

CV - NANAN BALAN



Dr. Nanan Balan

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Senior Scientist, University of Sheffield, Sheffield S1 7RH, UK.

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Degrees - B.Sc. Physics, 1973; M.Sc. Physics and Electronics, 1975; Post M.Sc Space Physics, 1976; Ph.D. Space Physics, 1984, all from University of Kerala, India.

Professional experience - 38 years experience in university teaching, research and developments, and administration (13 years in India and 25 years abroad).

Appointments -

- CSIR Research Fellow, Department of Physics, University of Kerala, India; 1976-79.
- Technical Officer, Department of Physics, University of Kerala, India; 1979-1987.
- Reader, Department of Physics, University of Kerala, India; 1987-1989.
- Visiting Fellow, Center for Space Physics, Boston University, USA; 1988.
- Research Associate, Applied Mathematics, University of Sheffield, UK; 1989-1995.
- Visiting Scientist, ISAS, Tokyo, Japan; 1995-1996.
- Professor, Kyoto University (RISH), Japan; 1996-97, 2000-01, 2010 (3 years).
- Professor, Nagoya University (STE-Lab), Japan; 1997-98, 1999-00, 2009 (2 years).
- Professor, INPE, Brazil; 1998-1999.
- Visiting Scientist, Hokkaido University (Earth Sci.) Japan; 2001-2002.
- Senior Scientist/Professor, Space Systems, University of Sheffield, UK, 2002 -
- Professor, Institute of Space Science, NCU, Taiwan, 2011 - continue.

Honorary positions -

- Member, review panel, Fellow of Indian National Science Academy - since 2012.
- Honorary scientist, University College London (UCL), London, UK, 2008-2013.
- Honorary lecturer, NASA's IHY School, 2007.
- NASA's peer review panel member, Living With a Star Program, 2004.

Awards/Honors -

- Citation for Excellence in Reviewing for American Geophysical Union, 2009.
- Professorship of Center of Excellence of Kyoto University, Japan; 1999-2000.
- Exceptional Performance Award of University of Sheffield, UK, 1992.
- Best paper award, National Space Science Symposium, ISRO, India, 1988.
- Berkner Award, American Geophysical Union, 1985.
- Young Scientist Award, International Union of Radio Science (URSI), 1984.
- Young Scientist Award, Indian National Science Academy, 1984.

Editorial positions -

- Guest Editor, Journal of Geophysical Research (America), 2012-2013.
- Associate Editor, Journal of Geophysical Research (America), 2011-2015.
- Guest Editor, IJRSP (India), 2011-2012.
- Guest Editor, JASTP (UK), 2007-2008.

Positions in professional bodies -

- Secretary, Asia Oceania Geosciences Society (AOGS), MI section since 2005.
- Associate, COSPAR (COMmittee on SPace Research).
- Member, American Geophysical Union.
- Member, European Geophysical Union.
- Member, UK/SP-MIST
- Member, Japan Geophysical Union.

Research interests - Solar-Terrestrial Relations; Climate Change; Space Weather.

- Lower and upper atmosphere coupling using observations and modeling.
- Sun-Earth system response to extreme solar and seismic events.
- Global atmospheric Electric Circuit (GEC) and Climate.

Scientific projects - Funded by Royal Society (UK, 1989-95); PPARC and STFC (UK, 2002-08); Kyoto University (Japan, 1996, 1999, 2010); ISRO, UGC and DST (India, 1976-89).

Scientific publications – Over 95 papers in refereed international journals (over 55 papers in JGR and GRL; 65% first author); and over 125 papers in the proceedings of international meetings (list attached).

Teaching - Assessed as one of the best teachers (in student assessments).

- Have taught Classical Physics, Electronics, Instrumentation, Space Physics and Plasma Physics for Master students (in University of Kerala, 1977-1989, and in the Universities in UK, Japan and Brazil, 1989-2010).
- Currently teaching Space Physics for Master-Ph.D students in NCU, Taiwan.

Research guidance -

- Produced 6 Ph.Ds (4 in University of Kerala, and 2 in Kyoto University).

International conference organizer and chairperson - Have been an organizer and chair person of sessions in a number of international meetings since 1998 (COSPAR,

IUGG, IAGA, AOGS, CPEA, AP-RASC, etc.), including three most popular sessions in AOGS (2007, 2012, 2013).

Scientific reviews - Reviews 20 to 25 papers per year for GRL, JGR, Radio Science, Ann. Geophys., JASTP, EPS and IJRSP.

Invited speaker -

- Attended over 65 international meetings in over 40 countries since 1984.
- Have been invited speaker in international meetings since 1994 –
COSPAR, Hamburg, Germany, 1994; IRI, New Delhi, India, 1995; URSI General Assembly, France, 1996; IAGA, Uppsala, Sweden, 1997; COSPAR, Nagoya, Japan, 1998; S-RAMP, Sapporo, Japan, 2000; AP-RASC, Tokyo, Japan, 2001; IAGA, Hanoi, Vietnam, 2001; AOGS, Singapore, 2004, 2005, 2006, 2009; AGU Fall meeting, San Francisco, USA, 2004, 2005, 2006; COSPAR, Paris, France, 2004; EGU, Nice, France, 2005, 2006; CPEA, Kyoto, Japan, 2007; EGU, Vienna, 2007, 2012; IUGG, Perugia, Italy, 2007; AOGS, Bangkok, Indonesia, 2007; IEAS, Crete, Greece, 2008; AOGS, Bussan, Korea, 2008; COSPAR, Montreal, Canada, 2008; IAGA, Hungary, 2009; COSPAR, Germany, 2010; IUGG, Melbourne, Australia, 2011; AOGS, Taipei, Taiwan, 2011; EGU, Vienna, 2012; COSPAR, Mysore, India, 2012; AOGS, Singapore, 2012; AOGS 2013, Brisbane, Australia; IAGA 2013, Mexico.

Important scientific contributions

- Developed the [first multi-receiver HF Doppler phase coherent radar in India](#), 1977-1980; it has been used to study the ionospheric plasma drift velocity and plasma irregularities by several Ph.D students.
- Associated in the development of the [Sheffield University Plasmasphere Ionosphere Model \(SUPIM\)](#), 1989-1995; the model has been used to study the ionosphere-plasmasphere system in several institutions.
- Predicted an [additional layer called F3 layer](#) in the equatorial ionosphere (1995); it was discovered in 1997; and its physical mechanism was explained in 1998.
- Explained an [equatorial plasma temperature anomaly \(EPTA\)](#) discovered by the Japanese satellite Hinotori, 1995-1997.
- Explained the phenomenon of [ionosphere-thermosphere saturation](#), 1993-1994.
- Explained the [equinoctial asymmetry in the ionosphere and thermosphere](#), 1997.
- Made the [first alternate MLT and thermospheric F region observations](#) using the Japanese MU radar, 2004.
- Explained the [physical mechanism for positive ionospheric storms](#) that severely affect satellite communication and navigation, 2010-2012.
- Discovered a hitherto unknown aspect of geomagnetic storms - [UT midnight preference for the onset of geomagnetic storms](#), which has important implications on magnetic reconnection and ring current intensification, 2012.