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## National Award for Atmospheric Science & Technology

### Dr. S. Suresh Babu



Dr. S. Suresh Babu is the first in country to quantify the regional radiative impacts of Black carbon (BC) aerosols, the most strongly light absorbing aerosol species, particularly when they are present as lofted layer in the middle troposphere. He discovered layers of enhanced BC concentration in the free troposphere (4 to 9 km). The radiative forcing due to these layers dramatically reduce the environmental lapse rate and increase the atmospheric stability, thereby increasing the lifetime of BC and atmospheric forcing. This finding has also raised new scientific issues, such as self lifting of BC to stratosphere leading to slowing down of ozone recovery, and increased life-time favouring BC setting up their homes in the upper layers.

He quantified the long-term trends in aerosol optical depth, its seasonality, spatial distinctiveness, possible causes and likely climate-impact indicators using multi-decadal aerosol optical depth data from network of aerosol observatories (ARFINET) being operated under his guidance. He was the chief scientist of recently conducted Integrated Campaign for Aerosol gases and Radiation Budget (ICARB 2018) field experiment on-board Sagar Kanya over Arabian sea and Indian ocean and mission Scientist of the aircraft experiments conducted as part of Regional Aerosol Warming Experiments (RAWEX) in 2012 and 2013 and South Asian Aerosol Monsoon Interaction (SWAAMI) experiments in 2016.

His first field experiments, aimed at quantifying the aerosol radiative forcing over an urban location using collocated measurements and delineating the role of BC in reversing the sign of the top of the atmosphere (TOA) forcing. He established the importance of mass fraction of BC to the composite aerosols in controlling atmospheric forcing efficiency.

He has established a series of observatories at high altitude sites on the Himalayas. His studies from Hanle, the second highest altitude aerosol observatory in the world has brought out several significant results. He established aerosol observatories at both Arctic and Antarctic and showed observational evidence of snow scavenging of BC and delineated the sharp contrast between the south and north poles in terms of their purity and human intervention. He quantified the role of long range transport of aerosols on aerosol forcing over Arabian sea, Bay of Bengal and Indian subcontinent and the large absorbing efficiency of dust by ground based measurements and satellite data.

In recognition to his outstanding contributions in the field of Atmospheric Science and Technology, Ministry of Earth Sciences (MoES) honours Dr. S. Suresh Babu with the “National Award in the field of Atmospheric Science and Technology” for the year 2020.