Michelle X. Bui

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EDUCATION:

Cornell University **Aug. 2021 – Aug. 2024**
Masters of Science (MS) in Atmospheric Sciences
Deans McNair Scholar

University of Texas at Arlington **Aug. 2017 – Jun. 2021**
Honors Bachelor of Science (BS) in Physics; Minor in Mathematics
Magna Cum Laude
McNair Scholar

Arlington High School **Aug. 2014 – Jun. 2017**
Distinguished Achievement High School Diploma
Summa Cum Laude
National Merit Commended Scholar

SKILLS:

- Computational modeling experience in geophysical fluid dynamics and plasma dynamics.
- Experience in computational languages and programs such as Python, Julia, LaTeX, MATLAB, R, and SAS Analytics.
- Scientific analyses and problem-solving using radar and satellite databases funded by NASA and NSF.
- Radar data analysis experience in coherent scatter radar techniques using Cornell University's Radar Laboratory in Ithaca, NY.
- Data analysis experience using the CEDAR Madrigal Database, NASA CDAWeb Database, NASA OMNIWeb Plus Database, JHU-APL SuperMAG Database, NASA SSCWeb database, and UC Berkeley THEMIS Database.
- Knowledge of illustrative and logistical software programs such as Inkscape, WACOM, ParaView, Google Suites, and Microsoft Office.
- Excited to collaborate and openly work with others, as shown by extensive group research and extra-curricular memberships.
- Instruction, curriculum, and tutoring experience ranging from middle school, high school, AP-level, and college-level courses in physics, calculus, chemistry, and other related courses, including online creation of instructional activities and labs.
- Writing, presentation, and communication capabilities as shown through numerous manuscripts and presentations, published at the national and regional levels.

RESEARCH EXPERIENCE:

Graduate Research Assistant **Aug. 2021 – Aug. 2024**

- Developed ion and neutral computational fluid simulations, locally representing the lower E-region ionosphere and lower thermosphere.
- Analyzed coherent scatter radar data to observe structuring of sporadic-E ionization layers.

Undergraduate Researcher **Jan. 2018 – May 2021**

- Studied the relationship between solar wind, magnetopause current, and magnetopause motion using theoretical and statistical, computational analyses.
- Investigated effects of high speed solar wind stream events on bursty bulk flow events in the magnetotail using analysis techniques on NASA satellite data.

Undergraduate Researcher **Jan. 2019 – May 2021**

- Studied the connection between magnetotail tilt and inter-hemispheric asymmetries in ionospheric outflow through computational model and data analyses.
- Triangulated ground-based magnetometer data from SuperMAG to determine fluctuations in magnetic field and applied these results to interdisciplinary research regarding fluctuations in bird migratory patterns.

WORK EXPERIENCE

Professional Tutor at Tompkins-Cortland Community College **Aug. 2024 – Present**

- Tutoring experience in Physics I-II, Chemistry I-II, Calculus I-III, Pre-Calculus, College Algebra, Statistics, and other related courses.

Executive Secretary for NASA Proposal Panel Reviews **Sep. 2023 – Nov. 2023**

- Organization, management, and technological support for two separate of NASA Heliophysics Proposal Panel Reviews.

Academic Instructor and Tutor at Porter Tutoring **Aug. 2017 – May 2021**

- Developed curriculum, lectures, and classroom activities for high school physics, high school math courses, SAT/ACT test preparation, and middle school general sciences.
- Tutoring experience in Physics I-II, College Algebra – Calculus II, AP-level sciences/math, middle – high school level math, and middle – high school general sciences.

Exam Reviewer & Test Grader at UT Arlington **Sept. 2018 – Mar. 2020**

- Taught exam reviews, hosted office hours, and distributed study resources for Physics I-II courses.
- Graded hundreds of multiple-choice exams.

Private Academic Tutor **Jul. 2017 – Jul. 2021**

- Tutoring experience in high school sciences/math, AP-level sciences/math, SAT prep, and ESL for Vietnamese speakers.

HONORS AND SCHOLARSHIPS:

Deans McNair Graduate Fellowship Stipend **Aug. 2021 – May 2022**

Cornell stipend fellowship ($33,012) awarded to graduate students who were awarded the McNair Scholars Fellowship during their undergraduate career.

McNair Scholar **Jan. 2020 – Jun. 2021**

NSF-funded program preparing qualified undergraduates for graduate study, especially students from disadvantaged demographics. Scholars complete the McNair Summer Research Internship under a research advisor and receive a stipend of $3,000 and support from program staff.

TSAPS Undergraduate Student Presentation Award **Awarded Nov. 2020**

Award by the Texas Section of the American Physical Society to the top undergraduate student presentations during the Fall 2020 meeting.

UTA McNair Scholars Award: Friends of the Library Scholarship **Awarded Aug. 2020**

I earned the top award given to the top two general audience oral presentations and research papers of the McNair Summer Research Internship.

UTA Libraries Best Papers Scholarship **Awarded Oct. 2020**

$200 scholarship awarded to the top papers of journals published by UTA Libraries.

UTA McNair Exemplary Senior Scholarship **Awarded Dec. 2020**

$300 scholarship awarded to exemplary McNair senior students.

UTA Presidential Scholarship **Awarded Aug. 2017**

Full-tuition scholarship ($48,000) awarded to high achieving admitted students, renewed annually for four years.

PUBLICATIONS:

Bui, M. X.; Hysell, D.; Larsen, Miguel. (2023) **Midlatitude Sporadic E-Layer Horizontal Structuring Modulated by Neutral Instability and Mixing in the Lower Thermosphere. Journal of Geophysical Research: Space Physics.** 128(2). https://doi.org/10.1029/2022JA030929

Gulson-Castillo, E. R.; Van Doren, B. M.; **Bui, M. X.**; Horton, K. G.; Li, J.; Moldwin, M. B.; Shedden, K.; Welling, D. T.; Winger, B. M. (2023) **Space weather disrupts nocturnal bird migration. Proceedings of the National Academy of Sciences.** 120(42). https://doi.org/10.1073/pnas.2306317120

Bui, M. X.; Lopez, R.E. (2021) **Comparing Approximate Total Current of the Dayside Magnetopause to Solar Wind Pressure.** McNair Scholars Research Journal, Vol. 24. University of Texas at Arlington Libraries. http://hdl.handle.net/10106/29689

Hysell, D. L.; **Bui, M. X.**; Larsen, M. F. (2024) **Observations and Model of Subauroral Sporadic E Layer Irregularities Driven by Turning Shears and Dynamic Instability. Journal of Geophysical Research: Space Physics.** 129(8). https://doi.org/10.1029/2024JA033088

PRESENTATIONS AND POSTERS:

Bui, M.X.; Hysell, D. Modulation of the Midlatitude Sporadic-E layer by Convective Instabilities in the MLT Region. Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) 2024 Workshop. Poster ID: IRRI-09. Jun. 2024.

Bui, M.X.; Hysell, D. L; Rojas-Villalba, E. L. A. Effects of Neutral Instability in the Lower Thermosphere on Midlatitude Sporadic E-Layer Structuring. American Geophysical Union (AGU) 2023 Workshop. Poster ID: SA21C-2691. Dec. 2023.

Bui, M.X.; Hysell, D. Midlatitude Sporadic E-Layer Horizontal Structuring Modulated by Neutral Instability and Mixing in the Lower Thermosphere. Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) 2023 Workshop. Poster ID: IRRI-07. Jun. 2023.

Bui, M.X.; Hysell, D. Midlatitude sporadic E-layer structuring from neutral instability and mixing in the lower thermosphere. American Geophysical Union (AGU) Fall Meeting 2022. Poster Abstract ID: SA55B-1399. Dec. 2022.

Bui, M.X.; Hysell, D. Midlatitude sporadic E-layer structuring due to instability and mixing in the lower thermosphere. Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) 2022 Workshop. Poster ID: MDIT-05. Jun. 2022.

Bui, M.; McCrum, J.; Welling, D. Can Interhemispheric Asymmetries in Ionospheric Outflow Wag the Magnetotail? American Geophysical Union (AGU) Fall Meeting 2020. Poster Abstract ID: SM040-737735. Dec. 2020.

Bui, M.; Lopez, R. E. Comparing Approximate Total Current of the Dayside Magnetopause and the Force to Solar Wind Pressure. Texas Section of the American Physical Society (TS-APS) Fall Meeting 2020. Oral Presentation. Nov. 2020.

Bui, M.; Lopez, R.E. Comparing Approximate J x B force on the Dayside Magnetopause to Solar Wind Pressure. UTA Honors Research Symposium Fall 2020. Poster Presentation. Nov. 2020.

Bui, M.; Lopez, R.E. Comparing Approximate Total Current of the Dayside Magnetopause to Solar Wind Pressure. UTA McNair Scholars Research Presentations 2020. Oral Presentation. Aug. 2020.

McCrum, J,; Bui, M.; Welling, D. Does Ionospheric Outflow Wag the Magnetotail? Geospace Environment Modeling (GEM) Workshop 2020. Poster ID: 233. Jul. 2020.

Bagheri, F.; Lopez, R.E.; Dredger, P.M.; Bonde, R.E.F.; Bui, M.; Chapagain, N.; Nelson, C.; Xing, C. Multipoint Observations of Solar Wind Conditions and Magnetopause Motion. American Geophysical Union (AGU) Fall Meeting 2019. Poster Abstract ID: SM51C-3198. Dec. 2019.

Bui, M.; Nelson, C.; Xing, C.; Dredger, P.; Bagheri, F.; Lopez, R.E. Identifying Magnetospheric Crossings between Northward and Southward IMF. Bulletin of the 2019 Joint Fall Meeting of the Texas Sections of APS, AAPT, and Zone 13 of the SPS, Vol. 64, No. 18. Poster Abstract ID: A01.00007. Oct. 2019.

Bagheri, F.; Lopez, R.E.; Dredger, P.; Bonde, R.E.F.; Xing, C; Nelson, C; Chapagain, N.; Bui, M. Study of Magnetopause Motion based on Multiple Crossings of THEMIS Spacecraft. Bulletin of the 2019 Joint Fall Meeting of the Texas Sections of APS, AAPT, and Zone 13 of the SPS, Volume 64, Number 18. Presentation Abstract ID: H01.00009. Oct. 2019.

Streetman, M.; Bui, M.; Crist, T.; Daniels, L.; Henke, M.; Carranza, H.; Lopez, R.E. Characteristics of Bursty Bulk Flows Originating from High Speed Streams. UTA College of Science ACES Research Symposium. Poster Presentation. Apr. 2018.

MEMBERSHIPS

Coupling, Energetics, & Dynamics of Atmos. Regions (CEDAR) **Jun. 2022 – Jun. 2024**
Member: Attended national CEDAR meetings during 2021-2023.

American Geophysical Union (AGU) **Jan. 2020 – Jan. 2024**
Member: Attended national AGU meetings during 2021-2023.

American Physical Society (APS) **Sept. 2019 – Aug. 2024**
Member: Attended regional APS meetings during 2019-2020

Snee Graduate Organization **Jan. 2022 – Dec. 2023**
President: Led group meetings and officer meetings, organized events, oversaw expenses
GPSA Representative: Attended GPSA meetings and kept track of relevant updates

Expanding Your Horizons at Cornell **Sep. 2022 - Mar. 2023**
Brochures and Publicity Chair: Designed and distributed brochures and postcards to local middle schools in central New York to recruit student participants for the workshop.

Women in Physics **Sep. 2017 – May 2021**
President: Led group meetings and managed group activities. Apr. 2018 – Present

Treasurer: Maintained finances and paperwork Jan. 2018 – Apr. 2018
Member: Attended group activities and meetings Sept. 2017 – Jan 2018

STEM Mentorship Program Sponsored by Women in Physics **Sept. 2018 – May 2021**

Founder and Activities Leader: Voluntary visits to high school and junior high students to host science activities and encourage students to pursue STEM careers.

Society of Physics Students **Jan. 2019 – May 2021**

Member: Attended weekly meetings and participated in group activities.

Honors College Council **Sept 2017 – May 2021**

Member: Attended meetings, colloquiums, and group events.