



Organised by
Department of Science, Technology & Waste Management,
Government of Goa.

The Government of Goa vide Department of Science, Technology & Waste Management organized a two-day event to honor the Hon'ble Ex-Chief Minister of the State of Goa, late. Shri. Manohar Parrikar. The event was held on 12th & 13th of December at the National Institute of Oceanography at Dona Paula.

Also Lecture Seminars and interactive sessions were held at four different location across the State on the 13th of December as part of enlightening school children across the State on Various Scientific topics:

- 1) Ravindra Bhavan, Margao
- 2) Govt. College of Arts & Commerce, Pernem
- 3) Ravindra Bhavan, Sanquelim
- 4) Govt. College of Arts, Science and Commerce, Quepem

Background:

The State of Goa, hosted a three-day successful event on Nobel Prize series in the year 2018 in collaboration with the Nobel Foundation, Sweden, Sweden Embassy in India, and Department of Bio-technology (DBT), Govt. of India. Four Nobel Laureates namely Dr. Christianne Nusslein-Volhard, Dr. Searge Haroche, Dr. Tomas Lindahl and Dr. Richard J Roberts participated in the event and interacted through lectures, panel and round table discussion with wide range of stakeholders including students. researches, academicians, industry and general public.

As part of this, a one-month exhibition on Nobel Prize series was also organized by Nobel Media Sweden AB along with DBT and Department of Science and Technology (DST), Govt. of Goa at the Kala Academy, Panaji. Information panels and working modules on scientific inventions by Nobel Laureates as well the life and scientific contribution of Indian scientists were displayed. The Department of Education, Directorate of Higher Education, Goa University and

various research and academic institution helped facilitate visitors to go through the exhibits. Daily special lectures on life of Indian Scientists was also organized as part of Exhibition. Around thirty thousand participants were benefitted.

The event was inaugurated by the then Chief Minister of Goa Late Shri. Manohar Parrikar, a scientific visionary who himself was a graduate from the Indian Institute of Technology (IIT), Mumbai. In his inaugural address, he opined that the Nobel Prize series is an excellent opportunity to meet and interact with scientific luminaries across the globe and learn from them and their research inventions. He announced in his inaugural speech, that Nobel series would be an annual feature in Goa and his government would support organize the same.

Honoring his commitment, and taking his scientific vision forward, the Government of Goa, decided to organize a two-day scientific event to commemorate his birth anniversary on the 13th of December, 2019 under the banner ‘Manohar Parrikar Vidnyan Mahotsav’. The event was managed through the Department of Science and Technology.

The event was proudly supported by the following organisations:

- 1) Directorate of Higher Education
- 2) Directorate of Education
- 3) Directorate of Technical Education
- 4) Department of Information and Publicity
- 5) Department of Protocol
- 6) Goa State Pollution Control Board
- 7) Goa State Innovation Council
- 8) Goa Waste Management Corporation
- 9) Goa Tourism Development Corporation
- 10) Centre for Environment Education

11) Goa University

12) VIBHA

The following organizations were also appointed as the Technical advisors for the event:

- 1) CSIR-National Institute of Oceanography
- 2) Indian Institute of Technology, Goa
- 3) Birla Institute of Technology & Science, Pilani-Goa Campus
- 4) National Institute of Technology, Goa

Various Corporate Houses came forward to partly support the event as was done in the year 2018. The event Associate Sponsors were as below:

- 1) SFC Environmental Technologies – Rs. 5 Lakhs
- 2) Deccan Fine Chemicals India Pvt. Ltd. – Rs. 5 Lakhs
- 3) Dempo Industries Ltd. – Rs. 3 Lakhs
- 4) V. M. Salgaocar & Bro. Pvt. Ltd. – Rs. 3 Lakhs
- 5) Cipla Limited – Rs. 1 Lakh

To ensure that the event was organized and convened smoothly an executive committee was constituted under the Chairmanship of Shri. Jose Manuel Noronha, Chairman Goa Public Service Commission and Goa State Innovation Council, with Shri. Prasad Lolyekar, Director, Higher Education as the Nodal Officer and Shri Levinson J. Martins, Director, Science & Technology as the Member Convenor. A subcommittee was also constituted to advise the Chairman on selection and finalization of event. This subcommittee comprised of Directors from NIO, IIT- Goa, NIT-Goa and Director BITS Pilani-Goa Campus.

However, to further streamline the implementation/decision of Executive Committee a task force was constituted in order to accomplish this time bound

task for the said event and assist the Director, Department of Science & Technology in smooth conduct of this event. The Order for the Executive committee along with the order for the Secretariat/Task force for the Manohar Parrikar Vidnyan Mahotsav 2019 has been Annexed below.

A team of Liaising officers from NIO, Dona Paula were assigned to each of the guest speakers as follows:

Sr. No.	Name of the Scientist	Respective Liaising Officer
1	Dr. Ranganath Navalgund	Dr. Sushant Naik
2	Dr. S K Tandon	Dr. Prakesh Mehera
3	Dr. J Srinivasan	Dr. Sundaresh
4	Dr. Shailesh Nayak	Dr. Manguesh Gauns
5	Dr. Ashok Misra	Dr. Suneel Vasimala
6	Dr. VijayRaghavan	Dr. Pawan Devagan
7	Dr. Prajval Shastri	Dr. Sourav Mandal
8	Prof. Annapurni Subramaniam	Dr. C. Ravindran
9	Dr. Dorje Angchuk	Dr. Jagdeesh Patil
10	Dr. Ajay Kumar Sood	Dr. R. Madhan

Event Details:

Day One:

The Two-day event was set into motion with the inaugural session on 12th December 2019 at 3:30pm in the Auditorium of the National Institute of Oceanography, Dona Paula. The Esteemed guests and speakers for this event along with their respective Liaising officers were welcomed into the Auditorium at 3:15pm. The Hon'ble Chief Minister of the State, Shri. Pramod Sawant, the Hon'ble Minister for Science, Technology and Waste Management, Shri. Michael Lobo and the Hon'ble Chief Secretary of the State, Shri. Parimal Rai arrived at the Venue and were warmly welcomed into the auditorium.

The esteemed Guests were cordially escorted to their designated seats in the Auditorium. Upon taking their respective places the event was set rolling with a Konkani welcome song performed by members of the Goa Art & Culture Department. After this soothing and warm song from the vocal group it was time for the welcome speech by the Hon'ble Minister for Science, Technology and Waste Management, Shri. Michael Lobo. He extended his warm welcome to all the dignitaries in the auditorium and specially thanked the esteemed Speakers for making the effort to come to Goa to be part of this Scientific event and inspire our young minds towards greatness. He also expressed the significance of this event and wished his very best for the events to follow.

Shri. Jose Maneul Noronha, Chairman Goa Public Service Commission and Goa State Innovation Council and also the Chairman of the executive committee followed the welcome speech with a brief address note about the Manohar Parrikar Vidnyan Mahotsav. He spoke about the Charismatic and visionary personality of late Shri. Manohar Parrikar, Hon'ble Ex-Chief Minister. He also elaborated on how Manohar Parrikar Vidnyan Mahotsav was envisaged and that

it was being organized in honor of Late Shri. Manohar Parrikar. He also stated how this event will be a regular fixture and expressed his gratitude to the Technical Advisors of this event in helping to identify Speakers, Technocrats who would participate in the event and deliver meaningful, scientific and quality talks to the young minds of the State.

This was followed by the lighting of the Lamp to mark the auspicious beginning of a new journey in memory of the Hon'ble Ex-CM towards a bright and intelligent future of the State. The dignitaries such as Hon'ble Minister for Science, Technology and Waste Management, Hon'ble Chief Secretary & Padmashri Dr. K VijayRaghavan to name a few joined the Hon'ble CM in lighting of the Lamp.



Lamp lighting ceremony

Following the Lighting of the Lamp Padmashri Dr. K VijayRaghavan delivered an enlightening Speech regarding the event and also commemorated the event on Nobel Prize series in the year 2018 in collaboration with the Nobel Foundation, Sweden, Sweden Embassy in India, and Department of Bio-technology (DBT),

Govt. of India. He also expressed his gratitude in being part of a scientific event of this caliber and appreciated the efforts taken by all to honor the Hon'ble Ex-CM of Goa.



Signing of MoU

This Enlightening speech also paved the way for the Signing of the two MoUs between Govt. of Goa, Director General, CSIR and the other with Govt. of Goa and Principal Scientific Advisor to the Govt. of India shall be signed aiming to stimulate an innovative and scientific thinking by bringing together eminent Indian and International scientists including Nobel Laureates so as offer exclusive opportunity for various stakeholders such as students, teachers, opinion makers, policy makers, researchers, scientist and general public to interact and learn from these scientists. The partner institutions shall support in identifying and inviting eminent scientists/Nobel Laureates and organizing this annual event.



The Hon'ble Chief Minister, Shri. Pramod Sawant then gladly occupied the podium to deliver the Inaugural speech of the session. He again stressed on how this event was important to honor the visionary Hon'ble Ex-CM and expressed how events like so allowed a platform for Great minds, Intellectuals and Technocrats to come forward and share their knowledge and wisdom and encourage aspiring students to achieve more in the Scientific field. He also

expressed his gratitude to the efforts put by various official to organize this fruitful event and urged the young minds of the state to take full advantage of such events in order to gain innate scientific knowledge. He concluded his Inaugural speech by wishing his very best to the success of this event and also hoped that students and teachers alike would benefit from this event being a regular fixture for the State.

At 4:15 pm Padmashri Prof. Ajay Kumar Sood, was welcomed on to the Stage to present a lecture on Nature Inspired Science: Why do we Flock together?

Padmashri Prof. Ajay Kumar Sood, FRS, President, Indian National Science Academy. FRS is Year of Science Chair Professor in Department of Physics at Indian Institute of Science, Bangalore. He is currently the President of the Indian National Science Academy. He was the President of the Indian Academy of Sciences from 2010 to 2012 and the Secretary General of the World Academy of Sciences (TWAS) from 2013 to 2018. Currently, he is a member of the Science, Technology and Innovation Advisory Council of the Prime Minister of India. Prof. Sood's research interests include Physics of Nano systems such as graphene and other 2D materials and soft condensed matter, with a strong focus on innovative experiments. He has published more than 400 papers in international journals and holds a few national and International patents. His work has been recognized by way of many honors and awards. These include the Fellowship of the Royal Society (FRS), all the three science academies of India and TWAS; the civilian honor, Padmashri by Government of India, S.S. Bhatnagar Prize, G.D. Birla Award, TWAS Prize in Physics, FICCI Prize, Goyal Prize, M.N. Saha Award and Millennium Gold Medal of Indian Science Congress, Sir C.V. Raman Award of UGC, Homi Bhabha Medal of Indian National Science Academy, DAE Raja Ramanna Award of JNCASR, National Award in Nanoscience and Nanotechnology by Government of India, Nano Award by Government of Karnataka, G.M. Modi Award of Science, R D Birla

Award for Excellence in Physics by Indian Physics Association and Had Om Ashram Senior Scientist Award. He is Associate Editor of ACS Nano and Executive Editor of Solid-State Communications.

Prof. Ajay Kumar Sood delivered a presentation on the topic: *Nature Inspired Science: Why do we Flock together?*

Where he spoke about how nature inspires us to explore fascinating phenomena such as Flocking in a Laboratory. He further explained that, Flocks of birds flying every morning and evening or of ants crawling in one direction are a common sight. Flocking, a self-organized motion of vast numbers of individuals of same species in a common direction is a common behavior in many animals like ants, locusts, birds, fishes etc. he elaborated how as physicists, they have tried to understand flocking behavior by working with inanimate asymmetric brass rods made active by placing them on rapidly vibrating surface amongst spherical beads. He then also presented their recent studies on how to separate active particles of same size but with different activities. He further stated how these experiments will bring out novel emerging issues in systems out of equilibrium, spanning different disciplines of science.

The end of this presentation was marked by a Question & answer session, in which Prof. Ajay Kumar Sood brilliantly provided solutions to queries lined by the students and teachers from various institutions.

Day 1 of the event was concluded by offering the Memento to our esteemed speaker for the day Prof. Ajay Kumar Sood followed by a vote of thanks and high tea. And the respective speaker was gratefully bid farewell to and all guests were carefully escorted to their respective hotels by their respective Liaising Officers

Day Two:

The day two of the event was conducted in 5 different locations across the State so as to increase the reach and benefit students and teachers across the State. The 5 selected Venues were as follows:

- 1) Ravindra Bhavan, Margao
- 2) Govt. College of Arts & Commerce, Pernem
- 3) Ravindra Bhavan, Sanquelim
- 4) Govt. College of Arts, Science and Commerce, Quepem
- 5) National Institute of Oceanography, Dona Paula

Ravindra Bhavan, Margao:

Ravindra Bhavan, Margao was chosen as one of the Venues for presentation by Dr. Shailesh Nayak.

All students and teachers from various institutions were welcomed and asked to register themselves on the counter, they were supplied with a note pad and pen to jot down and assigned their places in the audience. The esteemed guests and resource person arrived at the venue at 10:00 am. The speaker was warmly welcomed on to the stage with flowers, post a welcome speech for the gathering. Dr Shailesh Nayak, Director, National Institute of Advanced Studies, Bengaluru; is the Director of the National Institute of Advanced Studies, Bengaluru and Chancellor of the TERI School of Advanced Studies. He obtained PhD degree in Geology from the M.S University of Baroda in 1980. He was ‘Distinguished Scientist’ in the Ministry of Earth Sciences and President, International Geological Congress during 2015-2017. He was the Secretary, Ministry of Earth Sciences, Government of India, during August 2008-2015, and provided leadership for programs related to earth system sciences. He has been credited with launching many research programs related to monsoon, air-sea interaction, changing water cycle, atmospheric chemistry, coastal vulnerability, climate

services, polar science, etc. with US, UK, Germany, Japan, Australia, Norway, South Korea. He had set up HPC system having 1 .1 Peta flops capacity for weather and climate research and operations. He had restructured meteorological activities in the country and thus improved weather and hazard related services.

He had set up the state-of-the-art tsunami warning system for the Indian Ocean in 2007 in just two years' time, and providing tsunami advisories to the Indian Ocean rim countries. He pioneered in development of algorithms and methodologies for application of remote sensing to coastal and marine environment, and generated baseline database of the Indian coast, and developed services for fishery and ocean state forecast. The generation of detailed information on the Indian coast has influenced the development of policy for zoning of coastal zone for regulating coastal activities.

He is Fellow of the Indian Academy of Sciences, Bengaluru and the National Academy of Sciences, India, Allahabad. He has been awarded Honorary Degree of Doctor of Science by the Andhra University in 2011, Assam University in 2013 and Amity University in 2015. He was conferred the prestigious ISC Vikram Sarabhai Memorial Award 2012, Bhaskara Award for 2009, Fellowship of the International Society of Photogrammetry & Remote Sensing (ISPRS) and Academician of the International Academy of Astronautics (IAA) for his outstanding contributions in remote sensing and GIS. He has published about 160 papers in peer- reviewed journals.



Venue: Ravindra Bhavan, Margao

The title of his Presentation was: *An Indian perspective of Blue Economy*.

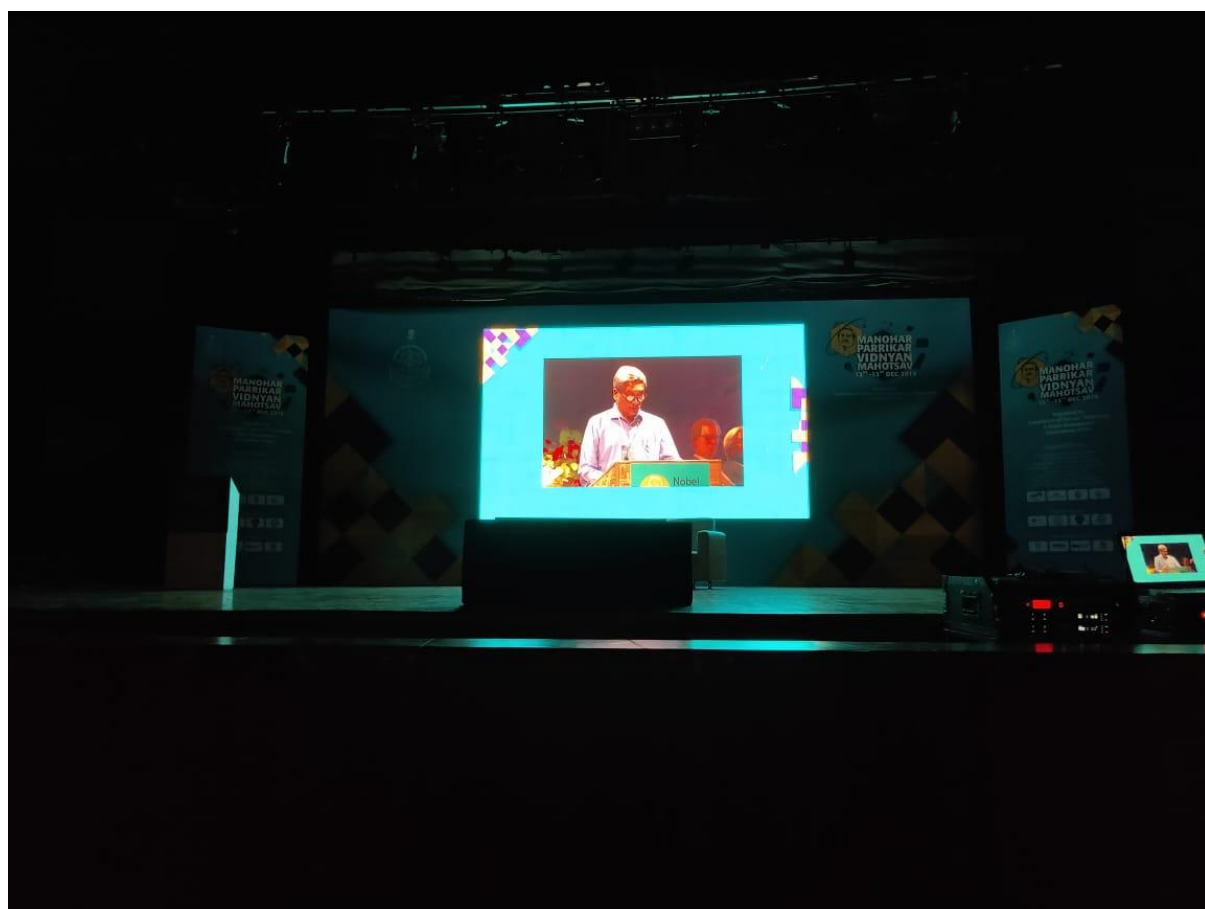
He spoke about the Oceans and how they provide us with energy, food and mineral resources and control weather, climate and hazards as well as an ecosystem to survive. He also stressed on the significance of oceans and stated that the focus has shifted to oceans in this century for sustaining our prosperity and life. He further explained his use of the term 'Blue Economy ' and mentioned that it was coined to address issues related to climate change without affecting our growth. He elaborated how the Blue Economy is essentially an ocean dependent economic development for improving quality of life of people while ensuring inclusive social development as well as environmental and ecological security. He also briefly explained the major components of the Blue economy:

- i. Sustainable use of living resources.
- ii. Exploration and utilization of minerals, hydrocarbons and develop Renewable Energy resources.
- iii. Development of Deep Ocean Technologies for harnessing resources.
- iv. Development of Shipping and ports for facilitate trade.
- v. To encourage Eco-friendly tourism along the coast.

- vi. Assessment of hazards and response mechanism (cyclone, tsunami, sea level rise, coastal erosion, etc.)

This concluded his lecture and it was followed by a Q & A session in which Dr. Shailesh Nayak resolved few queries raised by students in an interactive fashion.

This was followed by a Presentation from the next guest speaker Dr. Ashok Mishra, who was warmly welcomed to the stage.



Montage on Late Shri. Manohar Parrikar, Ex-CM

Dr. Ashok Misra, Professor, Indian Institute of Science, Bengaluru is currently NASI Distinguished Professor at the Indian Institute of Science, Bangalore. Earlier he was Director IIT Bombay, Chairman-India Intellectual Ventures at IIT Delhi and at Monsanto Chemical Co. He obtained his B.Tech. from IIT Kanpur and Ph.D. from the University of Massachusetts. He is a Director on the Boards of Jubilant Life Sciences Ltd., Jubilant Pharma Ltd., Kirloskar Electric Company

Ltd. and Higher Education Financing Agency. Earlier he has been on the Boards of Reliance Industries Ltd., National Thermal Power Corporation and Rashtriya Chemicals & Fertilizers Ltd. He has held several responsibilities with Ministry of Human Resource Development, Government of India, including Chairman of the Standing Committee of the IIT Council. He is a Fellow of National Academy of Sciences India and was its President from 2006-08, a Fellow of the Indian National Academy of Engineering, Founder President of the Polymer Processing Academy, Founder President of IT Alumni Centre, Bengaluru. He has received several awards. He has co-authored a book, has 8 patents and over 182 international publications

The title of his Presentation: *Excitement in Science & Technology through Innovation*

He began his presentation by talking about the fact that Institutions involved in teaching and learning of Science and Technology should encourage creativity, innovation and the development of new ideas through their programmes and that these institutions should establish processes for developing high quality students by involving them in research alongside the teaching and encourage the development of new knowledge. He spoke about both basic and applied research in science and technology, he explained how they are important for developing novel products and processes for the well-being of mankind at large.

He stressed that current times are rapidly shifting towards the knowledge economy and this by its nature is global because knowledge is shared internationally and that the advances in science and technology are increasingly based on creativity and innovations. He shared that those involved in the study of science and technology are well placed for the excitement provided through

understanding of basic principles and then applying them for creating innovations. He further stated that a logical follow up to this is the development of technology business incubators and new enterprises. He went on to say that Entrepreneurship provides the excitement of converting ideas into products and processes which benefit all human beings. He finally mentioned that Countries around the globe stand to benefit when new knowledge and ideas are shared internationally. This concluded his lecture and it was followed by a Q & A session in which Dr. Shailesh Nayak resolved few queries raised by students in an interactive fashion.

The Guest Speakers were presented with a memento as a token of appreciation for their dedication towards enlightening young minds and also taking the effort to make the event a success. This prompted the delivery of vote of thanks and also marked the conclusion of the session at Ravindra Bhavan, Margao. The event was concluded with joint lunch session for all the guests, organizing team & participants alike. The guests were then dropped off to the hotel by their respective Liaising officers.

Govt. College of Arts & Commerce, Pernem:

Govt. College of Arts & Commerce, Pernem was chosen as one of the Venues for presentation by Dr. Ranganath Navalgund.

All students and teachers from various institutions were welcomed and asked to register themselves on the counter, they were supplied with a note pad and pen to jot down and assigned their places in the audience. The esteemed guests and resource person arrived at the venue at 10:00 am. The speaker was warmly welcomed on to the stage with flowers, post a welcome speech for the gathering. Dr. Ranganath Navalgund, Former Vikram Sarabhai Distinguished Professor, ISRO, after obtaining his doctorate degree in Physics from the Tata Institute of Fundamental Research, Bombay, joined the Space Applications Centre of the

Indian Space Research Organization at Ahmedabad in 1977 and served it in different capacities for the last forty years. His major scientific contributions are in the broad area of remote sensing systems(satellites), science and applications.



Dr. Ranganath Navalgund Being welcomed on to the stage

As Director of the National Remote Sensing Centre (2001-2005) and the Space Applications Centre (2005-2012), the two major centers of ISRO, he has provided exemplary scientific leadership and over seen development of electro-optical and microwave sensors flown on Indian earth observation and planetary science missions(satellites), and communication and navigation payloads flown on board Indian satellites and development of associated ground segment. He has represented ISRO/India in many multilateral international forums such as UN-Committee on Peaceful Uses of Outer Space (COPUOS), Group on Earth Observation (GEO), Committee on Earth Observation Systems (CEOS) and has interfaced with several space agencies of major space faring nations including

US, France, China and many others in a leadership role. He was the President of the International Society for Photogrammetry and Remote Sensing Technical Commission VI 1 (2000-2004).

He is an Academician of the International Academy of Astronautics and a Fellow of the Indian Academy of Sciences. He is the recipient of Aryabhata award of the Astronautical Society of India, Outstanding Achievement award of ISRO, Bhaskara award of the Indian Society of Remote Sensing, Maharana Udaisingh Award for Environment 2009, instituted by the Maharana of Mewar Foundation, Udaipur, Technical Excellence award of the Tata Institute of Fundamental Research, Bombay, besides many others.



Dr. Ranganath Navalgund delivering presentation on Indian Space Programme

The Title of his Presentation was, *Indian Space Programme: Achievements and Challenges*.

He spoke about the Indian Space Programme, and how since its inception has aimed at indigenous development of different elements of space technology, and to harness it for national development, while pursuing space science research and planetary exploration. He stated that it made a modest beginning in the 1960s

with the launch of sounding rockets from Thumba, a fishing hamlet on Kerala coast and today it has grown into one of the very few successful space faring countries in the world he also stated that over the years, it has built and successfully launched polar and geosynchronous satellite launch vehicles which can carry very heavy satellites into space.



Venue: Govt. College of Arts & Commerce, Pernem

He further mentioned, it has not only mastered the development of solid propulsion and earth storable liquid engines, but also the more complex cryogenic engines and along with this it has built a modern spaceport with two well equipped launch pads and it has successfully designed, built and launched many state-of the art communication, remote sensing and global navigation satellites providing many socially relevant application services in the field of tele medicine, tele education, data connectivity, development communication, natural resources survey and monitoring, disaster monitoring and mitigation, improved weather forecasting, ocean state forecasts, and location specific services to the country. He also proudly expressed that the Chandrayaan I and 2, Mars Orbiter Mission and Astrosat have been path breaking space science missions and also Space capsule recovery experiment has been successfully undertaken and many new

missions including Aditya to study the Sun's corona is underway to facilitate further space exploration. He also explained some of the challenges faced throughout the above-mentioned studies and missions, and furthermore explained how more advanced communication and remote sensing satellites are planned to enhance services and observation capabilities.

This concluded his lecture and it was followed by a Q & A session in which Dr. Shailesh Nayak resolved few queries raised by students in an interactive fashion. The Guest Speaker was presented with a memento as a token of appreciation for their dedication towards enlightening young minds and also taking the effort to make the event a success. This prompted the delivery of vote of thanks and also marked the conclusion of the session at the Govt. College of Arts & Commerce, Pernem. The event was concluded with joint lunch session for all the guests, organizing team & participants alike. The guest was then dropped off to the hotel by his respective Liaising officer.

Ravindra Bhavan, Sanquelim:

Ravindra Bhavan, Sanquelim was chosen as one of the Venues for presentation by Dr. J. Srinivasan.

All students and teachers from various institutions were welcomed and asked to register themselves on the counter, they were supplied with a note pad and pen to jot down and assigned their places in the audience. The esteemed guests and resource person arrived at the venue at 10:00 am. The speaker was warmly welcomed on to the stage with flowers, post a welcome speech for the gathering.

Dr. J. Srinivasan, Professor, Divecha Centre for Climate Change, Indian Institute of Science, Bengaluru created the Divecha Centre for Climate Change at Indian

Institute of Science, Bangalore in 2009. He obtained B. Tech from IIT, Madras, M.S. from State University of New York and PhD from Stanford University. He was the Chairman of Centre for Atmospheric and Oceanic Sciences from 1997-2005 and Chairman, Mechanical Sciences Division from 2005-2009 at Indian Institute of Science.

He was Senior Resident Research Associate at NASA, Langley from 1993-1995. He was a lead author of the 2nd and 4th IPCC reports on Climate change and a review editor of 3rd IPCC report on Climate Change. He was the principal investigator of the Indo-French satellite mission Megha-Tropiques which was launched in October 2011. He has published more than 125 research papers in climate and thermal sciences. He is the fellow of the Indian Academy of Sciences, Indian National Science Academy, Indian National Academy of Engineering, & the World Academy of Art and Science. He was a "J. C. Bose National Research Fellow" during 2007-2012. He received the life time achievement award of the Ministry of Earth Sciences in 2019.



Dr. J. Srinivasan being welcomed at Ravindra Bhavan, Sanquelim.

The Title of his Presentation: *What really drives the monsoon?*

He began by talking about how Monsoon has been assumed to be driven by the contrast in surface temperature between land and ocean and stated that this assumption is wrong because after the onset of the monsoon the surface temperature of land is lower than that of the ocean. He went on to explain that Monsoon occurs in regions where the total amount of solar energy added to a vertical column of atmosphere is sufficient to lift moist air from the ground to a height where the water vapor can condense and drive the monsoon circulation. He expressed that the advent of large and powerful computers has improved the forecast of monsoon rainfall a week in advance but still the prediction of the seasonal mean rainfall is difficult since the conditions in the surface of the ocean can change substantially over several weeks. He also explained how the impact of air pollution on the monsoon has been difficult because some aerosols cool the atmosphere while others heat the atmosphere. The impact of climate change on the Indian monsoon was also highlighted by Dr. J. Srinivasan.



Dr. J. Srinivasan interacting with the students

This concluded his lecture and it was followed by a Q & A session in which Dr. Shailesh Nayak resolved few queries raised by students in an interactive fashion. The Guest Speaker was presented with a memento as a token of appreciation for their dedication towards enlightening young minds and also taking the effort to make the event a success.



The guest being given a token of appreciation

This prompted the delivery of vote of thanks and also marked the conclusion of the session at the Ravindra Bhavan, Sanquelim. The event was concluded with joint lunch session for all the guests, organizing team & participants alike. The guest was then dropped off to the hotel by his respective Liaising officer.

Govt. College of Arts, Science and Commerce, Quepem:

Govt. College of Arts, Science and Commerce, Quepem was chosen as one of the Venues for presentation by Dr. S K Tandon.



Venue: Govt. College of Arts, Science and Commerce, Quepem

All students and teachers from various institutions were welcomed and asked to register themselves on the counter, they were supplied with a note pad and pen to jot down and assigned their places in the audience. The esteemed guests and resource person arrived at the venue at 10:00 am. The speaker was warmly welcomed on to the stage with flowers, post a welcome speech for the gathering. Dr. S K Tandon, Professor, Department of Earth and Environmental Sciences, IISER, Bhopal Prof. Sampat Kumar Tandon, currently Visiting Professor in the Department of Earth and Environmental Sciences, IISER, Bhopal, formerly Sir JC Bose Chair Professor IISER Bhopal 2016, D N Wadia Chair Professor at the IIT, Kanpur 20132015 and Pro-Vice Chancellor, University of Delhi is an eminent geoscientist who has pursued an active career for almost five decades

spanning teaching, research, scientific management, and the advancement of higher education. He received his early education in geosciences at Panjab University, Chandigarh between 1961 and 1966, and obtained the Ph.D. degree from the University of Delhi in 1972. He has served as the faculty of IIT, Delhi (1966-68) as well as the University of Delhi 1976-2010. He has held scientific positions in the Wadia Institute of Himalayan Geology (WIHG) between 1971 and 1976.

As a researcher in the field of Geosciences, Prof. Tandon's interests lie in the fields of Physical Stratigraphy, Sedimentology, Quaternary Geology and Paleoclimate, and River Science. He emphasizes the integration of Earth Science disciplines and encourages inter-, multi- and trans-disciplinary approaches. He has contributed notably to the understanding of the Himalayan foreland and to the Cretaceous paleogeography of Central India. Apart from these research endeavors, Professor Tandon, his students and co-workers have addressed the question of how small and large river systems respond to Late Quaternary climatic changes, particularly the latter. He has more than a hundred and thirty-five publications to his credit.



Dr. S K Tandon being welcomed onto the stage

Title of Presentation: *The Anthropocene concept: Human disturbance of Earth Systems*

He began by explaining that in the new millennium, the concept of the Anthropocene has not only engaged the minds of scientists, social scientists, and philosophers but has entered the consciousness of writers, artists, and poets. It has become pervasive to our way of thinking about the contemporary environment at all scales, and includes the complex issues of climate change, global biodiversity, accelerated melting of the cryosphere and the associated sea level rise, ocean acidification, marine pollution, amongst others.

He then explained What is the Anthropocene? He stated that there are simple answers to this question by speaking about what does it mean different things to different communities? He briefed that the human enterprise with a current population approaching 7.5 billion people and a projected population of 9 billion people by the middle of this century, and its endless quest for increased water, food, and energy resources, has impacted the material and energy flows of the natural world in the past, and will continue to do so in the future. He elaborated that such human interactions with the planet disturb the natural planetary machinery, and involve perturbations in the material and energy flows, giving an example of the greenhouse gases. He went on to say such disturbances in natural flows has led scientists to the notion of tipping points, i.e. crossing of thresholds where the sub-systems of the planet may change into another state irreversibly on short time scales. He mentioned how this approach has led to the identification of Earth's tipping elements, and the idea of safe operating space and planetary boundaries within which humans have to learn to survive.

He also presented a summary of the idea of the Anthropocene as it has developed over the last two decades, and a narrative of the journey of the planet and its sub-systems through the last 12000 years- indeed a story of the Earth as it was dominated by natural material and energy flows for nearly all of these millennia before these were disturbed by the collective human enterprise, particularly so in approximately the last two centuries. This concluded his lecture and it was followed by a Q & A session in which Dr. Shailesh Nayak resolved few queries raised by students in an interactive fashion.

The Guest Speaker was presented with a memento as a token of appreciation for their dedication towards enlightening young minds and also taking the effort to make the event a success. This prompted the delivery of vote of thanks and also marked the conclusion of the session at the Govt. College of Arts, Science and Commerce, Quepem. The event was concluded with joint lunch session for all the guests, organizing team & participants alike. The guest was then dropped off to the hotel by his respective Liaising officer.

NIO, Dona Paula:

NIO, Dona Paula was chosen as one of the Venues for a Panel Discussion chaired by Principal Scientific Adviser, Government of India, Dr. Vijay Raghavan.



Venue: NIO, Dona Paula

The Principal Scientific Adviser to Government of India, Padmashri Dr. Krishnaswamy VijayRaghavan, succeeded Dr. R. Chidambaram as the Principal Scientific Adviser to the Government of India on April 13, 2018. Earlier, he served as the Secretary, Department of Biotechnology (DBT), Government of India, during January, 2013 to January, 2018. Till then, he was the Director of the National Centre for Biological Sciences, Bengaluru, where he continues as a Distinguished Professor. Born on 3rd February 1954, Prof. VijayRaghavan graduated with a Bachelor of Technology degree in Chemical Engineering from IIT Kanpur in 1975. He completed his doctoral work in 1983 in the field of Molecular Biology and holds a PhD from the Tata Institute of Fundamental Research. During his post-doctoral work, he worked as a Research Fellow from 1984 to 1985 and then, as a Senior Research Fellow-/from 1986 to 1988. At the California Institute of Technology. In 1988, he joined the Tata Institute of Fundamental Research as a reader. He was instrumental in establishing the National Centre for Biological Sciences (NCBS), Bengaluru, under the aegis of Tata Institute of Fundamental Research (TIFR) and moved over to NCBS in 1992. His fields of specialization are developmental biology, genetics and

neurogenetics. His research primarily focuses on the important principles and mechanisms that control the nervous system and muscles during development, and how these neuromuscular systems direct specific locomotor behaviors. This was achieved using the fruit fly- *Drosophila Melanogaster* as a model system. By patterning the segmental organization of the fly body plan, his research was able to shed more light on the functions of Hox genes in directing neuromuscular connectivity and motor behaviors. Currently, he is on the management board of the International Centre for Theoretical Sciences (ICTS) of TIFR and of the TIFR Centre for Interdisciplinary Sciences, in Hyderabad. Vijay Raghavan is also a director of the Centre for Cellular and Molecular Platforms. He is a member of the board of governors of the Okinawa Institute of Science and Technology, and the advisory committee of Janelia Farm Research Centre of the HHMI, and a senior editor of the journal *Life*. In January, 2013, he was conferred the honor of the Padma Shri. He is also a recipient of the Infosys Prize in the life sciences category in 2009.

The Topic of the Panel Discussion: *The Wonder of Astronomy*

The Panelists comprised of:

- 1) Dr. Vijay Raghavan Principal Scientific Adviser, Government of India
- 2) Dr. Prajval Shastri Senior Associate, ICTS-Tata Institute of Fundamental Research, India
- 3) Prof. Annapurni Subramaniam Director, Indian Institute of Astrophysics, Bengaluru
- 4) Dr. Dorje Angchuk Engineer-in-Charge IAO, Hanle, IIA



Dr. Vijay Raghavan commencing the panel discussion

Dr. Vijay Raghavan opened the Panel discussion and gave a 30-minute window for each Panelist to speak on a topic related to astronomy. Each panelist gave a brief but enlightening presentation on their respective topics which was then succeeded by an interactive Q&A session among the esteemed Guests and the Audience. The event was concluded and The Guest Speakers were presented with a memento as a token of appreciation for their dedication towards enlightening young minds and also taking the effort to make the event a success. This prompted the delivery of vote of thanks and also marked the conclusion of the session at the NIO, Dona Paula. The event was concluded with joint lunch session for all the guests, organizing team & participants alike. The guests were then dropped off to the hotel by his respective Liaising officer.





Organising team

This Marked the successful conclusion to the Manohar Parrikar Vidnyan Mahotsav.

Thank you

Annexure



Government of Goa

Department of Science, and Technology
1st Floor, Pandit Deendayal Upadhyay Bhavan,
Behind Pundalik Devasthan, Near Sanjay School,
Porvorim, Bardez Goa
Phone Nos.: 0832-2416581 / 2416583 / 2416584
e-mail: dir-ste.goa@nic.in

No: 6-238-2017/STE-DIR/Part/ 432

Dated: 04 /09/2019

ORDER

Department of Science & Technology, Government of Goa is organizing the “Manohar Parrikar Vidnyan Mahotsav” with a theme - Science for Vibrant Society; A dialogue with Scientists. which is scheduled to be held on 13th and 14th December 2019. To organize this event an executive committee is constituted as under :

- | | |
|--|-----------------|
| 1. Mr. Jose Manuel Noronha, Chairman GPSC and Goa State Innovation Council | Chairman |
| 2. Mr. Prasad Lolayekar, Director, Higher Education | Nodal Officer |
| 3. Director, National Institute of Oceanography | Member |
| 4. Mr. Nikhil Dessai, MD GTDC | Member |
| 5. Ms. Vandana Rao, IAS, Director Education | Member |
| 6. Prof. M. K. Janarthanam, Professor, Goa University | Member |
| 7. Prof. Suhas Ghodse, President, Goa Vidnyan Parishad | Member |
| 8. Mr. Gurudas Pilenkar, Director Dept. of Art and Culture | Member |
| 9. Mrs. Meghna Shetgaonkar, Director Dept. of Publicity | Member |
| 10. Mr. Sunil Masurkar, Addl. Secretary, Finance | Member |
| 11. Mr. Sujeetkumar Dongre, Scientist, Centre for Environment Education (CEE) | Member |
| 12. Mr. Sanjeev Joglekar, OSD, DSTE and EE GSPCB | Member |
| 13. Mr. Dominic Fernandes, OSD, DSTE and GM GWMC | Member |
| 14. Dr Dipak Gaitonde, Directorate of Technical Education | Member |
| 15. Smt. Sangeeta Naik, Dy Chief Electoral Officer, Office of the Chief Electoral office, Altinho Panaji Goa | Member |
| 16. Mr. Levinson Martins, Director , Science and Technology | Member Convenor |

The executive committee shall be responsible to oversee and conduct the event and shall have all powers to take decisions in respect to matters concerning administration and finance besides in finalization of scientists/ nobel lauretes.. The decisions taken with respect to finance shall be subject to approval of the State Government. The detailed expenditure besides programme towards the event will be worked out by the

executive committee. The executive committee is also empowered to take sponsorships from various private entities including industries to meet part expenses of this event.

The Chairman shall have power to invite/co-opt officials in the executive committee and requisition staff, vehicles and seek other logistical support from state government departments, corporations and agencies. The chairman shall also have powers to nominate officials to travel to invite Nobel Laureates/Scientists for the event and to constitute sub-committees for various purposes.

This issues with the approval of the Government vide U.O. No 3540/F dated 29/08/2019

Yours faithfully



(Levinson J. Martins)

**Director (S&T) & Ex-Officio
Jt. Secretary to Government**

Copy to:

1. Mr. Jose Manuel Noronha, Chairman GPSC and Goa State Innovation Council
2. Mr. Prasad Lolayekar, Director, Higher Education
3. Director, National Institute of Oceanography
4. Mr. Nikhil Dessai, MD GTDC
5. Ms. Vandana Rao, IAS, Director Education
6. Prof. M. K. Janarthanam, Professor, Goa University
7. Prof. Suhas Ghodse, President, Goa Vidnyan Parishad
8. Mr. Gurudas Pilenkar, Director Dept. of Art and Culture
9. Mrs. Meghna Shetgaonkar, Director Dept. of Publicity
10. Mr. Sunil Masurkar, Addl. Secretary, Finance
11. Mr. Sujeetkumar Dongre, Scientist, Centre for Environment Education (CEE)
12. Mr. Sanjeev Joglekar, OSD, DSTE and EE GSPCB
13. Mr. Dominic Fernandes, OSD, DSTE and GM GWMC
14. Dr Dipak Gaitonde, Directorate of Technical Education
15. Smt. Sangeeta Naik, Dy Chief Electoral Officer, Office of the Chief Electoral office, Altinho Panaji Goa

Copy for information to:-

1. O.S.D. to Hon'ble Chief Minister, Secretariat, Porvorim Goa.
2. O.S.D. to Hon'ble Minister for Science and Technology, Secretariat, Porvorim Goa
3. The Jt. Secretary to Chief Secretary, Government of Goa, Secretariat, Porvorim Goa.
4. P.A. to Pr. Secretary (S&T), Secretariat, Porvorim Goa.
5. The CEO, O/o the Chief Electoral Officer, Altinho, Panaji Goa.
6. Order File
7. Guard File
8. Office Copy



Government of Goa
Department of Science & Technology
Pandit Deendayal Upadhyay Bhavan, Near Pundalik Devasthan,
Pundalik Nagar, Alto - Porvorim, Goa - 403521
Phone Nos.: 0832-2416584

e-mail: dir-ste.goa@nic.in

No.6-238-2018/DIR-STE/PART/-708

Dated: 2/12/2019

ORDER

Sub:- Constitution of the Secretariat/task force for the "Manohar Parrikar Vidnyan Mahotsav 2019"

The Government of Goa has decided to organize a scientific event "Manohar Parrikar Vidnyan Mahotsav 2019" in Goa from 12th - 13th December, 2019 to commemorate the birthday of scientific visionary and Ex-Chief Minister of the State Shri Manohar Parrikar.

In order to organise the event successfully Government has already constituted an Executive Committee. However to further streamline the implementation /decision of Executive Committee a task force has been constituted with the following task force/secretariat in order to accomplish this time bound task for the said event comprising of the following officials:-

1. Shri Brijesh Manerkar, Registrar, Registrar of Co-operative Societies --- **Venue Incharge National Institute of Oceanography.**
2. Smt. Sangeeta Naik, Dy. Chief Electoral Officer, Altinho, Panaji - Goa --- **Event Coordinator.**
3. Shri Ajay Gaude, Dy. Collector & SDO-I, Salcete --- **Venue Incharge Ravindra Bhavan, Margao**
4. Nikhil Caeiro, Assistant Manager, GWMC
5. Tanvi Desai, Assistant Manager, GWMC
6. Siddhant Desai - Trainee, GWMC
7. Rohan Ghadi - Trainee, GWMC
8. Shoukhan Teli, Traine, GWMC
9. Gajanan Kamat, Trainee, GWMC
10. Yeshwant Gawas, LDC - Department of Environment
11. Jagannath Gaonkar, LDC - Department of Environment

The Secretariat/task Force shall assist the Director, Department of Science and Technology, Waste Management in smooth conduct of this event, They shall attend meetings as and when convened by the Director, Department of Science and Technology. The above named officials are requisitioned with immediate effect upto 14th December, 2019, who would work in Department of Science and Technology at Directorate of Planning, Statistics and Evaluation, Porvorim in addition to their work in their respective departments.

They shall be entitled for honorarium as approved by the Government.
This issues with the approval of Government.

Yours faithfully,



(Levinson J. Martins)
Director, Science & Technology

Copy to:-

1. The Additional Chief Electoral Officer, Altinho, Panaji - Goa
2. The Managing Director, Goa Waste Management Corporation, Saligao
3. The Director, Department of Environment, Porvorim
4. Shri Brijesh Manerkar, Registrar, Registrar of Co-operative Societies, Panaji - Goa
5. Smt. Sangeeta Naik, Dy. Chief Electoral Officer, Altinho, Panaji - Goa.
6. Shri Ajay Gaude, Dy. Collector & SDO-I, Salcete - Goa
7. Nikhil Caeiro, Assistant Manager, GWMC, Saligao - Goa.
8. Tanvi Desai, Assistant Manager, GWMC, Saligao - Goa.
9. Siddhant Desai - Trainee, GWMC, Saligao - Goa.
10. Rohan Ghadi - Trainee, GWMC, Saligao - Goa.
11. Shoukhan Teli, Trainee, GWMC, Saligao - Goa.
12. Gajanan Kamat, Trainee, GWMC, Saligao - Goa.
13. Yeshwant Gawas, LDC - Department of Environment, Porvorim - Goa.
14. Jagannath Gaonkar, LDC - Department of Environment, Porvorim - Goa.

Copy for Information to:-

1. **The Jt. Secretary (Personnel)**, Personnel Department, Secretariat, Porvorim - Goa.