

Zolal Ayazpour

CONTACT INFORMATION	Harvard-Smithsonian Center for Astrophysics 60 Garden Street Cambridge, MA 02138 USA	E-mail: <LastName>.<FirstName> at gmail.com https://www.acsu.buffalo.edu/~zolalaya
RESEARCH INTERESTS	Remote sensing, atmospheric monitoring, spectroscopy, retrieval theory, tropospheric chemistry	
EDUCATION	Ph.D. candidate , Environmental Engineering (GPA: 4/4) May 2019 – Present Specialization: Atmospheric Remote Sensing University at Buffalo , Buffalo, NY, USA Master of Science , Water Resources Engineering and Management October 2015 – June 2018 University of Stuttgart , Stuttgart, Germany Bachelor of Science , Civil Engineering September 2009 – July 2013 University of Tehran , Tehran, Iran	
RESEARCH EXPERIENCE	Harvard-Smithsonian Center for Astrophysics , Cambridge, MA, USA Research Fellow March 2023 – present (Advisors: Gonzalo González Abad and Caroline R. Nowlan) • Development of trace gas retrieval algorithms Harvard-Smithsonian Center for Astrophysics , Cambridge, MA, USA Visiting Ph.D. Student May 2020 – February 2023 (Advisors: Gonzalo González Abad and Caroline R. Nowlan) • Development of OMI satellite instrument collection-4 formaldehyde retrieval algorithm • Uncertainty quantification of OMI formaldehyde retrieval • Validation of OMI formaldehyde product with global, ground-based sensor networks University at Buffalo , Buffalo, NY, USA Graduate Research Assistant May 2019 – present (Advisor: Kang Sun) • Estimating NO_x emissions from power generating facilities in the US using satellite observations and comparing with ground-based measurements • Development of spatially complete planetary boundary layer height product using an observational data-driven approach • Study of spatial and temporal variability of ozone sensitivity over the Middle East observed by TROPOMI satellite instrument University of Stuttgart , Stuttgart, Germany Graduate Research Assistant November 2017 – September 2018 (Advisor: Ulrich Dittmer) • Development of a hybrid wavelet artificial neural network model to predict sewer flow University of Tehran , Tehran, Iran Undergraduate Researcher June 2011 – June 2012 (Advisor: Mohammad Shekarchizadeh) • Evaluation of chloride penetration in concrete in marine environment using artificial neural network algorithm	

HONORS AND AWARDS

SAO Pre-doctoral Fellowship

Harvard-Smithsonian Center for Astrophysics
Research fellowship to conduct part of my Ph.D. research

March 2023 – December 2024

AGU Student Travel Grant

American Geophysical Union
To present my Ph.D. research at AGU Fall Meeting 2022

December 2022

Robert P. Apmann Memorial Award

University at Buffalo
This award recognizes outstanding 1st-year graduate students

May 2020

DAAD Scholarship

German Academic Exchange Service
Scholarship for M.Sc. program at University of Stuttgart

June 2015 – March 2018

National Scholarship

University of Tehran
Scholarship for B.Sc. program at University of Tehran

September 2009 – July 2013

TEACHING EXPERIENCE

Guest lecturer, Environmental Fluid Mechanics, University at Buffalo

Sep 2021 & Aug 2022

Co-Instructor, Air Pollution, University at Buffalo

Spring 2022

Guest lecturer, Introduction to MATLAB and Python, University at Buffalo

March 2021

Teaching Assistant, Calculus II, University of Tehran

Fall 2010 & Spring 2013

Instructor, Mathematics and Physics, Kherad High School

September 2010 – June 2011

PUBLICATIONS

Submitted Manuscripts

Z. Ayazpour, G. González Abad, C. R. Nowlan, K. Sun, H. A. Kwon, C. C. Miller, H. Chong, H. Wang, X. Liu, K. Chance, E. O'Sullivan, L. Zhu, C. Vigouroux, I. De Smedt, et al. (2024). Aura Ozone Monitoring Instrument (OMI) Collection 4 Formaldehyde Product. [preprint for Earth and Space Science]. DOI: 10.22541/essoar.171804891.19520982/v1.

H. A. Kwon, G. González Abad, C. C. Miller, K. Hall, C. R. Nowlan, E. O'Sullivan, H. Wang, H. Chong, **Z. Ayazpour**, X. Liu, K. Chance (2024). Updated OMI Glyoxal Column Measurements using Collection 4 Level 1B Radiances. [submitted to Earth and Space Science].

J. Liao, G. M. Wolfe, A. E. Kotsakis, J. M. Nicely, J. M. St. Clair, T. F. Hanisco, G. González Abad, C. R. Nowlan, **Z. Ayazpour**, I. De Smedt, E. C. Apel, and R. S. Hornbrook (2024). Validation of formaldehyde products from three satellite retrievals (OMI SAO, OMPS-NPP SAO, and OMI BIRA) in the marine atmosphere with four seasons of ATom aircraft observations. [preprint for Atmospheric Measurement Techniques]. DOI: 10.5194/amt-2024-72.

H. Wang, G. González Abad, C. C. Miller, H. A. Kwon, C. R. Nowlan, **Z. Ayazpour**, H. Chong, X. Liu, K. Chance, E. O'Sullivan, K. Sun, R. Spurr, and R. J. Hargreaves (2023). Development of the MEaSUREs blue band water vapor algorithm – Towards a long-term data record. [preprint for Atmospheric Measurement Techniques]. DOI: 10.5194/amt-2023-66.

Journal Articles

T. Zhao, J. Mao, **Z. Ayazpour**, G. González Abad, C. R. Nowlan, and Y. Zheng (2024). Interannual variability of summertime formaldehyde (HCHO) vertical column density and its main drivers at northern high latitudes. *Atmospheric Chemistry and Physics*, 24, 6105–6121. DOI: 10.5194/acp-24-6105-2024.

H. Chong, G. González Abad, C. R. Nowlan, C. C. Miller, A. Saiz-Lopez, R. P. Fernandez, H. A. Kwon, **Z. Ayazpour**, H. Wang, A. H. Souri, X. Liu, K. Chance, E. O'Sullivan, J. Kim, J. H. Koo, W. R. Simpson, F. Hendrick, R. Querel, G. Jaross, C. Seftor, and R. M. Suleiman (2024). Global retrieval of stratospheric and tropospheric BrO columns from the Ozone Mapping and Profiler Suite Nadir Mapper (OMPS-NM) on board the Suomi-NPP satellite. *Atmospheric Measurement Techniques*, 17, 2873–2916.

DOI: 10.5194/amt-17-2873-2024.

D. C. Anderson, B. N. Duncan, J. Liu, J. M. Nicely, S. A. Strode, M. B. Follette-Cook, A. H. Souri, J. R. Ziemke, G. González Abad, and **Z. Ayazpour** (2024). Trends and Interannual Variability of the Hydroxyl Radical in the Remote Tropics During Boreal Autumn Inferred From Satellite Proxy Data, *Geophysical Research Letters*, 51, e2024GL108531. DOI: 10.1029/2024GL108531.

C. R. Nowlan, G. González Abad, H. A. Kwon, **Z. Ayazpour**, C. C. Miller, K. Chance, H. Chong, X. Liu, E. O'Sullivan, H. Wang, L. Zhu, I. De Smedt, G. Jaross, C. Seftor, and K. Sun (2023). Global Formaldehyde Products from the Ozone Mapping and Profiler Suite (OMPS) Nadir Mappers on Suomi NPP and NOAA-20. *Earth and Space Science*, 10, e2022EA002643. DOI: 10.1029/2022EA002643.

C. Howlett, G. González Abad, C. C. Miller, C. R. Nowlan, **Z. Ayazpour**, and L. Zhu (2023). The influence of snow cover on Ozone Monitor Instrument formaldehyde observations. *Atmósfera*, 37, 159–174. DOI: 10.20937/ATM.53134.

Z. Ayazpour, S. Tao, D. Li, A. J. Scarino, R. E. Kuehn, and K. Sun (2022). Estimates of spatially complete, observational data-driven planetary boundary layer height over the contiguous United States. *Atmospheric Measurement Techniques*, 16, 563–580. DOI: 10.5194/amt-16-563-2023.

Z. Ayazpour, A. E. Bakhshipour, U. Dittmer (2019). Combined Sewer Flow Prediction Using Hybrid Wavelet Artificial Neural Network Model. *International Conference on Urban Drainage Modelling 2018*, Springer, p. 693–8. DOI: 10.1007/978-3-319-99867-1_120.

SELECTED
CONFERENCE
PRESENTATIONS

Z. Ayazpour, G. González Abad, C. R. Nowlan, K. Sun, H. A. Kwon, C. C. Miller, H. Chong, H. Wang, X. Liu, K. Chance, E. O'Sullivan, L. Zhu, C. Vigouroux, I. De Smedt, et al., Aura Ozone Monitoring Instrument (OMI) Collection 4 Formaldehyde Product, OMI-TROPOMI Meeting, Boulder, CO, June 2024.

Z. Ayazpour, K. Sun, C. R. Nowlan, and G. González Abad, Quantification of NO_x Emissions from Power-Generating Facilities over the US using Satellite Observations and intercomparison with Ground Measurements, AGU Fall Meeting, San Francisco, CA, December 2023.

Z. Ayazpour, G. González Abad, C. R. Nowlan, H. A. Kwon, C. C. Miller, H. Chong, K. Sun, E. O'Sullivan, H. Wang, X. Liu, K. Chance, A Consistent Long-Term Global Data Record of Formaldehyde from UV-Visible Satellite Instruments, AGU Fall Meeting, San Francisco, CA, December 2023.

Z. Ayazpour, K. Sun, C. R. Nowlan, and G. González Abad, Estimating Short-lived Air Pollutant Emissions in the United States Using New Generation Satellite Observations, AGU Fall Meeting, Chicago, IL, December 2022.

Z. Ayazpour, K. Sun, S. Tao, and D. Li, Estimates of spatially complete, observational data-driven planetary boundary layer height over the contiguous United States, TEMPO Science Team Meeting (virtual), June 2022.

Z. Ayazpour, K. Sun, C. C. Miller, C. R. Nowlan, E. O'Sullivan, and G. González Abad, Aura Ozone Monitoring Instrument (OMI) Version-4 Formaldehyde Product, AGU Fall Meeting, New Orleans, LA, December 2021.

Z. Ayazpour, K. Sun, C. C. Miller, C. R. Nowlan, E. O'Sullivan, and G. González Abad, Improving the Spectral Fit of NASA's OMI Formaldehyde Operational Product, AGU Fall Meeting (virtual), December 2020.

Z. Ayazpour and K. Sun, TROPOMI Observations of the Atmospheric Composition over the Middle East, AMS Annual Meeting, Boston, MA, January 2020.

Z. Ayazpour and K. Sun, High-Resolution Satellite Remote Sensing of the Atmospheric Composition over the Middle East, AGU Fall Meeting, San Francisco, CA, December 2019.

Z. Ayazpour, A. E. Bakhshipour, and U. Dittmer, Combined sewer flow prediction using hybrid wavelet artificial neural network model, Urban Drainage Modeling Conference, Palermo, Italy, September 2018.

WORK EXPERIENCE	Civil and Environmental Engineer	January 2014 – April 2015
	Pazhooohesh Omran Rahvar (P.O.R) Consulting Engineers, Tehran, Iran	
	Civil Engineer Intern	September 2013 – October 2013
PROFESSIONAL ACTIVITIES AND SOCIETIES	HYETOS Consulting Engineers, Thessaloniki, Greece	
	This internship was offered by International Association for the Exchange of Students for Technical Experience (IAESTE)	
	Civil Engineer Intern	June 2012 – September 2012
	KAYSON INC., Tehran, Iran	
	Reviewer for Peer-Reviewed Journal	
	Atmospheric Pollution Research	
	Board member	
	Member of Equity, Diversity, Inclusion, & Belonging Committee at Harvard-Smithsonian Center for Astrophysics, December 2023 – Present	
	Vice president of American Society of Civil Engineers-Environmental & Water Resources Institute Student Chapter at University at Buffalo, September 2021 – December 2022	
	Executive officer of American Society of Civil Engineers-Environmental & Water Resources Institute Student Chapter at University at Buffalo, September 2019 – August 2020	
	Executive officer of Civil, Structural & Environmental Engineering Graduate Student Association at University at Buffalo, September 2019 – August 2020	
TECHNICAL SKILLS	Outreach	
	STEM mentor for the CfA Research Experiences in Astronomy, Technology, & Engineering (CREATE) interns, Harvard-Smithsonian Center for Astrophysics, June 2024 – August 2024	
	Volunteer at Cambridge Explores the Universe event, Harvard-Smithsonian Center for Astrophysics, September 2023	
	Member	
	American Geophysical Union, European Geosciences Union, American Meteorological Society	
	Languages	
	Persian (native), English (proficient), German and Arabic (basic knowledge)	
	Programming	
	Proficient in Python, MATLAB, and R - Familiar with FORTRAN, Linux Shell	
	Software	
	RStudio, L ^A T _E X, ArcGIS, Autodesk AutoCAD	
	High performance computing	
	High performance computing using computing clusters at University at Buffalo and Smithsonian Institution.	