



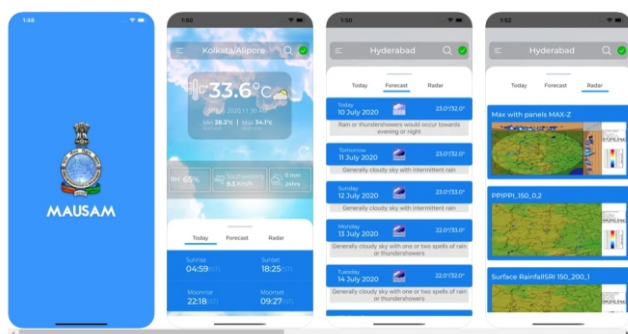
## Achievements

- ✦ **NFAR:** Standard Operating Procedures (SOP) for IITM-UAV submitted to DGCA has been *approved* by the competent authority of DGCA for further processing and necessary actions.
- ✦ A **Memorandum of Understanding (MoU)** and **Non-Disclosure Agreement (NDA)** between IITM and WRLDC, POSOCO (Power System Operation Corporation Limited, a government of India Enterprise, Ministry of Power) for sharing of weather forecasting data has been signed on 19 August 2020.
- ✦ GEFS based cyclone tracker has successfully predicted the ensemble track, landfall and strike probability for very severe cyclonic storm “NISARGA” during 1-3 June 2020, with longer lead.
- ✦ **Monsoon Mission:** The Probabilistic forecast for all the river basins of India has been developed and shared with IMD, New Delhi. It is now being utilized by IMD's Flood Monitoring Offices (FMOs) at different places.

## Development of Mausam Mobile App

- ✦ IITM contributed for the development of **Mausam mobile app** for India Meteorological Department to help enhance dissemination activity of weather forecast and warning services.

iPhone Screenshots



## MoES Knowledge Resource Centre Network (KRCNet)

LIP Division of IITM has worked for development of MoES KRCNet (single platform

for all kind of MoES eResources) and contributed and enriched the MoES KRCNet Portal with IITM eResources (research articles, Video Lectures, Annual Reports, Research Reports, Photo-galleries, Events, News-clippings) for wider visibility. This World-Class Knowledge Resource Centre Network (KRCNet) Portal was launched on MoES Foundation day 2020. After the launch, as entrusted by MoES, the LIP Division will have to keep updating the same for showcasing IITM research and development activities through this Portal. MoES KRCNet project is listed in the **Best of Tech report 2021**, published on Jul 18, 2020 by Coeus Age ( a research led initiative to keep a track of technology evolution in the government sector)[https://issuu.com/kapildevsingh/docs/best\\_of\\_tech\\_2021\\_final\\_report](https://issuu.com/kapildevsingh/docs/best_of_tech_2021_final_report)



Read Press Release on KRCNet Portal:  
<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1641508>

Mausam Mobile App and MoES KRCNet Portal were launched at the hands of Hon'ble Union Minister for Earth Sciences, Dr. Harsh Vardhan on MoES Foundation Day, 27 July 2020.

## Predictions

### Seasonal Prediction

- ✦ The operational seasonal forecast runs (using Monsoon Mission Climate Forecast System) are being carried out at IMD. The latest seasonal forecasts are made available at the link [http://www.imdpune.gov.in/Clim\\_Pred\\_LRF\\_New/Models.html](http://www.imdpune.gov.in/Clim_Pred_LRF_New/Models.html). IITM scientists of Seasonal Prediction Group provided necessary help and support to scientists at IMD on this front.

### Extended Range Prediction

- ✦ The extended range prediction products for research/scientific use based on 5 days initial condition have been made available at <http://www.tropmet.res.in/erpa/>. These forecast products are based on the real-time weekly operational forecast generated by IMD using the Multi Model Extended Range Prediction System developed at IITM. Rainfall, Maximum & Minimum temperatures, MJO forecasts, soil moisture (0-10 cm), Relative humidity, and Cyclogenesis predictions are also made available at the same link. The MME forecasts are prepared using CFS (T126 & T382) and GFS (T126 & T382). Each resolution of CFS and GFS is having 4 ensemble members. The IMD operational products are made available at [http://nwp.imd.gov.in/erf\\_outlook.php](http://nwp.imd.gov.in/erf_outlook.php).

### Global Forecast System for Short Range Forecast

- ✦ The forecast based on Global Ensemble Forecast System (GEFS) T1534 and Global Forecast System (GFS) T1534 is being continued operationally by IMD. The global highest resolution (12 km) Ensemble Prediction System (EPS) with 21 ensemble members for short range forecast system based on GEFS (T1534) has been made available to IMD for operational implementation. The high resolution short range EPS has been operationalized at IITM. The latest version 14 of GEFS has been implemented for operational forecast in IMD. GEFS probabilistic forecast based on 1200UTC initial condition has been initiated.
- ✦ The GEFS based cyclone tracker has successfully predicted the ensemble track, landfall and strike probability for very severe cyclonic storm “NISARGA” during 1-3 June 2020 with longer lead. The GEFS produced accurate track and land fall with lesser error in longer lead time for tropical cyclone “NISARGA”.
- ✦ The Probabilistic forecast for all the river basins of India have been developed and shared with IMD, New Delhi. It has been

utilized by IMD's Flood Monitoring Offices (FMOs) at different places.

- ✦ The GEFS ensemble forecast of 21 members for 10 days have been made available to TIGGE global archive since 1 July 2020.
- ✦ **Lightning forecast** is being daily updated on the STORM website under the title “Dynamic Prediction of Lightning Flash Count” ([https://srf.tropmet.res.in/srf/ts\\_prediction\\_system/index.php](https://srf.tropmet.res.in/srf/ts_prediction_system/index.php))
- ✦ **SAFAR-India Air Quality Forecast** on daily basis is being issued for Delhi, Pune, Mumbai, Ahmedabad cities vide SAFAR-online website, <http://safar.tropmet.res.in/>.
- ✦ **Air Quality Early Warning System** for Delhi NCR region is being issued on daily basis & made available vide EWS website, <https://ews.tropmet.res.in/index.php>.
- ✦ **Fog Forecast (WIFEX)** for Delhi NCR and IGIA, Delhi is being issued on daily basis and made available vide WIFEX web site, [https://ews.tropmet.res.in/fog\\_forecast.php](https://ews.tropmet.res.in/fog_forecast.php).

### Research Highlights

#### Indian monsoon can be predicted better after volcanic eruptions

Indian monsoon can be predicted better after volcanic eruptions Large volcanic eruptions can help to forecast the monsoon over India – the seasonal rainfall that is key for the country's agriculture and thus for feeding one billion people. As erratic as they are, volcanic eruptions improve the predictability, an Indian-German research team finds. What seems to be a paradox is in fact due to a stronger coupling between the monsoon over large parts of South and South-East Asia and the El Niño phenomenon after an eruption. Combining data from meteorological observations, climate records, computer model simulations, and paleoclimate archives such as tree-rings, corals, cave deposits and ice-cores from past millennia of Earth history, the researchers found that a synchronization of the monsoon

with the strongest mode of natural climate variability, the El Niño, makes it easier to anticipate the strength of seasonal rainfall in the Indian subcontinent.

The findings from this study can also help further developing climate models and could in fact also help assessing the regional implications of geo-engineering experiments. To reduce global warming from human-made greenhouse gases, some scientists envision solar radiation management – basically to block a portion of sunrays from warming Earth's surface by putting dust in the high atmosphere, similar to what the natural phenomenon of a volcanic eruption does. Artificially blocking sunshine, however, might dangerously interfere with a number of processes in the atmosphere. Understanding the mechanisms at play is thus important (Singh M., Krishnan R., Goswami B., Choudhury A.D., Swapna P., Vellore R., Prajeesh A.G., Sandeep N., Venkataraman C., Donner R.V., Marwan N., Kurths J., Science Advances, 6: eaba8164, September 2020, DOI:10.1126/sciadv.aba8164)

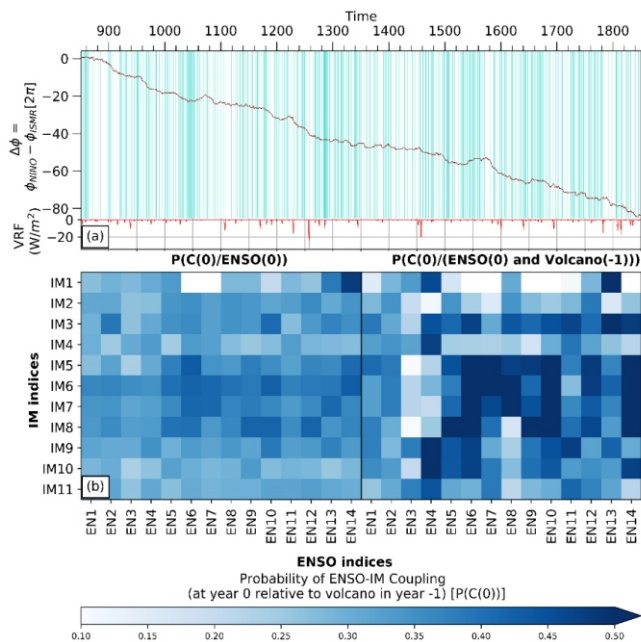


Figure 1: LVE-induced ENSO - IM phase coherence during the last millennium: (a) Phase Coherence Analysis of ENSO and Indian Monsoon (IM) using IPSL PMIP3 last millennium simulations (850 - 1850 AD). Time series of phase difference between the instantaneous phases of ENSO and IM (top panel). The green shading shows periods of phase coupling between ENSO and IM. (bottom panel) (b) Bayesian Analysis - Probability of

ENSO-IM phase coupling for year (0) conditioned on ENSO (0) (left panel) and ENSO (0) and Volcano (-1) (right panel). The paleoclimate reconstructions of 14 ENSO indices and 11 IM indices are used for computing the Bayesian probabilities.

### Diffusional growth of cloud droplets in homogeneous isotropic turbulence: DNS, scaled-up DNS, and stochastic model

This paper presents a novel methodology to use direct numerical simulation (DNS) to study the impact of isotropic homogeneous turbulence on the condensational growth of cloud droplets. As shown by previous DNS studies, the impact of turbulence increases with the computational domain size, that is, with the Reynolds number, because larger eddies generate higher and longer-lasting supersaturation fluctuations that affect growth of individual cloud droplets. The traditional DNS can only simulate a limited range of scales because of the excessive computational cost that comes from resolving all scales involved, that is, from large scales at which the turbulent kinetic energy (TKE) is introduced down to the Kolmogorov microscale, and from following every single droplet. The novel approach is referred to as the “scaled-up DNS”. The scaling up is done in two parts, first by increasing both the computational domain and the Kolmogorov microscale and second by using super-droplets instead of real droplets. To ensure proper dissipation of TKE and scalar variance at small scales, molecular transport coefficients are appropriately scaled up with the grid length. For the scaled-up domains, say, meters and tens of meters, one needs to follow billions of real droplets. This is not computationally feasible, and so-called super-droplets are applied in scaled-up DNS simulations. Each super-droplet represents an ensemble of identical real droplets, and the number of real droplets represented by a super-droplet is referred to as the multiplicity attribute. After simple tests showing the validity of the methodology, scaled-up DNS simulations are conducted for five domains, the largest of 643 m<sup>3</sup> volume using a DNS of 2563 grid points and various multiplicities. All simulations are carried out with vanishing mean vertical velocity and with no mean supersaturation, similarly to past DNS studies. As expected, the supersaturation fluctuations



as well as the spread in droplet size distribution increase with the domain size, with the droplet radius variance increasing in time  $t$  as  $t^{1/2}$  as identified in previous DNS studies. Scaled-up simulations with different multiplicities document numerical convergence of the scaled-up solutions. Finally, the scaled-up DNS results with a simple stochastic model that calculates supersaturation fluctuations based on the vertical velocity fluctuations updated using the Langevin equation have been compared. Overall, the results document similar scaling to previous small-domain DNS simulations and support the notion that the stochastic subgrid-scale model is a valuable tool for the multi-scale simulation of droplet spectral evolution applying a large-eddy simulation model. (Thomas L., Grabowski W.W., Kumar Bipin, Atmospheric Chemistry and Physics, 20, July 2020, DOI:10.5194/acp-20-9087-2020, 9087–9100)

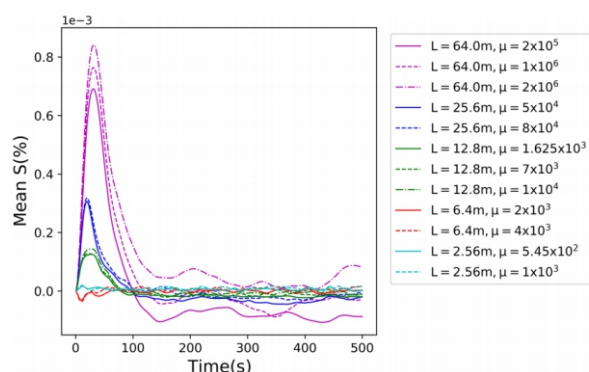


Figure 2: Evolution of the mean supersaturation for various scaled-up domains. Colors represent different domain sizes; different line styles correspond to different multiplicities. The additional simulation of 10 super-droplets per grid volume is only shown for 12.8 3 and 64.0 3 m3 volumes.

### Development of a probabilistic early health warning system based on meteorological parameters

Among the other diseases, malaria and diarrhoea have a large disease burden in India, especially among children. Changes in rainfall and temperature patterns likely play a major role in the increased incidence of these diseases across geographical locations. This study proposes a method for probabilistic forecasting of the disease incidences in extended range time scale (2–3 weeks in advance) over India based on an unsupervised pattern recognition technique that

uses meteorological parameters as inputs and which can be applied to any geographical location over India. To verify the robustness of this newly developed early warning system, detailed analysis has been made in the incidence of malaria and diarrhoea over two districts of the State of Maharashtra. It is found that the increased probabilities of high (less) rainfall, high (low) minimum temperature and low (moderate) maximum temperature are more (less) conducive for both diseases over these locations, but have different thresholds. With the categorical probabilistic forecasts of disease incidences, this early health warning system is found to be a useful tool with reasonable skill to provide the climate-health outlook about possible disease incidence at least 2 weeks in advance for any location or grid over India (Sahai A.K., Mandal R., Joseph S., Saha S., Awate P., Dutta S., Dey Avijit, Chattopadhyay R., Phani R., Pattanaik D.R., Deshpande S., Scientific Reports, 10:14741, September 2020, DOI:10.1038/s41598-020-71668-6, 1-13)

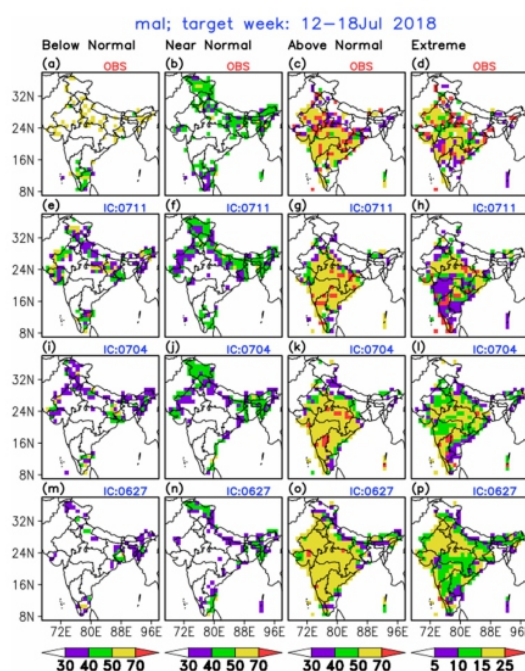


Figure 3: Probabilities of below normal (BN), near normal (NN), above normal (AN) and extreme (EXT) category of occurrences of MAL during 12–18 July 2018 for observation (a)–(d) and forecasts from initial conditions 11th July (e)–(h), 4th July (i)–(l) and 27th June (m)–(p) of 2018. (This map is generated using GrADS (version 2.0.2.0.g.a.1), <https://cola.gmu.edu/grads/>)

## Ongoing Developmental Activities

### National Facility for Airborne Research (NFAR)

- ✦ IITM-UAS Flight Manual” was prepared and submitted to Director General of Civil Aviation (DGCA) as per its requirements.
- ✦ Standard Operating Procedures (SOP) for IITM-UAV submitted to DGCA has been approved by the competent authority of DGCA for further processing and necessary actions.
- ✦ Detailed Project Report (DPR) for NFAR project was prepared.
- ✦ Online monitoring of instrument performance, data acquisition & trouble shooting: The instruments such as Radiometers and Sky imagers being operated regularly at IITM, Pune and HACPL, Mahabaleshwar are regularly monitored online through team viewer and the issues which aroused during this month were attempted through online procedures. Hence data continuity is maintained. The data is also being calibrated and processed regularly.

**CAIPEEX Phase-IV Solapur and Tuljapur Sites:** Aerosol Laboratory was resumed from 6 July 2020 after the COVID pandemic conditions. The Tuljapur site is fully functional and all observations are going on. Ground based observations are continuing at Solapur and Tuljapur sites. Necessary SoPs are in place for the operation of both the laboratories in view of COVID-19.

### High-Altitude Cloud Physics Laboratory, Mahabaleshwar

- ✦ The science plan of Atmospheric Research Testbed (ART) project was sent to the Ministry.
- ✦ The instruments such as Radiometers and Sky imagers being operated regularly at IITM, Pune and HACPL, Mahabaleshwar are regularly monitored online through team viewer and the issues which aroused during this month were attempted through online procedures. Hence, data continuity is maintained. The data is also being calibrated and processed regularly.

**Fluid Dynamics Laboratory:** Wall jet PIV experiments and hotwire spectral analysis of wall jets are in progress.

## Events and Activities

### IITM Monsoon Discussion Forum (IMDF) 2020

- ✦ The 2<sup>nd</sup> IITM Monsoon discussion seminar with a focus on “Advance of monsoon 2020” was organised on 16 July 2020 with the following talks by IITM Scientists <https://youtu.be/IC40zZqRtB8>:
  - ✦ **Mr. Ankur Srivastava**, Oceanic conditions & Seasonal Prediction.
  - ✦ **Dr. Susmitha Joseph**, Extended Range Prediction.
  - ✦ **Dr. Medha Deshpande**, Short Range Prediction.
- ✦ The 3<sup>rd</sup> IITM Monsoon discussion seminar with a focus on “Progress of monsoon and future evolution” was organised on 21 August 2020 with the following talks by IITM Scientists <https://youtu.be/sbpwZ8XBmKI>:
  - ✦ **Mr. Maheshwar Pradhan**, Oceanic conditions & Seasonal Prediction
  - ✦ **Mr. Avijit De**, Extended Range Prediction
  - ✦ **Mr. Tanmoy Goswami**, Short Range Prediction
- ✦ The 4<sup>th</sup> IITM Monsoon discussion seminar with a focus on “Withdrawal of monsoon” was organised on 21<sup>st</sup> September 2020 with the following talks by IITM Scientists (<https://www.youtube.com/watch?v=IBhaSUMfP5o&feature=youtu.be>)
  - ✦ **Dr. Prasanth Pillai**, Oceanic conditions & Seasonal Prediction
  - ✦ **Dr. Rajib Chattopadhyay**, Extended Range Prediction
  - ✦ **Dr. Malay Ganai**, Short Range Prediction
- ✦ **Hindi Week Celebration:** Hindi week was celebrated at IITM during 14-21 September 2020. The essay writing, solo-song, noting & drafting, extempore and poem recitation etc. Competitions were organized online due to COVID-19 during the Hindi Week. A large number of



employees participated in these competitions. Hindi Week concluding function and Prize distribution program was organized on 21 September 2020.

#### ✦ **World Ozone Day:**

ENVIS Centre on Atmospheric Pollution & Climate Change at IITM Pune, observed the "World Ozone Day (WOD)" by conducting innovative outreach & awareness events with action based activities towards environment protection. In view of COVID - 19 situation, IITM-ENVIS, Pune and TERRE Policy Centre, Pune have jointly organised "National Level Online Competitions" for students & common people to raise the awareness on protection of the Ozone Layer. The results of the competition were declared in the open interactive webinar on 16 September 2020.



Winners of IITM-ENVIS: WOD-2020 National Level Competitions

*Winners of IITM-ENVIS WOD 2020 National Level online Competitions*

Enlightening talks by Eminent Scientists via Open Webinars was organized as follows:

**Dr. Gilbert Bankobeza**, Chief, Legal Affairs and Compliance, Ozone Secretariat, UNEP, Kenya, UN

✦ Parameters of Success of the Montreal Protocol-Past and Future

**Dr. Paul Newman**, Chief Scientists, Earth Sciences, NASA/GSFC, Maryland, USA

✦ World Avoided -How Science Leads to Global Success Story



*Dr. Gilbert Bankobeza & Dr. Paul Newman*

#### **Prof. R. Ananthakrishnan Seminar Series:**

- ✦ 33<sup>rd</sup>, **Dr. S.A. Dixit**, "Scaling mean velocity in wall jets and drag in boundary layers: Recent laboratory studies from IITM", 19 August 2020, [youtu.be/Uv6TKtjSUTw](https://youtu.be/Uv6TKtjSUTw)
- ✦ 34<sup>th</sup>, **Dr. (Mrs.) Suvarna Fadnavis**, Chemical-Dynamical feedback of the Asian Summer monsoon circulation, 9 September 2020,
- ✦ 35<sup>th</sup>, **Dr. Anoop S. Mahajan**, Reactive trace gases in the Indian Ocean, Southern Ocean and Antarctica and why we need to change them, 23 September 2020,
- ✦ 36<sup>th</sup>, **Mr. Manmeet Singh**, Fingerprint of volcanic forcing on the ENSO-Indian monsoon coupling, 30 September 2020

#### **Program for Development of Skilled manpower in Earth System Sciences (DESK)**

- ✦ Weather and Climate Science for Service Partnership, Work package-2 (WCSSP WP2) meeting was conducted on 24 August 2020.
- ✦ DESK organized a 9 session virtual lecture series on '**Introduction to OpenMP**' from 17 August 2020 onwards. This series is led by Mr. Mandar Gurav from IIT Mumbai. The lectures are held every Monday, Wednesday, and Friday from 10:00 -11:30 hours.
- ✦ **MoES Webinar Series:** DESK with the

help of Computer Division and Library, Information and Publication Division has organised a series of Live Talks on "Earth Sciences Popular Lectures", in coordination with MoES & its Institution. Following are the details of talks delivered:

- + **17<sup>th</sup>, Dr. D.S. Pai**, Scientist-F & Head of Climate Research & Services, IMD, Pune, Climate Services for Society, 2 July 2020, <https://youtu.be/XIXbUJNErE>,
- + **18<sup>th</sup>, Dr. T.M. Balakrishnan Nair**, Director (I/c), INCOIS, Hyderabad, Ocean Information Services to Society and Industry, 7 July 2020 <https://youtu.be/BiUweOT6d2Q>,
- + **19<sup>th</sup>, Purnima Jalihal**, Scientist-G & Head Energy and Fresh Water, NIOT, Ocean Thermal Desalination - A Success Story, 9 July 2020 <https://youtu.be/BZWB7FwWqek>,
- + **20<sup>th</sup>, Dr. D.S. Suresh Babu**, Scientist-F, NCESS, MoES, Thiruvananthapuram, Ground Water Science and Societal implications, 14 July 2020 [https://youtu.be/HrtdKWwY\\_1w](https://youtu.be/HrtdKWwY_1w),
- + **21<sup>st</sup>, Dr. M. Ravichandran**, Director, NCPO R, Goa, Indian Arctic Program, 21 July 2020, <https://youtu.be/KtOvYM7DcZQ>,
- + **22<sup>nd</sup>, Dr. G.V.M. Gupta**, Scientist F, CMLRE, Marine Ecosystems and Living Resources in India, 23 July 2020 <https://youtu.be/WRTJuaUcUZs>,
- + **23<sup>rd</sup>, Dr. Abhijit Sarkar**, Scientist-E, NC M R W F, Basics of Numerical Weather Prediction and Data Assimilation, 28 July 2020 <https://youtu.be/IqAjt0hG3rw>,
- + **24<sup>th</sup>, Dr A.K. Sahai**, Scientist G, IITM Pune Floods and Droughts: Basic Science and Predictions, 30 July 2020 <https://youtu.be/pZPbTmdo4LQ>,
- + **25<sup>th</sup>, Dr. Kamaljit Ray**, Advisor/Sc-G, Ministry of Earth Sciences, New Delhi, 50 Years of Agro Advisory Services of IMD: In Support of Farmers, 4 August 2020 <https://youtu.be/UfEz-ErmEvg>,
- + **26<sup>th</sup>, Dr. A.P. Singh**, Scientist E, National Centre for Seismology Understanding the basic concept of

Seismology, Awareness regarding the techniques and Institutional Mechanism setup for monitoring of Seismic Activities of the Country, 6 August 2020, [https://youtu.be/\\_ePDV0n5XqY](https://youtu.be/_ePDV0n5XqY)

- + **27<sup>th</sup>, Dr. Supriyo Chakraborty**, Scientist-F, IITM, Pune Paleoclimatic study of the Indian summer monsoon variability, 11 August 2020 <https://youtu.be/mVCaIhZzSDg>
- + **28<sup>th</sup>, Prof. Ashok Sahni**, Emeritus Professor, Panjab University Modern Indian Biodiversity: The Geological Past, 18 August 2020 <https://youtu.be/jLGqj0Ordgc>
- + **29<sup>th</sup>, Dr. V.V.S.S. Sarma**, Sr. Principal Scientist & Professor, NIO, Vishakhapatnam Human impact on modification of biogeochemical processes in the seas around India, 20 August 2020, <https://youtu.be/zbghIL42pJA>
- + **30<sup>th</sup>, Prof. N.V. Chalapathi Rao**, Professor, Department of Geology, Institute of Science, Banaras Hindu University, Varanasi Kimberlites, related rocks, and Diamonds: Mysteries of the Earth's Mantle, 25 August 2020, <https://youtu.be/eoAkM2g6bko>
- + **31<sup>st</sup>, Dr. M. Ravichandran**, Director, NCPO R, Goa Ocean observations by India: a brief history, present status and future directions, 27 August 2020, <https://youtu.be/tenOdC2FD6g>
- + **32<sup>nd</sup>, Dr. S. Suresh Babu**, Head, Aerosols Trace Gases And Radiative Forcing Branch, Space Physics Laboratory, V S S C, ISRO Aerosol Radiative Forcing over India, 1 September 2020
- + **33<sup>rd</sup>, Dr. Lidita Khandeparker**, Principal Scientist, Biological Oceanography Division, CSIR- National Institute of Oceanography, Goa Marine Microbial Diversity: Implications for population connectivity and ecosystem functioning, 3 September 2020

- ✦ **34<sup>th</sup>, Dr. Indra Sekhar Sen**, Assistant Professor, IIT, Kanpur Surface Impurities in The Himalayan Glacier: Its sources, pathways, and spatial variation, 8 September 2020
- ✦ **35<sup>th</sup>, Dr. M.A. Atmanand**, Director, NIOT Chennai Growth of Ocean Technology in India, 10 September 2020
- ✦ **36<sup>th</sup>, Arvind Singh**, Associate Professor, Physical Research Laboratory, Ahmedabad Nitrogen Cycling in the Northern Indian Ocean, 15 September 2020

### Webinars by IITM Scientists:

**Prof. Ravi S. Nanjundiah**, Director, IITM Pune

- ✦ Understanding and Predicting the Monsoons <https://www.youtube.com/watch?v=3Bai-CvRicM>, Bhoo-Mandal Talk Series under IEEE GRSS Chapter, Bangalore, 14 August 2020.

**Dr R. Krishnan**, Scientist G, IITM Pune

- ✦ Climate Science & Earth System Modelling: Progress and Prospects, 13 July 2020 (IITM Special Live Talk)

**Dr G. Beig**, Scientist G, IITM Pune

- ✦ Do you care for Air you Breathe?, MIT-ADT University, Pune, 15 July 2020
- ✦ Exposure to UV Radiations – Key role of environmental factors, Baerlocher India R&D Pvt. Ltd., 2 July 2020

### Under India-UK Water Centre (IUKWC)

Following meetings were held:

- ✦ India-UK Water Centre (IUKWC) Meeting, regarding continuation of IUKWC with Secretary, MoES, Director IITM and Alan Jenkins, CEH, UK, 1 September 2020.
- ✦ IUKWC-5<sup>th</sup> Steering Group Meeting, 18 September 2020.
- ✦ IUKWC Management meeting, 24 September 2020.

### IUKWC Webinar Series 2020

**Dr. David Jenkins**, University of Plymouth, UK & **Dr. Shivaraju Puttaiah**, JSS Academy of Higher Education and Research (JSSAHER)

- ✦ Sustainable provision and access to drinking and irrigation water in rural communities, even during times of pandemic – such as with Covid-19, and the effect of lockdown, 6 August 2020, <https://iukwc.org/webinar-sustainable-provision-and-access-drinking-and-irrigation-water-rural-communities-even-during>

**Dr. Ajay Bhawe**, Newcastle University, UK & **Prof. Suraje Dessai**, Univ. of Leeds, UK

- ✦ Water Resource Planning Under Future Climate and Socioeconomic Uncertainty in the Cauvery River Basin in Karnataka, India, 19 August 2020, <https://iukwc.org/water-resource-planning-under-future-climate-and-socioeconomic-uncertainty-cauvery-river-basin>

**Dr Priyanka Jamwal**, Ashoka Trust for Research in Ecology and the Environment (ATREE), India & **Prof. Laurence Carvalho**, UK Centre for Ecology & Hydrology

- ✦ Approaches Towards Restoration of Urban Lakes: A case study from Bangalore, India, 16 September 2020, <https://iukwc.org/webinar-approaches-towards-restoration-urban-lakes-case-study-bangalore-india-wednesday-16th>,

**Dr. Shubha Sathyendranath**, Plymouth Marine Laboratory

- ✦ Threats to Human Health from Water-Associated Diseases: How Can Remote Sensing Help?, 2 September 2020, <https://iukwc.org/webinarthreats-human-health-water-associated-diseases-how-can-remote-sensing-help-wednesday-2nd>,

### Academic activities:

- ✦ Digital Screening Committee was constituted for Screening of applications received for the posts of Research Fellowships under MoES Research Fellow Program (MRFP).



✦ **PhD Synopsis and PhD Proposal Seminar** were conducted for IITM research scholars and scientists pursuing PhD degrees from Universities:

✦ **Mr. Sreeraj P.** (SPPU), Mean and Extreme Sea-level Response of the Indian Ocean to Climate Change, 10 July 2020, Dr. Swapna P. (guide), Dr. Krishnan R. (co-guide), <https://youtu.be/vO5LO1oi9-o>

✦ **Mr. Dipjyoti Mudiar** (BHU), Effects of Electric Forces on Rain Formation Processes in Tropical Clouds, 17 July 2020, Dr. S.D. Pawar (External Supervisor), Dr. Anupam Hazra & Dr. D.M. Lal (External Co-Supervisor), Dr. M.K. Srivastava, B.H.U., Varanasi (Internal Supervisor), <https://youtu.be/JSEVI2RPn-A>

✦ **Ms. Chandrima Mallick** (SPPU), Prediction of Lightning over India using dynamical model, 18 September 2020, Dr. Anupam Hazra (guide), Dr. H.S. Chaudhari and Dr. MahenKonwar (co-guides),

✦ **Mr. Anil Kumar V.** (SPPU), On the influence of Atmospheric Aerosols on Ice Nuclei Characteristics and its Parameterization, 23 September 2020, Dr. G. Pandithurai (guide), Prof. D.S.V.V. D. Prasad, Dep. of Physics, Andhra University (co-guide)

### PhD Awards

✦ **Ms. Sukanya Patra**, Savitribai Phule Pune University (SPPU), "Investigation of vertical structure of tropical clouds over Western Ghats using Ka-band radar", July 2020, Guide: Dr. M.C.R. Kalapureddy.

✦ **Mr. Utsav Bhowmik**, Savitribai Phule Pune University (SPPU), "Study of spatio-temporal variability of convection over the Western Ghats using Doppler Weather Radar", July 2020, Guide: Dr. G. Pandithurai and Dr. S.M. Deshpande.



*Ms. Sukanya Patra & Mr. Utsav Bhowmik*

### IITM Participation in Important Meeting

- ✦ IPCC Working Group-1 pre-LAM activities, July 2020.
- ✦ JpGU - AGU Joint Meeting 2020: Virtual, 12-16 July 2020.
- ✦ 16<sup>th</sup> Annual Meeting of the Indian Ocean Global Ocean Observing System (IOGOOS) Regional Alliance, 16 July 2020.
- ✦ Pre-Lead Author Meeting of IPCC 6th Assessment Report (IPCC AR6), 20-25 July 2020.
- ✦ CLIVAR/GEWEX Monsoons Panel Teleconference (fifth virtual meeting of 2020), 23 July 2020.
- ✦ *World Weather Research Programme (WWRP)* Scientific Steering Committee meeting, 1-7 September 2020.
- ✦ BGRL PAMC meeting, 8 September 2020.
- ✦ Quarterly meeting of the CLIVAR/IOC/GOOS Indian Ocean Region Panel, 21<sup>st</sup> September 2020.
- ✦ AOGS-EGU Natural Hazards Virtual Meeting: The AOGS-EGU Joint Conference series on New Dimensions for Natural Hazards in Asia' from 21-23 September 2020.
- ✦ S2S Steering Group-Liaison Group meeting, 22-24 September 2020.
- ✦ SASCOF17 and CSUF meeting, 23-28 September 2020.
- ✦ Climate Services Users Forum (CSUF) for Agriculture and Water (CSUF) session held online via video conference during the Day 3 of Winter SASCOF-17 conducted by RCC-IMD, WMO in collaboration with RIMES, and supported by UKMO-DFID ARRCC program, on 28 September 2020.
- ✦ IITM Finance Committee Meeting, 29th September 2020

- ✦ IITM Governing Council Meeting, 30th September 2020
- ✦ Surface Ocean - Lower Atmosphere Study (SOLAS) Indian Ocean Meeting, 30 September 2020.

### Awards and Honours

#### Dr. S.D. Pawar

- ✦ Member, Expert Group to implement the Action Plan on Thunderstorm & Lightning by National Disaster Management Agency.

#### Dr. Thara Prabhakaran

- ✦ Member, New Programme Advisory and Monitoring Committee (PAMC/MoES).

#### Dr. G. Pandithurai

- ✦ Chaired a Technical Evaluation Committee (TEC) meeting for IMD Pune on procurement of Automatic weather stations.
- ✦ Subject Expert (Radar Technology) for PhD review committee of Defence Institute of Advanced Technology, Pune.

#### Dr. J. Sanjay

- ✦ Resource Person, National Training Programme on “Audit of Climate Change and Disaster Management” organised by the International Centre for Environment Audit and Sustainable Development (iCED) Jaipur
- ✦ Member, Expert Network of the new WMO Technical Commissions: INFCOM and SERCOM.

#### Dr. P.D. Safai

- ✦ Expert in the meeting of Technical & Advisory Committee, Department of Chemistry, Savitribai Phule Pune University for the procurement of S500 Portable Air Monitor with PM sensors and viable cascade impactor used for sampling of bio-aerosols.

#### Dr. P. Mukhopadhyay

- ✦ Associate Editor, 'Journal of Earth System Science', Indian Academy of Sciences, Bengaluru, July 2020 to July 2024.
- ✦ Guest Editor, special issue of MAUSAM (January 2021) on the theme “Tropical cyclones over north Indian Ocean: Recent

advances in monitoring, understanding and prediction”.

- ✦ Member, TIGGE panel for GEFS forecast at TIGGE Archive.

#### Dr. Milind Mujumdar

- ✦ Reviewer, screening of abstracts for 3rd Conference of the Arabian Journal of Geosciences (CAJG), Sousse, Tunisia, 2-5 November 2020.

#### Dr. Roxy Mathew Koll

- ✦ Presented the 2019-2020 Annual Report of the Indian Ocean Region Panel (IORP) as the Chair of the IORP.
- ✦ Represented the Indian Ocean Region Panel at the quarterly session of the Indian Ocean Observing System (IndOOS) Resource Forum (IRF-11), organized by NOAA.

#### Dr. Yogesh K. Tiwari

- ✦ Member, WMO Integrated Global Greenhouse Gas Information System (IG3IS) Steering Committee.

#### Dr. Atul Kumar Srivastava

- ✦ Member, Scientific Organizing Committee (SOC), International Conference on "Aerosol Air Quality, Climate Change and Impact on Water Resources and Livelihoods in the Greater Himalayas"
- ✦ Member, RFP Committees for procurement of Ozone-sonde system and for CAMC of Brewer Spectrophotometers at IMD, New Delhi.
- ✦ Co-chaired a Session on “Source apportionment in Indo-Gangetic Plain and Gangetic Himalayan Region” in the Online International Conference on "Aerosol Air Quality, Climate Change and Impact on Water Resources and Livelihoods in the Greater Himalayas", ARIES, Nainital
- ✦ Member, Panel Discussion on “Recent Developments and Way Forward in Measurements and Modeling of Health and Climate Change”, during the Amity Innovation Week 2020 at Amity University Haryana (AUH), Gurugram.

**Ms. Aditi Modi**

- ✦ Core Committee Member, International Indian Ocean Expedition (IIOE-2) Early Career Scientist Network.

**Mr. Parmit Deb Burman,**

- ✦ External Reviewer, Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) Draft Scoping Report on the Underlying Causes of Biodiversity Loss and the Determinants of Transformative Change and Options for Achieving the 2050 Vision for Biodiversity (Transformative Change Assessment). Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Bonn, Germany has been nominated for the Nobel Peace Prize for their "invaluable contribution to world peace & global development".

**Mr. Abhishek Jha**

- ✦ Young Scientist Award, 33rd General Assembly and Scientific Symposium in the International Union of Radio Science (URSI-2020), Rome, Italy.

**MoES Annual Awards 2020 to IITM employees** were presented on the occasion of MoES Foundation Day Celebrations, 27<sup>th</sup> July 2020, New Delhi.

- ✦ **Dr. Sachin D. Ghude**, Scientist E was awarded the "Certificate of Merit" for the year 2020 for his outstanding contribution in the field of Atmospheric Science & Technology.
- ✦ **Smt. A.A. Desai**, Assistant Manager under category Group 'B' Gazetted
- ✦ **Shri Sandip S. Kulkarni**, Senior Executive under category Group 'B' Non-Gazetted
- ✦ **Shri Vikas V. Bamble**, MTS under the category 'Multi Tasking Staff'

**Important Events**

- ✦ **Swachhta Pakhwada Celebration**  
As per the guidelines received from Ministry of Earth Sciences (MoES), and Department of Drinking Water & Sanitation, Ministry of Jal Shakti, Govt. of India, IITM observed Swachhata Pakhwada 2020 during 1-15 July 2020. As a part of event, IITM organized

following webinars Series on theme "Swachhta":

- ✦ **Dr Pravakar Mishra**, Scientist-F, National Centre for Coastal Research, Chennai Clean Sea campaign: Citizen Science, Special Live Talk of the MoES Webinar Series, 8 July 2020, <https://youtu.be/WhdQTHPkssxk>
- ✦ **Dr. M. Mujumdar**, Scientist-E, IITM Pune, स्वच्छता अभियान २०२० - कोरोना महामारी की पृष्ठभूमि में सामाजिक उत्तरदायित्व के अनुपालन का महत्व, 10 July 2020, [https://youtu.be/Deh\\_Wgpiu\\_s](https://youtu.be/Deh_Wgpiu_s)
- ✦ **Dr. O.N. Shukla**, Hindi Officer, IITM Pune, शरीर और मन पर योग का प्रभाव 10 July 2020, [https://youtu.be/Deh\\_Wgpiu\\_s](https://youtu.be/Deh_Wgpiu_s)
- ✦ **Dr. Ojaswini Valsangkar**, Medical Consultant, IITM Dispensary कोविड - १९ महामारी की स्थिति में स्वच्छता का महत्व/Importance of Swachhata in COVID-19 pandemic situation, 10 July 2020, <https://youtu.be/RtSEnJPpyU>
- ✦ **Dr. Smitha BR**, Scientist-D, CMLRE, K o c h i Litters in the Marine Systems: Pathways, Hotspots and Ecosystem Impacts, 10 July 2020, <https://youtu.be/VfhsBHqGuR0>
- ✦ **Dr. K. Anoop Krishnan**, Scientist-D, Hydrological Processes Group, NCESS, T r i v a n d r u m Need for integrated monitoring and mitigation practices in containing pollution - The NCESS initiative, 16 July 2020, <https://youtu.be/JPw6dBYRY4A>

**Other Activities**

- ✦ All the officials of the Institute present in the office took **Sadbhavana pledge** on 20 August 2020 from their respective seat/room, on account of the restrictions on gatherings due to the COVID pandemic.
- ✦ As a part of the two yearlong commemoration of 150<sup>th</sup> birth anniversary of Mahatma Gandhi, a webinar on “राष्ट्रपिता महात्मा गांधी की १५० वीं जयंती के उपलक्ष्य में गांधी - दर्शन व्याख्यानमाला” (Title: "The **Relevance of Gandhian Philosophy in the Present**



**Context")** by डॉ. आर.के.पालीवाल, प्रधान मुख्य आयकर आयुक्त, आंध्रप्रदेश एवं तेलंगाना (Shri. RK Paliwal, Principal Chief Commissioner of Income Tax, Hyderabad) was organised on 16 September 2020

- ✦ IITM participated in the events on Gandhian philosophy during 26-27 September 2020 conducted by MoES.

#### **Editorial Team**

Chief Editor: Prof. Ravi S. Nanjundiah, *Director, IITM*

Co-Editors : Dr. Parthasarathi Mukhopadhyay, *Sc. E, IITM*

Dr. Shivsai A. Dixit, *Sc. E, IITM*

Mrs. Shompa Das, *Sc. E, IITM*



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