Curriculum Vitae

ALIA R. WOFFORD

George Mason University
Department of Atmospheric, Oceanic, & Earth Sciences
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EDUCATION

PhD Student, Climate Dynamics, George Mason University *2021-present*

MSc, Atmospheric Sciences, Howard University *2019 – 2021*

BSc Biology and Comprehensive Science with Teaching Licensure, Elizabeth City State University *2013 - 2017*

FELLOWSHIPS AND AWARDS

Shukla Doctoral Fellowship - College of Science, George Mason University *2022-2023*

National Astronomy Consortium (NAC) Bridge Scholarship Award – AUI Board of Trustees, National Radio Astronomy Observatory *2021*

NOAA Cooperative Science Center in Atmospheric Sciences and Meteorology (NCAS-M) Fellow – Graduate Studies Department, Howard University *2019-2021*

AAS 233rd Meeting Chambliss Astronomy Achievement Student Graduate Honorable Mention - American Astronomical Society (AAS) 233rd meeting, Seattle, Washington *2019*

AAS 231st Meeting Chambliss Astronomy Achievement Student Undergraduate Honorable Mention - American Astronomical Society (AAS) 231st meeting, Washington, D.C. *2018*

EMARC/UMARC-STAR Scholar – Department of Natural Sciences, Elizabeth City State University *2016-2017*

NSF'S Louis Stokes Alliances for Minority Participation Scholar- Department of Natural Sciences, Elizabeth City State University *2014-2016*

2ND place Oral Presentation Competition Winner - 9TH Annual LSAMP Symposium *2016*

3RD place Oral Presentation Competition Winner - 8TH Annual LSAMP Symposium *2015*

RESEARCH EXPERIENCE

Investigating the CO_2 Forcing Thresholds Needed to Deglaciate the Paleoproterozoic "Hard" Snowball Earth

August 2022-Present

Advisor: Dr. Linda Sohl, Dr. Shawn Domagal-Goldman
-Utilized the Resolving Orbital and Climate Keys of Earth and Extraterrestrial Environments with Dynamics (ROCKE-3D) Global Climate Model (GCM) to model the Paleoproterozoic "Hard" Snowball with CO_2 concentrations ranging from 500ppm-300,000ppm.
-Exploring the critical CO_2 levels needed to deglaciate the "hard" Snowball Earth

Comparative Analysis of Obliquity-Driven Changes in the Martian Atmosphere

August 2020-August 2021

Advisor: Dr. Scott Guzewich, Dr. Konstantinos Tsigaridis
-Utilized the Resolving Orbital and Climate Keys of Earth and Extraterrestrial Environments with Dynamics (ROCKE-3D) Global Climate Model (GCM) to simulate the modern Martian atmosphere configuration at obliquities ranging from 0°-35°
-Analyzed how changes in obliquity influenced the dust transport and removal processes on Mars
-Analyzed how changes in obliquity impacted water exchange processes through Mars's polar ice caps

Understanding Space Weather through Model Validation

May 2020-August 2020

Advisor: Dr. Dimitrios Vassiliadis, National Oceanic and Atmospheric Administration
- Conducted statistical analysis for model validation with regards to a space weather event
- Conducted graphical analysis for magnetospheric models in the model validation study

Revisiting Early Earth's Methanogen Biosphere

March 2018-July 2019

Advisor: Dr. Giada Arney, NASA Goddard Space Flight Center
-Utilized 1-D Photochemical Climate Simulator (Atmos) to simulate photochemistry and climatic profiles of various methane fluxes in Early Earth's atmosphere
-Plotted various methane mixing ratios of abundant atmospheric molecules in Early Earth's atmosphere
-Utilized SMART to generate spectra from the ATMOS simulation outputs to represent self-consistent synthesis of planetary processes from the biosphere, to the atmosphere, to the telescope.

Radio Observations of M-Dwarf Space Weather

Summer 2017

Advisor: Dr. Jackie Villadsen, National Radio Astronomy Observatory

-Utilized CASA to clean RFI in radio data of M-Dwarf star CNLeo in the 8-12(X-BAND) GHz frequency
-Plotted X Band radio circular polarizations and brightness temperature to determine the space weather conditions that the star could be producing such as non-thermal thermal gyrosyncrotron emission mechanisms, cyclotron maser emission or the detection of Coronal Mass Ejections.

How Microgravity Impacts Immune and Cancer Cell Development 2016-2017
Advisor: Dr.Hirendranath Bannerjee, Elizabeth City State University
-Suspended immune and cancer cells in microgravity chamber to simulate free fall effect that occurs in space in 48-96hr. cycles
-Ran cell death assays on immune and cancer cells at the conclusion of each cycle.

How Dense Gases Contributed to Star Formation In Starburst Galaxy NGC 2146
Summer 2016
Advisor: Dr. Amanda Kepley, National Radio Astronomy Observatory
-Compared the amount of HCN and CO gases that were produced by starburst galaxy NGC 2146 to other Luminous Infrared Galaxies

Effects of Antimalarial Drugs on Chick Embryonic Development 2014-2016
Advisor: Dr. Gloria Payne, Elizabeth City State University
-Chick embryos were injected 3x throughout their development with antimalarial drugsChloroquine and Pyrimethamine to simulate dosages that human embryos would receive when treating a pregnant patient
-Embryos were allowed to develop until day 10 and then sacrificed to study the morphological impact caused

PUBLICATIONS

Vidaurri, M., **Wofford, A**., Brande, J., Black-Planas, G., Domagal-Goldman, S., & Haqq-Misra, J. 2019: Absolute prioritization of planetary protection, safety, and avoiding imperialism in all future science missions: A policy perspective. *Space Policy.* *https://doi.org/10.1016/j.spacepol.2019.101345*

TECHNICAL EXPERIENCE

Computer Languages: Python, Command Line

Radio Astronomy Software: CASA

Atmospheric Modeling Software: ATMOS

Resolving Orbital and Climate Keys of Earth and Extraterrestrial Environments with Dynamics General Circulation Model: ROCKE-3D

Spectral Mapping and Atmospheric Radiative Transfer model: SMART

Planetary Spectrum Generator: PSG

SELECTED PRESENTATIONS

Posters

52nd Lunar and Planetary Science Conference 2021
Comparative analysis of obliquity-driven changes in the Martian atmosphere

233rd AAS Winter 2019
Comparative Climatology of Terrestrial Planets III 2018
Revisiting the Early Earth's Methanogen Biosphere

231st AAS Winter 2018
Radio Observations of M Dwarf Space Weather

229th AAS Winter 2017
Emerging Researchers National Conference 2016
How does Dense Molecular Gases contribute to star formation in starburst galaxy NGC 2146?

Talks

Aug. 3, 2020, NCAS-M NERTO Final Presentation
Understanding Space Weather through Model Validation

2019 AbSciCon
Revisiting the Early Earth's Methanogen Biosphere

2017 National Astronomical Consortium
Radio Observations of M Dwarf Space Weather

2016 National Astronomical Consortium
How does Dense Molecular Gases contribute to star formation in starburst galaxy NGC 2146?

LANS Conference 2016
How does Dense Molecular Gases contribute to star formation in starburst galaxy NGC 2146?

8th Annual LSAMP Consortium 2015
Early Effects of Chloroquine on day 10 chick embryos

9th Annual LSAMP Consortium 2016
Early Effects of Pyrimethamine on day 10 chick embryos

NEWS ITEMS AND MEDIA COVERAGE

Saxton, B. (2022). *Nac Role Models - Alia Wofford. Vimeo*. Retrieved January 27, 2022, from https://vimeo.com/619353119.

National Science Foundation. (2021). *Stem for all 2021 Video Showcase*. *2021 STEM For All Video Showcase*. Retrieved January 27, 2022, from https://stemforall2021.videohall.com/presentations/1923.

CLUBS AND ORGANIZATIONS

American Astronomical Society Member
American Meteorological Society Member
National Astronomy Consortium
Zeta Phi Beta Sorority Incorporated
Gamma Sigma Sigma National Service Sorority Incorporated
George Mason University Climate Consensus
Young Democrats of North Carolina Forsyth County Chapter

OUTREACH AND SERVICE

Young Democrats of North Carolina Piedmont Regional Vice President	2023-Present
George Mason Climate Consensus Chapter Secretary	2021- Present
National Astronomy Consortium Annual Meeting Organizing Chair	2020- Present
Forsyth County Democratic Party Secretary	2021- 2023
Young Democrats District 10 Chair	2020- 2023
Young Democrats of Forsyth County 2ND Vice Chair	2020 - 2023
Bridges Long-Term Science Teacher	Jun. 2018 – Nov. 2018
Student Activities Council VP of Administration	2016-2017
Emotional Awareness Month Movie Night Coordinator	Oct. 2016
March of Dimes Fundraiser Coordinator	Mar. 2016
American Red Cross Blood Drive Volunteer	Aug.-Dec. 2016
VESTEM Physic Tutor	Aug. 2014-2017
Elizabeth City State University Sound of Class Bandsmen	2013-2017
Heart Health Awareness Volunteer	Dec. 2014
Elizabeth City State University VESTEM Mentor Virtual Advisor	Jun. 2014 - Jul. 2014
Miss Phi Beta Sigma Pageant Volunteer	Spring 2014