

CURRICULUM VITAE

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Space Physics Laboratory (SPL)
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RESEARCH INTERESTS

Solar wind and its interaction with different solar system objects; planetary atmospheres, and solar flares.

CURRENT RESEARCH

Solar wind interaction with Earth's moon, and Mars; Martian neutral exosphere.

EDUCATION

- 1996–1998 Pre-Degree in Science (Physics, Chemistry and Mathematics), University of Calicut, Kerala, India.
Percentage Marks: 81.2% (First Class with Distinction)
- 1998–2001 Bachelor of Science (B.Sc.) in Physics, University of Calicut, Kerala, India.
Percentage Marks: 91% (First Class)
- 2001–2003 Master of Science (M.Sc.) in Physics, University of Calicut, Kerala, India
Percentage Marks: 81.45% (First Class with Distinction)
- 2010–2017 Ph.D. in Physics, Faculty of Science, University of Kerala, Thiruvananthapuram, Kerala, India.
Thesis Title: Study of Lunar-Solar Wind Interaction with the SARA Experiment aboard the Chandrayaan-1 Mission

PROFESSIONAL EXPERIENCE

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| Guest Lecturer
February 2004–March 2004 | Department of Physics, Vimala College
Thrissur, Kerala |
| Guest Lecturer
June 2004–March 2005 | Department of Physics, Vimala College
Thrissur, Kerala |
| Guest Lecturer
June 2005–February 2006 | Department of Physics, Vimala College
Thrissur, Kerala |
| Scientist 'SC'
February 2006–December 2010 | Space Physics Laboratory, VSSC
Trivandrum |
| Scientist 'SD'
January 2011–July 2015 | Space Physics Laboratory, VSSC
Trivandrum |
| Scientist 'SE'
July 2015–Present | Space Physics Laboratory, VSSC
Trivandrum |

AWARDS AND HONOURS

- **ISRO Story of the Week:** The paper 'Discovery of new suprathermal proton population around the Moon by SARA onboard Chandrayaan-1', published in Geophysical Research Letters, 2017 (doi: 10.1002/2017GL072605) has been highlighted as 'The Story of the Week' at ISRO website on 27 June 2017.

- **Young Research Award** by the Association of Asia Pacific Physical Societies, Division of Plasma Physics (AAPPS-DPP) for “Significant Contribution to the field of Plasma Physics”, under certificate of Laureate of Subrahmanyam Chandrasekhar Prize of Plasma Physics, 7 December 2016.
- **Special Mention Prize** for the MENCA experiment onboard Mars Orbiter Mission, in the contest for the innovative products/ideas in connection with the Innovation Day 2016 at Vikram Sarabhai Space Centre, Thiruvananthapuram.
- **ISRO Story of the Week:** The paper ‘On the evening time exosphere of Mars: Result from MENCA aboard Mars Orbiter Mission’, published in Geophysical research Letters, 2016 (doi: 10.1002/2016GL067707) made “The Story of the Week” at ISRO website on 02 May 2016.
- **ISRO Young Scientist Merit Award** for the year 2014.
- **Best Paper award for young scientists** at 19th National Space Science Symposium (NSSS-2016), Space Physics Laboratory, Vikram Sarabhai Space Centre, Thiruvananthapuram, 9–12 February 2016, for the paper titled *Source Mechanism of protons in near-lunar wake: SARA/Chandrayaan-1 observations* by **M. B. Dhanya**, Anil Bhardwaj, Yoshifumi Futaana, Stas Barabash, Abhinaw Alok, Martin Wieser, Mats Holmström, and Peter Wurz.
- **Best Paper award** at 27th Kerala Science Congress, organized by Kerala State Council for Science, Technology and Environment (KSCSTE) jointly with NATPAC, Alappuzha, 27–29 January 2015, for the paper *New population of protons in lunar wake: discovery by Chandrayaan-1/ SARA* by **M B Dhanya**.
- **Best Paper award** at National Space Science Symposium (NSSS-2014), Dibrugarh University, Assam, 29 January–1 February 2014, for the paper titled *First Observation of Protons in the Near-Lunar Plasma Wake for magnetic field aligned flow from SWIM/SARA on Chandrayaan-1* by **M. B. Dhanya**, Anil Bhardwaj, Y. Futaana, S. Fatemi, M. Holmstrom, S. Barabash, M. Wieser, P. Wurz, Abhinaw Alok and R. Satheesh Thampi.
- **Session chair**, scientific event B0.1: Lunar Science and Exploration, 40th COSPAR Scientific Assembly, Moscow State University, Moscow, Russia, 2-10 August 2014
- **Travel Support from Committee on Space Research (COSPAR)** to participate in 40th COSPAR scientific Assembly in Moscow, 2014.
- **Nature India Highlight** for the paper *First Observation of Protons in the Near-Lunar Plasma Wake for magnetic field aligned flow from SWIM/SARA on Chandrayaan-1* by **M. B. Dhanya**, A. Bhardwaj, Y. Futaana, S. Fatemi, M. Holmström, S. Barabash, M. Wieser, P. Wurz, A. Alok, R. S. Thampi published in Geophysical Research Letters, 2013.
- **Research Travel Grant from SIDA, Sweden**, for joint scientific analysis of SARA data at Swedish Institute of Space Physics (IRF), Kiruna during June - July 2013.
- **Travel support from NASA Living With a Star summer school sponsors** to participate in the Heliophysics Summer School, organised by UCAR, Boulder, Colorado, May 31- June 7, 2012.
- **Research Travel Grant from SIDA, Sweden**, for joint scientific analysis of SARA data at Swedish Institute of Space Physics (IRF), Kiruna during April - May 2010.
- **Best Paper award** at National Space Science Symposium (NSSS-2010), Saurashtra University, Rajkot, February 2010, for the paper *First Results from SARA Experiment on the Chandrayaan-1 Mission*.
- **ISRO Team Excellence Award** for Chandrayaan-1, 2008.
- **CSIR (Council of Scientific and Industrial Research) research fellowship** in 2006.

SCIENTIFIC PROJECTS

1. Co-investigator, SARA (Sub-keV Atom Reflecting Analyser) experiment on the Chandrayaan-1, the first Indian Lunar Mission.
2. Deputy Project Manager, MENCA (Mars Exospheric Composition Analyser) onboard MOM, the first Indian Mars Mission.
Responsible for scientific data analysis, quick look display (QLD) and archival of MENCA data. MENCA is a neutral mass spectrometer.
3. Project Manager, CHACE-2 (Chandra's Altitudinal Composition Explorer-2) experiment onboard Chandrayaan-2, the second Indian Lunar Mission.
Responsible for data handling and scientific analysis of the data from the CHACE-2, a neutral mass spectrometer.
4. Project Manager, PAPA (Plasma Analyser package) experiment on the Indian Aditya L1 mission.
Responsible for science data analysis, and payload operations.
5. Deputy Project Manager, ChaSTe(Chandra's Surface Thermo-physical Experiment) experiment on the Chandrayaan-2 lander.
Responsible for data handling, science data analysis, and payload operations.
6. Co-Principal Investigator, PREM (Plasma Analyser for the Environment of Mars) onboard MOM-2, the second Indian Mars Mission.

COMPUTER SKILLS

Operating System : Linux, Windows

Programming Languages: C, FORTRAN, IDL, R

Documentation : L^AT_EX, MS Word

Other softwares : SPICE toolkit (SPICE is the NASA ancillary data toolkit).

REFEREED JOURNAL PUBLICATIONS

1. **M. B. Dhanya**, A. Bhardwaj, Y. Futaana, S. Barabash, M. Wieser, M. Holmström, and P. Wurz (2017), New suprathermal proton population around the Moon: Observation by SARA on Chandrayaan-1, *Geophysical Research Letters*, 44, 4540-4548, doi: 10.1002/2017GL072605
2. T. P. Das, S. V. Thampi, **M. B. Dhanya**, A. Bhardwaj, S. M. Ahmed, R. Sridharan (2017), Upper limit of helium-4 in the sunlit lunar exosphere during magnetotail passage under low solar wind condition: Result from CHACE aboard MIP in Chandrayaan-1, *Icarus*, 297, 189-194, doi:10.1016/j.icarus.2017.07.001.
3. P. Janardhan, S. Vadawale, B. Bapat, K. P. Subramanian, D. Chakrabarty, P. Kumar, A. Sarkar, N. Srivastava, R. S. Thampi, V. K. Yadav, **M. B. Dhanya**, G. G. Nampoothiri, J. K. Abhishek, A. Bhardwaj, and K. Subhalakshmi (2017), Probing the heliosphere using in situ payloads onboard AdityaL1, *Current Science*, 113 (4), 62062.
4. **M. B. Dhanya**, A. Bhardwaj, Y. Futaana, S. Barabash, M. Wieser, M. Holmström, and P. Wurz (2017), New suprathermal proton population around the Moon: Observation by SARA on Chandrayaan-1, *Geophysical Research Letters*, 44, 4540-4548, doi: 10.1002/2017GL072605
5. A. Bhardwaj S. V. Thampi, T. P. Das, **M. B. Dhanya**, N. Naik, D. P. Vajja, P. Pradeepkumar, P. Sreelatha, G. Supriya, J. K. Abhishek, R. S. Thampi, V. K. Yadav, B. Sundar, A. Nandi, G. P. Padmanabhan and A.V. Aliyas (2017), Observation of Suprathermal Argon in the exosphere of Mars, *Geophysical Research Letters*, doi:10.1002/2016GL072001.
6. Vorburger, A., P. Wurz, S. Barabash, Y. Futaana, M. Wieser, A. Bhardwaj, **M. B. Dhanya**, and K. Asamura (2016), Transport of solar wind plasma onto the lunar nightside surface, *Geophysical Research Letters*, 43, 10586-10594, doi:10.1002/2016GL071094.

7. Choudhary, R. K., K. M. Ambili, S. Choudhury, **M. B. Dhanya**, A. Bhardwaj (2016), On the origin of the ionosphere at the Moon using results from Chandrayaan-1 S band radio occultation experiment and a photochemical model, *Geophysical Research Letters*, 43, 10025-10033, doi:10.1002/2016GL070612.
8. **M. B. Dhanya**, A. Bhardwaj, Y. Futaana, S. Barabash, A. Alok, M. Wieser, M. Holmström, and P. Wurz (2016), Characteristics of proton velocity distribution functions in the near-lunar wake from Chandrayaan-1/SWIM observations, *Icarus*, 271, 120-130, doi: 10.1016/j.icarus.2016.01.032.
9. Bhardwaj, A., S. V. Thampi, T. P. Das, **M. B. Dhanya**, N. Naik, D. P. Vajja, P. Pradeepkumar, P. Sreelatha, G. Supriya, J. K. Abhishek, S. V. Mohankumar, R. S. Thampi, V. K. Yadav, B. Sundar, A. Nandi, G. P. Padmanabhan and A. V. Aliyas (2016), On the evening time exosphere of Mars: Result from MENCA aboard Mars Orbiter Mission, *Geophysical Research Letters*, 43(5),1862–1867, doi: 10.1002/2016GL067707.
10. Bhardwaj, A., **M. B. Dhanya**, A. Alok, S. Barabash, M. Wieser, Y. Futaana, P. Wurz, A. Vorburger, M. Holmström, C. Lue, Y. Harada, and K. Asamura (2015), A New View on Solar wind interaction with Moon, *Geosciences Letters*, 2 (10), 1-15, doi: 10.1186/s40562-015-0027.
11. Bhardwaj, A., S. V. Mohankumar, T. P. Das, P. Pradeepkumar, P. Sreelatha, B. Sundar, A. Nandi, D. P. Vajja, **M. B. Dhanya**, N. Naik, G. Supriya, R. S. Thampi, G. P. Padmanabhan, V. K. Yadav, A. V. Aliyas (2015), MENCA Experiment aboard India’s Mars Orbiter Mission, *Current Science*, 109 (6), 1-8.
12. **M. B. Dhanya**, A. Bhardwaj, Y. Futaana, S. Fatemi, M. Holmström, S. Barabash, M. Wieser, P. Wurz, A. Alok, R. S. Thampi (2013), Proton entry into the near-lunar plasma wake for magnetic field aligned flow, *Geophysical Research Letters*, 40, 2913–2917, doi:10.1002/grl.50617.
13. A. Vorburger, P. Wurz, S. Barabash, M. Wieser, Y. Futaana, C. Lue, M. Holmström, A. Bhardwaj, **M. B. Dhanya**, K. Asamura (2013), Energetic neutral atom imaging of the lunar surface, *Journal of Geophysical Research*, 118 (7), 3937–3945, doi: 10.1002/jgra.50337.
14. Y. Futaana, S. Barabash, M. Wieser, M. Holmström, C. Lue, P. Wurz, A. Schaufelberger, A. Bhardwaj, **M. B. Dhanya**, K. Asamura (2012), Empirical Energy Spectra of Neutralized Solar Wind Proton from the Lunar Regolith, *Journal of Geophysical Research*, 117, E05005, doi:10.1029/2011JE004019, 2012.
15. Bhardwaj, A., **M. B. Dhanya**, R. Sridharan, S. Barabash, Y. Futaana, M. Wieser, M. Holmström, C. Lue, P. Wurz, A. Schaufelberger, and K. Asamura (2012), Interaction of solar wind with Moon: An Overview on the results from the SARA experiment aboard Chandrayaan-1, *Advances in Geosciences*, 25, 35–56.
16. A. Schaufelberger, P. Wurz, S. Barabash, M. Wieser, Y. Futaana, M. Holmström, A. Bhardwaj, **M. B. Dhanya**, R. Sridharan, and K. Asamura (2011), Scattering function for energetic neutral hydrogen atoms off the lunar surface, *Geophysical Research Letters*, 38, L22202, doi:10.1029/2011GL049362.
17. Lue, C., Y. Futaana, S. Barabash, M. Wieser, M. Holmström, A. Bhardwaj, **M. B. Dhanya**, P. Wurz (2011), Strong influence of lunar crustal fields on the solar wind flow, *Geophysical Research Letters*, 38, L03202, doi:10.1029/2010GL046215.
18. Bhardwaj, A., S. Barabash, **M. B. Dhanya**, M. Wieser, Y. Futaana, M. Holmström, R. Sridharan, P. Wurz, A. Schaufelberger, and K. Asamura (2010), Studying the Lunar–Solar Wind Interaction with the SARA Experiment aboard the Indian Lunar Mission Chandrayaan-1, *in SOLAR WIND TWELVE: American Institute of Physics Conference Proceedings*, 1216, 518–521.
19. Futaana, Y., S. Barabash, M. Wieser, M. Holmström, A. Bhardwaj, **M. B. Dhanya**, R. Sridharan, P. Wurz, A. Schaufelberger, K. Asamura (2010), Protons in the Lunar Wake Observed by the SARA Instrument on Board Chandrayaan-1, *Journal of Geophysical Research*, 115, A10248, doi:10.1029/2010JA015264

20. Wieser, M., S. Barabash, Y. Futaana, M. Holmström, A. Bhardwaj, R. Sridharan, **M. B. Dhanya**, P. Wurz, A. Schaufelberger, K. Asamura (2010), First observation of a mini-magnetosphere above a lunar magnetic anomaly using energetic neutral atoms, *Geophysical Research Letters*, 37, L05103, doi:10.1029/2009GL041721.
21. Bhardwaj, A., M. Wieser, **M. B. Dhanya**, S. Barabash, Y. Futaana, M. Holmström, R. Sridharan, P. Wurz, A. Schaufelberger, and K. Asamura (2010), The Sub-keV Atom Reflecting Analyzer (SARA) Experiment Aboard Chandrayaan-1 Mission: Instrument and Observations, *Advances in Geosciences*, 19, 151–162.
22. **M. B. Dhanya** and A. Bhardwaj (2010), Relationship between Soft X-rays and EUV Emissions during Solar Flares: A Case Study for October–November 2003, *Astrophysics and Space Science Proceedings*, XII, (Eds)S. Hasan, R. J. Rutten, 475–477.
23. Wieser, M., S. Barabash, Y. Futaana, M. Holmström, A. Bhardwaj, R. Sridharan, **M. B. Dhanya**, P. Wurz, A. Schaufelberger, K. Asamura (2009), Extremely high reflection of solar wind protons as neutral hydrogen atoms from regolith in space, *Planetary and Space Science*, 57, 2131–2134, doi:10.1016/j.pss.2009.09.012.
24. S. Barabash, A. Bhardwaj, M. Wieser, R. Sridharan, T. Kurian, S. Varier, E. Vijayakumar, V. Abhirami, K. V. Raghavendra, S. V. Mohankumar, **M. B. Dhanya**, S. Thampi, K. Asamura, H. Andersson, Y. Futaana, M. Holmström, R. Lundin, J. Svensson, S. Karlsson, R. D. Piazza and P. Wurz (2009), Investigation of the solar wind - Moon interaction onboard Chandrayaan-1 mission with the SARA Experiment, *Current Science*, 96, 526–34.

SCIENTIFIC/TECHNICAL REPORTS

1. **M. B. Dhanya**, Santa Martinez, Harold Metselaar, Martin Wieser, Futaana Yoshifumi, Anil Bhardwaj, Stas Barabash, Detlef Koschny, *SARA Experimenter to Archive team Interface Control Document*, CH1-SARA-EAICD-V1.0, 2011.
2. **M. B. Dhanya** and Neha Naik, *Software Design Document for MENCA QLD and Level-0 data processing*, PR-MENCA-SDDGS-1.0, September 2013.
3. Ajay Kumar Prashar, **M. B. Dhanya**, S. Manthira Moorthi, MENCA PDS Data Archive Pipeline Software Interface Control Document [ICD] version 1.3, 6 August 2014.
4. **M. B. Dhanya** and MENCA POC team, MENCA Payload Operations Center: Operations and Data Handling, PR-MENCA-POC-V2.2, February 2015.

COVER PAGE OF JOURNALS & HIGHLIGHTS

1. **Cover Page of Geophysical Research Letters**: The paper titled “First Observation of a Mini-Magnetosphere above a Lunar Magnetic Anomaly using Energetic Neutral Atoms” on the discovery of Mini-Magnetosphere on the Moon using the SARA experiment aboard Chandrayaan-1 mission made the cover page of the March 16, 2010 issue of the journal Geophysical Research Letters published by American Geophysical Union (AGU).
2. **Nature India Research Highlight**: The paper “Proton entry into the near-lunar plasma wake for magnetic field aligned flow”, published in Geophysical Research Letters (2013) made Research Highlight of Nature India with the title “Tracing Sun’s Protons Near Moon”, Published online on 23 July 2013; doi:10.1038/nindia.2013.99.

PRESS RELEASES

1. **ESA Press Release** on October 16, 2009: “Hydrogen offers a New Way to study the Moon” in the context of the paper “Extremely High Reflection of Solar Wind Protons as Neutral Hydrogen Atoms from Regolith in Space” published in the journal Planetary and Space Science in 2009.

POPULAR ARTICLES

1. Bhardwaj, A., S.V. Mohankumar, T. P. Das, S. V. Thampi, P. Pradeepkumar, P. Sreelatha, Sundar B., A. Nandi, D. P. Vajja, **M. B. Dhanya**, N. Naik, G. Supriya, R. S. Thampi, G. P. Padmanabhan, V. K. Yadav, and A.V. Aliyas, MENCA onboard the Indian Mars Orbiter Mission, *Physics Education*, Vol. 31, no. 3, July-Sept, 2015.
2. Bhardwaj, A., **M. B. Dhanya**, R. Sridharan, S. Barabash, M. Wieser, Y. Futaana, C. Lue, M. Holmstrom, P. Wurz, and A. Schaufelberger, Novel aspects of Solar Wind interaction with Moon as revealed by the SARA experiment on the Chandrayaan-1 mission, *Signatures (Newsletter of the Indian Society of Remote Sensing-Ahmedabad Chapter)*, Vol. 23, No. 4, Page: 87-92, November–December 2011.

PRESENTATIONS AT INTERNATIONAL/NATIONAL CONFERENCES/SYMPOSIA

1. *The Moon observed in Energetic Neutral Atoms: Review of the Scientific Findings from SARA/CENA on board Chandrayaan-1*, EGU General Assembly, Vienna, Austria, April 23-28, 2017.
2. *Science Objectives of PAPA payload on board Aditya-L1mission*, XXXV Meeting of Astronomical Society of India (ASI-2017), B.M. Birla Auditorium, Jaipur, Rajasthan, March 06-10, 2017; .
3. *Protons in the Near-Lunar Plasma Wake from SWIM/SARA on Chandrayaan-1*, Joint 13th Asia Pacific Physics Conference and Australian Institute of Physics Congress (APPC-AIP), Brisbane Convention and Exhibition Centre, Brisbane, Australia, 4-8 December 2016.
4. *Energetic Neutral Atom Imaging of the Lunar Poles and Night-Side*, Session PS2.2 Lunar Science and Exploration, **European Geosciences Union General Assembly 2016**, Vienna, Austria, 17–22 April 2016.
5. *Source Mechanism of protons in near-lunar wake: SARA/Chandrayaan-1 observations*, **National Space Science Symposium (NSSS)**, Trivandrum, India, 9-12 February 2016.
6. *What happens when the Solar Wind Interacts with the Moon*, **National Space Science Symposium (NSSS)**, Trivandrum, India, 9-12 February 2016.
7. *In situ observation of Martian neutral exosphere: Results from MENCA aboard Mars Orbiter Mission (MOM)*, **National Space Science Symposium (NSSS)**, Trivandrum, India, 9-12 February 2016.
8. *New population of protons in lunar wake: discovery by Chandrayaan-1/ SARA*, **27th Kerala Science Congress, organized by Kerala State Council for Science, Technology and Environment (KSCSTE) jointly with NATPAC**, Alappuzha, January 27–29 2015.
9. *Solar Wind Interaction with Moon: Observation of Protons in Lunar Wake during magnetic aligned flow by SARA aboard Chandrayaan-1 Mission*, **29th National Symposium On Plasma Science & Technology PLASMA-2014 and International Conference on plasma and Nano-technology**, M G University, Kottayam, Kerala, December 8–11, 2014.
10. *Probing of the Martian Neutral Exosphere with MENCA aboard the Mars Orbiter Mission*, **20th National Conference on Atomic and Molecular Physics (NCAMP-xx)**, IIST, Thiruvananthapuram, December 9–12, 2014.
11. *MENCA Calibration, Data analysis tools and Data Archiva*, **workshop on "Mars Orbiter Mission-Data Analysis and Science Plans**, Physical Research Laboratory, Ahmedabad, August 20–21, 2014.
12. *Investigation of Lunar plasma environment with the SWIM/SARA on Chandrayaan-1*, **40th COSPAR Scientific Assembly, Moscow State University**, Moscow, Russia, 2–10 August 2014.
13. *Life and times of a Woman Scientist: Challenges and way forward!*, **National Conference for ISRO Women Employees (associated with International Women's day)**, Thiruvananthapuram, March 4, 2014.

14. *First Observation of Protons in the Near-Lunar Plasma Wake for magnetic field aligned flow from SWIM/SARA on Chandrayaan-1*, **18th National Space Science Symposium**, Dibrugarh, India, 29 January–1 February, 2014.
15. *Global mapping of proton flux reflected/scattered from lunar dayside surface: SWIM/SARA observation onboard Chandrayaan-1*, **18th National Space Science Symposium**, Dibrugarh, India, 29 January–1 February, 2014.
16. *Interaction of Solar Wind with the Moon: A New View from the SARA/Chandrayaan-1*, **18th National Space Science Symposium**, Dibrugarh, India, 29 January–1 February, 2014.
17. *MENCA Experiment aboard the Indian Mars Orbiter Mission*, **18th National Space Symposium**, Dibrugarh, India, 29 January–1 February, 2014.
18. *An Orbiter-based in situ Study of the Lunar Exosphere: the CHACE-2 Experiment aboard Chandrayaan-2*, **18th National Space Science Symposium**, Dibrugarh, India, 29 January–1 February, 2014.
19. *Investigation of the lunar plasma wake by the SARA experiment on Chandrayaan-1*, **39th COSPAR international conference**, Mysore, India, 14–22 July 2012.
20. *Mars Exospheric studies with MENCA on a Mars Orbiter*, **39th COSPAR Scientific Assembly**, Mysore, India, July 14–22, 2012.
21. *Study of Lunar Atmosphere by CHACE aboard Chandrayaan-1 and a Follow-up by the CHACE-2 onboard Chandrayaan-2*, **39th COSPAR Scientific Assembly**, Mysore, India, July 14–22, 2012.
22. *Energetic Neutral Atom Observations of the Solar Wind Interaction with the Lunar Surface by SARA/Chandrayaan-1*, **39th COSPAR Scientific Assembly**, Mysore, India, July 14–22, 2012.
23. *Ion optics simulations of the response function of PLasma Energy eXplorer (PLEX)*, **39th COSPAR Scientific Assembly**, Mysore, India, July 14–22, 2012.
24. *Accelerated solar wind protons near Moon: observation by SWIM/SARA on Chandrayaan-1*, **39th COSPAR Scientific Assembly**, Mysore, India, July 14–22, 2012.
25. *Energetic Neutral Atom Imaging of the Lunar Surface*, **EGU General Assembly**, Vienna, Austria, April 22–27, 2012. item *Direct Observations of Magnetic Anomalies on the Lunar Surface under Varying Solar Wind Conditions*, **EGU General Assembly**, Vienna, Austria, April 22–27, 2012.
26. *A novel PLasma Energy eXplorer (PLEX) for Martian plasma exploration*, **17th National Space Science Symposium**, Tirupati, India, February 14–17, 2012.
27. *A New View of the Solar Wind-Moon Interaction: Results from SARA Experiment aboard Chandrayaan-1*, **17th National Space Science Symposium**, Tirupati, India, February 14–17, 2012.
28. *CHACE-2 Experiment Aboard the Chandrayaan-2: exploration of lunar exosphere*, **17th National Space Science Symposium**, Tirupati, India, February 14–17, 2012.
29. *Studying the Mars Exosphere with the MENCA Experiment on the Mars Orbiter*, **17th National Space Science Symposium**, Tirupati, India, February 14–17, 2012.
30. *Investigation of the Lunar Plasma wake by the SARA experiment on Chandrayaan-1*, **17th National Space Science Symposium**, Tirupati, India, February 14–17, 2012.
31. *Investigation of the lunar plasma wake by the SARA experiment on Chandrayaan-1*, **PLANEX conference and CH-1 seventh science meeting**, PRL, Ahmedabad, India, December 12–14, 2011.
32. *An overview on the Results from the SARA Experiment aboard the Chandrayaan-1 mission*, **AOGS international conference**, Taipei, August 08–12, 2011.

33. *A Global View on Lunar Magnetic Anomalies: Observations from SARA/Chandrayaan-1*, **EGU 2010 General Assembly**, Vienna, Austria, 2–7 May, 2010.
34. *Observation of a lunar mini-magnetosphere above a magnetic anomaly using energetic neutral atoms*, **EGU 2010 General Assembly**, Vienna, Austria, 2–7 May, 2010.
35. *Protons observed in the near lunar wake by SARA/SWIM sensor onboard Chandrayaan-1*, **EGU 2010 General Assembly**, Vienna, Austria, 2–7 May, 2010.
36. *A New Look at the Lunar-Solar Wind Interaction: An overview on Results from the SARA Experiment aboard Chandrayaan-1*, **AOGS international conference**, July 05–09, 2010.
37. *Observation of reflected Protons from the Lunar surface using the SWIM instrument of the SARA on Chandrayaan-1*, **National Space Science Symposium**, Rajkot, Feb. 24–27, 2010.
38. *First Results from the SARA Experiment on the Chandrayaan-1*, **National Space Science Symposium**, Rajkot, Feb. 24–27, 2010.
39. *Observation of reflected solar wind ions from the Moon by the SWIM of SARA on the Chandrayaan-1*, **International Conference on Low Cost Planetary Mission (LCPM8)**, Goa, August 31–September 04, 2009.
40. *Observations by the Sub-keV Atom Reflecting Analyzer (SARA) Experiment aboard the Indian Lunar Mission Chandrayaan-1*, **AOGS Annual Meeting**, Singapore, August 11–15, 2009.
41. *Sub-keV Atom Reflecting Analyzer (SARA) Experiment aboard the Indian Lunar Mission Chandrayaan-1*, **AOGS Annual Meeting**, Singapore, August 11–15, 2009.
42. *Studying the Solar Wind-Lunar Interaction with the SARA Experiment aboard the Indian Lunar Mission Chandrayaan-1*, **International Solar Wind 12 Conference**, Saint Malo, France, June 21–26, 2009.
43. *First observations of the solar wind - Moon interaction onboard Chandrayaan-1 mission*, **European Geophysical Union 2009 General Assembly**, Vienna, Austria, April 19–24, 2009.
44. *Relationship between Soft X-rays and EUV Emissions during Solar Flares: A Case Study for October-November 2003*, **Magnetic coupling between the Interior and the Atmosphere of the Sun-Centenary commemoration of the discovery of the Evershed effect**, IIA, Bangalore, December 2–5, 2008.
45. *Monitoring the Solar Wind in near-Earth Environment using SWIM/SARA aboard the Indian lunar Mission Chandrayaan-1*, **Magnetic coupling between the Interior and the Atmosphere of the Sun-Centenary commemoration of the discovery of the Evershed effect**, IIA, Bangalore, December 2–5, 2008.
46. *Conceptual Design of Low Energy Ion Mass Analyser (LEIMA) onboard Indian Lunar mission*, **National Space Science Symposium**, February 26–29, 2008.
47. *Solar Soft X-ray and EUV Emission during Flares: Characteristics of Temporal variation in Intensity*, **National Space Science Symposium**, Ooty, February 26–29, 2008.
48. *The SARA experiment on the Chandrayaan-1 mission*, **National Space Science Symposium**, Ooty, February 26–29, 2008.
49. *LENA imaging on Moon with SARA onboard Chandrayaan-1*, **Fourth AOGS Annual Meeting**, Bangkok, Thailand, July 31–August 4, 2007.
50. *Time Relationship between solar X-ray and EUV during flares: A case study for the years 2003-2005*, **International Conference on Challenges for Solar Cycle 24 (ICCSC24)**, PRL, Ahmedabad, January 22–25, 2007.

INVITED TALKS

1. *MENCA Calibration, Data analysis tools and Data Archival*, **workshop on Mars Orbiter Mission-Data Analysis and Science Plans**, PRL, Ahmedabad, August 20-21, 2014.
2. *MENCA payload and calibration program*, **Workshop on Infrared Spectroscopy of Planetary Atmospheres (ISPA)**, Space Science Instrumentation Facility (SSIF), ISRO Satellite Centre, ISITE campus, Bangalore, India, May 8–10, 2013.
3. *Planetary Exploration*, **Two day workshop on Space Physics**, Victoria College, Kerala, India, 3 March 2013 .
4. *Planetary Science*, **3 day Workshop in Advanced Data Analysis Techniques in Astrophysics**, University of Calicut, India, 12 October 2012.

PARTICIPATION IN SCHOOLS/WORKSHOPS

1. **Mars Data Analysis (MDA) meet**, ISRO HQ, 22-25 Feb 2016.
2. Training on ‘**Presentation Skills and Technical Writing**’, organised by HRDD of VSSC, Trivandrum, 11 September, 2015.
3. **One day workshop on ‘Data Analytics using R Language’** , organised by Computer Society of India, Trivandrum Chapter, 28 March 2015, Trivandrum.
4. **Heliophysics Summer School**, sponsored by NASA and conducted by UCAR, Boulder, Colorado, May 31–June 7, 2012.
5. **National Workshop: Results On Solar Eclipse**, SPL, VSSC, January 27-28, 2011.
6. **Familiarization workshop in Scientific Ballooning**, NBF (TIFR) Hyderabad, December 13-15, 2010.
7. **SPICE Training (Chandrayaan-1 Ancillary Data Processing)**, ISTRAC, December 11-15, 2007.
8. **IIA-Penn State Astrostatistics School**, Vainu Bappu Observatory (VBO), Kavalur, July 2-7, 2007.
9. **Winter School on Modeling of Planetary Atmospheres**, 17 December 2006 to 5 January 2007, PRL, Ahmedabad.
10. **Workshop on Innovative Experiments**, Jointly organised by Nuclear Science Centre, New Delhi and Department of Physics, St. Thomas’ College, Thrissur, Kerala, March 10, 2005.
11. **Workshop on Fascinating world of Physics**, Department of Physics, University of Calicut, December 1-5, 2003.
12. **National workshop on Recent Trends in Applied Physics**, Department of Physics, Zamorin’s Guruvayurappan College, Calicut, November 8-9, 2002.

PUBLIC OUTREACH

1. *Science Programs of ISRO*, Space Expo associated with the World Space week 2017 Celebrations of VSSC at S. T. Hindu College, Nagercoil, 07 October 2017.
2. *Chandrayaan-1, the first Indian Lunar Mission*, Zenana School, Trivandrum, 21 July 2016.
3. *The first Indian Mars Orbiter Mission*, Cafe Scientifique session on Women in Science and Technology (in connection with International Women’s Day), organized by Alliance Française de Trivandrum, 12 March 2015.

4. *Life and times of a Woman Scientist : Challenges and way forward!*, National Conference for ISRO Women Employees (associated with International Women’s day), Trivandrum, India, 4 March 2014.
5. *Curiosity Lander on Mars*, Dooradarshan, Trivandrum, India, 06 August 2012.
6. *Super Moon*, All India Radio, Trivandrum, India, 18 March 2011.
7. *Super Moon*, Club FM 94.3 Radio, 18 March 2011.
8. *Study of interaction between lunar surface and Solar wind by SARA on board Chandrayaan-1*, Inter-centre Technical Hindi seminar, LPSC Valiamala, Trivandrum, India, 22–23 September 2010.

FOREIGN DEPUTATIONS

1. **Joint 13th Asia Pacific Physics Conference and Australian Institute of Physics Congress (APPC-AIP)**, Brisbane Convention and Exhibition Centre, Brisbane, Australia, 4-8 December 2016.
2. **40th COSPAR Scientific Assembly**, Moscow State University, Moscow, Russia, August 2–10, 2014.
3. **Swedish Institute for Space Physics (IRF)**, for *Scientific discussions and joint analysis of SARA/Chandrayaan-1 data*, funded by Swedish Research grant, Kiruna, Sweden, June 20– July 12, 2013.
4. **Heliophysics Summer School**, NASA funding, conducted by UCAR, Boulder, Colorado, May 31– June 7, 2012.
5. **Swedish Institute for Space Physics (IRF)**, for *Scientific discussions and joint analysis of SARA/Chandrayaan-1 data*, funded by Swedish Research grant, Kiruna, Sweden, April 5–May 8, 2010.

OTHER RESPONSIBILITIES

1. **Member**, SPL Website upkeeping Team
2. **Member**, sub-committee for Website, National Space Science Symposium-2016 (NSSS-2016).
3. **Member**, functional committee, Printing and Publications, WSW2016, VSSC
4. **Member**, functional committee, Resource material generation, WSW2016, VSSC
5. **Member**, functional committee, Resource material generation & World Space Week @schools 2015, VSSC
6. **Convenor**, World Space Week@Schools functional committee, WSW2014, VSSC, India.
7. **Convenor**, World Space Week@Schools functional committee, WSW2013, VSSC, India.
8. **Member**, World Space Week@Schools functional committee, WSW2012, VSSC, India.

ACADEMIC PROJECTS

1. Supervised Nina. S. Darsan, M Sc Physics student from Department of Physics, Sree Narayana College, Cherthala, for doing project titled “The Mercury: Magnetized and Atmosphereless Planet in our Solar System”, April–June 2017.
2. Supervised C. Suvarna, M.Sc Physics student from MES, Kalladi College, Palakkad, Kerala, for doing project titled “Solar wind properties: Variability over two Solar Cycles”, April-June 2016.
3. Supervised Mr. Vishaal Singh, M.Sc Physics student from IIT, Kharagpur on the summer project titled *Investigations on the low ENA albedo regions on the Moon and their association with Lunar Surface Properties*, 25 May-17 July, 2015.

4. Supervised two M.Sc Physics students from St. Albert's College, Ernakulam for doing project during April-June 2014. The project details as follows.
 - (a) Parvathy S. Kumar, *X-ray and EUV emissions during X-class solar flares: Characteristics, time delays and flux enhancements.*
 - (b) Jinchu C S, *X-ray and EUV emissions during M-class solar flares: Characteristics, time delays and flux enhancements.*

MEMBERSHIP IN PROFESSIONAL BODIES

1. Member, Association of Asia Pacific Physical Societies, Division of Plasma Physics (AAPPS-DPP).
2. Life Member, Indian Space Scientists Association.
3. Life Member, Plasma science society of India.
4. Member, AAPPS-DPP (Association of Asia-Pacific Physical Societies - Division of Plasma Physics).

REFERENCES

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