



**Dr Mylswamy Annadurai, Distinguished Scientist,
Vice President, Tamil Nadu State Council for Science & Technology,
Chairman, Board of Governors, National Design and Research Forum
Director (Retired) , ISRO , Bangalore**

Significant contributions

Dr M Annadurai, is the space scientist of International repute and technical leader of par excellence. Currently holding the responsibilities of Vice President, Tamil Nadu State Council for Science and Technology and Chairman, Board of Governors, National Design and Research Forum. Prior to taking current responsibilities, with the educational qualifications of BE, ME and PhD in Engineering, Dr Annadurai led more than 2500 strong scientists and engineers as Director, ISRO Satellite Centre by expanding ISRO's horizons for making 12 to 15 Satellites per year and developing new technologies. Accordingly, 30 state of the art satellites have been launched during 2015-18 and few more are ready for launch. Prior to that he led two of the most significant achievements of ISRO namely **Chandryanna-1** and **Mars Orbiter Mission**, in the capacity of Project Director and Programme Director for the respective missions. Dr Annadurai has contributed more than 60 satellites made in India. He had led many international committees on space sciences.

1982-2004: Joining ISRO in 1982, Dr Annadurai grew in the organization steadily. During the period 1984-88, he was the team Leader for the design and development of ISRO's first S/W satellite Simulator. Promoted to Spacecraft operation manager for three different spacecraft namely IRS-1A, INSAT2A&2B during 1988-1992. In 1993 He became Deputy Project Director for INSAT-2C and Mission Director for all INSAT Missions namely INSAT-2C, 2D, 2E, 3B, 3E and GSAT-1, during the period 1996-2004. Automation for S/C operations was the major contribution during this period.

2004-2010: Significant contribution was made to the India's first Lunar Mission, Chandrayaan-1 as Project Director. Accommodating 12 science instruments, 6 from ISRO and 6 from foreign Space Agencies like NASA, ESA, JAXA and BSA. It was technically and managerially a challenging task. The project has won many appreciations and awards including Space Pioneer Award, 2009 for its innovative cost effective design, International Co-operation and the historical discovery of water

on the Moon. He also has shaped Chandrayaan-2 project that could be launched in Jan 2019.

2011-2015: As Programme Director of IRS & SSS programme, he led the respective project teams to realise five satellites viz. Resoursat-2A, YOUTHSAT, Megha-Tropiques, and RISAT-1. The list includes the most prestigious **Mars Orbiter Mission** realised in record time with minimal budget. Making of two student satellite were also overseen.

2015-2018: As Director, ISRO Satellite Centre and Chairman, Programme Management Council for Space Infrastructure, Dr Annadurai played pivotal role guiding the team of managers and engineers to realize a record number of 29 satellites as on Jun 2018, which include seven communication, seven navigation, eight Earth Observation, one Science, one meteorological satellite, three Nano and five student satellites. Few more satellites namely GSAT-11(ISRO's first six ton, high power S/C), G-29 an advanced communication satellite, one Hyper spectral earth observation satellite, one radar signal locating satellite were made ready for launch in the coming months. Seven more satellites including moon mission Chandrayaan-2 were brought in final stages of Assembly and integration for launch in the coming months. To develop newer technologies and to produce many satellites, multi pronged approaches were brought in. To produce the satellites in a faster rate, new innovative approaches like, standardization of satellite hardware systems, effective supply chain management, resource management, outsourcing, new project management aspects, improved outsourcing etc have been addressed and implemented. This enabled the centre to concurrently assemble and integrate about 10 satellites at a time, there by rolling out satellites in an unprecedented faster pace. This has enabled the centre to enhance it's capacity to make about 18 satellites per year from the year 2018.

In the technology front, technologies required for high power communication satellites, agile remote sensing satellites, lunar lander, micro and nano satellites were identified, developed and demonstrated in technology missions like GSAT-19, Microsat, INS-1A/1B satellites and being inducted in the operational missions.

Beyond making more and more state of the art satellites and satellite related technology developments, other actions pursued were, Human resource development in ISRO, Academia Interface, Vendor Development, International co-operation, Official Language Implementation, Social Service and Literary works.

Human Resource Development: In the satellite centre, Dr Annadurai took various initiatives like channelised mentoring, skill training for human resource development, formation of a new forum called innovators forum along with required multidisciplinary infrastructure along with competitive incentive/award scheme to identify and nurture new talents.

Academia Interface: Reached out to University teachers and students to enthuse them in space research. Guided many student satellite projects. Some more projects were identified and colleges and Universities are encouraged to carry out

with due guidance and support. Dr Annadurai Visits schools and colleges to interact with them during holidays and out of office hours.

Vendor Development : As a part of outsourcing effort, matured technologies were transferred to the identified vendors with due IPR protection mechanism. Good number of satellite hardware are being realized through increased industry partnership.

2019 - : Since Jan 2019 Dr Annadurai is working as Vice President for Tamil Nadu State Council for Science & Technology a new position created by Government of Tamil Nadu with the mandate to strengthen the development of S&T in the state. Recently he has been also appointed as Chairman, Board of Governors, National Design and Research Forum by Institution Of Engineers- India.

Dr Annadurai's education and achievements in satellite technology have been highlighted in tenth standard science text book in Tamilnadu

International co-operation and Leadership: With the experience gained out of Chandrayaan-1 success, many international cooperative missions were realized. Missions accomplished and being pursued are Meghatropique & SARAL with France, Astrosat with UK and Canada. NISAR with NASA, Oceansat with CNES France. Missions like a lunar mission with JAXA, Japan, Earth observation missions with NASA are under advanced stage of discussions. Additionally, taking active participation in various multilateral and bilateral international Space forums like UN Committee on Peaceful Use of Outer Space, Working groups of ASEAN, INDO-US, INDO-German, INDO-France, INDO-Indonesia. As Chairman of the working Group of the whole in the United Nation Committee on Peaceful uses of outer space, Dr Annadurai played a pivotal role in the recently concluded United Nations event UNISPACE+50 at Vienna, Austria. He also spear headed the Indian team that announced a unique program for Capacity building for developing nations, that is expected to have far reaching effects in the international arena to INDIA.

Social Outreach : Dr Annadurai also utilizes his free time for social causes such as clean India. He has been selected as the brand ambassador for the Clean Trichy movement by the People of Trichy. ISRO satellite Centre bagged best maintained campus among ISRO centres in 2016. He has close interaction with Sri Ramakrishna Mission and donated rupees Five Lakhs to the trust from one of the awards he received. He has helped many students for their education with both moral and monetary support. He has delivered more than 75 Convocation addresses and large number of inaugural, keynote and valedictory addresses in various conferences nationally and internationally.

Literary works: He is one of the good speakers and writers in local language and has written three books. One of the books has received "Adithnar literary award" and has been translated into Kannada. Hindi translation of the book is underway.

Awards and Recognition: Dr. Annadurai has received many awards including Padma Shree award in 2016 for Science and Technology from Govt. of India, Rajyotsava Prashasti award for Science in 2008 from Govt. of Karnataka, IEI-IEEE(USA) Engineering Excellence award 2016 along with many national and international awards, fellowships and recognitions.

Annexure 1: Awards

Dr Annadurai has received many awards, notable among them are as follow,

Awards from central/state Government

1. Padma Shri, 2016 for Science and Technology by Government of India
2. Rajyostava Prashasti for Science (2008) by Government of Karnataka .

Awards from ISRO

1. ISRO Outstanding Achievement award, 2014
2. Hariom Ashram pretit Vikram Sarabhai Research Award for the outstanding Contributions to Systems analysis and Space systems management(2004).
3. A citation from ISRO for contribution to the INSAT systems Mission management(2003)
4. Team Excellence award for contribution to Indian Space Program(2007).
5. ISRO Merit Award 2009
6. Team Excellence Award 2010 as team leader of Chandrayaan-1 team

Awards from Academic Institution

1. Doctor of Science, DSc (Honoris Causa) by MGR University, Chennai (2008)
2. Doctor of Science, DSc (Honoris Causa) , Central University, Pondicherry (2009)
3. Doctor of Science, DSc (Honoris Causa) by Anna University, Chennai(2009)
4. Doctor of Science, DSc (Honoris Causa) by University of Madras,(2009)
5. Fellow, International Astronautical Congress(FIAC)
6. Fellow Institution of Engineers, India(FIE)
7. Fellow Indian Remote Sensing Society(FIRSS)
8. Fellow, Shock wave Research, Indian Institute of Science(FSWR)
9. Fellow IETI, India(FIETI)
10. Eminent Scientist Award from 76th Indian Science Congress - Madurai Kamaraj University Endowment
11. Hikal Chemcon Distinguished Speaker Award 2010, the 63rd Annual Session of Indian Institute of Chemical Engineers, Annamalai University.
12. National Science and Technology Award, 2011, Sathyabama University, Chennai.
13. Distinguished Scientist Award, KC College, Mumbai, Diamond Jubilee Award
14. Distinguished Alumni Award, PSG College of Technology, 2009.
15. Jewel of GCT(Government College of Technology, Coimbatore) by GCT Alumni

16. Personality of the year Awarded by St. Johns International School, Chennai
17. SIES (South Indian Education Society) Sri Chandrasekharendra Saraswati National Eminence Award, 2009 for Science and Technology
18. Listed in the Dinamalar-Uninor Achiever of the year 2009,
19. Amara Bharathi National Eminence Award for Science and Technology, 2010
20. Sir CV Raman Award-2010 from Periyar University, Salem

Awards & Recognition from International bodies

1. Space Systems award, 2009 from American Institute of Aeronautics and Astronautics, US
2. Laurels for Team Achievement Chandrayaan-1, International Academy of Astronautics, 2013, Beijing China
3. Certificate of Appreciation from Boeing Asian - American professional Association, Houston, USA
4. Listed among 100 Global thinkers of 2014 and topped the innovators list, by Foreign Policy Magazine , USA
5. Chairman, Working Group of the Whole in UN Committee on Peaceful Use of Outer Space, since 2016
6. IEI-IEEE(USA) Engineering Excellence award 2016
7. IEEE- India Life Time Contribution Award, 2018

Awards From Professional Bodies & Societies

1. Vivekananda Award for Human Excellence by Rama Krishna Missions
2. National Aeronautical Award-2008 from Aeronautical Society of India
3. Fellow, Institution of Electronics and Telecommunication Engineering, (IETE)
4. Fellow, Indian Society for Remote Sensing (ISRS)
5. Fellow of The Society for shock wave research, Dept.of Aerospace Eng, Indian Institute of Science (IISc), Bangalore
6. NIQR Bajaj Award for "Outstanding Quality Man 2009"
7. H K Firodia awards, 2009 for Science and Technology
8. Dr Rajah Sir Muthiah Chettiar Birthday Commemoration Award for 2012.
9. Listed in the TNIE-Uninor Achiever of the year 2009,
10. Global Indian for Science, 2017 awarded by ICICI and Times Group
11. BHASKARA Award 2016 for outstanding Scientific Leadership, by Remote Sensing Society

12. Life Time Achievement Award 2017 in the field of science and technology by Union Bank of India, Mumbai
13. Karmaveerar Kamaraj Award, 2010 from Chennai Mhahajana sabha
14. "Tamil Maamani", Thiruppur Tamil Sangam
15. "Kongu Aciever award", NIA Charities
16. "Kalingarayar Award" , Kongu Charitable Trust, Tamilnadu
17. "Ariviyal Anna", Hubli Tamil Peravai, Karnataka
18. "Bharathi Award", Bharathi Tamil Sangam, Kolkatta
19. "Vinveli Tamilan", Sirpi Charitable Trust
20. MJFS, Rotary International, Coimbatore
21. Tamilan Award 2016, for Science and Technology by Puthia Thalaimur
22. Life time Achievement Award for promotion of Science 2017, Muthamizh Peravai
23. "Mars Man" by Indian Front Liners Association Kuwait – 2018
24. Life Time Achievement Award 2019, by Govt Higher Secondary School Alumni, Velandampalayam, Tamilnadu
25. Life Time Achievement Award, 2019 Rotary International, Pollachi, Tamilnadu