

7. Knowledge Activities & Products

Knowledge creation, knowledge enhancement, knowledge dissemination and knowledge management have been among the core activities of CSIR-4PI. Ever since its inception, CSIR-4PI has maintained a high knowledge output in terms of publications and other scientific programmes, knowledge synthesis and exchange through conferences, workshops, brain storming sessions, etc.

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7.1 Publications in Journals

- Agnihotri, Geeta, KC Gouda, and Someshwar Das. "Characteristics of pre-monsoon convective systems over south peninsular India and neighborhood using tropical rainfall measuring mission's precipitation radar". In: *Meteorology and Atmospheric Physics* 133.2 (2021), pages 193–203.
- Arya, VB, Sajani Surendran, and Kavirajan Rajendran. "On the build-up of dust aerosols and possible indirect effect during Indian summer monsoon break spells using recent satellite observations of aerosols and cloud properties". In: *Journal of Earth System Science* 130.1 (2021), pages 1–20.
- Bhimala, Kantha Rao, Krushna Chandra Gouda, and S Himesh. "Evaluating the Spatial Distribution of WRF-Simulated Rainfall, 2-m Air Temperature, and 2-m Relative Humidity over the Urban Region of Bangalore, India". In: *Pure and Applied Geophysics* 178.3 (2021), pages 1105–1120.
- Bhimala, Kantha Rao, V Rakesh, K Raghavendra Prasad, and GN Mohapatra. "Identification of vegetation responses to soil moisture, rainfall, and LULC over different meteorological subdivisions in India using remote sensing data". In: *Theoretical and Applied Climatology* 142.3 (2020), pages 987–1001.
- Ghavri, Sapna and Sridevi Jade. "Seismic potential of megathrust in the Kumaun-Garhwal region of NW Himalaya: implications from geodetic and seismic strain rates". In: *International Journal of Earth Sciences* 110.4 (2021), pages 1439–1452.
- Gouda, KC, S Joshi, and Nagaraj Bhat. "An optimum initial manifold for improved skill and lead in long-range forecasting of monsoon variability". In: *Theoretical and Applied Climatology* 144.3 (2021), pages 1161–1170.
- Gupta, S Vishal, Imtiaz A Parvez, Ankit, Prosanta K Khan, and Rakesh Chandra. "Site Effects Investigation in Srinagar City of Kashmir Basin Using Microtremor and Its Inversion". In: *Journal of Earthquake Engineering* (2020), pages 1–22.
- Jade, Sridevi, Ramees R Mir, Chiranjeevi G Vivek, TS Shrungheshwara, IA Parvez, Rakesh Chandra, D Suri Babu, S Vishal Gupta, Siva Sai Kumar Rajana, VK Gaur, et al. "Crustal deformation rates in Kashmir valley and adjoining regions from continuous GPS measurements from 2008 to 2019". In: *Scientific reports* 10.1 (2020), pages 1–11.
- Jayasankar, CB, K Rajendran, Surendran Sajani, and KV Ajay Anand. "High-resolution climate change projection of northeast monsoon rainfall over peninsular India". In: *Quarterly Journal of the Royal Meteorological Society* 147.737 (2021), pages 2197–2211.
- Johny, Alfred and Kalidhasan Vasanthakumari Ramesh. "Equatorial Indian Ocean Response during Extreme Indian Summer Monsoon Years Using Reliable CMIP5 Models". In: *Ocean Science Journal* 1 (2020), pages 17–31.
- Kakarla, Satya Ganesh, Kantha Rao Bhimala, Madhusudhan Rao Kadiri, Sriram Kumaraswamy, and Srinivasa Rao Mutheneni. "Dengue situation in India: Suitability and transmission potential model for present and projected climate change scenarios". In: *Science of The Total Environment* 739 (2020), page 140336.
- Kumar, V Anil and Debabrata Das. "Data sequence signal manipulation in multipath TCP (MPTCP): The vulnerability, attack and its detection". In: *Computers & Security* 103 (2021), page 102180.
- Kutty, Govindan, Rekha Gogoi, V Rakesh, and M Pateria. "Comparison of the performance of HYBRID ETKF-3DVAR and 3DVAR data assimilation scheme on the forecast of tropical cyclones formed over the Bay of Bengal". In: *Journal of Earth System Science* 129.1 (2020), pages 1–14.
- Majumdar, Sharanya J, Juanzhen Sun, Brian Golding, Paul Joe, Jimy Dudhia, Olivier Caumont, Krushna Chandra Gouda, Peter Steinle, Béatrice Vincendon, Jianjie Wang, et al. "Multiscale Forecasting of High-Impact Weather: Current Status and Future Challenges". In: *Bulletin of the American Meteorological Society* 102.3 (2021), E635–E659.

- Minocha, Sanchit and Imtiyaz A Parvez. “Self-Organized Fractal Seismicity and b-Value of After-shocks of the 2015 Gorkha Earthquake, Nepal”. In: *International Journal of Geosciences* 11.8 (2020), pages 562–579.
- Mir, Ramees R and Imtiyaz A Parvez. “Ground motion modelling in northwestern Himalaya using stochastic finite-fault method”. In: *Natural Hazards* 103 (2020), pages 1989–2007.
- Ningombam, Shantikumar S, ES Sethulakshmy, Sridevi Jade, TS Shrungheshwara, Chiranjeevi G Vivek, Dorje Angchuk, TP Prabhu, and Tashi Tshering Mahay. “Atmospheric opacity using 220 GHz (1.36 mm) radiometer data and water vapor trends over Indian Astronomical Observatory (IAO), Hanle”. In: *Journal of Atmospheric and Solar-Terrestrial Physics* 208 (2020), page 105404.
- Raj, Esack Edwin, Rajagopal Raj Kumar, and KV Ramesh. “El Niño–Southern Oscillation (ENSO) Impact on Tea Production and Rainfall in South India”. In: *Journal of Applied Meteorology and Climatology* 59.4 (2020), pages 651–664.
- Ramesh, KV, V Rakesh, and EVS Prakasa Rao. “Application of Big Data Analytics and Artificial Intelligence in Agronomic Research”. In: *Indian Journal of Agronomy* 65 (2020), pages 383–395.
- Ray, Jagat Dwipendra, M Sithartha Muthu Vijayan, and Walyeldeen Godah. “Seasonal horizontal deformations obtained using GPS and GRACE data: case study of North-East India and Nepal Himalaya”. In: *Acta Geodaetica et Geophysica* 56.1 (2021), pages 61–76.
- Sahoo, SK, S Himesh, and KC Gouda. “Impact of Urbanization on Heavy Rainfall Events: A Case Study over the Megacity of Bengaluru, India”. In: *Pure and Applied Geophysics* 177.12 (2020), pages 6029–6049.
- Santhanalakshmi, S, K Sangeeta, and GK Patra. “Design of group key agreement protocol using neural key synchronization”. In: *Journal of Interdisciplinary Mathematics* 23.2 (2020), pages 435–451.
- Sarkar, Sumana and S Himesh. “Evaluation of the Skill of a Fully-Coupled Atmospheric–Hydrological Model in Simulating Extreme Hydrometeorological Event: A Case Study Over Cauvery River Catchment”. In: *Pure and Applied Geophysics* 178.3 (2021), pages 1063–1086.
- Shimna, K and M Sithartha Muthu Vijayan. “Detecting ionospheric disturbances using GPS without aliasing caused by non-uniform spatial sampling: Algorithm, validation and illustration”. In: *Journal of Atmospheric and Solar-Terrestrial Physics* 209 (2020), page 105400.
- Silpa, K and Anil Earnest. “A note on stress rotations due to the 2004 M w 9.2 Sumatra–Andaman megathrust earthquake”. In: *Journal of Earth System Science* 129.1 (2020), pages 1–17.
- “Revisiting the seismogenic characteristics of stable continental interiors: The case of three Indian events”. In: *Quaternary International* 585 (2021), pages 152–162.
- Varghese, Stella Jes, Sajani Surendran, B Ajithkumar, Kavirajan Rajendran, and Akio Kitoh. “Future changes in rice yield over Kerala using climate change scenario from high resolution global climate model projection”. In: *Journal of Earth System Science* 129.1 (2020), pages 1–17.
- Vivek, Chiranjeevi G, TS Shrungheshwara, and Sridevi Jade. “GNSS and its impact on position estimates.” In: *Current Science (00113891)* 119.9 (2020).

7.2 Publications in Books/Proceedings

- A. Kitoh, E. Mohino, Y. Ding, K. Rajendran, T. Ambrizzi, J. Marengo and V. Magana, Combined oceanic influences on the continental climates, 2021: In: *Interacting climates of ocean basins: Observations, Mechanisms, Predictability, and Impacts*. Eds: Carlos R. Mechoso, Cambridge University Press, London, UK.
- K. Rajendran, Sajani Surendran, S. J. Varghese, A. Chakraborty, Sensitivity of Indian summer monsoon rainfall forecast skill of CFSv2 model to initial conditions and the role of model biases. 2021, arXiv (Physics), <https://arxiv.org/pdf/2101.07465.pdf>. USA.

- K. Rajendran, Sajani Surendran, S. J. Varghese, Anjali Sathyanath, Simulation of Indian summer monsoon rainfall, interannual variability and teleconnections: Evaluation of CMIP6 models, 2021, Research Square, <https://www.researchsquare.com/article/rs-242562/v1>. USA.
- K. Rajendran, Sajani Surendran, S. J. Varghese, Multiforcing ensemble projection based climate change information over Kerala for adaptation strategies, 2020, In: Impact of Climate change on hydrological Cycle, Eco system, Fisheries and Food Security, Eds: B. M. Kurup, M. R. Boopendranath, M. Harikrishnan and A. V. Shibu, Narendra Publications, New Delhi (www.nphi ndia.com). India.
- Kiran Kumar V, K. V. Ramesh and V. Rakesh, Deep LSTM model for Indian Summer Monsoon Rainfall prediction using indices, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020
- Kumari, R., Gouda, K. C., Singh, U., Maca, P., Bimla, K. R., S, Himesh., Nikhilasuma., Benke, M. V., Rao, S., and USN, Murty.: Hydro-meteorological Impact on Malaria Diseases at Regional Scale in India, EGU General Assembly 2020, Online, 4–8 May 2020, EGU2020-20045.
- L B Shyamasundar, V Anil Kumar, et al. “Analyzing Big Data Originated from Data Communication Networks using K-Means Algorithm to Understand the Nature of Incoming Malicious Connections”, Third International Conference on Multimedia Processing, Communication & Information Technology (MPCIT), IEEE Explore, pp. 129-132, 2020.
- Marndi A., Patra G.K. ,Atmospheric Temperature Prediction Using Ensemble Deep Learning Technique. In: Sharma H., Saraswat M., Yadav A., Kim J.H., Bansal J.C. (eds) Congress on Intelligent Systems. CIS 2020. Advances in Intelligent Systems and Computing, vol 1335. Springer, Singapore,5-6 September 2020 <https://doi.org/10.1007/978-981-33-6984-918>
- Marndi A., Patra G.K. (2021) Multidimensional Ensemble LSTM for Wind Speed Prediction. In: Sharma H.,
- Gupta M.K., Tomar G.S., Lipo W. (eds) Communication and Intelligent Systems. Lecture Notes in Networks and Systems, vol 204. Springer, Singapore.26-27 December 2020<https://doi.org/10.1007/978-981-16-1089-947>
- Neethu C and K. V. Ramesh, Impact of heat waves on vegetation cover and ground water, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020
- Neethu C and K. V. Ramesh, Variability and change in human thermal comfort during heat waves over India, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020
- R Harish, A Aswin Kumar, V Anil Kumar and P PAmritha, “Facilitating Cryptojacking Through Internet Middle Boxes”, Advances in Electrical and Computer Technologies, Lecture Notes in Electrical Engineering, vol. 711, pp. 41-52, Springer, Singapore, 2021.
- S Lenka, K C Gouda, Rani Devi and C M Joseph, Wind Shear And Thermal Gradient Analysis Over Indian Summer Monsoon Region, Proceedings of IC R TEETIMP-2020, Dayananda Sagar College of Engineering, Bangalore, 7-9 Dec 2020
- Sulochana Gadgil, P. A. Francis, K. Rajendran, Ravi S. Nanjundiah and Suryachandra Rao, Role of Land- Ocean Contrast in the Indian Summer Monsoon Rainfall, 2021: In: The Multiscale Global Monsoon System,Eds: Eds. C.-P. Chang, K.-J. Ha, R. H. Johnson, D. Kim, G. N. C. Lau, B. Wang, World Scientific Series on Asia- Pacific Weather and Climate, Volume 11, Singapore (<https://doi.org/10.1142/11723>).
- Sulochana Gadgil, P. A. Francis, P. N. Vinayachandran, Sajani Surendran, Interannual variation of the Indian summer monsoon, ENSO, IOD and EQUINOO, 2020, In: Monsoon Teleconnections,Eds: Jasti Chowdary, Anant Parekh, C. Gnanaseelan, Elsevier Publications.

Germany.

- Sumana S and Himesh S, A Hydro meteorological Analysis of a flash flood over the megacity of Bangalore: Assessing the forecast skill of the model and the impact of urbanization on flash flood, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020 (Virtual)
- V Anil Kumar and Debabrata Das, “Data Sequence Map Flooding in MPTCP Framework: Potential Challenges and Efficient Countermeasures”, the proceedings of 11th International Conference on Computing, Communication and Networking Technologies (ICCCNT 2020), IEEE publication, July 2020.
- Venkatesh Gowda P K, K. V. Ramesh and V. Rakesh, LULC classification using Convolutional Neural Network, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020

7.3 Presentations in Conferences/Symposia/Workshops/Seminars

- Anil Kumar V, Data Sequence Map Flooding in MPTCP Framework: Potential Challenges and Efficient Countermeasures, 11th International Conference on Computing, Communication and Networking Technologies (ICCCNT 2020), IIT Kharagpur, July 1-3, 2020.
- G K Patra “A framework for connected vehicle security research”, National Conference on AI & Perception Engineering, 30th July 2020
- Gupta, S. V. , Parvez, I. A. and Khan, P. K. Subsurface Shear wave velocity (Vs) mapping in Srinagar region of Kashmir Basin using microtremor data, American Geophysical Union, Fall Meeting 2020, Abstract No. NS009-04 (AGU)
- Kiran Kumar V, K. V. Ramesh and V. Rakesh, Deep LSTM model for Indian Summer Monsoon Rainfall prediction using indices, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020
- Kumari, R., Gouda, K. C., Singh, U., Maca, P., Bimla, K. R., S, Himesh., Nikhilasuma., Benke, M. V., Rao, S., and USN, Murty.: Hydro-meteorological Impact on Malaria Diseases at Regional Scale in India, EGU General Assembly 2020, Online, 4–8 May 2020, EGU2020-20045.
- Neethu C and K. V. Ramesh, Impact of heat waves on vegetation cover and ground water, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020
- Neethu C and K. V. Ramesh, Variability and change in human thermal comfort during heat waves over India, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020
- Priyanshi Singhai, A. Chakraborty, Sajani Surendran, K Rajendran, Association of Indian Summer Monsoon Variability with Mid-latitude Teleconnection in CFSv2, AGU Fall Meeting A226-0007, <https://agu.confex.com/agu/fm20/meetingapp.cgi/Paper/742569>. American Geophysical Union, USA. 16 December 2020.
- Rani Devi & Gouda K C. Temperature Variability over Indian Himalayan Region, IISF-2020 (Virtual Mode) held in New Delhi, 22-25 Dec 2020.
- Ray, J.D., Devaraju, B., Vijayan, M.S.M., & Godah, W., (2021). Geodetic monitoring of the hydrological changes in Nepal Himalaya, March 29-31, 2021, <https://iccc.iag-aig.org/iccc-workshops/ws21>
- S Lenka, K C Gouda, Rani Devi and C M Joseph, Wind Shear And Thermal Gradient Analysis Over Indian Summer Monsoon Region, Proceedings of IC R TEETIMP-2020, Dayananda Sagar College of Engineering, Bangalore, 7-9 Dec 2020
- Senthilkumar V, Kumar, J and Singh, R.K., Multi-walled Pentagraphene Nanotube, Young

Scientist Conference, IISF-2020, 23rd December 2020 (Virtual Event)

- Smrutishreelena & Gouda K C. Quantifying Rainfall Extremes over Continental India, IISF-2020 (Virtual Mode) held in New Delhi, 22-25 Dec 2020.
- Sumana S and Himesh S, A Hydro meteorological Analysis of a flash flood over the megacity of Bangalore: Assessing the forecast skill of the model and the impact of urbanization on flash flood, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020 (Virtual)
- Venkatesh Gowda P K, K. V. Ramesh and V. Rakesh, LULC classification using Convolutional Neural Network, Proceeding of TROPMET 2020, on Weather and Climate Services over Mountains Regions on Tropical Meteorology, NESAC, Shillong, 14 – 17 December 2020
- Vijayan, M.S.M., Vincent, A., & Rajendran, K. (2021). Utilising geodetic estimation of crustal response to changes in hydrological loading as a tool to measure climate change: opportunities and challenges, IAG-ICC 2021 workshop on Geodesy for Climate Research, March 29-31, 2021, <https://iccc.iag-aig.org/iccc-workshops/ws21>

7.4 Participation in Conferences/Symposia/Workshops/Training Programmes

- **Anil Kumar V**

“Data Sequence Map Flooding in MPTCP Framework: Potential Challenges and Efficient Countermeasures”, 11th International Conference on Computing, Communication and Networking Technologies (ICCCNT 2020), IIT Kharagpur, July 1-3, 2020.

- **Ashapura Marndi**

India International Science Festival Young Scientists Conference (IISF YSC), virtual mode, 22-24 December 2020.

RAISE 2020 - Responsible AI for Social Empowerment, Virtual Summit on Artificial Intelligence hosted by Ministry of Electronics IT, Govt India, virtual mode, 5-9 October 2020.

Sessions on HPC and AI/ML of Vaishvik Bhartiya Vaigyanik (VAIBHAV) Summit virtual mode, 4-5 October 2020.

- **Gouda K C**

Young Scientist Conference at IISF-2021 in the theme “Current Pandemic and Crisis” held at New Delhi during 22-25 Dec 2020 and delivered a talk on “Weather and COVID-19 Spread, Is there any linkage ”

Future directions of Subseasonal to Seasonal Prediction over South Asia" during 29-31 March 2021 at IITM, Pune, India. WMO Data Conference, 16-18 Nov 2020.

“Cloud anatomy structure during cloudburst events over India” in the IISF-2020 (Virtual Mode) held in New Delhi, 22-25 Dec 2020.

- **Patra G K**

“A framework for connected vehicle security research”, National Conference on AI & Perception Engineering, 30th July 2020

- **Sajani Surendran**

Climate Change: Challenges and Response, LBSNAA CDM online training programme for women scientists, Centre for Disaster Management Lal Bahadur Shastri National Academy of Administration, Mussoorie, 05 Oct 2020.

- **Vijayan M.S.M**

IAG-ICCC 2021 workshop on Geodesy for Climate Research, Online, March 29-31, 2021.

Brain storming meeting on “Satellite Observations and Modeling of GRACE Data for Terrestrial Applications” organized by CSIR-NGRI, Online, 9th February, 2021.

Groundwater Monitoring using Observations from NASA’s Gravity Recovery and Climate Experiment (GRACE) Missions. NASA Applied Remote Sensing Training Program (AR-SET). Online, 25th June, 2020.

COSEG Fall 2020 meeting on Solid Earth Science and Sea Level Change, Online, 12th – 13th November, 2021.

VAIBHAV-2020 Session [V13H4S3] on “Hydrological models & projections and space-based observations for decision-making”, Online, 18th October 2020.

TCS GNSS Data product webinar conducted by European Plate Observing System (EPOS), Online, 18th & 19th January, 2021.

7.5 Invited Talks

- **Anil Kumar V**
Feedback Manipulation in Next Generation Transport Layer Protocols, International Institute of Information Technology – Bangalore (IIIT-B), 20, January 2021.
Darknet Traffic Analysis and Security Inference, AICTE Faculty Development Programme on Artificial Intelligence and Its Applications in CPS, 5-9, October 2020.
- **Ashapura Marndi**
“Machine Learning Training Programme”, in the Inversion and Machine Learning Applications for Geoscience Data Analysis, 8-27th March 2021 (sponsored by MoES, Govt. of India).
- **Gouda K C**
Chief Guest and delivered talk on “Mathematical Modeling with Engineering Applications” in the fresher’s day at Mangalore Institute of Institute of technology engineering, Mangalore, 14th Oct 2020.
Chief guest and delivered talk on “Understanding NEP-2020”, An initiative of Unnat Bharat Abhiyan by VTU ON 23-SEPT-2020 at Sir MVIT, Bangalore.
Delivered talk on “Artificial Intelligence for Societal Applications”, DEC 9 2020, Dayananda Sagar College of Engineering, Bangalore, 9th Dec 2020.
Delivered talk on "Computer Science Engineering for Society", Mangalore Institute of Technology & Engineering, Mangalore, 14Oct 2020.
- **Mohapatra GN**
Invited talk as Chief guest for “MATLITE Club Activity - PI DAY” on 14th march 2021 organised by department of mathematics MVJ College of Engineering, Whitefield, Bangalore.
Chief Guest and speaker for the National mathematics day-2020, entitled “Mathematical Modelling with Engineering Applications” through online mode on 22nd December 2020 MVJ College of Engineering, Whitefield, Bangalore.
- **Patra G K**
“The Interesting Paradox of Security & Privacy”, in international webinar titled - Importance of Cyber security in the world of Pandemics and Social Media on May 6th 2020.
“Machine Learning Tutorials”, in the Inversion and Machine Learning Applications for Geoscience Data Analysis, 8-27th March 2021 (sponsored by MoES, Govt. of India).
“Critical Infrastructure Security”, panel discussion of Data security and Privacy in the VAIBHAV summit, 18th October 2020.

“Outcomes of the Data science vertical” to the advisory board of VAIBHAV summit, 30th October 2020.

“Cyber Security R&D of CSIR”, DSCI Road show on 6th November 2020.

“Data Science Activities @ CSIR-4PI”, CDISE Skolkovo Institute of Science and Technology (Skoltech), Russia, 18th December 2020.

“VISION of Data Science for CSIR”, a joint presentation for CSIR-4PI and CSIR-NIIST at the Indo-Belarus scientific collaboration on 17th February 2021.

- **Rajendran K**

Invited as panelist for the Vaishwik Bharatiya Vaigyanik (VAIBHAV) Summit which was a global virtual summit of overseas and resident Indian researchers and academicians organized by Ministry of S T, GoI and delivered a talk in the summit on “High resolution climate model projections over India and adaptation strategies for rice yield changes” under section V11H5S2 (Climate Change: Moving towards a climate resilient environment and society-advent of novel techniques and tools, Vertical: Environmental Sciences Horizontal: Climate Change), 16 October 2020.

- **Rakesh V**

Invited Talk in international workshop on "Agricultural Pest and Disease Simulation Modelling under different Climate Change Scenarios", organized by ICRISAT, Patancheru & UAS, Bangalore from 24th -28th August 2020.

Talk Title: Weather and climate informatics for crops: Crop Model configuration, simulation, generation of Agro-advisories, Future Climate scenarios.

- **Ramesh K V**

Invited Talk in international workshop on "Agricultural Pest and Disease Simulation Modelling under different Climate Change Scenarios", organized by ICRISAT, Patancheru & UAS, Bangalore from 24th -28th August 2020, Talk Title: “Application of Big Data Analytics and Artificial Intelligence in Crop disease forecasting”.

- **Sajani Surendran**

Aerosol indirect effects on Indian Summer Monsoon, NCAP Project Review Meeting, MoE-FCC, GoI, 25 April 2020.

- **Vijayan M.S.M**

“The Physics of GPS and Satellite based Navigation” in a national webinar organized by PSNA college of Engineering and Technology, Dindigul, Tamilnadu.

“Satellite Geodesy: An emerging tool to explore Relativity, Plasma Physics and the Dynamic Earth” in a national webinar on Emerging Trends in Physics, organized by Government Arts College for Women, Salem, Tamilnadu.

7.6 Visitors at CSIR-4PI

- **Ms K Sangeetha**, Amrita School of Engg, 27 May 2020
- **Dr Vijay Patel**, ADA – AcSIR meeting, 15 Sept 2020
- **Mr Raja Seevan**, Indian CST, 07 Dec 2020
- **Mr SK Dwivedi & Mr. PD Bagul**, HAL, Nasik, 30 Dec – 15 Jan 2021
- **Mr S Herkal**, Entuple Technologies Pvt Ltd, 12 Jan 2021
- **Mr Surinder Singh Narula**, Axiomatic ITech pvt ltd, 02 Feb 2021