

# Brief Curriculum vitae of Prof. Anil Bhardwaj

FNA, FASc, FNASc, JC Bose Fellow

**Position:** Director, Physical Research Laboratory, Ahmedabad

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## (1) Employment History:

Feb. 2017 –Present : Director, Physical Research Laboratory (PRL), Ahmedabad, India  
Feb. 2014 – Feb. 2017 : Director, Space Physics Laboratory (SPL), Vikram Sarabhai Space Centre (VSSC)  
Sept. 2007 – Feb. 2014 : Head, Planetary Science Branch, Space Physics Laboratory, VSSC, Trivandrum  
July 2002–Jan. 2014 : Senior Scientist, Space Physics Laboratory, VSSC, Trivandrum  
Jan. 2004–Oct. 2005 : NRC Senior Research Associate, NASA Marshall Space Flight Center, USA  
Aug. 1993– June 2002 : Scientist, Space Physics Laboratory, VSSC, Trivandrum, India  
April 1988– July 1993 : Research Fellow, Indian Institute of Technology, Banaras Hindu University, Varanasi

## (2) Education Degrees:

B.Sc.	Physics	1985	Lucknow University	Ist Class
M.Sc.	Physics	1987	Lucknow University	Ist Class
Ph. D.	Applied Physics	1992	Indian Institute of Technology, Banaras Hindu University	

Ph. D. Thesis Title : "Aurora and Airglow Processes on the Outer Planets and Comets".

## (3) Research Experience:> 30 years in Planetary and Space Sciences, and Solar System Exploration

### Experiments on Indian Planetary and Space Missions:

- 1) **Principal Investigator (PI)**, Sub-keV Atom Reflecting Analyzer (**SARA**) on **Chandrayaan-1 First Indian Moon Mission**.
- 2) **PI**, Mars Exospheric Neutral Composition Analyzer(**MENCA**) on **First Indian Mars Orbiter Mission (MOM)**.
- 3) **PI**, Chandra's Atmospheric Composition Explorer (**CHACE-2**) on the **Chandrayaan-2 Orbiter** mission.
- 4) **Supervision: (i) XSM on Orbiter, CHASTE on Lander, and APXS on Rover of the Chandrayaan-2 mission.**
- 5) **Currently Supervising (i) ASPEX (SWIS and STEPS) on Aditya-L1 mission; (ii) APXS on Rover and CHASTE on Lander of the Chandrayaan-3 mission; (iii) DISHA Twin Aeronomy Mission, and (iv) instruments for future planetary missions.**

### Planetary Multi-wavelength Astronomy using Ground- and Satellite-based Telescopes:

- 1) **PI on first radio observation (obs.) of Jupiter using Giant Metrewave Radio Telescope (GMRT), Feb. 2003.**
- 2) **Co-I, Jupiter GMRT obs May-June 2007, May-June 2008; Co-I, first GMRT obs. of Venus, Jan.2014,July-Sept. 2015.**
- 3) **Co-I, Chandra X-ray Obs. (CXO) HRC-I Jupiter obs. Dec. 2000; CXO HRC-I obs Jupiter 2001; CXO ACIS and Hubble Telescope (HST) STIS Jupiter obs Feb. 2003; Co-I, CXO ACIS Saturn obs Jan. 2004; CXO HRC-I Earth Dec. 2003-April 2004.**
- 4) **Co-I on XMM-Newton X-ray obs. of Saturn April & Oct. 2005; obs. of Mars Aug. 2016; Pluto in April-May 2017.**
- 5) **Co-I on Multi-wavelength GMRT, NASA-IRTF, HST, IPRT, SPRINT-A, Nict 34m obs. of Jupiter, Jan. 2014.**

## (4) Awards and Honors:

1. **Shanti Swarup Bhatnagar Prize**, in Earth and Planetary Sciences, 2007 [Highest Indian award under age of 45 years].
2. **ISRO Team Excellence Award for Chandrayaan-1 Science and Mission**, 2008.
3. **Indo-Swedish Project Award**, Swedish Research Council, 2010.
4. **Indo-Swiss Joint Research Program Fellowship**, 2010.
5. **ISRO (Indian Space Research Organization) Merit Award**, 2012.
6. **International Space Science Institute, Switzerland, Invited Expert**, 2012–2014.
7. **Distinguished Alumnus Award**, Indian Institute of Technology (IIT-Banaras Hindu University), 2015.
8. **Vainu Bappu Memorial (International) Award of Indian National Science Academy**, 2016.
9. **Infosys Prize in Physical Sciences of Infosys Science Foundation**, 2016. [Highest Science Award in India]
10. **Decennial Award of Indian Geophysical Union**, 2017.
11. **Outstanding Achievement Award of Indian Space Research Organization**, 2017. [Highest award of ISRO]
12. **J. C. Bose National Fellowship** of the Government of India (Science & Engineering Research Board), 2019.
13. **Prof. M. G. K. Menon Lecture Award of The National Academy of Sciences, India**, 2021.
14. **Elected Member of Council of The National Academy of Sciences, India**, 2022.
15. **Book Chapter "A Rocket to Poke Martians" on Life and work of Anil Bhardwaj** in Children's Book "They Made What?" - *Stories of Ingenious Inventions by Indian Scientists*, Author- Shweta Taneja (Hachette India), 2021.

## (5) Distinguished Lectures:

1. **Nehru Centenary Lecture** of the Kerala Academy of Sciences, 2007.
2. **Distinguished Lecture - Planetary Sciences**, Asia Oceania Geosciences Society, Japan, 2014.
3. **Dr. P. R. Pisharoty Memorial Lecture** of the Kerala Science Congress, 2015.
4. **Lunar and Planetary Society's Endowment Lecture** of Gujarat Science Congress, 2018.
5. **6th A. P. Mitra Memorial Lecture**, 2020.
6. **DAE - C V Raman Lecture** of the Indian Physics Association, 2021.

## (6) National and International Fellowships of Science Academy/Union:

1. **Elected Academician (Fellow)**, International Academy of Astronautics (IAA), 2018.
2. **Elected Fellow**, National Academy of Sciences, India (NASI), 2014.
3. **Elected Fellow**, Indian National Science Academy (INSA), 2010.
4. **Elected Fellow**, Indian Academy of Sciences (IASc), 2009.
5. **Elected Fellow**, Kerala Academy of Science, 2013; *Gujarat Sci. Academy*, 2019; *Astronautical Society of India*, 2021.
6. **Elected Liaison Officer**, European Geophysical Union (EGU), Planetary Division, 2009.
7. **Elected Member**, International Astronomical Union (IAU), 2009.
8. **Elected Fellow**, Indian Geophysical Union (IGU), 2008.

## (7) Membership in Professional Bodies:

1. **Member, American Geophysical Union (since 1988)**.
2. **Life Member** of : (i) Astronomical Society of India, (ii) Kerala Academy of Sciences, (iii) Indian Society of Atomic and Molecular Physics, (iv) Plasma Science Society of India, (v) Indian Physics Association, (vi) Indian Science Congress Association, (vii) Astronautical Society of India.

## (8) Service to Scientific Community:

1. **President**, Planetary Science Section of *Asia Oceania Geosciences Society (AOGS)*, 2006-2010.
2. **Vice-Chair, COSPAR Commission B**, 2012 –2020.
3. **Member, International Academy of Astronautics - Commission 1** (Space Sciences), 2015–2017.
4. **Member, several Award Committees, incl. SwarnaJayanti, Birla Science Prize, Bhatnagar Prize, CSIR awards.**
5. **Member, AOGS Award Committee**, 2014–2016; **Member, AOGS Publication Committee**, 2017– .
6. **Member, International Award Committee of American Geophysical Union**, 2019–.
7. **Member, IUGG Union Commission on Planetary Sciences (UCPS)**, 2015–2019.
8. **Editor-in-Chief, Advances in Geosciences** (World Scientific), 2006 – 2013.
9. **Associate Editor, Advances in Space Research** (Elsevier), 2014 –2020.
10. **Chair**, Publication Committee of **AOGS**, 2006 – 2008.
11. **Member, Board of Advisory Editors, Planetary and Space Science**(Elsevier), 2007–2009.
12. **Member, Editorial Advisory Board, Space Science Reviews** (Springer), 2010–.
13. **Member, Editorial Board, Molecular Astrophysics** (Elsevier), 2015–2020.
14. **Advisory Board Member**, Book Series: *Advances in Planetary Science* (World Scientific), 2015–.

## (9) Professional Responsibilities:

- 1) **President**, Indian Committee of **International Union of Radio Sciences (URSI)**.
- 2) **Member, ISRO-NASA Planetary Science Working Group**.
- 3) **Leader of Indian Delegation**, for the *Portugal Science Summit*, 2017.
- 4) **Leader of Indian Delegation**, for the *Indo-Israel Workshop on Astrophysics and Planetary Science*, 2019.
- 5) **Member, Governing Council** : (1) *Indian Institute of Geomagnetism (DST), Mumbai*; (2) *Indian Institute of Astrophysics (DST), Bangalore*; (3) *National Centre for Earth Science Studies (MOES), Trivandrum*; (4) *Aryabhata Research Institute of Observational Sciences (DST), Nainital*.
- 6) **Member, Research Advisory Council** : (1) *CSIR-National Geophysical Research Laboratory, Hyderabad*; (2) *CSIR-National Institute of Oceanography, Goa*; (3) *National Atmospheric Research Laboratory (DOS), Gadanki*.
- 7) **Nominated Member of Senate** of the **National Institute of Design** (Min. Commerce & Industry), Ahmedabad.
- 8) **Member**, Management Board of **Tata Institute of Fundamental Research (DAE) Balloon Facility**, Hyderabad.
- 9) **Chairman, INSA-International Science Council (ISC) Committee** for *COSPAR, SCOSTEP* and *URSI*, 2020-.
- 10) **Member, Projects Advisory Committee (PAC)** for the **International Cooperation Programs of DST**, India.
- 11) **Main Lead, ISRO Study Team**, Science and Instruments in *Space and Solar System Exploration Program*.
- 12) **Member, APEX Science Board for Space Sciences and Exploration Research of ISRO**.
- 13) **Proposal Evaluator**, GMRT, Indo-US Sci. & Tech. Forum, DST, MOES, ISRO, and CSIR.
- 14) **Reviewer**, FRS-FNRS Belgium, **NASA-Planetary Science**, **NASA** Postdoctoral Program, **Canadian NSERC**, etc.
- 15) **Referee**, *Nature, JGR, GRL, Science, ApJ, A&A, Icarus, MNRAS, PSS, RSA, IJRSP, Current Science, JESS*, etc.

## (10) Research Guidance and Student Supervision:

**Ph.D.s –8** (Michael, Jain, Raghuram, Ambili, Das, Dhanya, Shreedevi, Mukundan)

**M. Tech., M. Sc. and M. Phil. Thesis Supervision: 20**

**PDF/ISRO Research Associates: 4**

**DST-INSPIRE Faculty & Project Supervision: 4**

**Indian Academies Summer Fellows Supervision: 30**

## (11) Conferences and Outreach Activities:

- 1) **Session Convener or Member of Scientific Organizing Committee** at Conferences **outside India: >65**
- 2) **Invited Talks at Conferences: >120** (>50 outside India)
- 3) **Major Conferences/Workshops/Seminars Organized in India: >25**
- 4) **Invited lectures** in Space and Planetary Sciences at workshops/courses/training programs : **>170**
- 5) **Public Outreach Lectures** delivered at Schools/Colleges, or Science Camps: **>100** (addressed >50,000 students)
- 6) **Initiated new programs in PRL** for underprivileged and girl students in rural areas, impacted >10,000 students.

## (12) Publications:

*More than 170 peer-reviewed Publications*, 6 Chapters in Books, Edited 6 Books; Editor of 3 Special Issues of Journals, Reviewed one Book; 4 arXiv publications; several Popular/General Articles.