

Priscilla N. Mohammed

US Permanent Resident

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Current Position

Research Associate, University of Maryland Baltimore County
Onsite contractor at NASA Goddard Space Flight Center

Education

- 2001-2005 *Georgia Institute of Technology*, Atlanta, Georgia
Ph.D. graduate in Electrical and Computer Engineering
Research Area: Microwave Remote Sensing
- 2000-2001 *Georgia Institute of Technology*, Atlanta, Georgia
Master of Science in Electrical and Computer Engineering
Technical Area: Electromagnetics
- 1996-1999 *Florida Institute of Technology*, Melbourne, Florida
Bachelor of Science in Electrical Engineering
With High Honor

Research Interests

Microwave remote sensing of atmospheres, radio frequency interference mitigation in microwave radiometers.

Publications

Journal Publications

- 2008 Mohammed, P. N., J. J. Knuble and J. R. Piepmeier (2008), "Analog kurtosis detector for radio-frequency interference in microwave radiometers," *Electronics Letters*, vol. 44, no. 11, pp. 683-684.
- Piepmeier, J. R., P. N. Mohammed and J. Knuble (2008), A double detector for RFI mitigation in microwave radiometers, *IEEE Trans. Geosci. Remote Sens.*, 46(2), 458-465.
- 2004 Mohammed, P. N. and P. G. Steffes (2004), Laboratory Measurements of the W-band (3.2 mm) Properties of Phosphine (PH₃) and Ammonia (NH₃) under Simulated Conditions for the Outer Planets, *J. Geophys. Res.*, 109, E07S13, doi:10.1029/2003JE002201.
- 2003 Mohammed, P. N. and P. G. Steffes (2003), Laboratory Measurements of the Ka-band (7.5mm to 9.2mm) Opacity of Phosphine (PH₃) and Ammonia (NH₃) under Simulated Conditions for the Cassini-Saturn Encounter, *Icarus*, 166(2), 425-435.

Conference Presentations with Published Proceedings or Abstracts

- 2008 Mohammed, P. N., J. Knuble and J. R. Piepmeier (2008), Pulse and kurtosis detection of radio-frequency interference (RFI): An experimental comparison, presented at the IEEE International Geoscience and Remote Sensing Symposium, Boston, MA, 8, July.
- 2007 Piepmeier, J., P. Mohammed and J. Knuble (2007), Analog RFI detectors for microwave radiometers, presented (by Knuble) at the IEEE International Geoscience and Remote Sensing Symposium, Barcelona, Spain, 25 July.

- 2007 Mohammed, P. N., J. K. Knuble, J. R. Piepmeier (2007), Analog radio-frequency (RFI) suppression system for microwave radiometers, paper presented at the NASA Science Technology Conference, College Park, MD, 19, June.
- 2006 Mohammed, P., J. Knuble and J. Piepmeier (2006), Analog Radio-Frequency Interference (RFI) Suppression System for Microwave Radiometers, *EOS Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract IN21A-1189, presented at the American Geophysical Union Fall Meeting, San Francisco, CA, 12, December.
- 2005 Mohammed, P. N., P. G. Steffes, A. J. Kliore, A. Anabtawi, S. W. Asmar, E. Barbinis, G. Goltz, D. Johnston, E. A. Marouf (2005), Vertical Profiles of Phosphine and Ammonia on Saturn Derived from the First Cassini RSS Occultation Observation Using Forward Modeling, *Bulletin of the American Astronomical Society*, 37(3), presented at the 37th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Cambridge, England, 6, September.
- 2004 Mohammed, P. N. and P. G. Steffes (2004), Simulations of the Cassini Radio Occultation Experiments for the Atmosphere of Saturn Based on Recent Laboratory Measurements, *Bulletin of the American Astronomical Society*, 36(4), p. 1107, presented at the 36th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Louisville, KY, 9, November.
- 2003 Mohammed, P. N. and P. G. Steffes (2003), Laboratory Measurements of the W-band (3.2 mm) Properties of Phosphine (PH₃) and Ammonia (NH₃) Under Simulated Conditions for the Outer Planets, *Bulletin of the American Astronomical Society*, 35(3), p. 713, presented at the 35th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Monterey, CA, 2, September.
- 2002 Mohammed, P. N. and P. G. Steffes (2002), Laboratory Measurements of the Ka-band (7.5mm to 9.2 mm) Opacity of Phosphine (PH₃) and Ammonia (NH₃) Under Simulated Conditions for the Cassini-Saturn Encounter, *Bulletin of the American Astronomical Society*, 34(3), p. 910, presented at the 34th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Birmingham, AL, 11, October.
- 2002 Steffes, P. G. and P. N. Mohammed (2002), Study of Cassini Radio Occultation Sensitivity to Atmospheric Constituents Based on New Laboratory Measurements, *Bulletin of the American Astronomical Society*, 34(3), p. 910, presented (by Steffes) at the 34th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Birmingham, AL, 11, October.
- 2001 Mohammed, P. N. and P. G. Steffes (2001), Preliminary Laboratory Measurements of the Millimeter Wavelength Properties of Phosphine (PH₃) under Simulated Outer Planet Conditions, *Bulletin of the American Astronomical Society*, 33(3), p. 1141, presented at the 33rd Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, New Orleans, LA, 1, December.

Professional Presentations

- 2003 Mohammed, P. N. and P. G. Steffes (2003), Laboratory measurements of the Ka-band (7.5 to 9.2 mm) Opacity of PH₃ and NH₃ Under Simulated Conditions for the Cassini-Saturn Encounter, presented at a Cassini Radio Science Team Meeting, Jet Propulsion Laboratory, Pasadena, CA, 1, February.

Experience

- 2006-present *NASA Goddard Space Flight Center*, Greenbelt, MD
- Currently working with a team at NASA GSFC to fly an analog radio-frequency interference (RFI) suppression system with various radiometers to demonstrate RFI detection and mitigation

- Worked with a team at NASA GSFC to develop an analog RFI suppression system for microwave radiometers
- Crew member for flights of ESTAR (a synthetic aperture microwave radiometer) over the Delmarva Peninsular in the vicinity of NASA's Wallops Flight Facility

2005-2006 ***Guidant***

- Traveled to hospitals and clinics for Guidant to assess and resolve RF compatibility issues with their latest wireless programmer used for interrogating implantable defibrillators

2000-2005 ***School of Electrical and Computer Engineering, Georgia Institute of Technology – Graduate Research Assistant***

- Used forward radio occultation model to derive ammonia and phosphine profiles in the Saturn atmosphere from the May 3, 2005 Cassini radio occultation data (model created in Matlab)
- Simulated the radio occultation experiment specific to the Cassini mission to Saturn which predicts power and excess Doppler shift with time. This simulation can also be used to determine the sensitivity of the radio link to microwave absorbing atmospheric constituents
- Conducted laboratory measurements of the microwave properties at Ka-band (30-40 GHz) and W-band (94 GHz) of phosphine and ammonia for applications in radio occultation experiments/radio astronomy of the outer planets
- Assisted in the design, construction and testing of millimeter wave (W band) RF sub-system used to measure microwave properties of gases
- Created models to predict absorption by ammonia for use at Ka-band and W-band (models created in Matlab)
- Demonstrated that millimeter waves can be used for non invasive detection of water in composite airplane wings
- Designed, built and tested a 2.4 GHz bandpass filter and a 2.4 GHz mixer
- Designed a Ka-band satellite digital radio distribution network – this required RF link budget design, block level satellite design, power budget and cost analysis
- Designed a mock mission to orbit Mars for conducting radio science, ion, electron, and UV spectrometry and magnetometry with a network of satellites as part of a team of scientists and engineers at the JPL Planetary Sciences Summer School in 2001
- Investigated the detection of the presence of metallic oxides using the microwave measurements of electronic non-linearities
- Successful troubleshooting of a transceiver hardware system used in Ka-band satellite communications
- Evaluated wireless transmitter and receiver used in assessing antenna position, in validating network area coverage and in measuring PCS (1.85-2.10 GHz), Cellular (860-900 MHz), GSM and LMR band (850-870 MHz) signal propagation

Related Graduate Classes

Satellite Communications and Navigation, Electromagnetics, Microwave Design/Laboratory, Antennas, Random Processes, Advanced DSP

Honors/Associations

- Institute of Electrical and Electronic Engineers (IEEE)
- *Tau Beta Pi*, Florida Institute of Technology, Melbourne, Florida