

Priscilla N. Mohammed

US Permanent Resident

Citizenship: Trinidad and Tobago

Tel: 301-286-2309 (Work)

Email: pmohamme@pop500.gsfc.nasa.gov

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

2007

Piepmeier, J. R., P. Mohammed, J. Knuble (2007). A Double Detector for RFI Mitigation in Microwave Radiometers. *IEEE Trans. Geosci. Remote Sensing* (article accepted).

2004

P.N. Mohammed and P.G. Steffes, "Laboratory Measurements of the W-band (3.2 mm) Properties of Phosphine (PH₃) and Ammonia (NH₃) under Simulated Conditions for the Outer Planets." *Journal of Geophysical Research*, vol. 109, E07S13, July 2004.

2003

P.N. Mohammed and P.G. Steffes, "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*, vol. 166, pp. 425-435, December 2003.

Conference Presentations with Published Proceedings or Abstracts

2007

P. N. Mohammed, J. K. Knuble, J. R. Piepmeier (2007), "Analog Radio-Frequency Interference (RFI) Suppression System for Microwave Radiometers". NASA Science Technology Conference, Adelphi, MD, June 19, 2007.

2006

P. Mohammed, 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, December 12, 2006.

2005

P.N. Mohammed, P.G. Steffes, A.J. Kliore, A. Anabtawi, S.W. Asmar, E. Barbini, G. Goltz, D. Johnston, E.A. Marouf, "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*, vol. 37, no. 3, 2005. Presented at the 37th Annual Meeting of the Division

for Planetary Sciences of the American Astronomical Society, Cambridge, England, September 6, 2005.

- 2004 P.N. Mohammed and P. G. Steffes, "Simulations of the Cassini Radio Occultation Experiments for the Atmosphere of Saturn Based on Recent Laboratory Measurements." Bulletin of the American Astronomical Society, vol. 36, no. 4, 2004, p.1107. Presented at the 36th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Louisville, KY, November 9, 2004.
- 2003 P.N. Mohammed and P.G. Steffes, "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, vol. 35, no. 3, 2003, p.713. Presented at the 35th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Monterey, CA, September 2, 2003.
- 2002 P.N. Mohammed and P.G. Steffes, "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, vol. 34, no. 3, 2002, p.910. Presented at the 34th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Birmingham, AL, October 11, 2002.
- 2002 P.G. Steffes and P.N. Mohammed, "Study of Cassini Radio Occultation Sensitivity to Atmospheric Constituents Based on New Laboratory Measurements," Bulletin of the American Astronomical Society, vol 34, no. 3, 2002, p.910. Presented at the 34th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Birmingham, AL, October 11, 2002.
- 2001 P.N. Mohammed and P.G. Steffes, "Preliminary Laboratory Measurements of the Millimeter Wavelength Properties of Phosphine (PH₃) under Simulated Outer Planet Conditions," Bulletin of the American Astronomical Society, vol. 33, no. 3, 2001, p. 1141. Presented at the 33rd Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, New Orleans, LA, December 1, 2001.

Professional Presentations

- 2003 P.N. Mohammed and P. G. Steffes, "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," Cassini Radio Science Team Meeting, Jet Propulsion Laboratory, Pasadena, CA, February 1, 2003.

Experience

- 2006-present **NASA Goddard Space Flight Center**, Greenbelt, MD
- Currently working with a team at NASA GSFC to develop an analog radio-frequency interference (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

Skills

Engineering Software: MATLAB, Agilent ADS, OrCAD, PCSA, NEC2

Test and Measurement Instruments:

- Microwave Spectrum analyzer
- RF Network analyzer
- RF Sweep Signal Generator
- Automated Data Collection
- Millimeter Wave Components

Honors/Associations

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

References

Dr. Jeffrey R. Piepmeier (NASA Sponsor)
jeff.piepmeier@gsfc.nasa.gov

Dr. Paul G. Steffes (PhD advisor)
steffes@gatech.edu

Dr. Arv Kliore (Cassini Radio Science Team Leader)
akliore@jpl.nasa.gov