ANGELO S. TARZONA

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PROFILE

Fourth-year Ph.D. Candidate at Georgia Institute of Technology focusing on analyzing multi-decadal changes at Ross Ice Shelf, Antarctica from archival and modern airborne radar echo sounding data.

EDUCATION

Ph.D. Candidate in Geophysics concentrating in Cryosphere — May 2021 – May 2026
Ph.D. Minor in Geospatial and Environmental Planning
Georgia Institute of Technology, Atlanta, GA
GPA: 3.62/4.00
Advisor: Dr. Winnie Chu

Courseworks: Glacier Dynamics, Environmental Data Analysis, Land Remote Sensing, Geodynamics, Climate Global Change, Climate Change and City Planning, and Geovisualization and Geovisual Analytics

Bachelor of Science in Earth Sciences concentrating in Environmental Geosciences — May 2021
Dickinson College, Carlisle, PA
GPA: 3.49/4.00
Advisor: Dr. Jorden L. Hayes

Relevant Coursework: Environmental and Global Geophysics, Arctic Studies, Structural Geology, Surface Processes, Earth Materials, Field Geology, Sedimentology and Stratigraphy, Geographic Information Systems, and MATLAB

AWARDS & HONORS

Georgia Institute of Technology

AGU Cryosphere Section Student (CryoStuD) Travel Grant	Fall 2024
College of Sciences, Earth, and Atmospheric Sciences' Graduate Student Service Award	Spring 2024
37th Forum for Research into Ice Shelf Processes, Bremerhaven, DE, Travel Fund	Spring 2024
Subglacial Hydrology & Geology Workshop, Tasmania AU, Travel Fund	Fall 2023
Earth & Atmospheric Sciences' Symposium – 6th Place	Spring 2023
Magnetotelluric Instrumentation Short Course Conference, Socorro, NM, Travel Fund	Fall 2022
West Antarctic Ice Sheet Conference Travel Fund	Fall 2022
College of Sciences, Earth & Atmospheric Sciences' Teacher Assistant of the Year	Spring 2022
College of Sciences Dean's Fellowship	Fall 2021- Present

Dickinson College

William Vernon Prize for Excellence in Geology	2021
The Atlantic Richfield Foundation 1982 Research Award	2020
Pennsylvania Council of Professional Geologists Student Poster Session Award	2020
The Raven's Claw Scholarship	2020-2021
Honor Roll	2019-2021
Samuel G. Rose'58 Scholarship	2017-2021
The John Robert Paul Brock Scholarship	2017-2021

FUNDED GRANT PROPOSALS

Analyzing multi-decadal changes at Ross Ice Shelf through historical SPRI-NSF-TUD and modern NASA/NSF Operation IceBridge and ROSETTA-Ice radar sounding data. Future Investigators in NASA Earth and Space Science and Technology. $150K, August 22, 2022 – August 18, 2025. **Lead FI: A. Tarzona.** Co-Investigator: W. Chu (Advisor)

School of Earth and Atmospheric Sciences (EAS) Activities to Enhance Graduate Recruiting, Diversity, and Retention in EAS. The Provost's Fund for Excellence in Graduate Studies at Georgia Institute of Technology. $18K, October 12, 2023 – June 30, 2024. Awarded to Graduates of EAS. **GEAS President: A. Tarzona.** Graduate Coordinator: A. Higgins

RESEARCH EXPERIENCE

Graduate Research Assistant, Georgia Institute of Technology
Fourth-year Ph.D. Candidate Summer 2021-Present
Analyzing archival airborne radar data from SPRI-NSF-TUD campaign in Ross Ice Shelf, Antarctica to compare with modern airborne radar data such as NASA's Operation IceBridge & ROSETTA-Ice to observe for multidecadal changes.

Summer Research Experience for Undergraduate, Georgia Institute of Technology
Mentor Summer 2022
Guided 3 research undergraduate students in developing an algorithm to vertically calibrate archival airborne radar data by picking Ross Ice Shelf's surface and base and started the process to geographically re-position the archival dataset.

Geophysics Field Camp Experience, Rutgers University - Newark
Head Mentor Summer 2022
Assisted 4 mentors in introducing seismic tomography, electrical resistivity tomography, ground penetrating radar, and surveying to 15 undergraduate student participants studying the Shale Hills Critical Zone Observatory, Pennsylvania.

Earth Sciences Senior Capstone Research, Dickinson College
Undergraduate Researcher Spring 2021
Imaged lost gravesites in Mount Tabor African Methodist Church at Mt. Holly Springs, PA through a 500 MHz Ground Penetrating Radar grid survey to process a 3D image of the cemetery via GPR-SLICE.

Stanford Earth's Undergraduate Research in Geosciences and Engineering Program (SURGE), Remote Experience
SURGE Undergraduate Researcher Summer 2020
Analyzed ice shelves through image processing via MATLAB from archival (1966-1977) SPRI-NSF-TUD airborne radar-echo sounding campaign at East Antarctica to observe glacial activity since survey collection.

Student Collaborative Research with Faculty, Dickinson College
Undergraduate Researcher Fall 2019
Imaged the subsurface structure at Garner Run Subcatchment, Susquehanna Shale Hills Critical Zone Observatory through seismic refraction to understand how erosion and weathering shaped the surface to support life.

Arctic and Alpine Climate Research and Experience, Dickinson College
Undergraduate Researcher Summer 2019
Evaluated glacial water quality in Grise Fiord, Nunavut, Canada through pH, salinity, and dissolved oxygen in glacial streams via Yellow Spring Instrument to assess how glacial water quality changes away from the source.

PUBLICATION

Karlsson, N. B., Schroeder, D. M., Sørensen, L. S., Chu, W., Dall, J., Andersen, N. H., Dobson, R., Mackie, E. J., Köhn, S. J., Steinmetz, J. E., **Tarzona, A. S.**, Teisberg, T. O., and Skou, N.: A Newly Digitised Ice-penetrating Radar Data Set Acquired over the Greenland Ice Sheet in 1971–1979, Earth Syst. Sci. Data Discuss. [preprint], https://doi.org/10.5194/essd-2023-442, in review, 2024.

Schroeder, D. M., A. L. Broome, A. Conger, A. Lynch, E. J. Mackie, and **A. Tarzona.,** (2021), Radiometric analysis of digitized Z-scope records in archival radar sounding film, *Journal of Glaciology*, 1–8, doi:10.1017/jog.2021.130.

MANUSCRIPTS UNDER PREPARATION

Tarzona, A., W. Chu., B. Amaro., A. Altaweel., K. Tran., D.M. Schroeder., M. Siegfried., and H. Verbonceur. Implementing Canny Edge Detection for the SPRI-NSF-TUD 1974 Campaign at Ross Ice Shelf to extract ice thickness, *Journal of Glaciology.*

Tarzona, A., J. L. Hayes, L. Varner. Using Ground Penetrating Radar and Drone Imagery to Visualize Lost Gravesites at Mount Tabor Cemetery, Mount Holly Springs, PA., *Journal of Archeological Science: Reports*.

CONFERENCE ABSTRACTS

Tarzona A., Chu W., Verboncoeur H., Siegfried M., Schroeder M. D., Altaweel A., Amaro B., Yin R. (2024). Radiometric Interpretation of Archival Airborne Radio Echo Sounding in Ross Ice Shelf, Antarctica., American Geophysical Union Conference, San Francisco, Washington D.C., December 9 – 13, 2024, Abstract #NS33A-1205.

Tarzona A., Chu W., Verboncoeur H., Siegfried M., Schroeder M. D., Altaweel A., Amaro B., Tran K. (2023). Improved Vertical Calibration of the Historical SPRI-NSF-TUD Airborne Radar Echo Sounding Ice Thickness Measurements at Ross Ice Shelf, Antarctica (AGU), San Francisco, California, December 11 – 15, 2023, Abstract #C11D-1077.

Tarzona A., Chu W., Verboncoeur H., Siegfried M., Schroeder M. D., Altaweel A., Amaro B., Tran K. (2023). Extracting Ice Thickness Measurements from the Historical SPRI-NSF-TUD Airborne Radar Echo Sounding at Ross Ice Shelf through Computer Vision Algorithms, Subglacial Hydrology and Geology Workshop, Maydena, Tasmania, October 10 - 12, 2023.

Tarzona A., Chu W., Verboncoeur H., Siegfried M., Schroeder M. D., Altaweel A., Tran K. (2023). Using historical and modern radar echo sounding data to analyze multidecadal changes in Ross Ice Shelf, Antarctica, Graduate Students in Earth and Atmospheric Sciences (GEAS) 2nd Annual Symposium, Georgia Institute of Technology, Atlanta, Georgia, April 07, 2023.

Tarzona A., Chu W., Verboncoeur H., Siegfried M., Schroeder M. D., Combs L., Altaweel A., Prabu A., Tran K. (2022). Geographical repositioning efforts and vertical calibration of Z-scopes from SPRI-NSF-TUD surveys at Ross Ice Shelf, Antarctica, American Geophysical Union (AGU), Chicago, Illinois, December 12 – 16, 2022, Abstract #C45D-1123.

Tarzona A., Chu W., Verboncoeur H., Siegfried M., Schroeder M. D., Combs L., Altaweel A., Prabu A., Tran K. (2022). Archival airborne radio-echo sounding data geographical repositioning and calibration progress at Ross Ice Shelf, Antarctica, West Antarctic Ice Sheet (WAIS), Estes Park, CO, September 25-27, 2022.

Tarzona A., Chu W., Tran K., Teisberg T., Dawson E., (2021). Four-decades of Ross Ice Shelf changes: Part 2. Comparison using archival SPRI-NSF-TUD and modern ROSETTA-Ice and NASA/NSF IceBridge radio-echo sounding data, AGU, American Geophysical Union, New Orleans, December 13-17,2021, abstract #C25E-0866

Tran K., Chu W., **Tarzona A.,** Teisberg T., Dawson E., (2021). Four-decades of Ross Ice Shelf changes: Part 1. Modern Ice Shelf Basal Conditions based on ROSETTA-Ice and NASA/NSF IceBridge Radio-echo Sounding Observations, AGU, American Geophysical Union, New Orleans, December 13-17,2021, abstract #C25E-0865

Tarzona A., Mackie E., and Schroeder D. M., (2020). Archival Radar Echo Sounding Observations of Multi-Decadal Subsurface Changes Along the East Antarctic Coast, AGU, American Geophysical Union, Online, December 1-17,2020, abstract #C022-0014

Tarzona A., Castelo A., Del Vecchio J., Cambeiro J., Donaldson Y., Murray H., Hayes J., Mount J. G., Keating K., Brantley L. S., Forsythe B., Nyquist J., (2019). Imaging the structure of solifluction lobes in the Garner Run Subcatchment of the Susquehanna Shale Hills Critical Zone Observatory using 2D Seismic Refraction Tomography, AGU, American Geophysical Union, San Francisco, December 9-13,2019, abstract #NS21C-0834.

Cambeiro J., **Tarzona A.,** Donaldson Y., Pope G., O'Neill P., Hayes L. J., Mount J. G., Keating K., Brantley L. S., Nyquist J., (2018). Imaging the critical zone structure using seismic refraction in Garner Run at the Susquehanna Shale Hills Critical Zone Observatory, AGU, American Geophysical Union, Washington DC, December 10-14, 2018, abstract #NS41B-0818.

MENTORING

Undergraduate Student Advising

Rebecca Yin, High School Student, Woodward Academy, 2024
Taylor Bandy, Earth and Atmospheric Sciences major, Georgia Institute of Technology, 2024
Abdullah Altaweel, Computer Science Engineering major, Georgia Institute of Technology, 2022-2023
Kieran Choi-Slattery, Aerospace Engineering major, Georgia Institute of Technology, Summer 2022
Laila Combs, Earth & Atmospheric Sciences Research Experience for Undergraduate, Summer 2022
Kiera Tran, Earth & Atmospheric Sciences major, 2021-2022 (Now Ph.D. Candidate, Georgia Institute of Technology)

External Undergraduate Student Advising
Aadhav Prabu, Computer Science Engineering major, Stanford University, Summer 2022
Mikayla Pascual, Geology major, Middlebury College, Summer 2022 (Now Ph.D. Student, UT Austin)

FIELD CAMPAIGNS

Geophysical Field Methods Field Work, GSSI 3000 Ground Penetrating Radar, Zzyzx, CA, USA	Spring 2024
Helheim Glacier Field Work, ApRES Recovery, Greenland	Summer 2023
Geophysical Field Methods Field Work, GSSI 3000 Ground Penetrating Radar, Zzyzx, CA, USA	Spring 2022
Mt. Tabor Historic Cemetery Field Work, Pulse EKKO Ground Penetrating Radar, Mt. Tabor, PA, USA	Spring 2021
Fort Halifax Archeology Field Work, Pulse EKKO Ground Penetrating Radar, Ft. Halifax, PA, USA	Spring 2021
Arctic and Alpine Research Experience, Water Quality Specialist, Grise Fiord, NU, CAN	Summer 2019

EXTRA CURRICULAR ACTIVITIES

Committee Member, School of Earth and Atmospheric Sciences Chair Search	Spring 2024
Department Representative, College of Sciences Student Wellness Stakeholder Meeting	Spring 2024
Coordinator, Graduate Students in Earth and Atmospheric Sciences Science Symposium 2024	Spring 2024
President, Graduate Students in School of Earth and Atmospheric Sciences	Fall 2023 - Spring 2024
Coordinator, Future of Greenland Ice Sheet Science Workshop	Spring 2023
Social Chair, Graduate Students in School of Earth and Atmospheric Sciences	Fall 2022 - Spring 2023

EMPLOYMENT

Graduate Teaching Assistant, Georgia Institute of Technology
EAS 1601: Habitable Planets, Teaching Assistant Fall 2021- Summer 2022
Independently managing a hybrid lab version of Habitable Planets where I am responsible for helping 22 students each section understands concepts from lectures and lab activities.

Alliance for Aquatic Resource Monitoring (ALLARM), Dickinson College
Watershed Coordinator 2018-2021
Analyzed different streams throughout Central Pennsylvania using chemical and biological water quality monitoring techniques, subaquatic vegetation assessment, and rendering site maps in ArcGIS for volunteer monitors.

SKILLS

Programming Languages: MATLAB, Python
Processing Geophysical Data: ENVI Software, Geogiga Software, Res2Dinv, ResiPy, GPRPy, and GPR-SLICE
Geospatial: ArcGIS and ESRI Packages, QGIS, Google Earth Pro, Agisoft, Flowmapper, Kepler GL, GeoDa, Tableau
Graphics: Adobe Photoshop, Adobe Illustrator, Microsoft Office 365
Formal Languages: English, Tagalog/Filipino

REFERENCES

Dr. Winnie Chu, Assistant Professor of Earth and Atmospheric Sciences, Georgia Institute of Technology, 311 Ferst Drive, Atlanta, Georgia 30332-0340, email: wchu38@gatech.edu

Dr. Kristina Keating, Associate Professor of Department of Earth and Environmental Studies, Rutgers University, Newark, 101 Warren Street, Smith Hall, Newark, New Jersey 07102, email: kmkeat@newark.rutgers.edu

Dr. Jorden L. Hayes, Professor of Earth Sciences, Dickinson College PO Box 1773, Carlisle, PA 17013, email: hayesjo@dickinson.edu