

## **Brief Bio-Data of DR. ANIL BHARDWAJ**

Dr. Anil Bhardwaj joined Indian Space Research Organization (ISRO) in 1993, after completing M.Sc. (Physics) from Lucknow University and Ph.D. in Applied Physics (Space and Planetary Science) from the Institute of Technology, Banaras Hindu University, as a research scientist (Scientist SD) at Space Physics Laboratory (SPL) of the Vikram Sarabhai Space Center (VSSC), Trivandrum. Dr. Bhardwaj is currently a Senior Research Scientist (Scientist SG) and Head of the Planetary Sciences Branch of SPL, VSSC.

Dr. Bhardwaj has been awarded the Shanti Swarup Bhatnagar Prize for the year 2007 in the discipline 'Earth, Atmosphere, Ocean and Planetary Sciences' for his fundamental contributions in the area of Planetary Sciences, in particular planetary X-ray emissions. He was awarded NRC Senior Fellowship by US National Academy of Science, and worked at NASA Marshall Space Flight Center for ~2 year during 2004-2005. He was also awarded fellowship grant by United Nations Office of Outer Space Affairs (UN-OOSA), Vienna, Austria, in 1996. He has won best paper award at conferences.

His primary field of research is theoretical and observational studies of planetary atmospheres, ionospheres, and their coupling with magnetospheric plasma and solar wind. Topics of his current research interest are: Aurora and airglow processes in planetary atmospheres, chemistry of planetary ionospheres, auroral plasma processes on comets and its implications on coma chemistry and emissions, Monte Carlo simulations of processes in atmosphere, solar wind-lunar interaction, ENA imaging of the lunar surface and Earth's magnetosphere-ionosphere system, ground-based and space-based multi-wavelength (X-ray, UV, visible, radio) imaging and spectroscopy of emissions from planetary bodies, and comparative planetology. The planetary bodies that he has worked on include Jupiter, Saturn, Uranus, Neptune, Moon, Io, Europa, Ganymede, Triton, Titan, Rings of Saturn, Io plasma Torus, Mars, Earth, and Comets.

Dr. Bhardwaj is the Principal Investigator of the SARA experiment on Chandrayaan-1 – the first Indian Lunar Mission. He has been the Principal- and Co-Investigator on many observation programs with Chandra X-ray Observatory and Hubble Space Telescope of NASA; XMM-Newton X-ray Observatory of ESA; and Giant Meterwave Radio Telescope (GMRT) of India. He is a member of the ASTROSAT mission, and a Team Leader of International Heliophysical Year (IHY)-Coordinated Investigation Program (CIP3) "Universality of Auroral Structure". He is a Core Team member of ISRO's small satellite program SENSE (Satellite for Earth Near Space Environment) and of Mars Mission study group.

Dr. Bhardwaj has written a Chapter in "Encyclopedia of the Solar System" (2007), edited 2 books (Advances in Geosciences, Vols. 3 and 7 of World Scientific Publication, Singapore), and has written invited reviews for reputed international journals. He has over 60 refereed international journal publications and over 100 conference presentations. His research publications have made cover pages of journals 'Reviews of Geophysics' and 'Astronomy and Astrophysics', and one of his paper in Geophysical Research Letters is selected as the "AGU Journal Highlights". He has delivered several invited talks/colloquium at Institutes in the world, including, NASA, Caltech, JPL, UCL (London), IRF (Sweden), ESTEC (Netherlands), LPAP (Belgium), and many more. His collaborative research programs span over 30 research institutes in India, US, Europe, and Asia.

He is currently the President of Planetary Science Section of Asia Oceania Geosciences Society (AOGS); the Editor-in-chief of Advances in Geosciences (Planetary Science volume); and a Member of the Editorial Board of the European journal *Planetary and Space Science*. He has

convened several special sessions at international conferences abroad and in India on topics related to planetary sciences. He is a life member of Astronomical Society of India and Kerala Academy of Sciences, and a member of American Geophysical Union. He is a member of several ISRO and national level committees related to Planetary and Space Sciences research programs in India, including ADCOS (Advisory Committee on Space) Science Panel 3 for Vision document on Planetary Exploration Program of ISRO, and Space Generation Task Group “Space Sciences and Interplanetary Missions” of ISRO - Vision 2000-2025. He is a core member in the development of the ISRO’s PLANEX Program – a National Research Program on “Planetary Sciences and Exploration”. He is recognized Ph. D. Research Guide of University of Kerala and Mahatma Gandhi University.

Dr. Bhardwaj’s research findings have led to several Press Releases by NASA and ESA. He has discovered X-rays from rings of Saturn, soft X-rays from Earth’s aurora, and made the first detection of “X-ray flares” from Jupiter and Saturn. Several special news report on his research have appeared in New Scientist, Science News, Space Now, etc. and several national and international daily.

One Ph.D., two M.Tech. theses, one MS thesis from MIT (USA), and several MS projects, are awarded under his guidance.

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