

CURRICULUM VITAE

Name : **P Soma**

Date of Birth : **17.09.1949**

POSITION HELD AT RETIREMENT (SEPT 2009)

P. Soma
Scientist/Engineer “H”
Deputy Director, Navigation systems Area
Project Director, SATNAV Programme, Ground Networks
Secretariat Member: International Charter ‘Space and Major Disasters’

ISRO Telemetry Tracking and Command Network
Plot No. 12 & 13, 3rd Main, 2nd Phase
Peenya Industrial Area, Bangalore – 560 058.

Residential Address for communication

No. 734, 3rd B Main, 9th B cross
ISRO Layout, Bangalore 560 078
Phone :+ 91-080-26667800
Mobile :+ 91-9739321056
E-mail : som598@yahoo.com

EDUCATION:

Academic: **B.Sc., D.M.I.T., M.Tech (IIT-M)**

- Master of Technology in **Aeronautical Engineering** from Indian Institute of Technology, Chennai, India 1973.
 - D,M.I.T., **Aeronautical Engineering** from Madras Institute of Technology, Chennai, India 1971.
 - Bachelor of Science in **Mathematics** from Loyola College (Madras University) Chennai, India 1968.
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Expertise/Fields of Specialization:

- Aeronautics
 - Aerodynamics
 - Propulsion
 - Orbital and Space Mechanics
 - Satellite Mission Analysis/Operations
 - Navigation
 - Satellite Aided Search and rescue
 - Project Management and Risk Mitigation
 - Disaster Management
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Work Experience:

1. Shri P. Soma joined Vikram Sarabhai Space Centre, Trivandrum on July 23, 1973 and worked as Scientist in Aerodynamics Division till 1977; he was responsible for building the first Supersonic Wind Tunnel at VSSC. He developed computer programs for nozzle design by Foelsch method and MOC, including boundary layer correction.
2. From 1977 to 1986 he worked at Sriharikota Range as Senior Engineer and Deputy Head, Mission Operations Group. He worked extensively on the Tracking Data Evaluation, Orbit Determination, Error Analysis problems. He developed/operationalized Preliminary Orbit Determination (POD) Software for Launch Vehicle Missions. He was deputed to European Space Agency, Darmstadt, Germany during September 1983 – August 1984 for specialized training in Spacecraft Mission Analysis and Orbit Determination.
3. From 1986 onwards, he worked with ISRO Telemetry, Tracking and Command Network at Bangalore, as Group Director for Mission Operations & Health Analysis (MOHA) Group, until December 2007 and during this period he was responsible for evolving Spacecraft Operations for IRS/LEO Missions of ISRO. From December 2007 till Sept 2009 he was Deputy Director ISTRAC heading Navigation Systems Area.
4. During his tenure at ISTRAC, he was closely associated with the first Indian Communication Satellite APPLE, remote sensing satellites BHASKARA-1 & 2, SROSS and all IRS Satellite Missions launched until 2008. He was Deputy Project Director for IRS-1C and 1D Mission. He played an important role in the ground segment and Mission operation of Remote Sensing Satellite Missions. He was also involved in the establishment and evolution of Satellite Aided Search and Rescue Facilities (LUT/MCC) to its present form. He was responsible for LEOSAR and GEOSAR System Definition and implementation. He represented India in several COSPAS/SARSAT meetings.

5. At the time of retirement, he was the Project Director (Ground Elements) Satellite Navigation Programme which included GAGAN and IRNSS Projects. As Associate Project Director for GPS aided Geo Augmented Navigation, joint project of ISRO/AAI, he was instrumental in meticulous planning and implementation of the ground segment comprising of infrastructure for Indian Mission Control Centre, establishment of 8 reference stations, establishing land uplink station with 11 m antenna and also VSAT/terrestrial network communication links. He successfully lead the team in integrating ground segment with INMARSAT 4F1 and conducted Final Acceptance tests for GAGAN – TDS as chairman of the T&E committee.
 - a. As Project Director for IRNSS Ground Segment, he was responsible for defining the architecture, configuration and design for various ground elements comprising of 17 reference stations, 4 CDMA ranging station, Precision Timing Facility and Navigation Control facility and Data communication Network. The Ground Segment is being implemented.
6. He represented ISRO as Secretariat Member in the “International Charter Space and Major Disasters” working closely with 10 international space agencies.
7. His fields of specialization are: Aerodynamics, Orbital Mechanics, Navigation, Software, Spacecraft Mission Analysis/Operations and Project Management. He has several national and international, Technical Papers and Publications to his credit.
8. Mr. Soma is deeply interested in the study of Management Systems and implementing them. He received specialized training from Indian Institute of Management, Ahmadabad (IIM–A), NITTE, NIAS (National Institute of Advanced Studies). He was a regular faculty in the Middle Level Management Programs of ISRO and enjoyed these sessions immensely.
9. After Retirement he has taken up teaching and presently is Associate Professor in Department of Aeronautics at Dayananda Sagar College of Engineering, Bangalore. He also delivers guest lectures at MIT Chennai for Postgraduate students in Aeronautics.

Membership and Honors:

- Mr. Soma is life member of Astronautical Society of India and Associate of National Institute of Advanced Studies, Bangalore.
 - Mr. Soma is a recipient of ISRO Team excellence award 2006 for his contribution to SRE mission.
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PUBLICATIONS / Paper presentation :

1. *V.S. Iyengar and P. Soma*

“Real Time Orbit and Dynamic Search Zone Computations to Aid Satellite Acquisition in S-Band during the Launch Phase of Geosynchronous Transfer Orbit (GTO)”

Space Dynamics for Geostationary Satellites, CNES Publication Toulouse October 1985

2. *P. Soma and Y.K. Singal*

“LEO and MEO Satellite Systems for Communications and the chalanges involved”

Paper presented at IEEE conference at Chandigarh, 1996

3. *K V. Venkatachary, P. Soma, V. Jalaramaiah, A. Karuppaiyan, N. Sengupta, O. Chiranjeevi, Y.K. Singal*

“TTC Network and Spacecraft Control Centre for IRS-1C”

Paper published in current science., Volume-70, April 1996.

4. *P. Soma, O. Chiranjeevi, S. Sukumar, Y. Krishnachandra, G.J. Das*

“Multi-Mission operation of LEO satellite”

Paper presented at SPACE-OPS 96, International Symposium Mission Operations and Ground Data Systems, September 16-20, 1996 held at Munich Germany.

5. *P. Soma and K. Nageswara Rao*

“Estimation of Systematic errors in Angles of Tracking Antenna”

Paper presented at SPACE-OPS 96, International Symposium Mission Operations and Ground Data Systems, September 16-20, 1996 held at Munich Germany.

6. *P. Soma, S. Venkateswarlu and K. Nageswara Rao*

“Ground track shift of IRS-1A and IRS-1B during Low Solar Activity periods”

Paper presented at XII National Convention of Aerospace Engineers Trivandrum held during 5-7 March, 1997. Aerospace 97,

7. *P. Soma, S. Venkateswarlu and G. Ramalingam*

“Tracking and Orbit Determination of LEO Satellites”

Paper presented at XII National Convention of Aerospace Engineers Trivandrum held during 5-7 March, 1997. Aerospace 97,

8. *P. Soma, S. Balasubramanian, N.K. Srivastava, Y.K. Singhal and C. Venkataiah*

“Satellite Aided Search and Rescue Programme”

Paper presented at XII National Convention of Aerospace Engineers Trivandrum held during 5-7 March, 1997. Aerospace 97,

9. *S. Venkateswarlu, G. Ramalingam, P. Soma*

“Automation of Orbit and Attitude Determination Function of Sensing Satellite (IRS) mission”. Indian Remote

Paper presented at SPACE OPS 98 held during 1-5 June, 1998 at Tokyo, Japan.

10. *Y. Prakasa Rao and P. Soma*

“Pre-launch TTC and Mission Operations Simulations for LEO Missions”

Paper presented at SPACE OPS 98 held during 1-5 June, 1998 at Tokyo, Japan.

11. *P. Ramalingam, P. Soma, O. Chiranjeevi and S. Rangarajan*

“TTC Network Casting and Optimisation for LEO Missions”

Paper presented at SPACE OPS 98 held during 1-5 June, 1998 at Tokyo, Japan.

12. *J.D. Rao, P. Soma, G.S. Padmashree*

“Multi-Satellite scheduling System for LEO Satellite Operations”

Paper presented at SPACE OPS 98 held during 1-5 June, 1998 at Tokyo, Japan.

13. *K. Elango, P. Soma, K. Rameshchandra and S. Rangarajan*

“Site Selection Criteria for Locating Laser Station at ISTRAC Campus, Bangalore”

Paper presented in the 11th International workshop on Laser Ranging held in Germany during 20-25 September 1998.

14. *K. Elango, P. Soma, K. Rameshchandra and S. Rangarajan*

“ISRO initiative for Space Geodesy and Geodynamics in India”

Paper presented in the International Symposium of IAG at Munich, Germany during 5-9 October 1998.

15. *T. Parimalarangan, P. Kesava Rao, K. Nageswara Rao and P. Soma*

“Risk assessment and Operations Strategy for ISRO Satellites during Leonid Storm encounter”

Current Science, VOL.75, No. 9, 10 November 1998

16. *P. Soma, T. Parimalarangan*

“Rocket-Less, Propellant-Less Propulsion for Satellites”

Paper presented at BITS, Ranchi, India, 2001.

17. *P. Soma and S. Venkateswarlu*

“Orbit Control of IRS Spacecraft”

Paper presented at BITS, Ranchi, India, 2001.

18. *P. Soma*

“Orbit Decay, Recentry and Life time Prediction of LEO Satellites”

Paper presented at the workshop on Space Debris held at VSSC, Trivandrum during September 7-8, 2001

19. *P. Soma*

Introduction to Space Technology

Paper presented at UN-India Workshop on Satellite Aided Search and Rescue, Bangalore, India 18-22 March 2002.

20. Jean Luc Bessis, Ahmed Mahmood, Jerome Beqhigoon, P. Soma and Levin Lauritson

“International Charter ‘Space and Major Disasters’”

Paper presented at 12th Regional workshop on the use of Space Technology for DM, Addis Ababa, Fshiopion, 1-5 July 2002.

21. *K. Elango, M. Pitchaimani, P. Soma and S.K. Shivakumar*

Laser Petro Reflector Array (LPRA) for IRS Missions

Paper presented at 13th International Workshop on Laser Ranging, October 01-11, 2002, Washington D.C., USA.

22. *S.C. Garg, J.R. Anand, P. Subramanya, S.S. Rajput, H.K. Mani, P. Chopra, T. John, S.K. Singhal, Visharam Singh, Dhas singh, U.N. Das, Bhadekar, P. Soma, s. venkat and D.P. Goel*

RPA aeronomy experiment onboard the India Satellite SROSS-C2 Some Important aspects of the Payload and schedule

Paper in Indian Journal of Radio and Space Physics Vol 32, February 2003.

23. *Bagchi, Tapan P, Sanjay Kumar, Garime Shahi, sagar R Kape and P. Soma*

Optimal Spacecraft support in Remote Sensing Missions

Article in OPESEARCH, September, 2003 40(3) Page 132-179.

24. *P. Soma, J.D. Rao, T.V.S.R.K. Prasad, P. Ekambaram*

“Decision Support System for LEO satellite operations”

Paper presented at Eighth International Conference on Space
– A Global Enterprise”
May 17 – 21, 2004 Montreal, Canada

Operations “SpaceOps 2004

25. *P. Soma, Y. Prakasa Rao and T. Parimalarangan*

“Scientific Management and Development of Human Resources for Indian Remote Sensing Satellite Operations”

Paper presented at Eighth International Conference on Space
2004 – A Global Enterprise” May 17 – 21, 2004 Montreal, Canada

Operations “SpaceOps

26. *P. Soma, S. Venkateswarlu, S. Santhalakshmi, Tapan Bagchi,
Sanjay Kumar*

“Multi-Satellite scheduling using Genetic Algorithms”

Paper presented at Eighth International Conference on Space
2004 – A Global Enterprise” May 17 – 21, 2004 Montreal, Canada

Operations “SpaceOps

27. *K.N. Shankara and P. Soma*

**“International Charter: Space and Major Disaster – ISRO’s”
Participation and charter performance”**

Paper presented at National Convention and National Symposium,
Jaipur, November 3-5, 2004

28. *P. Soma*

“GPS for Civil Air Navigation: Current trends”

Paper presented at National Seminar on GPS: Current trends and
Application conducted by Aeronautical Society of India at Bangalore
on 7th January 2005.

29. *P. Soma*

**“Indian Mission Control Centre for search and rescue Facilities :
Performance and Contribution”**

Paper presented at AAI-ICAO sponsored SAR Seminar SAREX 2005 at Chennai during 9-10 March 2005.

30. *R. Anandraj, M.R. Ananthasayanam, P.R. Mahapatra and P. Soma*

**Constant Gain Kalman Filter Approach using Genetic Algorithm
for estimating the Ionospheric total electron Content over Low
Latitude**

Paper presented at URSI GA, New Delhi, October 29, 2005.

31. *P. Soma*

delivered three lectures on the following topics

- i) S-BAS : Grand Architecture**
- ii) S-BAS : Receiver and processing**
- iii) S-BAS : Signal structure and definition**

Proceedings of the Second School on “GPS Augmentation System and Atmospheric Corrections”
NERTU, Osmania University, November 2005.

32. *P. Soma*

**“Satellite Based Augmentation system – Solution for Future Air
Navigation”**

Paper presented at National Symposium on “Emerging Technologies
and Flights of the ture” held on 02 June 2006 at Kochi, India

33. *P. Soma*

“International Charter Space and Major Disasters”

Presentation at First International Conference on Disaster Reduction
on Public Private Partnership at New Delhi, 9-10 November 2006.

34. *M. Pitchaimani, T.S. Ganesh, P. Soma and S.K. Shivakumar*

**Strategies for Enhancing Power Generation in Satellites with
Large Local Time Analyser**

Paper presented at Space Ops 2006 Conference AIAA 2006-5740.

35. *R. Anandraj, M.R. Ananthasayanam, P.R. Mahapatra and P. Soma*

Estimation of Low Latitude Ionospheric TEC from Dual Frequency GPS Observations by using Adifdue Kalman Filtering Technique

Paper accepted for presentation at Ion NTM, Sandiago, California, USA

36. *P. Soma*

“Ground System for GAGAN and IRNSS”

Presentation at IEEE Workshop on Satellite Navigation, Hyderabad on 20-04-2007

37. *P. Soma*

Introduction to Orbital Mechanics

Lecture delivered at Kalpana Chawla, Institute for Space and nano Technology, Kolkatta ISRO sponsored workshop on Space Science and Technology during June 2007.

38. *P. Soma*

TTC and Satellite Control

Lecture delivered at Kalpana Chawla, Institute for Space and nano technology, Kolkatta ISRO sponsored workshop on Space Science and Technology during June 2007.

39. *P. Soma*

Current Trends in Satellite Navigation

Lecture delivered at Kalpana Chawla, Institute for Space and nano technology, Kolkatta ISRO sponsored workshop on Space Science and Technology during June 2007.

40. *Sri Ambarishababu, P. Soma, etal*

Techniques adopted to sustain data services from IRS-P4 mission

Paper presented at 58th International Astronautical Conference, September 2007, Hyderabad

41. *Sri T. Parimalarangan, P. Soma, et al*

HAMSAT – Small satellite Operations, A case study

Paper presented at 58th IAC, September 2007, Hyderabad.

42. *Smt K. Malarmani, P. Soma, et al*

Innovative Techniques adopted in Extending mission Life of IRS-1C beyond a decade

Paper presented at 58th IAC, September 2007 at Hyderabad, India.

43. *P. Soma and V.S. Hegde*

International Charter ‘Space and Major Disaster’

Paper presented at 58th IAC, September 2007, Hyderabad

44. *P. Soma*

S-BAS : Ground Architecture

Paper presented at SERC school, Osmania University, Hyderabad during December 1-2, 2007

45. *P. Soma*

S-BAS Receiver and Processing

Paper presented at SERC school, Osmania University, Hyderabad during December 1-2, 2007

46. *P. Soma*

S-BAS Receiver and Processing

Paper presented at SERC school, Osmania University, Hyderabad during December 1-2, 2007

47. *P. Soma*

Technology Challenges in Satellite Navigation

Invited talk at the International Conference on RF and Signal Processing Systems RSPS-2008, KLCE, Vijayawada, AP, India during February 1-2, 2008.

48. *P. Soma*

GAGAN: Overview

Presentation made at SBAS certification workshop, Fullerton, USA during 25-28 February, 2008

49. *P. Soma*

Technological Challenges and opportunities for Research and Development in Satellite Navigation.

Presentation at IIT Gauhati, on 25th March 2008.

50. *P. Soma*

Elements of SATNAV Ground Segment

Lecture delivered at One day workshop on GNSS held at ISTRAC on 14.5.2008

51. *P. Soma*

Ground and Control Segment of IRNSS

Presentation to the Strategic user, New Delhi, 04.06.2008

52. *P. Soma*

Augmentation Systems

Invited Lecture in the International Training Course on Satellite Navigation and Location Based Services at Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) affiliated to United Nations, at SAC Campus, Ahmedabad, July 1, 2008.

53. *P Soma*

Evolution of Satellite based Navigation

Key note address delivered at Arunai Engineering College,
September 12, 2008

Tiruvannamalai

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54. *P. Soma*

Principles of GAGAN and applications

Invited Lecture at “Three day Intensive Course on GNSS” conducted by Research and Training Unit of Navigational Electronics, Osmania University, Hyderabad during 3-5 Dec 2008

55. *P.Soma*

Team building

Lecture at ISAC –ISRO Induction Training Programme IITP–18 on November 18, 2008.

56. *P.Soma,S.Nanadulal et al.,*

Evaluation of Real-time position Accuracy and LNAV/VNAV service Availability for GAGAN SBAS

paper presented at the International workshop on Digital communication and enhanced services of aircraft and vehicle held at Capri, Italy Sept 3-5, 2008.

57. *P.Soma*

Lecture delivered at fourth SERC school on GPS and local Area Augmentation System during June 2009.

Current trends in satellite based Navigation and Indian Plans
Guest Lecture delivered at Diamond Jubilee celebration of M.I.T and Anna University., sept., 2009.

58. *P.Soma*

GAGAN Architecture and system Evaluation

Lecture delivered at fourth SERC school on GPS and local Area Augmentation System during June 2009.

59. *P.Soma*

GAGAN Signal Structure

Lecture delivered at fourth SERC school on GPS and local Area Augmentation System during June 20
Lecture delivered at fourth SERC 09.

60. *P.Soma*

GAGAN receiver data processing

Lecture delivered at fourth SERC school on GPS and local Area Augmentation System during June 2009.

61 *P.Soma*

Elements of Satellite Technology

Guest Lectures to M.E. Students at Anna University: Feb-March2010

62. *S Panneerselvam and P.Soma*

A Status Review and Perception for Indian Anti Satellite Weapon

Paper presented at ORF New Delhi on 21 Jan 2011