Kimberlee Dubé

(306) 290-2126 ◇ kimberlee.dube@usask.ca

EDUCATION

Ph.D. Physics *October 2018 - October 2022*
University of Saskatchewan
Thesis: Satellite Limb Observations of Stratospheric NO_x
Supervisors: Dr. Adam Bourassa, Dr. Doug Degenstein

Certificate in Graduate Professional Skills *January 2019 - August 2019*
University of Saskatchewan

M.Sc. Physics *September 2016 - October 2018*
University of Saskatchewan
Thesis: The Solar Signal in OSIRIS Ozone and Aerosol Measurements
Supervisors: Dr. Adam Bourassa, Dr. Kathryn McWilliams
Coursework completed at University of Helsinki

B.Sc. Honours Physics *September 2012 - April 2016*
University of Saskatchewan
Minor in Mathematics
Specialization in Atmospheric, Space, and Plasma Physics

RESEARCH EXPERIENCE

Postdoctoral Researcher *October 2022 - Present*
University of Saskatchewan
Visiting Researcher at Environment and Climate Change Canada (ECCC) Canadian Centre for Climate Modelling and Analysis (CCCma)
Supervisor: Dr. Susann Tegtmeier (Usask), Dr. James Anstey (ECCC)

Work is focused on understanding lower stratospheric ozone trends using satellite observations and climate models.

Graduate Student - Ph.D. *October 2018 - October 2022*
University of Saskatchewan and National Center for Atmospheric Research (NCAR)
Supervisors: Dr. Adam Bourassa (Usask), Dr. Doug Degenstein (Usask), Dr. William Randel (NCAR)

Worked with NO_2 data from several satellite limb instruments. Focused on improving the data quality, and using the observations to look at the response of stratospheric NO_2 to different geophysical phenomena.

Graduate Student - M.Sc. *September 2016 - October 2018*
University of Saskatchewan
Supervisors: Dr. Kathryn McWilliams, Dr. Adam Bourassa

Studied the effect of the 11-year solar cycle and 27-day solar rotation period on ozone and aerosol observations from the Optical Spectrograph and InfraRed Imager System (OSIRIS).

Undergraduate Research Assistant *May 2016 - August 2016*
University of Saskatchewan
Supervisors: Dr. Kathryn McWilliams, Dr. Adam Bourassa

Studied the feasibility of using OSIRIS observations to construct a solar proxy based on the 280 nm Mg II feature.

Undergraduate Research Assistant *May 2015 - August 2015*
University of Saskatchewan
Supervisor: Dr. Kathryn McWilliams

Used data from the Canadian ground-based magnetometer network and from several Super Dual Auroral Radar Network (SuperDARN) radars to assess the feasibility of using SuperDARN measurements to create more robust space weather forecasts.

Undergraduate Research Assistant *May 2014 - August 2014*
Western University
Supervisor: Dr. Peter Brown

Searched through infrasound detection reports produced by the International Monitoring System (IMS) to find possible meteor events, and analyzed the waveforms of these events to assess the ability of the IMS to detect bolides.

PUBLICATIONS

Published

Dubé, K., Tegtmeier, S., Bourassa, A., Zawada, D., Degenstein, D., Sheese, P., Walker, K., Randel, W. (2023). N_2O as a regression proxy for dynamical variability in stratospheric trace gas trends. *Atmospheric Chemistry and Physics*, 23, 1328313300, https://doi.org/10.5194/acp-23-13283-2023.

Dubé, K., Zawada, D., Bourassa, A., Degenstein, D., Flittner, D., Sheese, P., Walker, K., Randel, W. (2022). An improved OSIRIS NO_2 profile retrieval in the UTLS and intercomparison with ACE FTS and SAGE III/ISS. *Atmospheric Measurement Techniques*, 15, 61636180, https://doi.org/10.5194/amt-15-6163-2022.

Dubé, K., Randel, W., Bourassa, A., Degenstein, D. (2022). Tropopause-level NO_x in the Asian summer monsoon. *Geophysical Research Letters*, 49, e2022GL099848.

Solomon, S., Dubé, K., Stone, K., Yu, P., Kinnison, D., Toon, O. B., Strahan, S. E., Rosenlof, K. H., Portmann R., Davis, S., Randel, W., Bernath, P., Boone, C., Bardeen, C. G., Bourassa, A., Zawada, D., Degenstein, D. (2022). On the stratospheric chemistry of mid-latitude wildfire smoke. *Proceedings of the National Academy of Sciences*, 119(10), e2117325119.

Dubé, K., Bourassa, A., Zawada, D., Degenstein, D., Damadeo, R., Flittner, D., Randel, W. (2021). Accounting for the photochemical variation of stratospheric NO_2 in the SAGE III/ISS solar occultation retrieval. *Atmospheric Measurement Techniques*, 14(1):557-566.

Dubé, K., Randel, W., Bourassa, A., Zawada, D., McLinden, C., Degenstein, D. (2020). Trends and variability in stratospheric NO_x from merged SAGE II and OSIRIS satellite observations. *Journal of Geophysical Research: Atmospheres*, 125, e2019JD031798.

In Progress

Zhang, J., Kinnison, D., Zhu, Y., Wang, X., Tilmes, S., Dubé, K., Randel, W. (2023). Chemistry contribution to stratospheric ozone depletion after the unprecedented water rich Hunga Tonga eruption. Under review for *Geophysical Research Letters*.

Zawada, D., Dubé, K., Warnock, T., Bourassa, A., Tegtmeier, S., Degenstein, D. (2023). A Multi-Decadal Time Series of Upper Stratospheric Temperature Profiles from Odin-OSIRIS Limb Scattered Spectra. Under review for *Atmospheric Measurement Techniques*.

PRESENTATIONS

SCISAT 20th Anniversary Meeting *October 16-18, 2023*
Canadian Space Agency
N_2O as a regression proxy for dynamical variability in stratospheric trace gas trends (talk)

12th Atmopsheric Limb Workshop *May 22-26, 2023*
Brussels, Belgium
N_2O as a regression proxy for dynamical variability in stratospheric trace gas trends (talk)

CSA Earth Observation in Orbit Webinar *March 15, 2023*
Virtual
A Canadian View of Stratospheric Trace Gas Trends (talk)

7th SPARC General Assembly *October 24-28, 2022*
Boulder, Colorado
Tropopause-level NO_x in the Asian summer monsoon (poster)

Canadian Meteorological and Oceanographic Society 56th Congress *June 1-7, 2022*
Saskatoon, Saskatchewan (Virtual)
Tropopause-level NO_x in the Asian summer monsoon (talk)

Living Planet Symposium *May 23-27, 2022*
Bonn, Germany
Tropopause-level NO_x in the Asian summer monsoon (poster)

Physics and Engineering Physics Departmental Seminar *January 11, 2022*
University of Saskatchewan
Satellite Limb Measurements of Stratospheric NO_x (talk)

American Geophysical Union Fall Meeting *December 13-17, 2021*
New Orleans, LA (Virtual)
Intercomparison of NO_2 from ACE-FTS, SAGE III/ISS, and OSIRIS (poster)

SAGE III/ISS Science Team Meeting *November 4-5, 2021*
Virtual
Intercomparison of NO_2 from ACE-FTS, SAGE III/ISS, and OSIRIS (talk)

ACE Science Team Meeting *October 14, 2021*
Virtual
Intercomparison of NO_2 from ACE-FTS, SAGE III/ISS, and OSIRIS (talk)

SAGE III/ISS Science Team Meeting *October 19-20, 2020*
Virtual
Accounting for the photochemical variation of stratospheric NO_2 in the SAGE III/ISS solar occultation retrieval (talk)

American Geophysical Union Fall Meeting *December 9-13, 2019*
San Francisco, California
Trends and variability in stratospheric NO_x from merged SAGE II and OSIRIS satellite observations (poster)

SAGE III/ISS Science Team Meeting *October 29-30, 2019*
NASA Langley, Hampton, Virginia
Trends and variability in stratospheric NO_x from merged SAGE II and OSIRIS satellite observations (talk)

Women in Physics Canada Conference *June 25-28, 2019*
McGill University
Trends in stratospheric NO_x observed by SAGE II and OSIRIS (poster)

European Geosciences Union Annual Meeting *April 8-13, 2018*
Vienna, Austria
The solar signal in OSIRIS ozone measurements (poster)

Women in Physics Canada Conference *July 26-28, 2017*
University of Waterloo

The effect of solar rotation on OSIRIS stratospheric ozone observations (talk)

9th Atmospheric Limb Workshop *June 12-14, 2017*
University of Saskatchewan
The 27 day solar rotation signal in OSIRIS tropical stratospheric ozone profiles (poster)

Undergraduate Project Symposium *January 2016*
University of Saskatchewan
Space Weather Forecasting with SuperDARN (poster)
2nd place in science division

Canadian Conference for Undergraduate Women in Physics *January 2016*
Dalhousie University
Space Weather Forecasting with SuperDARN (poster)

COURSES

VolImpact Summer School *September 20-24, 2021*
Virtual, via University of Greifswald, Germany
- Consisted of lectures and group work on the effects of volcanic eruptions of the atmosphere and climate.
Poster Presentation: The effect of large volcanic eruptions on stratospheric NO_x trends.

NASA Earth Observations Summer School *August 16-27, 2021*
Virtual, via NASA JPL Center for Climate Sciences
- Consisted of lectures and a group project pertaining to the use of satellite data from a variety of instruments, as well as the use of climate models. Focus was on monitoring and understanding the effects of climate change.

NSERC CREATE International Space Mission Training *January 2019 - August 2019*
Royal Military College of Canada and University of Saskatchewan
- Involved coursework on designing space missions with an international group of students, as well as a course on professional skills and development.
- An intensive summer program consisted of designing, building, and launching a stratospheric balloon instrument.

Incoherent Scatter Radar Summer School *July 2016*
Sodankyla, Finland
- Attended lectures to learn about the EISCAT radars, and collaborated with an international group of graduate students to perform an experiment using one of the radars. The school culminated with a presentation of our results.

CaNoRock Student Sounding Rocket Course *March 2015*
Andoya, Norway
- Spent a week at the Andoya Space Centre in northern Norway learning the basics of rocket physics. This involved attending a series of lectures, as well as working with an international group of students to build and launch a sounding rocket.

AWARDS

Graduate Research Fellowship: 2021/22
B.W. Currie Graduate Scholarship: 2020/21
Physics Scholarship: 2017/18, 2018/19, 2019/20
Jack Henry Meek Scholarship: 2017/18
Graduate Scholarship: 2016/17
ISAS Book Award: 2016/17
Study Abroad Scholarship: 2016

Ruth and Eber Pollard Scholarship: 2016
Saskatchewan Innovation and Opportunity Scholarship: 2015
Sylvia Fedoruk Scholarship: 2014
Jennette Gertrude Traynor Physics Award: 2013
Government of Saskatchewan General Proficiency Award: 2012
University of Saskatchewan Greystone Scholar Award: 2012

TEACHING EXPERIENCE

Teaching Assistant *January 2017 - March 2021*
University of Saskatchewan

Jan. to Mar. 2019, 2021: Assisted with third year engineering physics lab (EP 354)
Sep. to Dec. 2020: Instructed first year physics lab (PHYS 115)
Jan. to Apr. 2018, 2019: Supervised first year engineering lab (PHYS 155)
Sep. to Nov. 2017, 2019: Assisted with second year engineering physics lab (EP 253)
June 2017: Assisted with first year physics lab (PHYS 117)
May 2017, 2020: Assisted with first year physics lab (PHYS 115)
Jan. to Apr. 2017: Graded assignments for first year engineering course (PHYS 155)

LEADERSHIP AND VOLUNTEER EXPERIENCE

Peer reviews for Geophysical Research Letters, Atmospheric Measurement Techniques, Atmospheric Chemistry and Physics
Volunteer with SCAT street cat rescue: 2022-present
President of Physics and Engineering Physics Graduate Association of Students at the University of Saskatchewan (PEGASUS): 2019/20, 2020/21, 2021/22
University of Saskatchewan Space Design Team (CubeSat Project Member, Payload team): 2019/20, 2020/21
University of Saskatchewan Graduate Student Association (Sustainability Committee Member): 2019/20
Vice President of PEGASUS: 2018/19
Lets Talk Science (Volunteer): 2017/18, 2018/19
The Word on the Street Book Festival (Volunteer): September 2017
YWCA Young Womens Leadership Summit (Participant): March 2017
Vice President of University of Saskatchewan Physics Student Society: 2015/16
Canadian Women in Physics conference (Planning Committee Member): 2016