

**IIT Hyderabad establishes a ground-breaking
Raindrop Research Facility (RRF)
to estimate Raindrop size distribution for precise rainfall prediction
Inaugurated by Dr V K Saraswat
(Hon'ble Member, NITI Aayog, Government of India)**

Highlight: *This world-class facility at IITH will simulate atmospheric conditions from the clouds to the ground in order to better predict rainfall.*

Hyderabad, February 03, 2023: Accurate rainfall prediction is one of the grand challenges in environmental research due to its relevance to understanding climate change and its accompanying socio-economic impacts. However, it is far from perfect. Rainfall is influenced by several factors and atmospheric conditions. India experiences high unpredictability in rainfall making it a distinct and complex process compared to the rest of the world. An accurate understanding of Indian rainfall will help us understand global climate change. The Indian Institute of Technology Hyderabad has established a world-class Raindrop Research Facility (RRF) for simulating atmospheric conditions from the clouds to the ground in order to better predict rainfall. Hon'ble Member, NITI Aayog, Government of India Dr V K Saraswat inaugurated the facility in the august presence of Prof B S Murty, Director, IITH, Prof Vidyasagar M FRS, Distinguished Professor, IITH, guests from other institutes, faculty, staff & students of IITH

Complimenting RRF at IITH, Prof B S Murty, Director, IITH, said, *"Prof. Sahu, a faculty in the Chemical Engineering Department at IITH, is one of the stars of the country working in the area of raindrop dynamics. After a lot of research, Prof Sahu and his team were able to set up the first-of-its-kind experimental facility, which can predict raindrop dynamics at various altitudes. This facility is expected to provide a lot of information on weather forecasting, particularly on rainfall. It is not only going to be useful for our country but also to the whole world in predicting rainfall with much better precision. I congratulate Prof Sahu and look forward to the contributions coming out of this facility."*

Explaining the uniqueness of the facility, Prof Kirti Sahu, lead researcher of RRF & Professor, Department of Chemical Engineering IIT Hyderabad said, *"One of the key limitations in rainfall modelling is the lack of fundamental knowledge of the microphysical processes like coalescence, breakup and phase change, in the actual atmospheric conditions. Using the novel experimental facility developed at IITH, the temperature can be varied from -10°C to 40°C and relative humidity can be maintained from zero to saturation level. Thus, we can mimic the dynamic atmospheric conditions from cloud to ground and estimate the shape and size distributions of raindrops at various altitudes. This information will be used to improve rainfall prediction. We use cutting-edge machine learning-based digital in-line holography technology to predict the raindrop size distribution. This methodology is a far better choice than the other measurement methods now in use."*

Elaborating on the advantages of the facility, Dr Lakshmana Dora Chandrala, Assistant Professor, Department of Mechanical & Aerospace Engineering, said, *"The machine learning-based digital holography technique developed at IIT Hyderabad has recently emerged as a powerful tool for capturing three-dimensional information about raindrops with high spatial resolution. This technique will be beneficial for improving rainfall forecasts when combined with the unique experimental facility."*

Dr V K Saraswat, Hon'ble Member, NITI Aayog, Government of India & Distinguished Professor, IITH, said, *"Raindrop facility being set up at IIT Hyderabad is one of its kind. It will help in understanding the processes involved in the formation of raindrops, followed by its impact on the environment & climate change. It will be useful in the prediction of weather. This kind of research was initially done to understand space, rocket engines & similar things. But now the interaction with the atmosphere is going to be very predominant here, the impact of humidity, temperature & environmental parameters for the formation of rain clouds and quantity of rain takes place. This is a very important facility and the research will be very useful for climate control."*

Electronic Release (RRF Facility): <https://youtu.be/x6k-emUTnmA>

About IIT Hyderabad:

Indian Institute of Technology Hyderabad (IITH) is one of the eight new IITs established by the Government of India in 2008. In a short span of **14** years, the institute has become a top-ranker. It has **300+** full-time faculty, **~4,299** students, **18** Departments + Centre for Interdisciplinary Programs, nearly **200+** state-of-the-art laboratories, and five research and entrepreneurship centres. The institute has a strong research focus with approx. Rs **~700** crores of sanctioned research funding, with PhD scholars accounting for about **30%** of total student strength. IITH has more than **8100+** research publications with **1,20,000+** Citations, **190+** Published Patents, **2,000+** sponsored/consultancy projects with **500+** running projects, and about **100+** startups that have generated more than 1000 jobs and a revenue of Rs. 800 Cr.

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