Saswati Das

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RESEARCH INTERESTS

Remote Sensing, Satellite Data Validation, Sudden Stratospheric Warmings, Lower and Middle Atmosphere, Air Quality, Greenhouse Gases, Carbon Cycle

EDUCATION

Virginia Polytechnic Institute and State University (Virginia Tech) **Blacksburg, VA**
Ph.D., Electrical Engineering (GPA: 3.53) 2022
- Fields: Aeronomy, Remote Sensing, Instrumentation
- Advisor: Dr. Scott M Bailey

M.S., Electrical Engineering 2019

KIIT University **India**
B.Tech., Electronics and Telecommunication 2017

EXPERIENCE

Jet Propulsion Laboratory/Caltech **Pasadena, CA**
Postdoctoral Fellow in Earth Science Division - Tropospheric Composition November 2022 – present

- Validation of the Orbiting Carbon Observatory-2 (OCO-2) and Orbiting Carbon Observatory-3 (OCO-3) column averaged dry-air mole fractions of carbon dioxide (X_{CO2}) against independent measurements from the Total Carbon Column Observing Network (TCCON) and the EM27/SUN Fourier transform spectrometer.

Virginia Tech **Blacksburg, VA**
Graduate Teaching Assistant
- Physics Department for PHYS,3704 -Thermal Physics Jan 2018 – May 2018
- ECE Department for ECE,2146 -Exploration of Space Jan 2019 – May 2019

Center for Space Science and Engineering Research - Virginia Tech **Blacksburg, VA**
Graduate Research Assistant Aug 2018 – August 2022

- Validated the SOFIE (Solar Occultation for Ice Experiment) ozone data product, compared it to ACE (Atmospheric Chemistry Experiment) and MIPAS (Michelson Interferometer for Passive Atmospheric Sounding) measurements, and evaluated ozone's seasonal variation.
- Investigated the spatial and temporal variation of the ozone daytime secondary maximum during SSWs (Sudden Stratospheric Warmings).
- Derived and validated atomic oxygen from SOFIE ozone, made comparative analyses to SABER (Sounding of the Atmosphere using Broadband Emission Radiometry) and MSIS (Mass Spectrometer Incoherent Scatter radar) class models.
- Investigated the SSW events of the last two decades, focusing on the 2019 Arctic SSW-triggered transport event and compared it to previous transport events of 2004, 2006, 2009, and 2013 from SOFIE and ACE.
- Investigated the ozone enhancement during the 2019 SSW in the southern hemisphere and assessed the role of PSCs (Polar Stratospheric Clouds) in the reduced ozone hole size in 2019.

PROJECTS

SOCRATES/GLO to Quantify UTLS's Role in Climate Change Aug 2017 – September 2022
- Worked on the mechanical and electrical development of the GLO (GFCR (Gas Filter Correlation Radiometry) Limb solar Occultation) instrument for the SOCRATES (Solar Occultation Constellation for Retrieving

Aerosols and Trace Element Species) mission concept to measure the vertical profile of atmospheric trace species and tested its readiness for balloon-based flights.
- Participated in the successful balloon-based launch campaign of GLO in 2019 from Ft. Sumner, New Mexico.

Polar NOx to Determine the Altitude Profile of NO in the Polar Night Aug 2018 – September 2022
- Worked on the optics, instrumentation, testing and integration of the Polar-NOx sounding rocket that aimed to determine the altitude profile of NO in the polar night and understand its enhancement in the absence of sunlight using stellar occultation.
- Participated in the successful Polar NOx rocket launch in 2020 from Poker Flat Research Range, Alaska.

TECHNICAL SKILLS

- Experienced with MATLAB, Python, IDL, STK, and AutoCAD.

HONORS AND AWARDS

- Best Seminar in Space Science Award, 2021-2022 Seminar Series - Center for Space Science and Engineering Research, Virginia Tech

PUBLICATIONS

Journal Publications
- Bailey, Scott M., et al. "Sounding Rocket Observation of Nitric Oxide in the Polar Night.", *Journal of Geophysical Research: Space Physics: e2021JA030257.*
- Das, Saswati, et al. " Version 1.3 AIM SOFIE measured ozone (O_3): Validation and seasonal climatology. " *(Under Review – AGU Earth and Space Science)*
- Das, Saswati, et al. " Atomic oxygen in the mesopause region using SOFIE measurements." *(in line for submission to AGU Journal of Geophysical Research: Atmospheres)*
- Das, Saswati, et al. " Sudden stratospheric warming-triggered composition response of the mesosphere-lower thermosphere-stratosphere." *(Under Review – AGU Journal of Geophysical Research: Atmospheres)*
- Das, Saswati, et al. " Ozone enhancement during the 2019 sudden stratospheric warming in the southern hemisphere from multi-instrument analysis." *(under review by co-authors)*

Conference Publications
- Kumar, Pranaw, et al. "Highly Birefringent with Low Dispersion Photonic Crystal Fiber doped with Crown glass for sensor and non-linear applications.", *2016 International Conference on Innovations in Information Embedded and Communication Systems (ICIIECS).*
- Kumar, Pranaw, et al. "Designing Photonic Crystal Fiber for Optical Sensor and Medical Application and Suitable for Wavelength Division Multiplexing Systems. ", *2016 International Conference on Intelligent Systems and Control (ISCO).* IEEE, 2016.

Conference Presentations
- Das, Saswati, et al. "Exploring the Spatial and Temporal Structure of Ozone in the Mesosphere and Lower Thermosphere: An Investigation of the Sudden Stratospheric Warming Events of 2009 – 2013", *2020 American Geophysical Union Conference.*
- Bailey, Scott M, et al. "Sounding Rocket Observation of Lower Thermospheric Nitric Oxide in the Polar Night", *2020 American Geophysical Union Conference.*
- Das, Saswati, et al. "A Multi Tracer Analysis to Study the Chemical Composition Changes associated with the 2019 Sudden Stratospheric Warming Dynamics using SOFIE Observations", *2021 Coupling, Energetics, and Dynamics of Atmospheric Regions Workshop.*
- Das, Saswati, et al. "Temporal Variation of Upper-Mesospheric Atomic Oxygen Using SOFIE Measurements", *2021 American Geophysical Union Conference.*
- Das, Saswati, et al. "Sudden Stratospheric Warming-Triggered Composition Response of the Mesosphere-Lower Thermosphere- Stratosphere", *2021 American Geophysical Union Conference.*

- Das, Saswati, et al. “Enhancement in Antarctic Ozone During the 2019 Sudden Stratospheric Warming from SOFIE”, *2022 American Meteorological Society 102nd Annual Meeting.*
- Das, Saswati, et al. “Composition Response of the Mesosphere-Lower Thermosphere-Stratosphere During 2019 Arctic Late-Winter”, *2022 American Meteorological Society 102nd Annual Meeting.*
- Das, Saswati, et al. “Investigation of the Ozone Enhancement during the 2019 Sudden Stratospheric Warming in the Southern Hemisphere”, *2022 European Geosciences Union General Assembly.*
- Das, Saswati, et al. “SMLT Ozone from SOFIE and Other Instruments – Validation and Seasonal Climatology”, *2022 Coupling, Energetics, and Dynamics of Atmospheric Regions Workshop.*
- Das, Saswati, et al. “Temporal Variation of Atomic Oxygen in the Upper Mesosphere from SOFIE”, *2022 Coupling, Energetics, and Dynamics of Atmospheric Regions Workshop.*
- Das, Saswati, et al. “Sudden Stratospheric Warming-triggered composition response of the Stratosphere-Mesosphere-Lower Thermosphere from SOFIE and ACE.”, *2022 Coupling, Energetics, and Dynamics of Atmospheric Regions Workshop.*
- Das, Saswati, et al. “SMLT Ozone from SOFIE – Validation and Seasonal Climatology”, 2022 *American Geophysical Union Conference*.
- Das, Saswati, et al. “Investigation of the Southern Hemispheric Ozone Enhancements during the 2019 Sudden Stratospheric Warming”, 2022 *American Geophysical Union Conference*.