Ruf, "Wind Speed Retrieval Algorithm for the Cyclone Global Navigation Satellite System (CYGNSS) Mission," *IEEE Trans Geosci. Remote Sens.*, **54**(8), doi:10.1109/TGRS.2016.2541343, Aug. 2016.
73. Ruf, C. S., R. Atlas, P. S. Chang, M. P. Clarizia, J. L. Garrison, S. Gleason, S. J. Katzberg, Z. Jelenak, J. T. Johnson, S. J. Majumdar, A. O'Brien, D. J. Posselt, A. J. Ridley, R. J. Rose, V. U. Zavorotny, "New Ocean Winds Satellite Mission to Probe Hurricanes and Tropical Convection," *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMS-D-14-00218.1, pp385-395, Mar 2016.
72. Gleason, S., C. Ruf, M. P. Clarizia, A. O'Brien, "Calibration and Unwrapping of the Normalized Scattering Cross Section for the Cyclone Global Navigation Satellite System (CYGNSS)," *IEEE Trans. Geosci. Remote Sens.*, **54**(5), 2495-2509, doi:10.1109/TGRS.2015.2502245, 2016.
71. Clarizia, M.P., C. Ruf, P. Cipollini and C. Zuffada, "First Spaceborne Observation of Sea Surface Height Using GPS Reflectometry," *Geophys. Res. Lett.*, **43**, doi:10.1002/2015GL066624, 2016.
70. Yang, J. X., D. S. McKague and C. S. Ruf, "Boreal, Temperate, and Tropical Forests as Vicarious Calibration Sites for Spaceborne Microwave Radiometry," *IEEE Trans. Geosci. Remote Sens.*, doi:10.1109/TGRS.2015.2472532, **54**(2), 1035-1051, 2016.
69. Morris, M., and C. S. Ruf, "A Coupled-Pixel Model (CPM) Atmospheric Retrieval Algorithm for High Resolution Imagers," *J. Atmos. Oceanic Technol.*, **32**(10), 1866-1879, doi:10.1175/JTECH-D-15-0016.1, 2015.
68. Chen, D. D., and C. S. Ruf, "Adaptive Control of Undetected Radio Frequency Interference with a Spaceborne Microwave Radiometer," *IEEE Trans. Geosci. Remote Sens.*, **53**(9), 4972-4984, doi:10.1109/TGRS.2015.2414395, Sep. 2015.

67. *Clarizia, M. P., Ruf, C., Jales, P. and Gommenginger, C., "Spaceborne GNSS-R Minimum Variance Wind Speed Estimator," IEEE Trans Geosci. Remote Sens., 52(11), 6829-6843, doi:10.1109/TGRS.2014.2303831, Nov. 2014.*
66. *Yang, J. X., D. S. McKague and C. S. Ruf, "Land contamination correction for passive microwave radiometer data: Demonstration of wind retrieval in the Great Lakes using SSM/I," J. Atmos. Oceanic. Tech., 31, doi:10.1175/JTECH-D-13-00254.1, Oct. 2014.*
65. *Le Vine, D.M., P. de Matthaëis, C. Ruf and D. Chen, "Aquarius RFI Detection and Mitigation: Assessment and Examples," IEEE Trans. Geosci. Remote Sens., 52(8), 4574-4584, doi:10.1109/TGRS.2013.2282595, Aug. 2014.*
64. *Piepmeyer, J. R., J. T. Johnson, P. N. Mohammed, D. Bradley, C. Ruf, M. Aksoy, R. Garcia, D. Hudson, L. Miles and M. Wong, "Radio-Frequency Interference Mitigation for the Soil Moisture Active Passive Microwave Radiometer," . IEEE Trans. Geosci. Remote Sens., 52(1), 761-775, doi:10.1109/TGRS.2013.2281266, Jan. 2014.*
63. *Kroodsmä, R., D. McKague and C. S. Ruf, "Extension of Vicarious Cold Calibration to 85-92 GHz for Spaceborne Microwave Radiometers," IEEE Trans. Geosci. Remote Sens., 51(9), 4743-4751, doi:10.1109/TGRS.2013.2267152, Sep. 2013.*
62. *Meadows, L.A. C. Whelan, D. Barrick, R. Kroodsmä, C. Ruf, C.C. Teague, G.A. Meadows and S. Wang, "High Frequency Radar and its Application to Fresh Water," J. Great Lakes Research, doi:10.1016/j.jglr.2013.01.002, Mar 2013.*
61. *Renno, N. O., and C.S. Ruf, "Comments on the Search for Electrostatic Discharges on Mars," The Astrophysical Journal, 761:88, doi:10.1088/0004-637X/761/2/88, Dec 2012.*
60. *Misra, S., R.D. De Roo and C.S. Ruf, "An Improved Radio Frequency Interference Model: Reevaluation of the Kurtosis Detection Algorithm Performance under Central-Limit Conditions," IEEE Trans. Geosci. Remote Sens., 50(11), 4565-4574, doi:10.1109/TGRS.2012.2191972, 2012.*
59. *Misra, S., and C.S. Ruf, "Analysis of Radio Frequency Interference Detection Algorithms in the Angular Domain for SMOS," IEEE Trans. Geosci. Remote Sens., 50(5), 1448-1457, doi:10.1109/TGRS.2011.2176949, 2012.*
58. *Kroodsmä, R.A., D.S. McKague, C.S. Ruf, "Inter-Calibration of Microwave Radiometers using the Vicarious Cold Calibration Double Difference Method," J. Selected Topics Remote Sensing, 5(3), 1006-1013, doi:10.1109/JSTARS.2012.2195773, 2012.*
57. *Amarin, R. A., W. L. Jones, S. F. El-Nimri, J. W. Johnson, C. S. Ruf, T. L. Miller, and E. Uhlhorn , "Hurricane Wind Speed Measurements in Rainy Conditions Using the Airborne Hurricane Imaging Radiometer (HIRAD)," IEEE Trans. Geosci. Remote Sens., 50(1), 180-192, doi:10.1109/TGRS.2011.2161637, 2012.*
56. *Park, J., J. T. Johnson, N. Majurec, N. Niamsuwan, J. Piepmeyer, P. Mohammed, C. Ruf, S. Misra, S. Yueh and S. Dinardo, "Airborne L-band Radio Frequency Interference Observations from the SMAPVEX08 Campaign and Associated Flights," IEEE Trans. Geosci. Remote Sens., 49(9), 3359-3370, doi:10.1109/TGRS.2011.2107560, 2011.*
55. *McKague, D.S., C.S. Ruf and J.J. Puckett, "Beam Spoiling Correction for Spaceborne Microwave Radiometers using the Two-Point Vicarious Calibration Method," IEEE Trans. Geosci. Remote Sens., 49(1), 21-27, doi:10.1109/TGRS.2010.2068052, 2011.*
54. *Bailey, M.C., R. Amarin, J. Johnson, P. Nelson, M. James, D. Simmons, C. Ruf, L. Jones and X. Gong, "Multi-Frequency Synthetic Thinned Array Antenna for the Hurricane Imaging Radiometer," Trans. Antennas Propagat., 58(8), doi:10.1109/TAP.2010.2050453, 2010.*

53. Peng, J., and C. S. Ruf, "Effects of clock frequency stability on digital microwave radiometer performance," *Radio Sci.*, **45**, RS4005, doi:10.1029/2009RS004272, 2010.
52. Amarin, R., C. Ruf and L. Jones, "Impact of Spatial Resolution on Wind Field Derived Estimates of Air Pressure Depression in the Hurricane Eye," *Remote Sens.*, **2**(3), 665-672, doi:10.3390/rs2030665, 2010.
51. Peng, J., and C. S. Ruf, "Covariance Statistics of Fully Polarimetric Brightness Temperature Measurements," *Geosci. Rem. Sens. Ltrs.*, **7**(3), doi: 10.1109/LGRS.2009.2039115, 2010.
50. El-Nimri, S. F., W. L. Jones, E. Uhlhorn, C. Ruf, J. Johnson and P. Black, "An Improved C-band Ocean Surface Emissivity Model at Hurricane-force Wind Speeds over a Wide Range of Earth Incidence Angles," *Geosci. Remote Sens. Ltrs*, **7**(4), doi: 10.1109/LGRS.2010.2043814, 2010.
49. Misra, S., P. N. Mohammed, B. Guner, C. S. Ruf, J. R. Piepmeier and J. T. Johnson, "Microwave Radiometer Radio Frequency Interference Detection Algorithms: A Comparative Study," *Trans. Geosci. Remote Sens.*, **47**(11), 3742-3754, doi: 10.1109/TGRS.2009.2031104, 2009.
48. Lim, B. H., and C. S. Ruf, "A High Resolution Full Earth Disk Model for Evaluating Synthetic Aperture Passive Microwave Observations from GEO," *Trans. Geosci. Remote Sens.*, **47**(11), 3731-3741, doi: 10.1109/TGRS.2009.2031172, 2009.
47. Keihm, S., S. Brown, J. Teixeira, S. Desai, W. Lu, E. Fetzer, C. Ruf, X. Huang and Y. Yung, "Ocean Water Vapor and Cloud Liquid Water Trends from 1992-2005 TOPEX Microwave Radiometer Data," *J. Geophys. Res.*, **114**(D18101), doi: 10.1029/2009JD012145, 2009.
46. Ruf, C., N. O. Renno, J. F. Kok, E. Bandelier, M. J. Sander, S. Gross, L. Skjerve, and B. Cantor, "Emission of Non-thermal Microwave Radiation by a Martian Dust Storm," *Geophys. Res. Lett.*, **36**(13), L13202, doi: 10.1029/2009GL038715, 2009.
45. Peng, J., and C. S. Ruf, "Covariance Statistics of Polarimetric Brightness Temperature Measurements," *Trans. Geosci. Remote Sens.*, **46**(10), 3238-3251, 2008.
44. Misra, S., and C. S. Ruf, "Detection of Radio Frequency Interference for the Aquarius Radiometer," *Trans. Geosci. Remote Sens.*, **46**(10), 3123-3128, 2008.
43. Peng, J., and C. S. Ruf, "Calibration Method for Fully Polarimetric Microwave Radiometers Using the Correlated Noise Calibration Standard," *Trans. Geosci. Remote Sens.*, **46**(10), 3087-3097, 2008.
42. Lagerloef, G., F. R. Colomb, D. Le Vine, F. Wentz, S. Yueh, C. Ruf, J. Lilly, J. Gunn, Y. Chao, A. deCharon, G. Feldman and C. Swift, "The Aquarius/SAC-D mission –Designed to Meet the Salinity Remote Sensing Challenge," *Oceanography – Special Issues on Salinity*, **21**(1), 68-81, doi: 10.5670/oceanog.2008.68, Mar 2008.
41. Tanner, A.B., W.J. Wilson, B.H. Lambrigsten, S.J. Dinardo, S.T. Brown, P.P. Kangaslahti, T.C. Gaier, C.S. Ruf, S.M. Gross, B.H. Lim, S. Musko, S. Rogacki, J.R. Piepmeier, "Initial Results of the Geostationary Synthetic Thinned Array Radiometer (GeoSTAR) Demonstrator Instrument," *Trans. Geosci. Remote Sens.*, **45**(7), 1947-1957, 2007.
40. De Roo, R., S. Misra and C. Ruf, "Sensitivity of the Kurtosis Statistic as a Detector of Pulsed Sinusoidal RFI," *Trans. Geosci. Remote Sens.*, **45**(7), 1938-1946, 2007.
39. Brown, S.T., and C.S. Ruf, "Validation and Development of Melting Layer Models Using Constraints by Active/Passive Microwave Observations of Rain and the Wind Roughened Ocean Surface," *AMS J. Oceanic Atmos. Tech.*, **24**(4), 543-563, 2007.
38. Ruf, C.S., and A.M. Warnock, "GEOSAT Follow On Water Vapor Radiometer: Performance with a Shared Active/Passive Antenna," *Trans. Geosci. Remote Sens.*, **45**(4), 970-977, 2007.

37. Ruf, C.S., S. M. Gross and S. Misra, “RFI Detection and Mitigation for Microwave Radiometry with an Agile Digital Detector,” *Trans. Geosci. Remote Sens.*, **44**(3), 694-706, 2006.
36. Brown, S.T., C.S. Ruf and D.R. Lyzenga, “An Emissivity Based Wind Vector Retrieval Algorithm for the WindSat Polarimetric Radiometer,” *Trans. Geosci. Remote Sens.*, **44**(3), 611-621, 2006.
35. Ruf, C.S., Y. Hu and S.T. Brown, “Calibration of WindSat Polarimetric Channels with a Vicarious Cold Reference,” *Trans. Geosci. Remote Sens.*, **44**(3), 470-475, 2006.
34. Brown, S.T., and C.S. Ruf, “Determination of a Hot Blackbody Reference Target over the Amazon Rainforest for the On-orbit Calibration of Microwave Radiometers,” *AMS J. Oceanic Atmos. Tech.*, **22**(9), 1340-1352, 2005.
33. Brown, S., C. Ruf, S. Keihm and A. Kitiyakara, “Jason Microwave Radiometer performance and on-orbit calibration,” *Marine Geodesy*, **27**(1-2), 199-220, 2004.
32. Ruf, C.S. and J. Li, “A Correlated Noise Calibration Standard for Interferometric, Polarimetric and Autocorrelation Microwave Radiometers,” *Trans. Geosci. Remote Sens.*, **41**(10), 2187-2196, 2003.
31. Ruf, C.S., “Vicarious Calibration of an Ocean Salinity Radiometer from Low Earth Orbit,” *AMS J. Atmos. Oceanic Tech.*, **20**(11), 1656-1670, 2003.
30. Fischman, M.A., A.W. England and C.S. Ruf, “How digital correlation affects the fringe washing function in L-Band aperture synthesis radiometry,” *Trans. Geosci. Remote Sens.*, **40**(3), 671-679, 2002.
29. Ruf, C.S., “Characterization and Correction of a Drift in Calibration of the TOPEX Microwave Radiometer,” *Trans. Geosci. Remote Sens.*, **40**(2), 509-511, 2002.
28. Tran, N., D. Vandemark, C. Ruf and B. Chapron, “The dependence of nadir ocean surface emissivity on wind vector as measured with TMR,” *Trans. Geosci. Remote Sens.*, **40**(2), 515-523, 2002.
27. Giampaolo, J.C. and C.S. Ruf, “The Effect of Atmospheric Stability on Microwave Excess Emissivity due to Wind,” *Trans. Geosci. Remote Sens.*, **39**(10), 2311-2314, 2001.
26. Ruf, C.S. and H. Zhang, “Performance Evaluation of Single and Multichannel Microwave Radiometers for Soil Moisture Retrieval,” *Remote Sens. of Envir.*, **75**(1), 86-99, 2001.
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ORAL PRESENTATIONS

- Invited Seminar*, “Early On-Orbit Results for the NASA Cyclone Global Navigation Satellite System,” ECE Distinguished Colloquium Series, University of Illinois Champaign-Urbana, 26 Oct 2017.
- Invited Seminar*, “CYGNSS Cyclone Global Navigation Satellite System,” IEEE Geoscience and Remote Sensing Society, High Plains/Denver Chapter, University of Colorado, Boulder, CO, 24 Oct 2017.
- Invited Seminar*, “CYGNSS Cyclone Global Navigation Satellite System,” IEEE Geoscience and Remote Sensing Society, Southeast Michigan Chapter, University of Michigan, Ann Arbor, MI, 20 Oct 2017.
- Conference Paper*, “NASA CYGNSS Tropical Cyclone Mission,” Advanced RF Sensors and Remote Sensing Instruments 2017, ESA-ESTEC, Noordwijk, NL, 12-14 Sep 2017.
- Invited Paper*, “CYGNSS Cyclone Global Navigation Satellite System,” NASA SmallSat Reliability Workshop, NASA Headquarters, Washington DC, 11 Oct 2017.
- Invited Seminar*, “CYGNSS Cyclone Global Navigation Satellite System,” Goddard Earth Sciences Technology and Research (GESTAR) Program, Goddard Space Flight Center, Greenbelt, MD, 17 Aug 2017.
- Conference Paper*, “Storm Surge Prediction with CYGNSS Winds,” 2017 International Geoscience and Remote Sensing Symposium, Houston, TX, 23-28 July 2017.
- Invited Paper*, “The NASA CYGNSS Mission: Overview and Status Update,” 2017 International Geoscience and Remote Sensing Symposium, Houston, TX, 23-28 July 2017.
- Poster Presentation*, “CYGNSS Cyclone Global Navigation Satellite System,” Coalition for Aerospace and Science Day on the Hill & Exhibition, Rayburn House Office Building, Capitol Hill, Washington DC, 14 Jun 2017.
- Conference Paper*, “Storm Surge Modeling with CYGNSS Winds,” GNSS+R 2017 Workshop, Ann Arbor, MI, 23-25 May 2017.
- Conference Paper*, “NASA CYGNSS Mission,” GNSS+R 2017 Workshop, Ann Arbor, MI, 23-25 May 2017.
- Conference Paper*, “NASA CYGNSS Tropical Cyclone Mission,” 2017 European Geophysical Union, Vienna, Austria, 25 Apr 2017.
- Conference Paper*, “The NASA CYGNSS Satellite Constellation for Tropical Cyclone Observations,” 2017 Tropical Cyclone Operations and Research Forum (TCORF) and 71st Interdepartmental Hurricane Conference (IHC), Miami, FL, 14-16 Mar 2017.
- Invited Presentation*, “Cyclone Global Navigation Satellite System,” NASA Hyperwall at 2017 AMS Annual Meeting, Seattle, WA, 22-26 Jan 2017.
- Conference Paper*, “The NASA CYGNSS Satellite Constellation for Tropical Cyclone Observations,” 2017 AMS Annual Meeting, Seattle, WA, 22-26 Jan 2017.
- Conference Paper*, “CYGNSS Mission Update,” European GNSS-R Environment Monitoring (E-GEM) Workshop, Lisbon, PORTUGAL, 14 Nov 2016.
- Invited Seminar*, “Cyclone Global Navigation Satellite System (CYGNSS) for Frequent Measurement of Hurricane Wind Speed and Structure,” NOAA National Hurricane Center, Miami, FL, 14 Jun 2016.
- Conference Paper*, “The CYGNSS Constellation Satellite Mission,” 2016 European Space Agency Living Planet Symposium, Prague, CZ, 9-13 May Apr 2016.
- Conference Paper*, “The NASA CYGNSS Satellite Constellation Tropical Cyclone Mission,” 2016 AMS Hurricanes and Tropical Meteorology Conference, San Juan, Puerto Rico, 17-21 Apr 2016.

- Conference Paper*, “Tropical Cyclone Forecast Skill Impact Simulations with the NASA CYGNSS Constellation,” 2016 AMS Annual Meeting, New Orleans, LA, 11-14 Jan 2016.
- Conference Paper*, “The NASA Cyclone Global Navigation Satellite System (CYGNSS): Mission Status,” Fall 2015 American Geophysical Union Meeting, San Francisco, CA, 14-18 Dec 2015.
- Keynote Speaker*, “NASA Earth Venture Mission Cyclone Global Navigation Satellite System (CYGNSS),” MEXT Summer Seminar, Fukuoka, JAPAN, 11 Sep 2015.
- Panel Member*, Achieving Science Goals with CubeSats Workshop, National Academy of Sciences Space Studies Board, Irvine, CA, 2-3 Sep 2015.
- Invited Paper*, “Forward Model and Retrieval of TC Wind Speed with CYGNSS,” 2015 International Geoscience and Remote Sensing Symposium, Milan, ITALY, 27-31 July 2015.
- Invited Paper*, “The NASA CYGNSS Tropical Cyclone Mission,” 2015 International Geoscience and Remote Sensing Symposium, Milan, ITALY, 27-31 July 2015.
- Panel Member*, “Using Commercial Space and Small Satellites Assets” GEOINT Forward 2015 Small Sat Panel, GEOINT Conference, Washington DC, 22 June 2015.
- Keynote Speaker*, “Overview of CYGNSS Mission,” NASA CYGNSS Applications Workshop, NOAA, Silver Spring, MD, 27-29 May 2015.
- Conference Paper*, “CYGNSS Mission Update,” 2015 International Ocean Vector Wind Science Team Meeting, Portland, OR, 19-21 May 2015.
- Conference Paper*, “NASA CYGNSS Mission – Status and Future Plans,” GNSS+R 2015 Workshop, Potsdam, GERMANY, 11-13 May 2015.
- Invited Seminar*, “NASA Cyclone Global Navigation Satellite System (CYGNSS) Earth Venture Mission,” Information, Science & Technology Colloquium, NASA Goddard Space Flight Center, Greenbelt, MD, 6 May 2015.
- Conference Paper*, “The NASA CYGNSS Satellite Constellation: Probing the Inner Core of Hurricanes,” 2015 Tropical Cyclone Research Forum/69th Interdepartmental Hurricane Conference, Jacksonville, FL, 2-5 March 2015.
- Invited Seminar*, “The NASA Cyclone Global Navigation Satellite System,” University of Texas Brownsville Physics & Astronomy Colloquium, Brownsville, TX, 14 November 2014.
- Conference Paper*, “The NASA Cyclone Global Navigation Satellite System (CYGNSS): A Constellation of Bi-static Ocean Scatterometer Microsatellites to Probe the Inner Core of Hurricanes,” Fall 2014 American Geophysical Union Meeting, San Francisco, CA, 15-19 Dec 2014.
- Conference Paper*, “The NASA Cyclone Global Navigation Satellite System (CYGNSS) Mission,” Advanced RF Sensors and Remote Sensing Instruments 2014, ESA-ESTEC, Noordwijk, NETHERLANDS, 4-7 November 2014.
- Conference Paper*, “CYGNSS: NASA Earth Venture Tropical Cyclone Mission,” SPIE 2014 Remote Sensing Conference, Amsterdam, NETHERLANDS, 22-25 September 2014.
- Workshop Paper*, “Time and Space Sampling Coordination between PMM and CYGNSS Ocean Surface Winds,” NASA PMM Science Team Meeting, Baltimore, MD, 4-8 August 2014.
- Invited Paper*, “The NASA CYGNSS Mission: Design and Predicted Performance,” 2014 International Geoscience and Remote Sensing Symposium, Québec City, CANADA, 14-18 July 2014.
- Conference Paper*, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” 2014 International Geoscience and Remote Sensing Symposium, Québec City, CANADA, 14-18 July 2014.

Keynote Speaker, “Measuring Hurricanes with the Cyclone Global Navigation Satellite System (CYGNSS),” Ford Motor Company/University of Michigan Innovation Alliance, Executive Committee Meeting, Dearborn, MI, 20 June 2014.

Invited Seminar, “The Theory, History and Future of Global Navigation Satellite System Reflectometry (GNSS-R),” with S. Gleason, JAMSTEC/JMA, Yokohama, JAPAN, 30 April 2014.

Invited Seminar, “The Theory, History and Future of Global Navigation Satellite System Reflectometry (GNSS-R),” with S. Gleason, University of Tokyo, Tokyo, JAPAN, 28 April 2014.

Invited Seminar, “The Theory, History and Future of Global Navigation Satellite System Reflectometry (GNSS-R),” with S. Gleason, Kobe University, Kobe, JAPAN, 25 April 2014.

Invited Seminar, “The Theory, History and Future of Global Navigation Satellite System Reflectometry (GNSS-R),” with S. Gleason, Kyushu University, Fukuoka, JAPAN, 24 April 2014.

Invited Seminar, “CYGNSS: A New NASA Hurricane Satellite,” Local Chapter of the American Meteorology Society, University of Michigan, Ann Arbor, MI, 15 April 2014.

Conference Paper, “Enhanced Spatial & Temporal Sampling of Air/Sea Interaction in Tropical Cyclones by the NASA CYGNSS Mission,” 31st Conference on Hurricanes and Tropical Meteorology, San Diego, CA, 1 April 2014.

Invited Seminar, “CYGNSS: A New NASA Hurricane Satellite,” IEEE-GRSS Southeastern Michigan Chapter, University of Michigan, Ann Arbor, MI, 20 March 2014.

Invited Seminar, “CYGNSS: A New NASA Hurricane Satellite,” Aerospace Lecture, Student Activities Board, University of Michigan, Dearborn, MI, 18 March 2014.

Conference Paper, “The NASA Cyclone Global Navigation Satellite System (CYGNSS) Mission,” 18th Conf. Integrated Observing and Assimilation Systems for Atmosphere, Oceans, and Land Surface, 2014 AMS Annual Conf., Atlanta, GA, 3 Feb. 2014.

Invited Paper, “The CYGNSS Constellation Mission,” International Earth Observation Convoy and Constellation Concepts Workshop, ESA-ESTEC, Noordwijk, NETHERLANDS, 11 Oct 2013.

Invited Seminar, “Hurricane Remote Sensing,” Natural Disasters Class, Livonia High School, Livonia, MI, 25 Sep 2013.

Invited Paper, “CYGNSS Wind Retrieval Performance,” 2013 International Ocean Vector Wind Science Team Meeting, Kailua-Kona, HI, 7 May 2013.

Invited Paper, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” 2013 International Ocean Vector Wind Science Team Meeting, Kailua-Kona, HI, 7 May 2013.

Invited Seminar, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” Univ. of New Hampshire, 3 May 2013.

Conference Paper, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” 2013 European Geophysical Union, Vienna, AUSTRIA, 12 April 2013.

Invited Seminar, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” Microsatellite Mission Applications Study Panel, Air Force Scientific Advisory Board, 11 Apr 2013.

Invited Seminar, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” Duke University, 12 Feb 2013.

Invited paper, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” 2013 Annual AMS Meeting, Austin, TX, 9 Jan 2013.

- Invited Paper*, “The CYGNSS Constellation Mission,” International Earth Observation Convoy and Constellation Concepts Workshop, ESA-ESTEC, Noordwijk, NETHERLANDS, 11 Oct 2013.
- Invited Seminar*, “Hurricane Remote Sensing,” Natural Disaster Class, Churchill High School, Livonia, MI, 25 Sep 2013.
- Invited paper*, “Cyclone Global Navigation Satellite System (CYGNSS) NASA Earth Venture Mission,” A-Team GNSS-R Workshop, NASA Jet Propulsion Laboratory, Pasadena, VA, 14 August 2013.
- Invited paper*, “CYGNSS Wind Retrieval Performance,” 2013 International Ocean Vector Wind Science Team Meeting, Kailua-Kona, HI, 7 May 2013.
- Invited paper*, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” 2013 International Ocean Vector Wind Science Team Meeting, Kailua-Kona, HI, 7 May 2013.
- Invited Seminar*, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” Univ. of New Hampshire, 3 May 2013.
- Conference paper*, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” 2013 European Geophysical Union, Vienna, AUSTRIA, 12 April 2013.
- Invited Seminar*, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” Microsatellite Mission Applications Study Panel, Air Force Scientific Advisory Board, 11 Apr 2013.
- Invited Seminar*, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” Duke University, 12 Feb 2013.
- Invited paper*, “The NASA EV-2 Cyclone Global Navigation Satellite System (CYGNSS) Mission,” 2013 Annual AMS Meeting, Austin, TX, 9 Jan 2013.
- Conference paper*, “HIRAD TB Calibration and Multi-frequency Hurricane Imaging,” 12th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment, Frascati, ITALY, 5-9 Mar 2012.
- Conference paper*, “Aquarius Radiometer Radio Frequency Interference (RFI) Detection, Characterization and Mitigation,” 12th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment, Frascati, ITALY, 5-9 Mar 2012.
- Invited paper*, “Citations for Data in Refereed Journals,” Fall 2011 American Geophysical Union, San Francisco, CA, 9 Dec 2011.
- Invited paper*, “First Tropical Cyclone Overflights by the Hurricane Imaging Radiometer,” 2011 International Geoscience and Remote Sensing Symposium, Vancouver, BC, CANADA, 25-29 July 2011.
- Invited paper*, “K-Band Radio Frequency Interference Survey of Southeastern Michigan,” 2010 International Geoscience and Remote Sensing Symposium, Honolulu, HI, USA, pp. 2486-2489, 26-30 July 2010.
- Invited paper*, “From a Real Pencil to a Synthetic Broom: The Past, Present and Future of HIRAD,” 2010 International Geoscience and Remote Sensing Symposium, Honolulu, HI, USA, 26-30 Jul 2010.
- Invited paper*, “Digital Radiometers for Earth Science,” 2010 International Microwave Symposium, Anaheim, CA, 26 May 2010.
- Invited paper*, “Spectral Mapping of Radio Frequency Interference at K-Band Using a Kurtosis Spectrometer,” 11th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment, Washington DC, 1-4 Mar 2010.

Invited paper, “Digital Microwave Radiometers: Instrument Capability v. Digital Technology,” 11th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment, Washington DC, 1-4 Mar 2010.

Invited paper, “Detection of Lightning on Mars with a Digital Kurtosis Detector,” URSI National Radio Science Meeting, Boulder, CO, J2-1, 6-9 Jan 2010.

Invited Seminar, “Hallway Conversations and the Discovery of Lightning on Mars,” Atmos. Sci. Dept. Seminar, Texas A&M Univ., 22 Sep. 2009..

Invited paper, “Digital Microwave Radiometers: Digital Signal Processing Device Capabilities vs. Radiometer Sensor Performance,” 2009 International Geoscience and Remote Sensing Symposium, Cape Town, S.A., 13-17 July 2009.

Invited paper, “The Hurricane Imaging Radiometer (Hirad): Instrument Status and Performance Predictions,” 2009 International Geoscience and Remote Sensing Symposium, Cape Town, S.A., 13-17 July 2009.

Guest Panelist, “International Remote Sensing Publication Forum,” 30th Canadian Symposium on Remote Sensing, Lethbridge, Alberta CANADA, 24 June 2009.

Invited paper, “Discussions/Perspectives on International Collaboration on Radiometer Calibration,” 8th Global Precipitation Measurement Planning Workshop, Paris, FRANCE, 16-19 June 2009.

Invited paper, “Digital Correlators for Spaceborne Earth Remote Sensing - Current Status and Near Term Technology Development,” Keck Institute for Space Studies MMIC Array Receivers and Spectrographs Workshop, Pasadena, CA, 21-25 Aug. 2008.

Invited paper, “Design and Performance Considerations for a Spaceborne Digital Radiometer,” 2008 International Geoscience and Remote Sensing Symposium, Boston, MA, 7-11 July, 2008.

Conference paper, “Comparison of Pulsed Sinusoid Radio Frequency Interference Detection Algorithms Using Time and Frequency Sub-Sampling,” 2008 International Geoscience and Remote Sensing Symposium, Boston, MA, 7-11 July, 2008.

Conference paper, “Cross Calibration of Microwave Radiometers in the GPM Constellation,” 2008 International Geoscience and Remote Sensing Symposium, Boston, MA, 7-11 July, 2008.

Conference paper, “Vicarious Calibration of Global Precipitation Measurement Microwave Radiometers,” 2008 International Geoscience and Remote Sensing Symposium, Boston, MA, 7-11 July, 2008.

Invited paper, “Design and Development of the Hurricane Imaging Radiometer (HIRAD),” 2008 International Geoscience and Remote Sensing Symposium, Boston, MA, 7-11 July, 2008.

Conference paper, “Detectability of Radio Frequency Interference due to Spread Spectrum Communication Signals using The Kurtosis Algorithm,” 2008 International Geoscience and Remote Sensing Symposium, Boston, MA, 7-11 July, 2008.

Conference paper, “Characterization of the Aquarius and Juno Radiometers Using a Programmable Digital Noise Source,” 2007 International Geoscience and Remote Sensing Symposium, Barcelona, SPAIN, 23-27 July, 2007.

Conference paper, , “Detection of Radio Frequency Interference with the Aquarius Radiometer” 2007 International Geoscience and Remote Sensing Symposium, Barcelona, SPAIN, 23-27 July, 2007.

Conference paper, “The Hurricane Imaging Radiometer – An Octave Bandwidth Synthetic Thinned Array Radiometer,” 2007 International Geoscience and Remote Sensing Symposium, Barcelona, SPAIN, 23-27 July, 2007.

- Conference paper*, “Detection of RFI by its Amplitude Probability Distribution,” 2006 International Geoscience and Remote Sensing Symposium, Denver, CO, 31 Jul - 4 Aug 2006.
- Conference paper*, “Agile Digital Detector for RFI Mitigation,” 2006 Specialist Meeting on Microwave Radiometry, San Juan, PR, 28 Feb – 3 Mar 2006.
- Conference paper*, “Wind Vector Retrieval with WindSat – Impact on Performance of Missing Channels,” 2005 International Geoscience and Remote Sensing Symposium, Seoul, KOREA, 25-29 July 2005.
- Conference paper*, “Calibrating a Polarimetric Radiometer with the Correlated Noise Calibration Standard,” 2005 International Geoscience and Remote Sensing Symposium, Seoul, KOREA, 25-29 July 2005.
- Conference paper*, “Ensemble Scattering and RFI Speckle Caused by Collision Avoidance Radar,” Proc. URSI National Radio Science Meeting, Boulder, CO, F/J1-7, 215, 5-8 Jan 2005.
- Conference paper*, “WindSat Calibration and Geophysical Parameter Estimation,” International Geoscience and Remote Sensing Symposium, Anchorage, AK, 20-24 Sept. 2004.
- Conference paper*, “Simultaneous Retrieval of Surface Wind Speed and Rain Rate using Radar and Radiometer Measurements,” International Geoscience and Remote Sensing Symposium, Anchorage, AK, 20-24 Sept. 2004.
- Conference paper*, “X-Band Lightweight Rainfall Radiometer First Light,” 2003 International Geoscience and Remote Sensing Symposium, Toulouse, FRANCE, July 2003
- Conference paper*, “WindSat SDR and EDR On Orbit Calibration and Validation,” 2003 International Geoscience and Remote Sensing Symposium, Toulouse, FRANCE, July 2003.
- Conference paper*, “Jason Microwave Radiometer On Orbit Calibration, Validation and Performance,” AGU Fall Meeting, San Francisco, CA, December 2002.
- Conference paper*, “Jason Microwave Radiometer On Orbit Calibration, Validation and Performance,” Jason-1/TOPEX/Poseidon Science Working Team Meeting New Orleans, LA, 21-23 Oct 2002.
- Conference paper*, “Evaluation of Correlation Radiometers using Programmable Correlated Noise,” Second International Microwave Radiometer Calibration Workshop, Barcelona, Spain, Oct 2002.
- Conference paper*, “Early On Orbit Performance of the Jason-1 Microwave Radiometer,” 2002 Progress in Electromagnetics Research Symposium, Cambridge, MA, July 2002.
- Invited panel member*, NPOESS Cal/Val Panel Discussion, IGARSS2002, Toronto, Canada, June 2002
- Conference paper*, “Lightweight Rainfall Radiometer STAR Aircraft Sensor,” International Geoscience and Remote Sensing Symposium, Toronto, CA, June 2002.
- Keynote speaker*, “Cal/Val Activities and Issues for SMOS,” 3rd ESA Soil Moisture and Ocean Salinity Workshop, Oberpfaffenhofen, Germany, 11 Dec 2001.
- Conference paper*, “Environmental Testing of Correlation Radiometer Pairs with a Digital Noise Source,” 7th Specialist Meeting on Microwave Remote Sensing, Boulder, CO, November 2001.
- Invited speaker*, “Design Features of a Boresighted Radiometer,” NASA Workshop on GPM Core Satellite Radiometer Improvements, NASA Goddard Space Flight Center, Greenbelt, MD, 31 August 2001.
- Invited speaker*, “Enabling Technologies for the Global Precipitation Measurement Mission,” NASA Earth Science Technology Conference, University of MD, College Park, MD, 29 August 2001.

- Conference paper*, “MMIC Receiver Modules for Digital Correlation Radiometry,” 2001 International Geoscience and Remote Sensing Symposium, Sydney, Australia, July 2001.
- Conference paper*, “The GPM Constellation Microwave Radiometer Testbed,” 2001 International Geoscience and Remote Sensing Symposium, Sydney, Australia, July 2001.
- Invited speaker*, “Rainfall Measurement Technology - Passive Systems,” Global Precipitation Mission Workshop, NASA Goddard Space Flight Center, 20 February 2001.
- Invited speaker*, “Large, Lightweight Deployable Antenna Session – Large Radiometer Arrays in Space: Science and Technology Issues,” Technology Planning Workshop, NASA Earth Science Enterprise New Millennium Program, Arlington, VA, 23-24 January 2001
- Invited speaker*, “Outstanding Issues - Calibration,” 2nd ESA Soil Moisture and Ocean Salinity Science Workshop, Toulouse CESBIO, FRANCE, 28-30 November 2000
- Plenary speaker*, “Using Vicarious Calibration to Diagnose a Drift in the TOPEX Microwave Radiometer” First International Microwave Radiometer Calibration Workshop, Adelphi, MD, 30 Oct 2000.
- Invited seminar*, “Diagnosis of the Evidence for and Cause of a Drift in the TOPEX Microwave Radiometer,” CETP/IPSL/CNRS, Université St Quentin-Versailles, FRANCE, 16 October 2000
- Conference paper*, “Enabling Technologies to Map Precipitation with Near-Global Coverage and Hour-Scale Revisit Times,” 2000 International Geoscience and Remote Sensing Symposium, Honolulu, HI, July 2000.
- Conference paper*, “Statistical Analysis of a Lower Bound on Microwave Radiometer Brightness Temperature from Space,” 2000 International Geoscience and Remote Sensing Symposium, Honolulu, HI, July 2000.
- Conference paper*, “Implications of an improved atmospheric absorption model on water vapor retrievals,” 6th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment, Florence, Italy, March 2000.
- Conference paper*, “A Temperature Dependent Correction to the Model for Microwave Excess Emissivity of the Ocean due to Surface Winds,” 1999 International Geoscience and Remote Sensing Symposium, Hamburg, GERMANY, July 1999.
- Conference paper*, “Calibration of the model for ocean surface emissivity at microwave frequencies,” 1999 International Geoscience and Remote Sensing Symposium, Hamburg, GERMANY, July 1999.
- Invited speaker*, “Polarization purity requirements for a polarimetric radiometer,” Workshop on Problems to be Addressed by Microwave Radiometers in the 21st Century, Rolighed, Denmark, September 1998
- Conference paper*, “Littoral antenna deconvolution for a microwave radiometer,” 1998 International Geoscience and Remote Sensing Symposium, Seattle, WA, July 1998.
- Conference paper*, “Polarimetric radiometry - Coherent vs. incoherent detection,” 1998 International Geoscience and Remote Sensing Symposium, Seattle, WA, July 1998..
- Conference paper*, “Prediction of water vapor scale height from integrated water vapor measurements,” 1996 International Geoscience and Remote Sensing Symposium, Lincoln, NE, July 1996.
- Conference paper*, “Estimation of the ocean/atmosphere boundary layer height of water vapor from space,” International Geoscience and Remote Sensing Symposium, Lincoln, NE, July 1996.
- Conference paper*, “An algorithm for improving the retrieval of cloud liquid water and water vapor using effective radiating temperature of clouds,” Second Topical Symposium on Combined Optical-Microwave Earth and Atmosphere Sensing, Atlanta, GA, April 1995.

- Conference paper*, "Rain rate estimation from attenuation measurements using a 35 GHz dual polarization propagation link," 1994 International Geoscience and Remote Sensing Symposium, Pasadena, CA, August 1994.
- Conference paper*, "Digital correlator performance analysis for a synthetic aperture imaging radiometer," 1994 International Geoscience and Remote Sensing Symposium, Pasadena, CA, August 1994.
- Conference paper*, "TOPEX Microwave Radiometer in-flight performance evaluation," 1993 International Geoscience and Remote Sensing Symposium, Tokyo, JAPAN, August 1993.
- Conference paper*, "Improved array configurations for synthetic aperture interferometric radiometers," 1993 International Geoscience and Remote Sensing Symposium, Tokyo, JAPAN, August 1993.
- Conference paper*, "The TOPEX Microwave Radiometer: Verification Phase Evaluation," AGU 1992 Fall Meeting, San Francisco, CA, Dec. 1992.
- Conference paper*, "The TOPEX microwave radiometer," Specialist Meeting on Microwave Radiometry and Remote Sensing, Boulder, Colorado, 1992.
- Conference paper*, "Error analysis of image reconstruction by a synthetic aperture interferometric radiometer," 1992 International Geoscience and Remote Sensing Symposium, , Houston, TX, May 1992.
- Conference paper*, "Antenna performance for a synthetic aperture microwave radiometer in geosynchronous earth orbit," 1990 International Geoscience and Remote Sensing Symposium, College Park, MD, May 1990.
- Conference paper*, "TOPEX/POSEIDON microwave radiometer - post-launch ground based calibration/validation," 1990 International Geoscience and Remote Sensing Symposium, College Park, MD, May 1990.
- Conference paper*, "Sparse aperture interferometric radiometry (SAIR) for the remote sensing of the earth," 1989 International Symposium on Antennas and Propagation, Tokyo, JAPAN, August 1989.
- Conference paper*, "TOPEX microwave radiometer system calibration; refining the SMMR heritage," 1989 International Geoscience and Remote Sensing Symposium, Vancouver, B.C., CANADA, July 1989.
- Conference paper*, "Atmospheric profiling of water vapour with a 20.5-23.5 GHz autocorrelation radiometer," 1988 International Geoscience and Remote Sensing Symposium, Edinburgh, UK, August 1988.
- Conference paper*, "The electronically steered thinned array radiometer (ESTAR)," 1986 International Geoscience and Remote Sensing Symposium, Zurich, SWITZ., October 1986.
- Conference paper*, "Electronically steered thinned array radiometer, system design, performance and calibration," 1985 International Geoscience and Remote Sensing Symposium, Amherst, MA, October 1985.