

CURRICULUM VITAE DR. RENJU R.

SCIENTIST/ENGINEER- SD

Microwave Remote Sensing/Microwave and Boundary Layer Physics

Space Physics Laboratory

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Sex: Female

Date of Birth: 26th September 1985

Nationality: Indian

AREA OF SPECIFIC RESEARCH INTEREST

MICROWAVE REMOTE SENSING OF ATMOSPHERE AND TERRAIN

- Ground-based microwave measurements of atmosphere and clouds
- GPS application for tropical water vapour & atmosphere studies
- Ka/Ku band propagation studies
- Microwave Probing for future Planetary Missions
- Radiative Transfer model based analysis for simulation studies
- Satellite based microwave data utility for water vapour and convective studies

Ph.D Thesis Title: TROPICAL ATMOSPHERE STUDIES USING MULTIFREQUENCY GROUND BASED MICROWAVE RADIOMETER PROFILER AND ANCILLARY SENSORS OVER A COASTAL STATION TRIVANDRUM

PROFESSIONAL EXPERIENCE

Research Associate: (07/2016 - 03/2018)

Space Physics Laboratory

Vikram Sarabhai Space Centre, Thiruvananthapuram, India

Research Fellow: (03/2010 - 2015)

Space Physics Laboratory

Vikram Sarabhai Space Centre, Thiruvananthapuram, India

ACADEMIC QUALIFICATIONS

Ph.D. Physics (2016) University of Kerala,

MSc. Physics (2009) 83% University of Kerala

BSc. Physics (2007)	95%	University of Kerala
12th (2003)	82%	Higher Secondary Board
10th (2001)	92 %	SSLC

AWARDS AND HONORS

- **Young Scientist Award** – International URSI, Atlantic Radio Science Meeting (AT- RASC) 2018, Gran Canaria, Spain.
- Shortlisted for **DST Inspire Faculty Award -2017**.
- Research Fellowship of Indian Space Research Organization, 2012-2015
- Selected for best paper presentation in Kerala Science Congress, 2015
- **Best poster presentation award:** National Climate Science Conference, Divecha Centre for Climate Change, Indian Institute of Science, Bengaluru, 02-03 July, 2015.
- **Best paper Award:** Tropical Meteorology (TROPMET-2011), 14-16 December 2011, Hyderabad.
- **Best paper Award:** National Space Science Symposium (NSSS) 2016, VSSC, Trivandrum, Kerala.
- **Best paper Award:** International Tropical Meteorology (INTROMET-2014), 20-24 February, 2014, Chennai.

PUBLICATIONS AND PROCEEDINGS

- Peer Reviewed International Journals :10 (9 published & 1 communicated)
- Conferences/Symposia Presentations : 12

IMPORTANT SCIENTIFIC CONTRIBUTIONS

Area of research includes the investigations of the energetics and dynamics of the tropical troposphere by making use of microwave remote sensing – an emerging field.

- Observations from ground-based passive hyperspectral microwave radiometer profiler (MRP); space borne microwave sounder (SAPHIR) aboard Megha-Tropiques satellite, a triple frequency GPS receiver, ancillary instruments such as disdrometers, LIDAR, radiosonde ascents along with microwave radiative transfer (RT) scheme have been utilized for scientific studies.
- Developed methods to infer precipitable water vapour content from the MRP and validated the retrieval technique using simultaneous estimates from GPS-wet delay (*Renju et.al, J. Geophys. Res., 2015*).
- Validation of the MRP derived vertical profiles of temperature and humidity has been carried out with concurrent radiosonde ascents, as well as those simulated using microwave radiative transfer scheme.
- Characterizing the coastal atmospheric boundary layer dynamics, its temporal features and also the thermal internal boundary layer characteristics (*Renju et.al, IEEE TGRS., 2017*).
- Using multi-year data on vertical profiles of water vapour content, she quantified the signatures of the active and break spells of the Indian summer monsoon in the humidity structure (*Renju et.al, J. Geophys. Res., 2015*).

- Investigated the genesis, thermodynamical and microphysical changes during evolution, propagation and dissipation of mesoscale convective systems.
- Development of a method based on brightness temperature difference between the 23 and 30 GHz to delineate the phase (vapour/liquid) of moisture in clouds and use this to characterize them and also to identify their cellular nature(*Renju et.al, IEEE TGRS., 2016*).

LIST OF SCIENTIFIC PUBLICATIONS

1. **Renju, R.**, C. Suresh Raju, N. Mathew, T. Antony, and K. Krishna Moorthy (2015), “Microwave radiometer observations of inter-annual water vapor variability and vertical structure over a tropical station”, **J. Geophys. Res. Atmos.**, 120, 4585-4599. doi. 10.1002/2014JD022838. (**Impact factor: 3.5**)
2. **Renju, R.**, C. Suresh Raju, N. Mathew, N.V.P. Kiran Kumar, and K. Krishna Moorthy (2016), “Tropical Convective Cloud Characterization Using Ground-Based Microwave Radiometric Observations”, **IEEE Trans. Geoscience and Remote Sensing (TGRS)**, Vol. 54, No. 7, 3774-3779, doi.10.1109/TGRS.2016.2527099. (**Impact factor: 4.9**)
3. **Renju, R.**, M. K. Mishra, Suresh Raju C., K. Rajeev and K. Krishna Moorthy (2017), “Atmospheric boundary layer characterization using ground-based microwave radiometric observations over a tropical coastal station”, **IEEE Trans. Geoscience and Remote Sensing (TGRS)**, Vol.55, No.12, 6877-8682, doi.10.1109/TGRS.2017.2735626. (**Impact factor: 4.9**)
4. Suresh Raju C., **R. Renju**, Tinu Antony, Nizy Mathew and K. Krishna Moorthy (2013), “Microwave radiometric observation of an intense convective system that formed waterspout over the coastal Arabian Sea”, **IEEE Geoscience and Remote Sensing Letter (GRSL)**, No.10, 1075-1079, doi: 10.1109/LGRS.2012.2229960. (**Impact factor: 2.76**)
5. Nizy Mathew, C. Suresh Raju, **R. Renju** and Tinu Antony (2016), “Distribution of Tropical Deep Convective Clouds from Megha-Tropiques SAPHIR Data”, **IEEE Trans. Geoscience and Remote Sensing (TGRS)**, Vol. 54, No. 11, 6409-6414 doi.10.1109/TGRS.2016.2584540. (**Impact factor: 4.9**)
6. Yan Feng, M. Cadeddu, V. R. Kotamarthi, **R. Renju** and C. Suresh Raju (2016) “Humidity bias and effect on simulated aerosol optical properties during the Ganges Valley Experiment”, **Current Science**, Vol. 111, No. 1, 93-100. (**Impact factor: 0.88**)
7. Tinu Antony, Suresh Raju C., **R. Renju**, Nizy Mathew and K. Krishna Moorthy (2018), “Microwave emissivity over arid regions at 10 GHz- Potential for subsurface studies”, **International Journal of Rem. Sens.** (**Impact factor: 0.9**)
8. Kavitha M, Prabha R. Nair, I. A. Girach, S. Aneesh, S. Sijkumar and **R. Renju** (2018), “Diurnal and seasonal variations in surface methane at a tropical coastal station: Role of boundary layer meteorology”, **Science of Total Environment**, 631:1472-1485.(**Impact factor: 4.9**).
9. Kavitha M, Prabha R. Nair and **R. Renju** (2018), “Thunderstorm induced changes in near-surface O₃, NO_x and CH₄ and associated boundary layer meteorology over a tropical coastal station”, **Journal of Atmospheric and Solar-Terrestrial Physics**, 179, 261-272. (**Impact factor: 1.49**).

10. **R. Renju**, Suresh Raju C., and K. Krishna Moorthy (2017), “Validation of ground based microwave radiometer measurements and retrievals over a tropical coastal station”, **Current Science** (Under revision). ([Impact factor: 0.88](#)).

CONFERENCE PRESENTATIONS

1. **Renju, R.**, Suresh Raju C., Uma, K. N., and K. Krishna Moorthy, “Thermodynamics of Convective Cloud System during a Waterspout studied using Microwave Radiometer observations at Thiruvananthapuram”, *TROPMET 2011*, 14- 16 December 2011, Hyderabad. ([BEST PAPER AWARD](#)).
2. **Renju, R.**, Suresh Raju C., Uma, K. N., and K. Krishna Moorthy, “Thermodynamics of Convective Cloud System during a Waterspout studied using Microwave Radiometer observations at Thiruvananthapuram”, *NSSS 2012*, 14- 16 February 2012, Tirupati.
3. Uma, K. N., Suresh Raju C., **R. Renju**, Tinu Antony and K. Krishna Moorthy, “Relative Humidity profiles retrieved from SAPHIR on board Megha-Tropiques: A quantitative evaluation against concurrent ground based microwave radiometer profiler over an equatorial station”, *International Tropical Meteorology (INTROMET-2014)*, Chennai, 20-24 February, 2014. ([BEST PAPER AWARD](#))
4. **R. Renju**, Suresh Raju C., Uma, K. N., Nizy Mathew and K. Krishna Moorthy, “Inter-annual variability of water vapor over an equatorial coastal station using microwave radiometric observations”, *NSSS 2014*, Dibrugarh, 28 Jan - 01 Feb, 2014.
5. **R. Renju**, Suresh Raju C. and K. Krishnamoorthy, “Multi- Scale analysis of humidity over equatorial coastal station observed using ground based microwave radiometer profiler and GPS”, *27th Kerala Science Congress- 2015*, Alappuzha, 27-29 Jan, 2015.
6. **R. Renju**, Suresh Raju C., Tinu Antony, Nizy Mathew, “Microwave Radiometer Observations of vertical structure of water vapor and tropical convections”, *IAA-IISL-KSCSTE International Conference on Climate change and Disaster Management (i3cdm- 2015)*, Kovalam, 26-28 February, 2015.
7. **R. Renju**, Suresh Raju C., Tinu Antony, Nizy Mathew and K. Krishnamoorthy, “Microwave Radiometer Observations of vertical structure of water vapor”, *National Climate Science Conference*, Divecha Centre for Climate Change, Indian Institute of Science, Bengaluru, 02-03 July, 2015 ([BEST POSTER PRESENTATION AWARD](#)).
8. **R. Renju**, Suresh Raju C., Nizy Mathew and K. Krishnamoorthy, “Tropical convective cloud characterization using ground based microwave radiometric observations”, *NSSS 2016*, VSSC, Kerala, 09-12 February, 2016 ([BEST PAPER AWARD](#)).
9. **R. Renju** and C. Suresh Raju, “Application of Ground based microwave radiometry for characterizing tropical convection”, *International symposium on Antennas and Propagation (APSYM 2016)*, CUSAT, 15-17 December, 2016.
10. **R. Renju** and C. Suresh Raju, “Characterization of tropical convection using ground based Microwave Radiometric observations”, *URSI, RCRS-2017*, Tirupati, 01-04 March 2017.

REVIEWER FOR INTERNATIONAL JOURNALS

IEEE Geoscience Remote Sensing Letters

WORKSHOP ATTENDED

SMART training programme on INSAT -3DR data utility at Space Application Centre, Ahmedabad, 2017