Chayan Roychoudhury

Contact Information

Department of Hydrology and Atmospheric Sciences
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Education

Doctoral Studies - PhD January 2021 - *Present*
The University of Arizona, Department of Hydrology and Atmospheric Sciences
Supervisor : Dr. Avelino F. Arellano

Post-Graduation - MSc August 2017 - July 2019
University of Calcutta, Department of Atmospheric Science
Thesis: *Simulation of Hygroscopic Factors on Polar Aerosols over East Antarctica*
Supervisor : Dr. Sanat Kumar Das, Bose Institute

Graduation - BSc
University of Calcutta, Department of Physics August 2014 - June - 2017
First Class Honours

Work Experience

Graduate Research Assistant January 2021 - Present
Graduate Teaching Assistant January 2023 - Dec 2023
ATMO 430 - Computational Methods in Atmospheric Sciences
ATMO 469/569 - Air Pollution I : Gases
The University of Arizona, Department of Hydrology and Atmospheric Sciences
Supervisor : Dr. Avelino F. Arellano

Guest Research Worker August 2019 - July 2020
Bose Institute, Environmental Sciences Section
Supervisor : Dr. Sanat Kumar Das

Research Experience

Publications

1. *C Roychoudhury*, C He, R Kumar, JM McKinnon, and AF Arellano. **On the relevance of aerosols to snow cover variability over High Mountain Asia.** *Geophysical Research Letters*, *49*, e2022GL099317.

In progress

1. *C Roychoudhury*, C He, R Kumar, AF Arellano Jr. **Unraveling the Complexities of Aerosol-Meteorology Interactions on Snowmelt in High Mountain Asia**. (*Submitted to Scientific Reports*).
2. A Sorooshian, AF Arellano Jr, M Fraser, P Herckes, G Betito, E Betterton, R Braun, Y Guo, MA Mirrezaei, *C Roychoudhury*. **Ozone in the Desert Southwest of the United States: A Synthesis of Past Work and Steps Ahead**. (*Submitted to ACS ES&T Air*).
3. D Das, S Chiao, *C Roychoudhury*, F Khan, S Chaudhuri, S Mukherjee. **Tropical Cyclone Energy Variability in North Indian Ocean: Insights from ENSO.** *Climate. (In review)*.
4. SK Das, *C Roychoudhury*, SK Ghosh, S Raha, and U Das. **Deterioration of background air quality by transported winter haze: Alarming high health risk for urban people over Indo-Gangetic Plain**. (*In preparation*).
5. SK Das, *C Roychoudhury*, and A Taori. **Virga observed over East Antarctica: An alarming indication of global warming**. (*In preparation*).

Conference Presentations

1. Y Guo, AF Arellano, *C Roychoudhury*, A Sorooshian, R Kumar, G Pfister (2023). **Harnessing our Air Quality Modeling & Observational Capabilities to Establish Key Factors Influencing Ozone Levels in Arizona**. Poster at 2023 MAC-MAQ Conference, UC Davis, CA.
2. MA Mirrezaei, Y Guo, *C Roychoudhury*, AF Arellano, A Sorooshian, W Tang, L Emmons (2023). **Investigating surface ozone sensitivity to HCHO/NO_2 ratios over Arizona using the Multi-Scale Infrastructure for Chemistry and Aerosols (MUSICA) model**. Poster at 2023 MAC-MAQ Conference, UC Davis, CA.
3. D Das, S Chiao, ET Swenson, GG Persad, *C Roychoudhury* (2023). **Past, Present and Future Humid Heat Extremes over the East Coast of the United States** (2023). Poster at 2023 103rd AMS Annual Meeting, Denver, CO.

4. *C Roychoudhury*, C He, R Kumar, JM McKinnon and AF Arellano (2022). **Tracing the sources of black carbon deposition over the glaciers in High Mountain Asia: A tagged-tracer approach using WRF-Chem**. Poster at 2022 AGU Fall Meeting, Chicago, IL.
5. JM McKinnon, AF Arellano, *C Roychoudhury* (2022). **Spatio-temporal Pattern Analysis of Trace Gases and Aerosol Abundance Using Varimax Rotation and Locally Linear Embeddings.** Poster at 2022 AGU Fall Meeting, Chicago, IL.
6. *C Roychoudhury*, C He, R Kumar, JM McKinnon and AF Arellano (2022). **Source attribution of aerosol impacts to snow cover over High Mountain Asia.** Poster at 2022 International Global Atmospheric Chemistry (IGAC) Project Science Conference, Manchester, UK.
7. *C Roychoudhury*, C He, R Kumar, MK Shrivastava, JM McKinnon , AF Arellano (2022). **Do aerosols really matter over High Mountain Asia?**. Oral Presentation at University of Arizona's annual El Día Del Agua Y La Atmósfera, Tucson, AZ.
8. *C Roychoudhury*, C He, R Kumar, and AF Arellano (2021). **Investigating the relationship of meteorology and atmospheric composition to snow cover: A comparative study over High-Mountain Asia and Andes**. Lightning Talk and Poster at 2021 International Global Atmospheric Chemistry (IGAC) Project Science Conference, (virtual).
9. *C Roychoudhury*, C He, R Kumar and AF Arellano (2021). **Exploring the association of meteorology and atmospheric composition to snow cover changes: A case study over High-Mountain Asia and Central Andes**. Lightning Talk at 2021 MAC-MAQ Conference, (virtual).
10. *C Roychoudhury*, C He, R Kumar, MK Shrivastava, JM McKinnon , AF Arellano (2021). **Model simulations and satellite data analysis of aerosol impacts to snow cover over High Mountain Asia**. Oral Talk at 2021 Fall Meeting, AGU, New Orleans, LA.
11. JM McKinnon, *C Roychoudhury*, B Gaubert, RR Buchholz, AF Arellano (2021). **Spatio-temporal Pattern Analysis of Trace Gases and Aerosol Abundance Using PCA, SOMs, and Convolution Autoencoders**. Oral Talk at 2021 AGU Fall Meeting, and 2022 AMS Annual Meeting.
12. C He, R Kumar, MK Shrivastava, *C Roychoudhury*, AF Arellano (2021). **Brown carbon climatic impacts over High Mountain Asia: WRF-Chem model implementation and application**. Presented at 2021 AGU Fall Meeting (virtual).
13. D Das, D Strauss, *C Roychoudhury*, E Swenson, S Paul, G Fang, P Sinha, A Roy Chowdhury (2020). **Oceanic and Atmospheric factors contributing towards the rapid intensification of tropical cyclones in a warming climate: A diagnostic study of Super Cyclone AMPHAN over the Bay of Bengal**. Poster at 2020 AGU Fall Meeting (virtual).
14. D Das, *C Roychoudhury*, S Paul, F Khan, S Chaudhuri (2020). **Impact of ENSO on Tropical Cyclone Season over North Indian Ocean**. Oral Presentation at the International Virtual Conference on Earth's Changing Climate: Past, Present & Future, Society of Earth Scientists (virtual).
15. F Khan, D Das, *C Roychoudhury*, S Chaudhuri (2018). **Role of geo-potential height in estimating the variablity in Indian Summer Monsoon Rainfall: A comparative study with NCEP-NCAR Reanalysis and CFSR**. Poster Presentation at 2018 TROPMET National Symposium, Indian Meteorological Society.
16. *C Roychoudhury*, R Ray (2018). **Impact of climate change on butterfly population over a metropolis of India**. Oral Presentation at 2018 TROPMET National Symposium, Indian Meteorological Society and BIOSPECTRUM-2018, India.

Technical Skills

Python, GrADS, IDL, MATLAB, QGIS/ArcGIS, LaTeX, Linux, and HPC.

Honours & Awards

i) Recipient of John & Margaret Scholarship, University of Arizona (2023).
ii) Recipient of Sol Resnick Scholarship, University of Arizona (2023).
iii) Recipient of Galileo Circle Scholarship, University of Arizona (2022).
iv) Rank 1 in MSc in Atmospheric Science (2019) and eligible for INSPIRE-Fellowship under DST, Government of India.
v) First Position for the poster on *Impact of Climate Change on Butterfly Population over a Metropolis of India* presented at BIOSPECTRUM - 2018 in Environmental Biotechnology and Bioremediation (2018).