
Dr. Sachin Ghude



Dr. Sachin Ghude has made pioneering contributions in both the observational and modeling aspects of atmospheric chemistry that culminated in the development of an operational early warning system for winter fog and air quality for the first time in India. Many novel approaches and tools developed by him are providing a more-realistic estimation of several chemical emissions. His work has led to a quantum jump in the understanding of atmospheric chemistry of reactive species and its linkage to socioeconomic issues viz. air quality, vegetation, human health, and climate specific to India. His latest work on 3D-VAR chemical data assimilation embedded in a regional chemistry transport model resulted in a phenomenal increase in the short-term prediction skill of air quality in Delhi for extreme pollution events up to 72 hours ahead. The newly developed operational model shows the accuracy of 0.82 for predicting the unhealthy category of air quality, which is much higher than the estimate available for a similar system. This is commendable in short-term chemical weather forecasting at a city-scale to street-level and made IITM and MoES ranks ahead of any other operational agency across the globe that makes such forecasts.

Dr. Sachin Ghude was instrumental in designing and leading the multi-institutional intensive winter fog field experiment (WiFEX) at Delhi since 2015 and made insightful contributions to understanding this complex interaction between different thermo-dynamical, microphysical and chemical process in the fog life cycle. His modeling tools and early warning system is now being used operationally by IMD, CPCB and DPCP for providing early warning for air quality to public, and by IMD, ATC-AAI and Indian Air force for fog warnings to the aviation sector. This has significantly contributed to the build-up of the organization's trust many folds amongst the end-users and policy-makers for taking science-based well-informed decisions and actions for important public services in India.

His basic research on ozone pollution and its burden on human-health, vegetation (crop-yield), and air-quality and climate-change have greatly advanced our understanding of the environmental issues which have global as well as national relevance. Apart from scientific work including guiding Ph.D. students and research staff, he is putting constant efforts on basic research to understand chemically reactive species and physical process in global and regional climate.

Dr. Sachin Ghude is awarded Certificate of Merit for his outstanding contribution in the field of Atmospheric Science.