Curriculum vitae with track record

Personal information

First name, Surname:	**Tarkeshwar Singh.** 		
Date of birth:	1st September 1987	Sex:	Male
Nationality:	Indian		
Researcher unique identifier(s) (ORCID, Researcher ID, etc.):	ORCID ID: https://orcid.org/0000-0002-0902-539X		
URL for personal website:	https://www.nersc.no/staff/tarkeshwar-singh		

Education

Year	Faculty/department - University/institution - Country
2018	PhD thesis at Centre for Atmospheric Sciences, Indian Institute of Technology (IIT) Delhi, India (22/03/2018). Thesis Title: "*A Global-Regional Data Assimilation System for Indian Subcontinent Monsoon Region*"
2011	Master of Technology (M.Tech.) in *Atmospheric-Oceanic Science and Technology* at Centre for Atmospheric Sciences, Indian Institute of Technology (IIT) Delhi, India. Thesis Title: "*Impact of spatial and temporal resolution on simulated precipitation using COSMO-CLM Model"*
2009	Master of Science (M.Sc.) in **Physics** at Department of Physics and Astrophysics, University of Delhi, New Delhi, India.

Positions - current and previous

Year	Job title – Employer - Country
2020-	Researcher at NERSC, Bergen, Norway
2017-	Project Scientist-C at NCMRWF, Ministry of Earth Sciences, Noida, India
2011-	Senior Research Fellow (SRF) at Centre for Atmospheric Sciences, IIT Delhi, New Delhi

Track record

I have a strong interest in the development of data assimilation systems and parameter estimation for climate models to enhance the skill of dynamical predictions. I have authored and co-authored 9 peer review publications.

Peer-Reviewed Publications

- Tewari, M., Kishtawal, C.M., Moriarty, V.W., Ray, P., **Singh, T.,** Zhang, L., Treinish, L. and Tewari, K., (2022). "Improved seasonal prediction of harmful algal blooms in Lake Erie using large-scale climate indices." *Communications Earth & Environment-Nature*, 195. https://doi.org/10.1038/s43247-022-00510-w
- **T. Singh,** Counillon F, Tjiputra J, Wang Y and Gharamti ME (2022) "Estimation of Ocean Biogeochemical Parameters in an Earth System Model Using the Dual One Step Ahead Smoother: A Twin Experiment". *Front. Mar. Sci.* 9:775394. doi: 10.3389/fmars.2022.775394
- **T. Singh,** U. Saha, V. S. Prasad, M. Das Gupta (2020), "Assessment of newly-developed high resolution reanalyses (IMDAA, NGFS and ERA5) against rainfall observations for Indian region" Atmospheric Research, 259, 105679.
- **T. Singh** (2020). **"**Development of an ensemble data assimilation system with LMDZ5 AGCM for regional reanalysis". *Climate Dynamics (https://doi.org/10.1007/s00382-020-05147-z).*
- Saha, U., **T. Singh**, P. Sharma, M.D. Gupta, M.D. and V.S. Prasad (2020). **"**Deciphering the extreme rainfall scenario over Indian landmass using satellite observations, reanalysis and model forecast: Case studies". *Atmospheric Research*, p.104943.
- Mittal, R., M. Tewari, C. Radhakrishnan, P. Ray, **T. Singh** and A. Nickerson (2019). "Response of tropical cyclone Phailin (2013) in the Bay of Bengal to climate perturbations". *Climate Dynamics, https://doi.org/10.1007/s00382-019-04761-w*
- Bhardwaj A., TN Krishnamurti, Om Prakash Sharma, Akhilesh Mishra and **T. Singh** (2018). "Monsoon Precipitation Forecast Using a Suite of Mesoscale Models". *International Journal of Earth and Atmospheric Sciences. Jakraya Publication, 2349-9222*
- **T. Singh**, R. Mittal and M. V. Shukla, (2017). "Validation of INSAT-3D temperature and moisture sounding retrievals using matched radiosonde measurements". *International Journal of Remote Sensing, 38(11), 3333-3355 (DOI:10.1080/01431161.2017.1294776)*
- **T. Singh**, R. Mittal, & H. C. Upadhyaya (2015). "Ensemble Adjustment Kalman Filter Data Assimilation for a Global Atmospheric Model." *Lecture Notes in Computer Science, vol 8964. Springer, Cham (DOI: 10.1007/978-3-319-25138-7_26)*

Fellowships and awards

- Qualified joint **CSIR-UGC** test for Junior Research fellowship (**JRF**) and eligibility for Lectureship (**NET**, Jun-2009) and secured 163 All India rank in physical sciences organized by Council of Scientific & Industrial Research (CSIR) government of India.
- Qualified Graduate Aptitude Test for Engineering (**GATE**, 2009) in physics organized by the Ministry of Human resource development (MHRD), Govt. of India, and received GATE scholarship from July-2009 to June-2011 for M. Tech. program.
- Received **DAAD-IIT Master Sandwich Scholarship** to do M.Tech thesis work at Karlsruhe Institute of Technology (KIT), Germany from Sep-2010 to May-2011.

- Received Senior Research Fellowship (**SRF**) from Space Application Centre, ISRO sponsored project during Sep-2011 to May-2015 period.
- Received Senior Research Fellowship (**SRF**) from Ministry of Earth Sciences (MoES), Government of India Sponsored project during Jun-2015 to Nov-2015 period.

Papers Presented/Proceedings in Conferences/Workshops

- ***Development and Verification of Surface Analysis over India using Real Time Mesoscale Analysis System (RTMA)*** by **T. Singh** and V.S. Prasad. An oral presentation in the **TROPMET-2019** conference **National Symposium on Land, Ocean and Atmosphere Interactive Processes in the Context of Weather and Climate** organized at Andhra University, Visakhapatnam, Andhra Pradesh, during 11–14 December, 2019. Abstract ID-191, Page-172
- ***Simulation of Indian Summer Monsoon using the MPAS and the LMDZ5 Atmospheric General Circulation Model*** by **T. Singh**, R. Mittal, M. Duda and M. Tewari, 17th Annual WRF Users Workshop, June 27 - July 1, 2016, Boulder, CO, USA. Abstract number-P59.
- ***Estimating root mean square errors in INSAT-3D retrieved temperature and moisture sounding using Triple Collocation method*** by **T. Singh**, R. Mittal, H.C. Upadhyaya and Om. P. Sharma, 10th SPIE Asia-Pacific Remote Sensing Symposium, 4-7 April 2016, New Delhi, India (Paper number 9882-81).
- ***Ensemble Adjustment Kalman Filter Data Assimilation for a Global Atmospheric Model*** by **T. Singh**, R. Mittal and H.C. Upadhyaya, 1st DyDESS conference, Nov 5-7, 2015, MIT, Boston, USA.
- ***Development of a 4D Variational Radiance Data Assimilation System for LMDZ5 GCM*** by **T. Singh**, H.C. Upadhyaya, O.P. Sharma, and R. Mittal, International conference on "Future Directions for Weather & Climate Research in the Tropics" at Centre for Atmospheric Sciences, IIT Delhi, 3-5 December 2012.
- ***Design and Development of a Unified Model on Icosahedral-Hexagonal Grids.*** By Om P. Sharma, H. C. Upadhyaya, P.M.V. Subbarao, and **T. Singh,** The T. N. Krishnamurti Symposium, American Metrological Society Annual Meeting, January 26, 2012, New Orleans, Louisiana, Abstract Volume 617.

Scientific/technical accomplishment

- Developed an Ensemble Kalman Filter based data assimilation system with LMDZ5 atmospheric Model in collaboration with NCAR DART group. It is available inside DART software for public use and can be seen at following UCAR-NCAR website.
  https://svn-dares-dart.cgd.ucar.edu/DART/branches/LMDZ_trunk/models/LMDZ/
- Developed a 4D-Variational Data assimilation System with LMDZ5 dynamics. This work includes
  - Development of the adjoint model for LMDZ5 dynamics.
  - Implementation of the NMC method to estimate Background error covariance metrics (B).
  - Coupling of Fast Radiative transfer model, RTTOV, with LMDZ5 AGCM to enable assimilation of satellite radiances.

Teaching activities

During my PhD tenure,

- Assisted faculties at the CAS, IIT Delhi for the lab and lecture classes.
- Conducted regular tutorials classes for the M.Tech. Students for the course "Physics of Atmosphere and Ocean" at CAS, IIT Delhi.