

Tianlin Wang

Curriculum Vitae

tianlin.wang@jpl.nasa.gov

EDUCATION

Ph.D. Electrical Engineering, University of Michigan, Ann Arbor, 2021

Dissertation: Engineering Calibration and Physical Principles of GNSS-Reflectometry for Earth Remote Sensing

Committee: Christopher S. Ruf (Chair), Fawwaz T. Ulaby, Kamal Sarabandi, Mark Moldwin, Darren S. McKague

M.E. Electrical and Computer Engineering, University of Michigan, Ann Arbor, 2019

M.S. Radio Physics, Fudan University, 2012

B.E. Electrical Engineering, East China University of Science and Technology, 2009

PROFESSIONAL EXPERIENCE

8/2023-Present Research Technologist II, NASA Jet Propulsion Laboratory (JPL)

2/2021-8/2023 President's Postdoctoral Scholar, ElectroScience Laboratory, Department of Electrical and Computer Engineering, The Ohio State University

1/2015-2/2021 Graduate Student Research Assistant, Graduate Student Instructor, Department of Electrical Engineering and Computer Science, Department of Climate and Space Sciences and Engineering, University of Michigan

1/2017-12/2020 Engineering Teaching Consultant, Center for Research on Learning and Teaching in Engineering, University of Michigan

9/2013-12/2014 Research Assistant, Teaching Assistant, Department of Electrical Engineering, University of Washington

RESEARCH INTERESTS

On-orbit calibration and validation methods for microwave remote sensors

Design, implementation, and measurement of radio frequency (RF) circuit, device, and system

Instrumentation and technology development of next generation sensors and subsystem

Science and applications of microwave remote sensing in Earth and planetary sciences

Electromagnetic wave propagation and scattering theory with applications in remote sensing

RECENT RESEARCH AWARDS

- 2023 Young Scientist Award, XXXVth URSI General Assembly and Scientific Symposium
- 2023 Young Scientist Award, 44th PhotonIcs and Electromagnetics Research Symposium
- 2021 Ernest K. Smith USNC-URSI Student Prize (Second Place in Student Paper Competition), 2021 USNC-URSI National Radio Science Meeting (NRSM) Virtual Conference
- 2020 Richard F. and Eleanor A. Towner Prize for Distinguished Academic Achievement, College of Engineering, University of Michigan
- 2020 First Place in Poster Paper Competition, 2020 IEEE Rising Stars Conference
- 2018 IEEE Mikio Takagi Student Prize (First Place in Student Paper Competition among 230 submissions), 2018 IEEE Geoscience and Remote Sensing Symposium, Valencia, Spain
- 2018 Outstanding Student Presentation Award, 2018 AGU Fall Meeting, Washington, D.C.
- 2018 Second Place, Poster Competition in Atmospheric and Climate Science Track, 14th Annual Meeting of Michigan Geophysical Union, University of Michigan

RECENT GRANTS & FELLOWSHIPS

- 2022 Research Sub Award from NASA CYGNSS Cal/Val team
- 2021 Mistletoe Research Fellowship (20 Awardees Selected from 330 Candidates)
- 2021 Office of Postdoctoral Affairs (OPA) Scholarship, The Ohio State University
- 2020 President's Postdoctoral Scholars Fellowship, The Ohio State University
- 2017-2020 Rackham Conference Travel Grant, University of Michigan
- 2018 IEEE Young Professionals Arctic Challenge Research Award
- 2015 Electrical Engineering Department Fellowship, University of Michigan

RECENT HONORS

- 2020 IEEE GRSS Chapter Excellence Award (Presented annually to one chapter selected from more than 90 chapters over the globe; Group award received as the chapter chair)
- 2020 Distinguished Leadership Award, College of Engineering, University of Michigan
- 2020 Early Career Member, USNC-URSI Commission F
- 2019 Ambassador, 2020 IEEE Rising Stars Conference
- 2019 Ambassador, Department of Electrical and Computer Engineering, University of Michigan
- 2019 IEEE Southeastern Michigan Section (SEM) Outstanding Student Award
- 2018 Member, Tau Beta Pi Engineering Honor Society (DA, 2018 and 2020; PA, 2019)
- 2018 Member, IEEE Eta Kappa Nu (HKN) Honor Society

TEACHING AND MENTORING EXPERIENCE

The Ohio State University

Teaching Assistant, Wireless Propagation and Remote Sensing (fall 2022)

University of Michigan, Ann Arbor

Graduate Student Instructor, Introduction to Signals and Systems (fall 2016)

Grader, Electromagnetics (fall 2019)

Grader, Introduction to Planetary Science (winter 2019)

Ph.D. Mentorship Program, Department of Electrical and Computer Engineering (2018)

Graduate Mentor for Lunch and Lab Mentoring Program (2018, 2019)

University of Washington, Seattle

Teaching Assistant, Circuit Theory (spring 2014, fall 2014)

Teaching Assistant, Introduction to Electrical Engineering (winter 2014)

Fudan University

Teaching Assistant, Electromagnetic and Microwave Engineering (spring 2010, fall 2011)

FIELD CAMPAIGN EXPERIENCE

CYGNSS Field Campaign, Deployment of Soil Moisture Sensing Controller And oPtimal Estimator (SoilSCAPE) Wireless Sensor Network, San Luis Valley, CO, USA Aug 19-23 and Oct 23-28 2019

Measurement of Methane Concentration at University of Michigan Biological Station, Pellston and Wawa, Canada for IEEE Arctic Challenge “Arctic Methane and Climate Change” Feb 2019

PROFESSIONAL SERVICE

To Profession

Co-Chair, IEEE Geoscience and Remote Sensing Society (GRSS) Modeling in Remote Sensing (MIRS) Technical Committee (2021-Present)

Co-Chair, Organizing Committee, IEEE GRSS-USC MHI Remote Sensing Summer School (2023)

Session Co-Chair, 2022 IEEE International Geoscience and Remote Sensing Symposium (2022)

Session Co-Chair, IEEE Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity (2021)

Student Chapter Coordinator, IEEE Geoscience and Remote Sensing Society (2020- Present)

Young Professionals Ambassador, IEEE Geoscience and Remote Sensing Society (2019-Present)

Founding Chair, IEEE Geoscience and Remote Sensing Society (GRSS) Student Branch Chapter at University of Michigan (2018-Present)

Session Co-Chair (1 session) and Session Manager (6 sessions), 2020 IEEE International Geoscience and Remote Sensing Symposium

Organizing Committee Chair, IEEE GRSS Workshop on Microwave Remote Sensing

Member, Standards of GNSS-Reflectometry Working Group, IEEE GRSS (2018-Present)

To Community

Judging Committee, Electrical and Computer Engineering John D. Alice Nelson Kraus Memorial Poster Competition, The Ohio State University (2021, 2022)

Team Lead, Training for Better Presentations Graduate Speaker Series, Tau Beta Pi – Michigan Gamma Chapter (2019-2020)

CLaSP Teaching Panel, Gaining Teaching Experience at UM, Department of Climate and Space Sciences and Engineering, University of Michigan (2019)

Graduate Student Representative in College Curriculum Committee, College of Engineering, University of Michigan (2018-2019)

Student Member of Planning Committee of Climate Seminars, Dept. Climate and Space Science and Engineering, University of Michigan (2018-2019)

Member, Engineering Graduate Symposium Organizing Committee, University of Michigan (2018)

Peer Review

IEEE Transactions on Geoscience and Remote Sensing

IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

IEEE Geoscience and Remote Sensing Letters

IEEE Geoscience and Remote Sensing Magazine

Remote Sensing of Environment

Progress in Electromagnetics Research

MDPI Remote Sensing, Sensors, MicroMachines

India Geoscience and Remote Sensing Symposium (InGARSS)

PROFESSIONAL ASSOCIATIONS

Institute of Electrical and Electronics Engineers (IEEE), 2013-present

Geoscience and Remote Sensing Society (GRSS),

Antenna and Propagation Society (APS)

Young Professionals (YP)

Institute of Navigation (ION), 2017-present

American Geophysical Union (AGU), 2018-present

American Society for Engineering Education (ASEE), 2022-present

PUBLICATIONS

Book

- 2022 C. Ruf, D. McKague, D. Posselt, S. Gleason, M. P. Clarizia, V. Zavorotny, T. Butler, J. Redfern, W. Wells, M. Morris, J. Crespo, C. Chew, E. Small, D. Pasqual, T. Wang, A. Warnock, D. Mayers, M. Al-Khalidi, and A. J. O'Brien, "CYGNSS handbook: Cyclone Global Navigation Satellite System (Edition 2)," Michigan Publishing, University of Michigan, Ann Arbor, MI, Dec. 2022.

Peer Reviewed Journal Articles

- In review T. Wang, C. Ruf, A. O'Brien, S. Gleason, D. McKague, B. Block, and A. Russel, "Measurement of GPS and CYGNSS Antenna Gain Patterns with a Spaceborne Antenna Range," Submitted to *IEEE Transactions on Aerospace and Electronic Systems*.
- 2023 M. M. Al-Khalidi, S. Gleason, J. Johnson, R. Balasubramaniam, C. Ruf, D. McKague, B. Annane, T. Wang, A. Russel, and D. Twigg, "Using Synthetic Cyclone Models for High Wind GNSS-R Calibration, Validation, and Algorithm Development: A CYGNSS Case Study," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 61, pp. 1-11, 2023, Art no. 5801911.
- 2022 J. Campbell, R. Akbar, A. Bringer, D. Comite, L. Dente, S. Gleason, L. Guerriero, E. Hodges, J. Johnson, S. Kim, A. Melebari, N. Pierdicca, C. Ruf, L. Tsang, T. Wang, H. Xu, J. Zhu, and M. Moghaddam, "Intercomparison of Electromagnetic Scattering Models for Delay-Doppler Maps along a CYGNSS Land Track with Topography," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 60, pp. 1-13, 2022, Art no. 2007413.
- 2021 T. Wang, C. Ruf, S. Gleason, A. O'Brien, D. McKague, B. Block, and A. Russel, "Dynamic Calibration of GPS Effective Isotropic Radiated Power for GNSS-Reflectometry Earth Remote Sensing," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 60, pp. 1-12, 2022, Art no. 5800512.
- 2021 S. Gleason, M. Al-Khalidi, C. Ruf, D. McKague, T. Wang, and A. Russel, "Characterizing and Mitigating Digital Sampling Effects on the CYGNSS Level 1 Calibration," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 60, pp. 1-12, 2022, Art no. 5802812.
- 2021 H. Carreno-Luengo, A. Camps, C. Ruf, N. Floury, M. Martin-Neira, T. Wang, S. J. Khalsa, M. P. Clarizia, J. Reynolds, J. Johnson, A. O'Brien, C. Galdi, M. di Bisceglie, A. Dielacher, P. Jales, M. Unwin, L. King, G. Foti, R. Shah, D. Pascual, B. Schreiner, M. Asgarimehr, J. Wickert, S. Ribo, and E. Cardellach, "The Standard for GNSS-R Data and Metadata Content Working Group," *IEEE Access*, vol. 9, pp. 89906-89933, 2021.

- 2019 T. Wang, C. Ruf, B. Block, D. McKague, and S. Gleason, "Design and Performance of a GPS Constellation Power Monitor System for Improved CYGNSS L1B Calibration," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 12, no. 1, pp. 26-36, Jan. 2019.
- 2016 T. Wang, L. Tsang, J. T. Johnson, and S. Tan, "Scattering and Transmission of Waves in Multiple Random Rough Surfaces: Energy Conservation Studies with the Second Order Small Perturbation Method," *Progress In Electromagnetics Research*, vol. 157, 1-20, 2016.
- 2015 S. Tan, A. Mustafa, M. Brogioni, G. Macelloni, M. Durand, K. Jezek, T. Wang, L. Tsang, J. Johnson, M. Drinkwater, and L. Brucker, "Physical Models of Layered Polar Firn Brightness Temperatures from 0.5GHz to 2GHz," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 8, no. 9, pp. 4418-4430, 2015.
- 2012 T. Wang, Y.-Q. Jin, "Postearthquake Building Damage Assessment Using Multi-Mutual Information from Pre-Event Optical Image and Postevent SAR Image," *IEEE Geoscience and Remote Sensing Letters*, vol. 9, no. 3, pp. 452-456, 2012.
- 2012 T. Wang, Y.-Q. Jin, "Change Evaluation of Buildings Damages after Earthquake from Pre-Event Optical Image and Post-Event SAR Image," *Journal of Remote Sensing*, vol. 16, no. 2, pp. 248-261, 2012.
- 2011 H. P. Wang, T. Wang, F. Xu, Y.-Q. Jin, "Assessment of Building Damage in 2008 Wenchuan Earthquake from Multi-temporal SAR Images Using Getis Statistics," *IEICE Transactions on Communications*, vol. E94B, pp. 2983-2986, 2011.

Magazine Publication

- 2020 T. Wang and D. Mayers, "Activities of the GRSS University of Michigan Student Chapter," *IEEE Geoscience and Remote Sensing Magazine*, vol. 8, no. 1, pp. 166-168, March 2020.

Conference Presentations Proceedings and Abstracts

- 2023 T. Wang, J. Johnson, A. Bringer, and M. M. Al-Khaldi, "Surface Roughness and Spectral Analysis Using Airborne Lidar Digital Elevation Models (DEMs) for Modeling and Calibration/Validation of GNSS-R Land Returns," XXXVth URSI General Assembly and Scientific Symposium (GASS), Sapporo, Japan, Aug 19-26, 2023.
- 2023 T. Wang, J. Johnson, A. Bringer, Y. Yi, and M. M. Al-Khaldi, "Understanding the Relationship Between Surface Roughness and Coherence in GNSS Land Reflected Signals," 44th Photonics and Electromagnetics Research Symposium, Prague, Czech, July 3-6, 2023.
- 2023 T. Wang, J. Johnson, A. Bringer, Y. Yi, and M. M. Al-Khaldi, "Derivation of Surface Properties from Airborne Lidar Digital Elevation Models to Support CYGNSS Land Cal/Val Activities," 2023 IEEE International Geoscience and Remote Sensing Symposium, Pasadena, CA, USA, July 16-21, 2023.
- 2023 S. Gleason, M. M. Al-Khaldi, D. S. McKague, C. S. Ruf, T. Wang, A. Russel, and D. Twigg, "An Overview of Recent Updates to CYGNSS's Level-1 Calibration Algorithm," 2023 IEEE International Geoscience and Remote Sensing Symposium, Pasadena, CA, USA, July 16-21, 2023.

- 2023 D. Moller, M. M. Al-Khaldi, S. Gleason, C. Ruf, X. Lin, A. O'Brien, S. Musko, M. Wilson, D. S. McKague, and T. Wang, "On the Sensing Applications of Rongowai's First Dual-Pol GNSS-R Observables," 2023 IEEE International Geoscience and Remote Sensing Symposium, Pasadena, CA, USA, July 16-21, 2023.
- 2023 T. Wang, J. Johnson, A. Bringer, Y. Yi, and M. M. Al-Khaldi, "Characterizing Land Surface Properties Using Airborne and In-situ Lidar Measurements for GNSS-R Land Cal/Val," IEEE GNSS+R 2023 Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity, Boulder, CO, USA, May 24-26, 2023.
- 2022 T. Wang, A. Bringer, J. Johnson, Y. Yi, and M. M. Al-Khaldi, "Characterizing Surface Roughness Properties Using Airborne Lidar Digital Elevation Models for CYGNSS Land Cal/Val," USNC-URSI National Radio Science Meeting, Boulder, CO, USA, Jan 10-14, 2023.
- 2022 T. Wang, A. Bringer, and J. Johnson, "Land Surface Roughness Investigations Using Airborne Lidar and Stereo Photogrammetry," 2022 AGU Fall Meeting, Chicago, IL, USA and Online Everywhere, Dec 12-16, 2022.
- 2022 T. Wang, A. Bringer, and J. Johnson, "A Study of The Relationship Between Surface Roughness and GNSS-R Coherent Returns Over Land," 2022 IEEE International Geoscience and Remote Sensing Symposium, Kuala Lumpur, Malaysia, July 17-22, 2022.
- 2022 A. Bringer, T. Wang, and J. Johnson, "Analysis of Lidar Digital Elevation Models to Support CYGNSS Cal/Val Activities," 2022 IEEE International Geoscience and Remote Sensing Symposium, Kuala Lumpur, Malaysia, July 17-22, 2022.
- 2022 A. Bringer, T. Wang, and J. Johnson, "Understanding the Impact of Surface Roughness on GPS Land Reflected Signals," Photonics and Electromagnetics Research Symposium, Hangzhou, China, Apr 25-27, 2022.
- 2022 S. Gleason, M. Al-Khaldi, T. Wang, C. Ruf, D. McKague, A. Russel, and D. Twigg, "An Approach for The Mitigation of L-band SBAS Radio Frequency Interference Effects in the Calibration of CYGNSS's Level-1 Observables," 2022 USNC-URSI National Radio Science Meeting (NRSM), Boulder, CO, Jan 4-8, 2022.
- 2022 A. Bringer, T. Wang, and J. Johnson, "Using Lidar Airborne Datasets to Understand the Relationship Between Surface Roughness and GNSS-R Coherent Returns over Land," 2022 USNC-URSI National Radio Science Meeting (NRSM), Boulder, CO, Jan 4-8, 2022.
- 2021 T. Wang, A. Bringer, J. Johnson and M. Al-Khaldi, "Studies of the Relationship Between Surface Roughness and Coherence in GNSS-R Measurements," 2021 IEEE Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity, Online, Sept 13-17, 2021.
- 2021 D. McKague, S. Gleason, M. Al-Khaldi, T. Wang, C. Ruf, A. Russel, D. Twigg, and D. Pascual, "Status and Assessment of CYGNSS Level 2 Updates," 2021 IEEE Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity, Online, Sept 13-17, 2021.
- 2021 S. Gleason, M. Al-Khaldi, T. Wang, C. Ruf, D. McKague, A. Russel, D. Twigg, and D. Pascual, "Recent Developments in CYGNSS's Level-1 Calibration Algorithm: Improving Knowledge and Estimation of External Factors," 2021 IEEE Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity, Online, Sept 13-17, 2021.
- 2021 T. Wang, C. Ruf, A. O'Brien, S. Gleason, D. McKague, and B. Block, "The Important Role of Antenna Pattern Characterization in the Absolute Calibration of GNSS-R Measurements,"

- 2021 IEEE International Geoscience and Remote Sensing Symposium, Virtual Conference, July 12-16, 2021.
- 2021 T. Wang and C. Ruf, "Measuring GPS EIRP in Real-Time with a Spaceborne GNSS-Reflectometry Remote Sensing System," 2021 USNC-URSI National Radio Science Meeting (NRSMS), Virtual Conference, Jan 4-9, 2021.
- 2021 C.K. Shum, Y. Zhang, Y. Yi, H. Ge, M. Ge, T. Wang, E. Cardellach, S. Gleason, W. Li, J. Johnson, C. Kuo, A. O'Brien, C. Ruf, Y. Xiao, and X. Wang, "Precision Orbit Determination for NASA's CYGNSS 8-Satellite Constellation Mission to Enable GNSS Altimetry Studies," 43rd COSPAR Scientific Assembly, Sydney, Australia, Jan 28-Feb 4, 2021.
- 2020 T. Wang, C. Ruf, S. Gleason, D. McKague, A. O'Brien, and B. Block, "Monitoring GPS EIRP for CYGNSS Level 1 Calibration," 2020 IEEE International Geoscience and Remote Sensing Symposium, Virtual Conference, Sept 26-Oct 2, 2020.
- 2020 T. Wang, V. U. Zavorotny, J. Johnson, Y. Yi, C. Ruf, S. Gleason, D. McKague, P. Hwang, E. Rogers, S. Chen, Y. Pan, and T. Bakker, "Improvement of CYGNSS Level 1 Calibration Using Modeling and Measurements of Ocean Surface Mean Square Slope," 2020 IEEE International Geoscience and Remote Sensing Symposium, Virtual Conference, Sept 26-Oct 2, 2020.
- 2020 H. Carreno-Luengo, A. Camps, N. Flouri, M. Martin-Neira, C. Ruf, T. Wang, S. J. Khalsa, M. Clarizia, J. Reynolds, J. Johnson, A. O'Brien, L. Galdi, M. di Bisceglie, A. Dielacher, P. Jales, M. Unwin, L. King, and Giuseppe Foti, "The GRSS Standard for GNSS-Reflectometry," 2020 IEEE International Geoscience and Remote Sensing Symposium, Virtual, Sept 26-Oct 2, 2020.
- 2020 D McKague, C. Ruf, R. Balasubramaniam, M. Clarizia, D. Mayers, and T. Wang, "Status of CYGNSS Level 2 Winds", 100th AMS Annual Meeting, Boston, MA, USA, Jan 12-16, 2020.
- 2019 T. Wang, C. Ruf, V. U. Zavorotny, J. Johnson, and Y. Yi, "NASA Cyclone Global Navigation Satellite System: From Characterization of GPS EIRP to Physical Oceanography," 2019 AGU Fall Meeting, San Francisco, CA, USA, Dec 9-13, 2019.
- 2019 T. Wang, H. Huang, and W. Gu, "Investigation of Methane Emission in Permafrost Using In-situ Measurements and Satellite Remote Sensing Data for Climate Change Education," 2019 AGU Fall Meeting, San Francisco, CA, USA, Dec 9-13, 2019.
- 2019 T. Wang, C. Ruf, S. Gleason, B. Block, D. McKague, and A. O'Brien, "A Real-Time EIRP Level 1 Calibration Algorithm for the CYGNSS Mission Using the Zenith Measurements," 2019 IEEE International Geoscience and Remote Sensing Symposium, Yokohama, Japan, July 28-Aug 2, 2019.
- 2019 T. Wang, V. U. Zavorotny, J. Johnson, Y. Yi, and C. Ruf, "Integration of CYGNSS Wind and Wave Observations with the WaveWatch III Numerical Model," 2019 IEEE International Geoscience and Remote Sensing Symposium, Yokohama, Japan, July 28-Aug 2, 2019.
- 2019 T. Wang, C. Ruf, B. Block, and A. O'Brien, "Measuring GPS Transmit Antenna Pattern Using On-Orbit Receivers," 2019 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, Atlanta, GA, USA, July 7-12, 2019.
- 2019 T. Wang, C. Ruf, S. Gleason, B. Block, D. McKague, and A. O'Brien, "Characterization of GPS EIRP and CYGNSS Ocean Level 1 Calibration Update," 2019 IEEE Specialist Meeting

- on Reflectometry using GNSS and other Signals of Opportunity, Benevento, Italy, May 20-22, 2019.
- 2019 V. U. Zavorotny, T. Wang, J. Johnson, Y. Yi, and C. Ruf, "Approaches of Incorporating Wave Model Information into CYGNSS Wind Speed Retrieval," 2019 IEEE Specialist Meeting on Reflectometry using GNSS and other Signals of Opportunity, Benevento, Italy, May 20-22, 2019.
- 2019 T. Wang, C. Ruf, S. Gleason, D. McKague, and A. O'Brien, "CYGNSS Constellation Ocean Level 1 Calibration and Wind Speed Retrieval Update," 2018 USNC-URSI National Radio Science Meeting, Boulder, CO, USA, Jan 9-12, 2019.
- 2018 T. Wang, V. U. Zavorotny, J. Johnson, C. Ruf, and Y. Yi, "Investigation of Ocean Surface Wind and Wave Coupling Using CYGNSS Observations," 2018 AGU Fall Meeting, Washington, D.C., USA, Dec 10-14, 2018.
- 2018 T. Wang, C. Ruf, B. Block, D. McKague, and S. Gleason, "Characterization of GPS L1 EIRP: Transmit Power and Antenna Gain Pattern," 31th International Technical Meeting of the Satellite Division of the Institute of Navigation, Miami, FL, USA, Sept 24-28, 2018.
- 2018 T. Wang, V. U. Zavorotny, J. Johnson, C. Ruf, and Y. Yi, "Modeling of Sea State Conditions for Improvement of CYGNSS L2 Wind Speed Retrievals," 2018 International Geoscience and Remote Sensing Symposium, Valencia, Spain, July 22-27, 2018.
- 2018 T. Wang, C. Ruf, B. Block, and D. McKague, "Characterization of the Transmit Power and Antenna Pattern of the GPS Constellation for the CYGNSS Mission," 2018 International Geoscience and Remote Sensing Symposium, Valencia, Spain, July 22-27, 2018.
- 2017 T. Wang, C. Ruf, S. Gleason, B. Block, D. McKague, and D. Provost, "Development of GPS Constellation Power Monitor System for High Accuracy Calibration/Validation of the CYGNSS L1B Data," 2017 International Geoscience and Remote Sensing Symposium, Fort Worth, TX, USA, July 23-28, 2017.
- 2017 T. Wang, C. Ruf, S. Gleason, B. Block, D. McKague, and D. Provost, "Implementation and Calibration of GPS Constellation Power Monitor System for High Accuracy Calibration/Validation of CYGNSS L1B Data," 2017 Specialist Meeting on Reflectometry Using GNSS and Other Signals of Opportunity, Ann Arbor, MI, USA, May 23-25, 2017.
- 2016 L. Tsang, S. Tan, H. Xu, T. Wang, M. Sanamzadeh, J. Johnson, and K. Jezek, "Effects of Layered Media with Random Permittivities and Roughness on the Ice Sheet Emission from 0.5-2.0GHz," Progress in Electromagnetics Symposium, Shanghai, China, Aug 8-11, 2016.
- 2016 J. Johnson, K. Jezek, M. Aksoy, A. Bringer, C. Yardim, M. Andrews, C. Chen, D. Belgiovane, V. Leuski, M. Durand, Y. Duan, G. Macelloni, M. Brogioni, S Tan, T. Wang, and L. Tsang, "The Ultra-Wideband Software-Defined Radiometer (UWBRAD) for Ice Sheet Internal Temperature Sensing: Results from Recent Observations," 2016 International Geoscience and Remote Sensing Symposium, Beijing, China, July 10-15, 2016.
- 2016 L. Tsang, T. Wang, J. Johnson, K. Jezek, and S. Tan, "A Partially Coherent Microwave Emission Model for Polar Ice Sheets with Density Fluctuations and Multilayer Rough Interfaces from 0.5 to 2 GHz," 2016 International Geoscience and Remote Sensing Symposium, Beijing, China, July 10-15, 2016.

- 2016 A. Bringer, K. Jezek, J. Johnson, M. Durand, L. Tsang, S. Tan, T. Wang, G. Macelloni, and M. Brogioni, "Modeling UHF-Band Spectra of Lake Ice Brightness Temperature," 23rd IAHR International Symposium, Ann Arbor, MI, USA, May 31-June 3, 2016.
- 2016 L. Tsang, S. Tan, T. Wang, J. Johnson, and K. Jezek, "A Partial Coherent Model of Layered Media with Random Permittivities and Roughness for Polar Ice Sheet Emission in UWBRAD," 14th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment (MicroRad 2016), Espoo, Finland, Apr 11-14, 2016.
- 2015 L. Tsang, T. Wang, J. Johnson, K. Jezek, and S. Tan, "Modeling the Effects of Multi-layer Surface Roughness on 0.5-2 GHz Passive Microwave Observations of the Greenland and Antarctic Ice Sheets," 2015 AGU Fall Meeting, San Francisco, CA, USA, Dec 14-18, 2015.
- 2015 T. Wang, L. Tsang, J. Johnson, K. Jezek, and S. Tan, "Partially Coherent Model for the Microwave Brightness Temperature of Layered Snow Firn with Density Variations and Interface Roughness," 2015 International Geoscience and Remote Sensing Symposium, Milan, Italy, July 27-31, 2015.
- 2015 A. Bringer, J. Johnson, M. Aksoy, S. Tan, T. Wang, L. Tsang, M. Brogioni, G. Marcelloni, M. Durand, K. Jezek, M. Drinkwater, and L. Brucker, "An Examination of Models for Predicting the 0.5-2 GHz Brightness Temperatures of Ice Sheets," 2015 International Geoscience and Remote Sensing Symposium, Milan, Italy, July 27-31, 2015.
- 2015 J. Johnson, K. Jezek, M. Aksoy, A. Bringer, C. Yardim, M. Andrews, C. Chen, D. Belgiovane, V. Leuski, M. Durand, G. Macelloni, M. Brogioni, S Tan, T. Wang, and L. Tsang, "The Ultra-Wideband Software-Defined Radiometer (UWBRAD) for Ice Sheet Internal Temperature Sensing: Instrument Status and Experiment Plans," 2015 International Geoscience and Remote Sensing Symposium, Milan, Italy, July 27-31, 2015.
- 2014 K. C. Jezek, J. Johnson, M. T. Durand, A. Mustafa, L. Tsang, T. Wang, S. Tan, G. Macelloni, M. Brogioni, and M. Drinkwater, "Ice Sheet Thermometry Using Wideband Radiometry," 2014 AGU Fall Meeting, San Francisco, CA, USA, Dec 15-19, 2014.
- 2012 Y.-Q. Jin, C Liu, and T. Wang, "Simulation of Radar Sounder Echoes and Inversion for Mars Layered Media," 14th International Conference on Ground Penetrating Radar, Shanghai, China, Jun 4-8, 2012.
- 2011 T. Wang and Y.-Q. Jin, "Detection and Evaluation of Building Damages in Earthquake from VHR optical and SAR images Using Multiple Mutual Information Techniques," Progress in Electromagnetics Symposium, Suzhou, China, Sep 12-16, 2011.
- 2009 T. Wang and Y.-Q. Jin, "A Study Case of the Road Network Extraction from Multi-temporal SAR Images," Workshop for Space, Aeronautical and Navigational Electronics, Shanghai, China, Nov 1-4, 2009.