

National Award for Ocean Science & Technology

Dr. P. N. Vinayachandran



Dr. P.N.Vinayachandran is a Professor at the Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science Bangalore since 1999. He obtained his B.Sc. from University of Calicut, M. Sc. from Cochin University of Science and Technology and M.Sc(Engg.) & Ph.D. from IISc, Bangalore.

Dr. Vinayachandran has made significant contributions to the physical oceanography of the Indian Ocean. He pioneered the use of ocean general circulation models in India and used models creatively to address problems in ocean dynamics, air-sea interaction and physical-biological interactions. One can see a blend of physics, state-of-the-art models, theory and observations in his studies, a combination of data and quantitative earth-system-science, making his work unique. His achievements include development of a high resolution Indian Ocean model to simulate the freshwater plume in the Bay of Bengal, and its simulation of SST is yet unparalleled. He is one among the few oceanographers in the world with expertise in both observational oceanography and ocean general circulation modelling.

Dr. Vinayachandran has discovered the existence of a Bay of Bengal salt pump which is crucial for maintaining the salt and freshwater balance of the Indian Ocean, that the runoff into the world oceans can increase the monsoon rainfall, that salinity effects determine the intraseasonal SST amplitudes, the orographic effects of Western Ghats cause formation of the Arabian Sea mini warm pool, East India Coastal Current bifurcates east of Sri Lanka, wind-driven circulation determines the routes of freshwater in the Bay of Bengal, existence of a North Bay Monsoon Current that prohibits free southward movement of low-salinity water, the existence of Sri Lanka Dome, and that Southwest Monsoon Current curves around Sri Lanka to intrude into the BOB.

His other discoveries include weakening of equatorial jets during certain years which unravelled the now-famous Indian Ocean Dipole, simulation of IOD of 2006 showing that air-sea fluxes affect generation of SST dipole, phytoplankton blooms in the southwestern Bay and around Sri Lanka, and sub-surface chlorophyll maximum as a significant contributor to surface blooms. Recent research led by him has identified the mechanisms that lead to the formation of the cold pool in the southern Bay of Bengal, identified the individual impacts of rainfall and river runoff on the temperature, salinity and currents in the Bay of Bengal and the impact of diurnal cycle on the intraseasonal SST variations in the Bay of Bengal.



He has actively contributed to the growth of the oceanography in India by participating/leading in Indian National Experiments such as Bay of Bengal Monsoon Experiment (BOBMEX), Arabian Sea Monsoon Experiment (ARMEX), and Continental Tropical Convergence Zone (CTCZ) and by leading the international BOBBLE (Bay of Bengal Boundary Layer Experiment) and the first expedition of IIOE-2. The first Indian Ocean Model that he provided to INCOIS paved the way for the development of an Indian Ocean Forecasting System. He is a fellow of the Indian Academy of Sciences and National Academy of Sciences, India and recipient of the Frontier Research Award (Japan) Shanti Swarup Bhatnagar Prize.

In recognition to his outstanding research contributions in the field of Ocean Science and Technology the Ministry of Earth Sciences honours Prof. P.N. Vinayachandran with the “National Award in the field of Ocean Science and Technology” for the year 2017.