Curriculum Vitae

Personal Data

Shakeel Asharaf
Born in Kushinagar, India
Nationality: Indian
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Education

2016: **PhD** (Natural Sciences; *Magna cum laude*), J. W. Goethe University (GUF), Frankfurt/Main, Institute for Atmospheric and Environmental Sciences, Germany
Theme: Land-Atmosphere Interaction
Thesis Title: *Land-Atmosphere Feedbacks in Indian Summer Monsoon Rainfall: A Regional Climate Modeling Perspective*

2008: **M.Tech.** (Earth System Science & Technology), Indian Institute of Technology (IIT), Kharagpur, India
Degree: Master of Technology (M.Tech.)
Thesis Title: "*Mesoscale Simulation of Severe Thunderstorm over Gangetic West Bengal-Representation of Cloud Microphysics*"

2006: **M.Sc.** (Applied Geology)**,** Allahabad University, Allahabad, India
Degree: Master of Science (M.Sc.)
Thesis Title: "*Shallow Seismic Refraction Survey in Allahabad city (U.P.), India*

2004: **B.Sc.** (Math, Physics, and Chemistry), Allahabad University, Allahabad, India
Degree: Bachelor of Science (B.Sc.)

Scientific Position

02/2021 – present **Asst. Project Scientist** at JIFRESSE University of California Los Angeles (UCLA) / JPL, USA
Project involved: CYGNSS wind/flux cal./val. (https://science.jpl.nasa.gov/projects/CYGNSS/), MEaSUREs, Atmospheric Rivers, Surface Ocean Heat Fluxes
Theme: Air-Sea interaction

11/2017 – 01/2021 **Postdoctoral Researcher** at JPL / JIFRESSE University of California Los Angeles (UCLA), USA
Project involved: CYGNSS wind/flux cal./val.
Theme: Surface winds validation/performance using observations (satellites, ground based in-situ such, as buoy, ship tracks) and models

07/2013 – 09/2016 **Research Scientist**, German Weather Service (DWD), Offenbach/Main, Germany
Project involved: EU-Project "EUPORIAS" (http://www.euporias.eu/)
Theme: Seasonal hydrological extremes (drought and floods) forecasting in eastern Africa

12/2008 – 07/2013 **Research Scientist**, J. W. Goethe University, Frankfurt/Main, Germany
Theme: Land-Atmosphere interaction and regional water cycle in India
Teaching assignment: Numerical Weather Prediction (exercise course during the winter semester, 2009, 2010, 2011) for M.Sc. at Goethe University, Frankfurt, Germany

Additional Information / Award

2006 Qualified Graduate Aptitude Test in Engineering (GATE) – 2006 with All India Rank 92
2006 - 2008 Awarded assistantship at IIT Kharagpur (2006-2008) by HRD Ministry Govt. of India
2013 Awarded funding from World Meteorological Organization (WMO) to attend the international training course on producing high resolution climate information: scientific basis and application, Seoul, S. Korea from 13 to 24 October 2013

Projects / Grants
- Understanding Atmospheric River Lifecycles with CYGNSS: A Multivariate Process Study and Model Evaluation, *Co-I*, NASA CYGNSS Competed Science Team 2021-2024.

External Research & Training
- 05/2023: MPAS-Atmospheric Tutorial, *virtual*, NCAR, Boulder, CO, USA
- 05/2023: GNSS-IR Short Course, *virtual*, Co-sponsored by University of Bonn, Germany
- 04/2021: XSEDE HPC Workshop: BIG DATA and Machine Learning, *virtual*, Pittsburg, PA, USA
- 08/2020: CESM Tutorial, *virtual*, NCAR, Boulder, CO, USA
- 05/2016: ECMWF Training Course on Predictability and ocean-atmosphere ensemble forecasting, *in person*, ECMWF, Reading, UK.
- 09/2014: Seasonal Forecasting and Downscaling Workshop, *in person*, Santander, Spain.
- 10/2013: KMA-WMO Training Workshop on Producing High Resolution Climate Information (training / workshop), *in person*, Seoul (KMA) & Busan (APEC), S. Korea.
- 04/2013: High Performance Computing Workshop, *in person*, TU Darmstadt, Germany.
- 03/2009: COSMO/CLM Training, *in person*, DWD, Langen, Germany.

Computer Skills
- Working experience on LINUX / UNIX / Mac OS systems
- High-performance computing (e.g., CRAY, AIX IBM) on parallel environment at DWD (2013-2016), ECMWF (2013-2016), GUF (2009-2016)
- Working experience of FORTRAN
- Working experience of R, Python, MATLAB, Julia, GMT, Linux/Unix shell script

Research Experience / Interest
- Ocean Surface Wind / Heat Fluxes
- Air-Sea interaction
- Land-Atmosphere interaction
- Satellite / *in-situ* data validation
- Atmospheric Rivers
- Regional climate modeling
- Monsoons
- Seamless Prediction / Projection
- Ensemble statistical verification

Regional Climate / Weather Model Experience
- COSMO-CLM, MM5

Editor for the Journal
- 2023-2024: *Climate* (Guest Editor for the special issue on “Statistical Dynamical and Hybrid Climate Prediction”; https://www.mdpi.com/journal/climate/special_issues/Seasonal_Climate)

Reviewer for the Journal
- *Meteorology and Atmospheric Physics, Theoretical and Applied Climatology, International Journal of Climatology, Journal of Hydrometeorology, Journal of Climate, Monthly Weather Review, Climate Dynamics, International Journal of Atmospheric Sciences, Transaction of the ASABE, Journal of Geophysical Research, Natural Hazards, Atmospheric Research, Dynamics of Atmospheres and Oceans, Atmosphere, Meteorological Application, IEEE, Remote Sensing, Journal of Advances in Modeling Earth Systems, Advance in Space Research*

Deliverables
- Asharaf, S., 2024, "ROTATE: A Coordinate System for Analyzing Atmospheric Rivers [Algorithm Code]", https://doi.org/10.25346/S6/WGRIRC, UCLA Dataverse, V2
- CORDEX-South Asia Regional Climate Model Experiment data (contributing partner from the CLM-Community)-CCLM simulated data available on CCCR-IITMP data portal http://cccr.tropmet.res.in/cordex/files/downloads.jsp
- COSMO Model setup/configuration for the CORDEX-South Asia domain (delivered to the CLM-Community; https://clmcom.scrollhelp.site/clm-community/06-south-asia)
- Seasonal forecasting in East Africa- EUPORIAS http://www.euporias.eu/system/files/D21.2_Final.pdf

Language known
- Hindi (native), English, Urdu, German (elementary)

Publications, Proceedings, and miscellaneous

Refereed Publications

Asharaf, S., Guan, B., & Waliser, D. E. (2024). ROTATE: A Coordinate System for Analyzing Atmospheric Rivers. *Geophysical Research Letters*, 51, e2023GL106736. https://doi.org/10.1029/2023GL106736

Asharaf, S., D.J. Posselt, F. Said, C. Ruf (2023), Updates on CYGNSS Ocean Surface Winds Validation in Tropics, *J. Atmospheric and Oceanic* Tech.,40(1), 37-51. https://doi.org/10.1175/JTECH-D-21-0168.1

Wang, X., D.E. Waliser, X. Jiang, S. Asharaf, F. Vitart, W. Jie (2023), Evaluating Nortwestern Pacific Tropical Storm Forecast in the Subseasonal to Seasonal Predition Project Database, *Frontier in Earth Sciences,*10

Crespo, J.A., S. Asharaf, D. J. Posselt, C. M. Naud, A. Cobb (2023), CYGNSS Ocean Surface Heat Flux Product Development, Updates, and Applications with Extratropical Cyclones and Atmospheric Rivers, *IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium*, Pasadena, CA, USA, 845-847, doi: 10.1109/IGARSS52108.2023.10282114.

Asharaf, S., D.E. Waliser, D.J. Posselt, C. Zhang, C. Ruf, A.W. Putra (2021), CYGNSS Ocean Surface Winds Validation in Tropics, *J. Atmospheric and Oceanic Tech*., 38(4), 711-724.

Ruf, C., S. Asharaf, R. Balasubramaniam, S. Gleason, T. Lang, D. McKague, D. Twigg, D. Waliser (2019): In-Orbit Performance of the Constellation of CYGNSS Hurricane Satellites. *Bull. Amer. Meteor. Soc.*,100 (10), 2009-2029, doi:10.1175/BAMS-D-18-0337.1.

Crespo, J., Posselt, D. J., S. Asharaf (2019), CYGNSS Surface Heat Flux Product Development, *Remote Sensing*, 11, 2294.

DeFlorio, M. J., D. E. Waliser, F. M. Ralph, B. Guan, A. Goodman, P. B. Gibson, S. Asharaf, L. Delle Monache, Z. Zhang, A. C. Subramanian, F. Vitart, H. Lin, and A. Kumar (2019), Experimental subseasonal-to-seasonal (S2S) forecasting of atmospheric rivers over the western United States, *Journal of Geophysical Research - Atmospheres*, 124, 11242-11265.

Nikulin, G., S. Asharaf, M.E., Magarino, S. Calmantie, R.M. Cardoso, J. Bhend, J. Fernandez, M.D. Frias, K. Fröhlich, B. Früh, S.H. Garcia, R. Manzanas, J.M. Gutierrez, U. Hansson, M. Kolax, M.A. Liniger, P.M.M. Soares, C. Sprig, R. Tome, and K. Wyser (2018): Dynamical and statistical downscaling of a global seasonal hindcast in eastern Africa, *Climate Services*, 9, 72-85.

Cheneka, B.R., S. Brienen, K. Fröhlich, S. Asharaf, and B. Früh (2016): Searching for an added value of precipitation in downscaled seasonal hindcasts over east Africa: COSMO-CLM forced by MPI-ESM, *Advance in Meteorology*, vol. 2016, Article ID 4348285.

Asharaf, S., and B. Ahrens (2015): Indian summer monsoon rainfall processes in climate change scenarios, *J. Climate.*, 28, 5414-5429.

Asharaf, S., and B. Ahrens (2013): Soil moisture memory in the regional climate model COSMO-CLM during the Indian summer monsoon season. *J. Geophys. Res.*, 118(12), 6144-6151.

Kumar, P., A. Wiltshire, C. Mathison, S. Asharaf, B. Ahrens, P. Lucas-Picher, J. H. Christensen, A. Gobiet, F. Saeed, S. Hagemann, and D. Jacob (2013): Downscaled climate change projections with uncertainty assessment over India using a high resolution multi-model approach, *Science of the Total Environment,* 468, 18-30.

Asharaf, S., A. Dobler, and B. Ahrens (2012): Soil moisture-precipitation feedback processes in the Indian summer monsoon season. *J. Hydrometeor.*, 13, 1461-1474.

Lucas-Picher, P., J.H. Christensen, F. Saeed, P. Kumar, S. Asharaf, B. Ahrens, A.J. Wiltshire, D. Jacob, and S. Hagemann (2011): Can regional climate models represent the Indian monsoon? *J. Hydrometeor.*, 12, 849–868.

Asharaf, S., A. Dobler, and B. Ahrens (2011): Soil moisture initialization effects in the Indian monsoon system, *Adv. Sci. Res.*, 6, 161-165.

Tripathi, J. N., S. Asharaf, and V. Singh (2011): Shallow seismic refraction survey in Allahabad city (UP), India, *Proc. Nat. Acad. Sci. India Sect. A*, 81A, 245-258.

Extended Abstracts / Research Reports

Nikulin et al. (2016): *Report on the added value of dynamical and statistically downscaled data* EUPORIAS report D21.2.

Asharaf, S., B. Ahrens (2014): *The Indian Summer Monsoon Projections: Climate variability or Climate Change?* The Third International Regional-scale Workshop on 21st Century Challenges in Regional Climate modelling, 16-19 June, Lund, Sweden.

Cheneka et al. (2014): *Potential Added Value of COSMO-CLM in simulating Extreme Precipitation over East Africa*, The Third International Regional-scale Workshop on 21st Century Challenges in Regional Climate modelling, June 16-19, 2014, Lund, Sweden.

Asharaf, S., and B. Ahrens (2012): *Soil moisture sensitivity simulations over the Indian region*, Research Report Hochleistungsrechner in Hessen 2010/2011.

Ahrens, B., and S. Asharaf (2012): *Soil moisture precipitation feedback processes in the Indian summer monsoon season*, OCHAMP, February 21-25, 2012, Pune, India.

Asharaf, S., A. Dobler, and B. Ahrens (2010): *The Indian summer monsoon: precipitation -soil moisture feedback/recycling*, 3rd WMO International Conference on Quantitative Precipitation Estimation, Quantitative Precipitation Forecasting and Hydrology Nanjing, China, October 18-22, 2010.

Ahrens, B., A. Dobler, and S. Asharaf (2010): *Regional Climate Projections in Alpine River Basins: Upper Danube and Upper Brahmaputra*, Global Change and the World's Mountains, Perth, Scotland, UK, September 27-30, 2010.

Asharaf, S., A. Dobler, and B., Ahrens (2010): *Regional climate simulation over south Asia*, Research Report High-Performance Computing in Hessen 2009, March 29, 2010.

Theses

Asharaf, S. (2016): *Land-Atmosphere Feedbacks in Indian Summer Monsoon Rainfall: A Regional Climate Modelling Perspective*, PhD Thesis, Institute for Atmospheric and Environmental Sciences, Goethe University, Frankfurt am Main.

Asharaf, S. (2008): *Mesoscale simulation of severe thunderstorm over Gangetic West Bengal – representation of cloud microphyiscs*, M.Tech. Thesis, Centre for Ocean, River, Atmosphere, and Land Sciences, Indian Institute of Technology, Kharagpur, India.

Asharaf, S. (2006): *Shallow seismic refraction survey in Allahabad city (U.P.), India*, M.Sc. Thesis, Department of Earth and Planetary Sciences, Allahabad University, Allahabad, India.

Conference Proceedings

Asharaf, S., B. Guan, D. E. Waliser (2024): Analyzing Atmospheric Rivers with a Storm-centric Approach, *Asia Oceania Geosciences Society (AOGS)*, June 23-28, 2024, Pyeongchang, S. Korea. (Oral Presentation)

Asharaf, S., B. Guan, D. E. Waliser (2024): A New Lens on Atmospheric Rivers, *European Geosciences Union General Assembly (EGU)*, EGU24-11684. April 14-19, 2024, Vienna, Austria. (Oral Presentation)

Asharaf, S., J. A. Crespo, D. J. Posselt (2024): Advancing CYGNSS derived Ocean Surface Turbulent Fluxes: Accounting for Stability Effects, *International Ocean Vector Winds Science Team Meeting (IOVWST). May 29-31, 2024.* Salt Lake City, Utah, USA. (Oral Presentation)

Ruf, C. *et al.* (2024): Performance and Characterization of CYGNSS Wind Speed Products, *IGARSS 2024*, July 7-14, 2024, Athens, Greece. (Oral Presentation).

Crespo, J. *et al.* (2023): CYGNSS Ocean Surface Heat Flux Product Development, Updates, and Applications with Extratropical Cyclones and Atmospheric Rivers, *IGARSS 2023*, July 16-21, 2023, Pasadena, CA, USA. (Oral Presentation).

Crespo, J. *et al.* (2023): CYGNSS Surface Heat Flux Product Updates and Surface Flux Impacts of Lower Latitude Extratropical Cyclones Cloud and Precipitation Development, *AMS 2023*, January 8-12, 2023, Denvar, CO, USA. (Poster Presentation).

Wang, X. *et al.* (2023): Evaluating Western North Pacific Tropical Cyclone Forecast in the Subseasonal to Seasonal Prediction Project Database. *European Geosciences Union General Assembly (EGU)*, April 23-28, 2023, Vienna, Austria. (Poster presentation)

Asharaf, S., B. Guan, D. E. Waliser (2022): Understanding Atmospheric River Wind Characteristics Using CYGNSS Satellite Observations, American Meteorological Society (AMS), August 8-12, 2022, Madison, USA. (Poster presentation)

Ruf, C., C. Chew, D. McKague, S. Asharaf, M. Moghaddam (2020): The NASA CYGNSS microsat constellation, CubeSats and SmallSats for Remote Sensing, IV, 2020

Asharaf, S., D. E. Waliser, D.J. Posselt, C. Ruf, C. Zhang, and A.W. Putra (2020): CYGNSS surface wind validation over the Tropical Ocean using Moored Buoy Observations, American Meteorological Society (AMS), January 12-16, 2020, Boston, USA. (Oral presentation)

Crespo, J., D.J. Posselt, and S. Asharaf (2020): CYGNSS Surface Heat Flux Product: Development, Results, and Updates, American Meteorological Society (AMS), January 12-16, 2020, Boston, USA. (Oral presentation)

Crespo, J., D.J. Posselt, and S. Asharaf (2019): CYGNSS Surface Heat Flux Product and Low-Latitude Extratropical Cyclone Analysis, American Geophysical Union (AGU), December 9-13, 2019, San Francisco, CA, USA. (Poster presentation)

Asharaf, S., D. E. Waliser, C. Zhang, D.J. Posselt, and A.W. Putra (2019): Validation of CYGNSS Surface Winds using in-situ Marine Observation in the Maritime Continent Region, American Meteorological Society (AMS), January 6-10, 2019, Phoenix, AZ, USA. (Oral presentation)

Asharaf, S., D. E. Waliser, C. Zhang, and A.W. Putra (2017): CYGNSS surface wind validation in the maritime continent, CYGNSS Science Team Meeting, December 18-19, 2017, NOAA/AOML Miami, USA. (Oral presentation)

Asharaf, S., D. E. Waliser, C. Zhang, and A.W. Putra (2017): CYGNSS surface wind validation and characteristics in the maritime continent, *American Geophysical Union (AGU)*, December 11-15, 2017, New Orleans, USA. (Poster presentation)

Asharaf, S., K. Fröhlich, J. Fernandez, R. M. Cardoso, G. Nikulin, B. Früh, and the EUPORIAS East Africa Team (2016): Dynamically downscaled multi-model ensemble seasonal forecasts over Ethiopia, *European Geosciences Union General Assembly (EGU)*, April 17-22, 2016, Vienna, Austria. (Oral presentation)

Asharaf, S., B. Ahrens (2016): Land–Climate Feedbacks in Indian Summer Monsoon Rainfall, *European Geosciences Union General Assembly (EGU)*, April 17-22, 2016, Vienna, Austria. (Poster presentation)

Asharaf, S., K. Fröhlich, J. Fernandez, R. M. Cardoso, G. Nikulin, B. Früh, and the EUPORIAS East Africa Team (2016): Performance of dynamically downscaled ensemble seasonal forecast over east Africa, *COSMO/CLM User Seminar*, March 7-9, 2016, Offenbach am Main, Germany. (Oral presentation)

Ahrens, B., S. Asharaf (2014): Influence of anthropogenic forcing and the inherent feedback processes on the Indian summer monsoon, *European Geosciences Union General Assembly (EGU)*, April 27- May 02, 2014, Vienna, Austria. (Poster presentation)

Asharaf, S., B. Ahrens (2014): The Indian Summer Monsoon Projections: Climate variability or Climate Change? *The Third International Regional-scale Workshop on 21st Century Challenges in Regional Climate modelling*, June 16-19, 2014, Lund, Sweden. (Poster presentation)

Ahrens, B., S. Asharaf (2013): Soil-moisture memory during the Indian summer monsoon season as simulated by the Regional Climate Model COSMO-CLM, *CORDEX Regional Climate Models Performance in Present-day Climate for South Asia*, Nov. 4-7, 2013, Brussels. (Poster presentation)

Mujumdar, M., Sabin T.P., Priya P., Sanjay J., Revadekar J. V., Krishnan R., Nikulin G., Asharaf S., Jones C., Ahrens B., M. Rixen (2013): Simulation of summer monsoon rainfall over the Western Ghats in CORDEX models. Talk at CORDEX 2013, Brussels, 4--7 Nov. 2013

Krishnan, R., P. Priya, T.P. Sabin, M. Mujumdar, J. Sanjay, S. Asharaf, B. Ahrens, C. Jones, G. Nikulin, M. Rixen (2013): CORDEX multi-model assessment of patterns of rainfall and circulation variability associated with 'breaks' in the Indian monsoon. Talk at CORDEX 2013, Brussels, 4--7 Nov. 2013

Sanjay, J., M.V.S. Ramarao, J. Kim, T. P. Sabin, G. Nikulin, S. Asharaf, R. Krishnan, C. Jones, B. Ahrens, M. Mujumdar, F. Giorgi, D. E. Waliser, M. Rixen (2013): CORDEX Regional Climate Models Performance in Present-day Climate for South Asia. Poster at CORDEX 2013, Brussels, 4--7 Nov. 2013

Asharaf, S. (2012): Soil moisture precipitation feedback processes in the Indian summer monsoon season, *IAU/GUF seminar*, December 13, 2012, Frankfurt, Germany. (Oral presentation, *invited*)

Asharaf, S., and B. Ahrens (2012): Soil moisture memory in a regional climate model for the Indian summer monsoon season, *12th EMS Annual Meeting & 9th European Conference on Applied Climatology (ECAC)*, September 10-14, 2012, Lodz, Poland. (Oral presentation)

Ahrens, B., and S. Asharaf (2012): Variability, climate change or drift in the Indian summer monsoon as simulated by the regional climate model COSMO-CLM. *International workshop on interdecadal variability of the global monsoons*, September 10-12, 2012, Nanjing, China. (Oral presentation)

Ahrens, B., and S. Asharaf (2012): Soil moisture precipitation feedback processes in the Indian summer monsoon season, *OCHAMP*, February 21-25, 2012, Pune, India. (Oral presentation)

Asharaf, S., and B. Ahrens (2011): Influence of pre-monsoonal soil moisture on the Indian summer monsoon precipitation*, 11th EMS Annual Meeting / 10th European Conference on Applications of Meteorology (ECAM)*, September 12-16, 2011, Berlin, Germany. (Oral presentation)

Asharaf, S., A., Dobler, and B. Ahrens (2011): Indian summer monsoon onset sensitivity on soil moisture, *COSMO/CLM User Seminar*, March 1-4, 2011, BTZ Langen, Germany. (Oral presentation)

Hagemann, S., P. Kumar, D. Jacob, S. Asharaf, and B. Ahrens (2010): Regional climate simulations over India, *EU project WATCH General assembly*, November 2010, Amsterdam, Netherlands. (Oral presentation)

Asharaf, S., A. Dobler, and B. Ahrens (2010): The Indian summer monsoon: precipitation -soil moisture feedback/recycling, *3rd WMO International Conference on Quantitative Precipitation Estimation, Quantitative Precipitation Forecasting and Hydrology Nanjing*. China, October 18-22, 2010. (Oral presentation)

Asharaf, S., A. Dobler, and B. Ahrens (2010): Soil moisture initialization effects in the Indian monsoon system, *10th EMS Annual Meeting / 8th European Conference on Applied Climatology (ECAC)*, September 13-17, 2010, Zurich, Switzerland. (Oral presentation)

Lucas-Picher, P., J.H. Christensen, P. Kumar, F. Saeed, S. Asharaf, A. Wiltshire, B. Ahrens, and S. Hagemann (2010): Evaluation of the Indian monsoon generated by four regional climate models during the period 1981-2000, *10th EMS Annual meeting, 8th European Conference on Applied Climatology*, Zurich, Switzerland, September 13-17, 2010. (Oral presentation)