

# Nikaan Koupaei Abyazani

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## Education

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- **University of Wisconsin-Madison** **2022-2025**
  - **Ph.D.** – Atmospheric and Oceanic Sciences
  - **Ph.D. Minor** – Soil Science
- **University of Wisconsin-Madison** **2020-2022**
  - **Master of Science** – Atmospheric and Oceanic Sciences
- **University of Wisconsin-Madison** **2016-2020**
  - **Bachelor of Science** – Physics
  - **Bachelor of Science** – Astronomy
  - **Certificate** – Mathematics

## Teaching and Mentoring Experience

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- **Teaching Assistant** **2020-2025**
  - Courses
    - Algebra-based Physics I (online)
    - Algebra-based Physics II (online and in-person)
    - Global Change – Atmospheric Problems of Global Significance (in-person)
  - Led three discussion sections and three lab sections for ~60 students per semester
  - Graded lab work and class attendance
  - Held office hours for three hours per week per semester
  - Held review sessions for exams for eight hours per semester
- **Research Mentor** **2022**
  - Assisted new lab members with Python coding and conducting literature reviews
- **Physics Peer Mentor Tutor** **2018-2020**
  - Engaged students in challenging physics concepts as a group leader
  - Assisted students while working on worksheets, homework, exam problems, etc.
  - Facilitated an active and inclusive learning environment

## Computer Skills

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- **Python Programming Proficiency**
  - Utilized in research for data analysis and visualization
- **Unix Proficiency**
  - Utilized to copy, remove, store, and navigate through data files
- **LaTeX Proficiency**
  - Utilized to write research papers

## Projects

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- **Dissertation Chapter 3 – *Impacts of Anthropogenic Disturbance on Soil Greenhouse Gas Fluxes in Malaysian Peatlands*** **2024-2025**

Fulbright project involving fieldwork in Malaysian peatlands

  - **Key responsibilities**
    - Gathering peat soil samples and peat soil gas samples from three peatland sites of varying disturbance

- Measuring water table level
  - Measuring peat subsidence
  - Analyzing peat soil samples and peat soil gas samples (carbon dioxide, methane, and nitrous oxide) in lab
- **Dissertation Chapter 2 – *Forecasting Tropical Peatland Burned Area Potential 10-30 Days in Advance*** **2023-2025**
- Using a remote sensing-based model to forecast tropical peatland burned area
- **Key responsibilities**
    - Developing a model using remotely sensed moisture indices
    - Working with data from the Global Fire Emissions Database
    - Working with the Moderate Resolution Imaging Spectroradiometer (MODIS) surface reflectance and vegetation index products
- **Dissertation Chapter 1 – *Tropical Peatland Water Table Estimations from Space*** **2022-2024**
- Using a remote sensing-based model to estimate temporal variability of water table levels in tropical peatlands
- **Key responsibilities**
    - Writing Python script for model from scratch
    - Working with Landsat 7 and 8 surface reflectance products
    - Plotting maps
- **Master's Thesis - *The Influence of Interannual Carbon Variability on Long-Term Sequestration in Proximate Northern Forests and Wetlands*** **2020-2022**
- Utilization of various flux data from data repositories to compare year to year carbon uptake variability and relevant drivers between nearby forests and wetlands
- **Key responsibilities**
    - Data analysis via the Pandas package (Python)
    - Constructing plots via Matplotlib (Python)
    - Writing relevant equations via *LaTeX*
- ***Wetland Porewater Sampling in Northern Wisconsin*** **2021**
- Utilized filters to obtain porewater samples at two wetland sites in northern Wisconsin
- ***Hydrogen Emission in the Earth's Upper Atmosphere*** **2018-2020**
- Investigation of solar cycle influence on hydrogen Balmer-alpha emissions in the upper atmosphere
- **Key responsibilities**
    - Interpreting data from the Wisconsin H-Alpha Mapper
    - Using spectral fitting code to fit model Gaussians to data
    - Performing data calibration using the North America Nebula

## Publications

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- Desai, A.R., Murphy, B., Wiesner, S., Thom, J., Butterworth, N.J., **Koupaei-Abyazani, N.**, Muttaqin, A., Paleri, S., Talib, A., Turner, J., Mineau, J., Merrelli, A., Stoy, P.C., Davis, K.J., 2022. Drivers of decadal carbon fluxes across temperate ecosystems. *J. Geophys. Res.-Biogeosciences*, 127, e2022JG007014, doi:[10.1029/2022JG007014](https://doi.org/10.1029/2022JG007014).

- Golub, M., **Koupaei-Abyazani, N.**, Vesala, T., Mammarella, I., Ojala, A., Bohrer, G., Weyenmeyer, G.A., Blanken, P.D., Eugster, W., Koebisch, F., Chen, J., Czajkowski, K., Deshmukh, C.S., Guérin, F., Heiskanen, J., Humphreys, E., Jonsson, A., Karlsson, J., Kling, G., Lee, X., Liu, H., Lohila, A., Lundin, E., Morin, T., Podgrasjek, E., Provenza, M., Rutgersson, A., Sachs, T., Sahlée, E., Serça, D., Shao, C., Spence, C., Strachan, I.B., Xiao, W., Desai, A.R., 2023. Diel, seasonal, and Inter-annual variation in carbon dioxide effluxes from lakes and reservoirs. *Environmental Research Letters*, doi:[10.1088/1748-9326/acb834](https://doi.org/10.1088/1748-9326/acb834).
- Kurek, M. R., Wickland, K. P., Nichols, N. A., McKenna, A. M., Anderson, S. M., Dornblaser, M. M., **Koupaei-Abyazani, N.**, Poulin, B.A., Bansal, S., Fellman, J.B., Druschel, G.K., Bernhardt, E.S., Spencer, R.G.M. (2024). Linking dissolved organic matter composition to landscape properties in wetlands across the United States of America. *Global Biogeochemical Cycles*, 38, e2023GB007917. doi: [10.1029/2023GB007917](https://doi.org/10.1029/2023GB007917)
- **Koupaei-Abyazani, N.**, Burdun, I., Desai, A.R., Hergoualc'h, K., Hirano, T., Melling, L., Swails, E., Tang, A.C.I., Wong, K., 2024. Tropical peatland water table estimations from space. *J. Geophys Res: Biogeosciences*, 129, e2024JG008116. <https://doi.org/10.1029/2024JG008116>.
- **Acknowledgements**
  - Nossal, S.M., *et al.* “Geocoronal Hydrogen Emission Variation Over Two Solar Cycles.” *Journal of Geophysical Research: Space Physics*, 2019, doi:[10.1029/2019JA026903](https://doi.org/10.1029/2019JA026903).

## Awards, Recognition, and Certificates

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| ➤ <i>Fulbright U.S. Student Researcher</i>                                                                                                                                                     | 2023 |
| ➤ <i>AsiaFlux Conference Scholarship Award</i>                                                                                                                                                 | 2022 |
| ➤ <i>University of Wisconsin-Madison Conference Presentation Award</i>                                                                                                                         | 2022 |
| ➤ <i>Land Carbon Cycle Modeling Certificate</i>                                                                                                                                                | 2022 |
| <ul style="list-style-type: none"> <li>○ <i>Achieved through completion of training course on new advances in land carbon cycle modeling offered by Northern Arizona University</i></li> </ul> |      |
| ➤ <i>University of Wisconsin-Madison Department of Atmospheric and Oceanic Sciences Travel Grant Award</i>                                                                                     | 2021 |
| ➤ <i>University of Wisconsin-Madison Dean's List</i>                                                                                                                                           | 2018 |

## Volunteer and Outreach Experience

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| ➤ <i>University of Wisconsin- Madison Department of Atmospheric and Oceanic Sciences Social Committee Chair</i>                                                                                                                                                            | 2022 |
| ➤ <i>Wisconsin Science on the Square</i>                                                                                                                                                                                                                                   | 2022 |
| <ul style="list-style-type: none"> <li>○ Held station where research was presented to public as part of the Wisconsin Science Festival</li> </ul>                                                                                                                          |      |
| ➤ <i>Wisconsin Idea Stem Fellow</i>                                                                                                                                                                                                                                        | 2022 |
| <ul style="list-style-type: none"> <li>○ Program enabling the writing of a comic book describing our research to a general audience (in development)</li> <li>○ Comic book is being made along with two other researchers (Susanne Wiesner and Sreenath Paleri)</li> </ul> |      |
| ➤ <i>Tutor Development Conference</i>                                                                                                                                                                                                                                      | 2020 |
| <ul style="list-style-type: none"> <li>○ Presented a PowerPoint presentation on student learning to tutors and tutoring faculty from a wide range of disciplines</li> </ul>                                                                                                |      |
| ➤ <i>University of Wisconsin-Madison Wonders of Physics</i>                                                                                                                                                                                                                | 2020 |
| ➤ <i>University of Wisconsin-Madison Physics Fair</i>                                                                                                                                                                                                                      | 2018 |
| <ul style="list-style-type: none"> <li>○ Interacted with many adults and children, increasing curiosity and passion for Physics and other STEM fields</li> </ul>                                                                                                           |      |

- *University of Wisconsin-Madison Space Place*
  - Handed out programs, explained exhibits, and socialized with faculty involved at the 50<sup>th</sup> anniversary celebration of NASA's Orbital Astronomical Observatory

2018

## Presentations

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- *2025 American Geophysical Union Fall Meeting (Oral Presentation)*
- *University of Malaysia Sarawak (2024)*
- *International Conference on Tropical Sciences (2024)*
- *Living Labs for Wetland Forest Research (2024)*
- *Led a tutorial on Remote Sensing and how to access Remote Sensing data for the Sarawak Tropical Peat Research Institute in Malaysia (2024)*
- *Presented a Presentation named "Basics of Soil Science" to the Sarawak Tropical Peat Research Institute in Malaysia (2024)*
- *2024 Asia Oceania Geosciences Society Meeting (Two Oral Presentations)*
- *2022 American Geophysical Union Fall Meeting (Poster Presentation)*
- *2022 AsiaFlux Conference (Poster Presentation)*
- *2022 Ameriflux Annual Meeting (Poster and Oral Presentation)*
- *University of Wisconsin-Madison Day at the Capitol (2022)*
  - Presented research poster to state legislators at the Wisconsin State Capitol
- *University of Wisconsin-Madison Atmospheric and Oceanic Sciences Department Seminar (2022)*
- *2022 University of Wisconsin-Madison Atmospheric and Oceanic Sciences Poster Reception (Poster Presentation)*
- *2021 Ameriflux Annual Meeting (Poster Presentation)*
- *2021 Graduate Climate Conference (Poster Presentation)*
- *2021 American Geophysical Union Fall Meeting (Poster Presentation)*
- *2020 University of Wisconsin-Madison Undergraduate Research Symposium (Poster Presentation)*

## Languages

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- *English Fluency*
- *Farsi (Persian) Fluency*
  - Learned through growing up in an Iranian household
- *Minimal French*

## Personal Activities

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- *University of Wisconsin-Madison Atmospheric and Oceanic Sciences Graduate Student Association Social Chair* 2022
- *University of Wisconsin-Madison Korean-American Student Association Board Member* 2022-2024
  - Planned and led a variety of events that promoted better understanding of Korean-American culture, heritage, and tradition
- *University of Wisconsin-Madison Chinese-American Student Association Member* 2022
- *University of Wisconsin-Madison Japanese Student Association Member* 2022