








Whyjay Zheng

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 <https://ncu-cryosensing.org/>

 <https://scholar.google.com/citations?user=HJ64WwsAAAAJ>

Research Interests

I am interested in processes that shape a planet's surface and how cutting-edge remote sensing data and statistical models help us understand them better. My recent work focuses on glacier physics and cryospheric changes in the context of global warming, one of this century's most urgent global issues. I am also keen to improve the efficiency of geoscience research/education by developing software tools and promoting open science practices.

My areas of expertise are geophysics, cryospheric science, remote sensing, data science, and planetary geomorphology. I collaborate with international science teams on glacier geophysics, glacier hydrology, land ice mass balance, and the cryosphere of the other planets. I analyze various satellite data sets, such as optical & SAR images, SAR interferometry (InSAR), and geodetic data (altimetry & GNSS). My past research projects include volcanic intrusion and its surface deformation, earthquake-related crustal deformation, and the ice flexure model of Saturn's satellite Iapetus.

Current Projects

- 1 Detecting and understanding subglacial hydrological events at different temporal scales.
- 2 Quantifying the glacier dynamic thinning using machine learning approaches and rich observational data, focusing on marine-terminating glaciers and their surge events.
- 3 Analyzing seasonal to multiannual signals of glacier velocity and elevation change.
- 4 Developing interactive, reproducible, and scalable software packages for cryospheric science.
- 5 Deciphering the physical mechanism of glacier perturbation in the context of the global warming crisis.

Education

- Dec. 2020 **Cornell University**, Ph.D. Geological Sciences
Advisor: Matthew Pritchard
Investigating mass loss and changing ice dynamics of Arctic ice caps using remote sensing
- Jan. 2013 National Taiwan University, M.Sc. Geosciences
Co-advisors: Wing-Huen Ip (National Central University) and Louis Suh-Yui Teng
Elastic flexure model of Iapetus' equatorial ridge
Class rank: 2 of 16
- Jun. 2010 National Taiwan University, B.Sc. Geosciences
Dean's Award. Class rank: 1 of 28
- Jun. 2006 Jianguo High School, Taipei, Taiwan
Program for gifted students in math and science (數理資優班)

Appointments

- Feb. 2023 – **Assistant Professor**
Center for Space and Remote Sensing Research, National Central University, Taiwan
Co-affiliated with Taiwan Polar Institute since Aug. 2023
Co-affiliated with Dept. of Earth Sciences since Feb. 2024
- 2021 – 2023 Postdoctoral Scholar
Department of Statistics, University of California Berkeley, USA
Supervisor: Fernando Pérez
Jupyter Meets the Earth project team: advancing an open ecosystem that supports science by co-developing research and software, with a focus on cryosphere data. We presented research use cases in geoscience with technical developments within the Jupyter and Pangeo ecosystems.
- 2014 – 2015 Research Assistant (full-time)
Institute of Oceanography, National Taiwan University
Supervisor: Emmy T. Y. Chang
Theme: GNSS time series analysis and ocean-bottom seismometer data analysis
(research output available at <https://doi.org/10.1029/2020EA001159>)
- 2013 – 2014 Served in the ROC Army, Matsu Islands, Taiwan

Professional Experience & Training

- 2020 ICESat-2 Hackweek, University of Washington, Jun. 8–18 (online program)
Project lead, *ICESat-2 data assimilation with raster format DEMs*
- 2018 International Summer School in Glaciology, Jun. 5–15, McCarthy, Alaska
Project: *Tidewater glacier cycle constrained by flowline topography*
- 2016 – 2020 Graduate Research Assistant, Cornell University (in summer)
Tectonic and magmatic processes during early-stage rifting: an integrated study of northern Lake Malawi, Africa
- 2010 – 2011 Graduate Research Assistant, National Taiwan University
Modeling the chronology of the marine terraces in Henchun peninsula, Taiwan
- 2007 – 2008 Undergraduate lab intern, National Taiwan University
Geodesy & Remote Sensing Lab, Dept. of Geosciences

Teaching

- 2023 – Instructor at **National Central University**
RS 5046 / GP 5024: **Environmental data science**
2024 Spring & Fall, in either English or Chinese (Taiwan)
<https://whyjz.github.io/ncu-env-data-science/>
RS 6026: **Open Science Practices in Remote Sensing** (2023 Spring & 2024 Fall)
<https://whyjz.github.io/ncu-open-science>
RS 600x: Seminar (Sep. 2023 – Jun. 2024)
GP 2004: Introduction to Remote Sensing (Sep. 2023–Jan. 2024)
Co-taught with Dr. Tseng, Kuo-Hsin

Teaching (continued)

- 2018 – 2020 Teaching Assistant at Cornell University
Have participated in various types of teaching scenarios, from a class of over 1000 students to field work with only few students.
EAS 1600: Environmental Physics (Aug.–Dec. 2020)
EAS 2500: Meteorological Observations and Instruments (Jan.–May 2020)
Lab instructor
EAS 1101: Climate and Energy: a 21st Century Earth Science Perspective (Aug.–Dec. 2019)
EAS 4370: Field Geophysics (Jan.–May 2019)
EAS 1560: Introductory Oceanography with Laboratory (Aug.–Dec. 2018)
Lab instructor
- 2010 – 2015 Teaching Assistant at National Taiwan University
Geo 1008: Introduction to Field Geology (II)
TA (Sep. 2010 – Jan. 2013, May 2014)
Course Coordinator (Aug. 2014 – Jan. 2015)
Ocean 5066: Seminar in Geophysics: General Aspects (Feb.–Jun. 2015)
Ocean 5001: Introduction to Marine Geology (Sep. 2014 – Jan. 2015)
- 2009 – 2011 Instructor of Magic Club, Dongshan High School, Taipei, Taiwan
- 2006 – 2013 Private tutor for math and science in high-school level

Honors, Awards, & Certification

- 2023/24 New faculty award: research excellence (中央大學新聘卓越人才獎勵)
National Central University, TWD240,000 for two years
- 2023 **Emerging Young Scholar**, 2030 Cross-Generation Young Scholars Program, NSTC Taiwan (2030跨世代年輕學者方案-新秀學者)
See Grants for details
- 2020 Top 10% downloaded paper in Geophysical Research Letters [4]
- 2018 Arthur L. Bloom Fund for Geological Sciences Research and Education in the Pacific Region
Cornell University, USD1,000
- 2017 Wilderness first aid training (16 hours), Cornell Wilderness & Environmental Medicine lapsed, last renewal 2017–2020
- 2013 **Overseas Ph.D. scholarship** (公費留學), Ministry of Education, Taiwan
USD141,000 for tuition and stipend. Used in 2015–2018.
- 2012 Poster presentation award, the Physical Society of ROC (Taiwan) Annual Meeting
- 2011 **Applied geotechnical technician** (應用地質技師)
Certified by Ministry of Examination, Taiwan
- 2007 Third prize, National Science Education Program, Taiwan
- 2005 First prize, National Earth Sciences Academic Competence Contest, Taiwan (全國地球科學學科能力競賽一等獎)

Professional Services

Advising: graduate students

2024 – Han-Yu He (M.S. program)
Cryosphere software development

Advising: undergraduate students

2023 Han-Yu He, University of Taipei, Taiwan
Undergraduate research program in summer, National Central University
Surge behaviors of the marine-terminating glaciers in Svalbard

2020 – 2022 Gerald Meyer, Hartwick College, USA
Research Experiences for Undergraduates (REU), NSF
Investigating brain terrain morphology on Mars [37]

2019 – 2021 Leena Sen, Cornell University, USA
Undergraduate Honor Thesis
Satellite observations of glacier changes in Severnaya Zemlya, the Russian Arctic

2014 – 2015 Andy Chiu, National Central University, Taiwan
Undergraduate Research Program, National Taiwan University
Relocating the position of the ocean-bottom seismometers using airgun survey data

Software and Open Science

2024 – Project lead of the **Taiwan Polar Institute (TaiPI) Data Repository**, an online hosting service for research output from the TaiPI and its international partners.
<https://taipidata.ncu.edu.tw/>

2022 Hosted a working session entitled “Keeping your head in the clouds: reproducible, collaborative science with open cloud infrastructure” at the 2022 EarthCube annual meeting.

2021 – 2022 Organized four invited workshops (in-person/online) introducing the software tools in the Jupyter ecosystem to promote open, cloud-based science practices. [20, 21, 22, 23]

2021 Organized and presented at the workshop entitled “The Jupyter Landscape: a high-level map for (geo)scientists” at the 2021 EarthCube annual meeting.
Part of the workshop materials is published at <https://workflow.jupyterearth.org/>

2016 – Author of **GMT Tutorials**, an educational website with articles and gallery examples showing how to plot spatial data and make scientific figures using the free, open source Generic Mapping Tools (GMT) software and its Python version (PyGMT). Licensed under MIT and CC-BY 4.0 Licenses.
<http://gmt-tutorials.org/en/>, originally in Chinese (Taiwan) and partially translated into English
Github repository: <https://github.com/whyjz/GMT-tutorials>

Professional Services (continued)

- 2015 – **Lead developer** of the Cryosphere And Remote Sensing Toolkit (**CARST**) and the GLAcier Feature Tracking testkit (**GLAFT**) [1] for processing high-resolution remote sensing data sets for cryosphere studies. Both of them are open-source packages with documentation available online.
CARST: <https://github.com/whyjz/CARST>
GLAFT: <https://whyjz.github.io/GLAFT/>
- 2021 – Translator of the **JupyterLab** GUI (English to Chinese (Taiwan)). JupyterLab is a web-based interface for accessing computing resources, whether they are local or remote, and is optimized for interactive data analysis.
<https://jupyter.org/try-jupyter/lab/>
- 2016 – Translator of the **QGIS Tutorials and Tips** website (English to Chinese (Taiwan)). QGIS is a free and open source Geographic Information System (GIS), and is commonly used within the geophysics and cryosphere community.
<https://www.qgistutorials.com/en/docs/introduction.html>

Professional Communities

- 2022 Convener of the AGU fall meeting session "A Data-Driven Cryosphere: Insights from Machine Learning and Other Statistical Methods"
- 2016 – 2017 Coordinator of the Earth & Atmos. Sciences Department Seminar, Cornell University
- 2014 Co-founder of the Geodesy Society of the ROC (Taiwan)
- Member of the following organizations:
 - AGU (2017–)
 - EGU (2024–)
 - IACS (International Association of Cryospheric Sciences, 2018–)
 - AOGS (2011)
 - AAAS (2017–2019)
 - Reviewer of the following journals and book:
 - The Cryosphere
 - Earth System Science Data
 - Remote Sensing of Environment
 - Journal of Glaciology
 - International Journal of Digital Earth
 - Advances in Space Research
 - Journal of Mountain Science
 - Encyclopedia of Planetary Landforms (ISBN 978-1-4614-3135-0)

Education and Outreach

Science Education and Outreach

- 2024 Participated in the education program operated by Delta Electronics, Inc. for communications in climate change. I hosted three episodes featuring the recent cryospheric changes, available on YouTube: https://youtube.com/playlist?list=PLI6pJZaOCtF0sg-n3mR_XOVKLDcN6Icdp&si=nPrADFwGsm56BKBM
Lecturer at the Edison Camp of Natural Science (愛迪生自然科學營)

Education and Outreach (continued)

- 2023 Interviewed by the TaiwanPlus TV show “Connected with Divya Gopalan” for the episode “Earth’s Melting Ice and Shrinking Glaciers”: <https://www.taiwanplus.com/news/connected/full-episode/231211016/earths-melting-ice-and-shrinking-glaciers>
- Helped the production of the 2024 CSRSR calendar with a theme on Earth’s cryosphere (寒·極). I selected the calendar images and wrote captions for all months.
- 2020 – 2021 Contributed a short demo session entitled “Glacier Flow on Your Desk” to the Expanding Your Horizon program, Cornell University (a K–12 educational program that invites girl students to explore the STEM fields with connection to multiple universities).
- The demo session was canceled in 2020 due to the COVID-19 pandemic. The 2021 demo is available at <https://www.youtube.com/watch?v=5-YKufHzx0U>
- 2018 – 2019 Made two videos introducing the research content (the collapse of Vavilov Ice Cap, Russia) to the general public. The total views have reached 300k on YouTube: <https://youtu.be/jeC47jxiuuA> and <https://youtu.be/WPfvUHFpRhk>
- 2016 Varna after-school program, Varna, New York
- Designed scientific activities for people aged 4–11, e.g., making “glacier goo,” simulating volcano eruption using baking soda, etc.
- 2013 – **Columnist** at PanSci (泛科學), the largest science communication website in Taiwan. To date, I have written 17 short to mid-sized articles for the general public, providing latest research digest in Earth and planetary science. For the full list of my column posts, see <https://pansci.asia/archives/author/whyj>, in Chinese (Taiwan)

Community Outreach

- 2024 Guest at the ChattyAF YouTube channel sharing my experience and suggestions for studying in the U. S. for a PhD. <https://www.youtube.com/watch?v=0gsYASwuMfk>
- 2019 **President** of Snee Graduate Organization (SGO), the graduate community in Earth & Atmospheric Sciences, Cornell University. During my term, SGO initiated many programs to facilitate inclusion, equity, and diversity in the Cornell and local Earth science community, including weekly tea time, Friday happy hour, and special seminars. SGO also contributed the formation of the Inclusion, Diversity, and Equity in Earth and Atmospheric Sciences (IDEEAS) working group in late 2019.
- 2018 – 2020 Staff member, Big Red Barn Graduate and Professional Student Center, Cornell University
- Co-hosted the weekly trivia night (2020)
- 2017 – 2018 Co-hosted the weekly International Coffee Hour at Cornell University
- 2016 – 2017 Officer of the Cornell Taiwanese Student Association (CTSA)

Others

- 2021 – Developer of the rime-moetaigi (萌台語) input method editor (IME). Rime-moetaigi is the first IME that allows users to type Taiwanese Hokkien (Taigi) using the Taiwanese Phonetic Symbols (also known as Taiwanese Bopomofo, 台語注音符號).

Research

Highlights

- Zheng, W., Pritchard, M. E., Willis, M. J. & Stearns, L. A. (2019). The possible transition from glacial surge to ice stream on Vavilov Ice Cap. (Publication #3)
The paper analyzes the change of ice dynamics at Vavilov Ice Cap, Severnaya Zemlya, Russia, in 2017, several years after an initial surge phase. Remote sensing observations of shear margin development, glacier speeds, and Péclet number indicate possible ice stream formation. This paper adopts Péclet number and the glacier perturbation theory to quantify different stages during an unusual glacier surge. This novel and creative method provides insight about how a surge can break a cyclic mass balance by changing its ice dynamics. These analyses also show that an ice stream, which is capable of draining ice quickly over years, might develop from a short-term disruption of a glacier basin, posing a concern about underestimating sea level rise contribution. This paper has been covered by at least 8 media outlets including *Scientific American* and *Forbes*, and has been recognized as one of the most downloaded GRL papers during 2018–2019.

- Zheng, W., Pritchard, M. E., Willis, M. J., Tepes, P., Gourmelen, N., Benham, T. J. & Dowdeswell, J. A. (2018). Accelerating glacier mass loss on Franz Josef Land. (Publication #6)
This paper analyzes the high-resolution glacier elevation changes on Franz Josef Land (FJL) between 1953 and 2015, using data derived from satellite stereo imagery (WorldView and SPOT), radar altimetry (CryoSat-2), and a digitized cartographic map. For most glacier basins in FJL, the paper presents the first ever elevation change map during the 21st century. Our major findings include a doubled rate of ice mass loss from 2011 to 2015 compared to any previous time spans, and a SW-NE thinning-thickening pattern with variable local changes. The results also show that the shrinking ice cap uncovered at least one island during 2013–2016.
<https://news.cornell.edu/stories/2018/04/recent-russian-arctic-glacier-loss-doubles-previous-60-years>

- Zheng, W. (2022). Glacier geometry and flow speed determine how Arctic marine-terminating glaciers respond to lubricated beds. (Publication #1)
In this study I present improved equations that relate the change of glacier flow to the change of bed friction. Two numbers in these equations (J_0 and Péclet number, P_e) depend on the glacier shape and speed, and determine the instability when basal lubrication occurs. Greenland outlet glaciers with lower P_e and J_0 are more likely to accelerate in the past 20-year span than those with higher P_e and J_0 , which matches the model prediction. These results indicate a combined factor of ice thickness, surface slope, and initial speed for ice flow as a key to assess how much and how fast glaciers respond to lubricated beds.

Peer-reviewed Journal Publications

- 1 Zheng, W., Bhushan, S., Van Wyk De Vries, M., Kochtitzky, W., Shean, D., Copland, L., Dow, C., Jones-Ivey, R., & Pérez, F. (2023). GLACIER Feature Tracking testkit (GLAFT): a statistically and physically based framework for evaluating glacier velocity products derived from optical satellite image feature tracking. *The Cryosphere*, 17, 4063–4078.
<https://doi.org/10.5194/tc-17-4063-2023>

- 2 Zheng, W. (2022b). Glacier geometry and flow speed determine how Arctic marine-terminating glaciers respond to lubricated beds. *The Cryosphere*, 16, 1431–1445.
<https://doi.org/10.5194/tc-16-1431-2022>

- 3 **Zheng, W.**, Oliva, S. J., Ebinger, C., & Pritchard, M. E. (2020). Aseismic Deformation During the 2014 Mw 5.2 Karonga Earthquake, Malawi, From Satellite Interferometry and Earthquake Source Mechanisms. *Geophysical Research Letters*, 47(22), 1–12. <https://doi.org/10.1029/2020GL090930>
- 4 **Zheng, W.**, Pritchard, M. E., Willis, M. J., & Stearns, L. A. (2019). The possible transition from glacial surge to ice stream on Vavilov Ice Cap. *Geophysical Research Letters*, 46. <https://doi.org/10.1029/2019GL084948>
- 5 Gaherty, J. B., **Zheng, W.**, Shillington, D., Pritchard, M. E., Henderson, S. T., Chindandali, P. R., Mdala, H., Shuler, A., Lindsey, N., Oliva, S. J., Nooner, S., Scholz, C. A., & Schaff, D. (2019). Faulting processes during early-stage rifting: seismic and geodetic analysis of the 2009–2010 Northern Malawi earthquake sequence. *Geophysical Journal International*, 217, 1767–1782. <https://doi.org/10.1093/gji/ggz119>
- 6 Willis, M. J., **Zheng, W.**, Durkin, W. J., Pritchard, M. E., Ramage, J. M., Dowdeswell, J. A., Benham, T. J., Bassford, R. P., Stearns, L. A., Glazovsky, A. F., Macheret, Y. Y., & Porter, C. C. (2018). Massive destabilization of an Arctic ice cap. *Earth and Planetary Science Letters*, 502, 146–155. <https://doi.org/10.1016/j.epsl.2018.08.049>
- 7 **Zheng, W.**, Pritchard, M. E., Willis, M. J., Tepes, P., Gourmelen, N., Benham, T. J., & Dowdeswell, J. A. (2018). Accelerating glacier mass loss on Franz Josef Land, Russian Arctic. *Remote Sensing of Environment*, 211, 357–375. <https://doi.org/10.1016/j.rse.2018.04.004>

Other Publications

- 1 **Zheng, W.**, Grigsby, S., Sapienza, F., Taylor, J., Snow, T., Pérez, F., & Siegfried, M. (2021). *Mapping ice flow velocity using an easy and interactive feature tracking workflow*. <https://doi.org/10.5281/zenodo.5496306>
- 2 **Zheng, W.** (2020b). *Investigating Mass Loss and Changing Ice Dynamics of Arctic Ice Caps Using Remote Sensing* [Doctoral Dissertation]. Cornell University. <https://doi.org/10.7298/qcf9-f163>
- 3 **Zheng, W.**, Durkin, W. J., Melkonian, A. K., & Pritchard, M. E. (2019). *Cryosphere And Remote Sensing Toolkit (CARST) v1.0.1*. Zenodo. <https://doi.org/10.5281/zenodo.3475693>
- 4 **Zheng, W.** (2013). *Elastic Flexure Model of Iapetus' Equatorial Ridge* [Master Thesis]. National Taiwan University. <https://doi.org/10.6342/NTU.2013.02546>

Selected Seminar/Workshop Talks

- 1 **Zheng, W.** (2024a, September). *What makes a Canadian glacier lower its surface by twenty stories high within a year?* IONTU Seminar [invited].
- 2 **Zheng, W.** (2024b, March). *What if you could only get to know one glacier in your lifetime...?* U. Taipei Environment Seminar [invited].
- 3 **Zheng, W.** (2024c, March). *What makes a Canadian glacier lower its surface by twenty stories high within a year?* NTOU MEI Seminar [invited].
- 4 **Zheng, W.** (2024d, March). *What makes a Canadian glacier lower its surface by twenty stories high within a year?* NCU Department of Earth Science Seminar [invited].
- 5 **Zheng, W.** (2023a, September). *Collapsing Arctic glaciers: Flow dynamics disrupted by the warming crisis?* Academia Sinica IES Seminar [invited].
- 6 **Zheng, W.** (2023b, September). *Collapsing Arctic glaciers: Flow dynamics disrupted by the warming crisis?* NASA/GISS Sea Level Rise Seminar [invited].

- 7 **Zheng, W.** (2023c, March). *Monitoring and quantifying the instability of Arctic marine-terminating glaciers under a warming climate*. NCU IHOS Seminar [invited].
- 8 **Zheng, W.** (2022a, October). *JupyterHub Mini-Workshop: Cloud Infrastructure for Open Science*. Project Tyra Seminar Series [invited].
- 9 **Zheng, W.** (2022c, January). *Jupyter meets the Earth: Building a software ecosystem tailored for geoscience research*. Project Tyra Seminar Series.
- 10 **Zheng, W.** (2021a, August). *Analyzing the seismic deformation during the 2014 Mw 5.2 Karonga earthquake, Malawi, using seismic and satellite interferometry data*. Cheng Kung University Earth Sciences, Special Seminar [invited].
- 11 **Zheng, W.** (2021b, July). *Aseismic deformation during the 2014 Mw 5.2 Karonga earthquake, Malawi*. Taiwan University Geosciences, Departmental Seminar [invited].
- 12 **Zheng, W.** (2021c, July). *Diminishing Arctic ice caps: From a glacier surge to an ice stream*. Taiwan Normal University Earth Sciences, Departmental Seminar [invited].
- 13 **Zheng, W.** (2021d, April). *The demise of Arctic ice caps: from glacier surge to ice stream*. Berkeley Seismology Lab Seminar [invited].
- 14 **Zheng, W.** (2020a). *How much is a glacier likely to collapse when bed conditions change?* Cornell Astronomy and Space Sciences, Planetary Lunch Seminar [invited].

Selected Conference Presentations

- 1 **Zheng, W.**, Wychen, W. V., & Li, T. Significant subglacial water activities and their patterns across the Canadian Arctic. In: 2024 AGU Fall Meeting (December 9-13). Washington, D.C., USA, 2024, December.
- 2 Ni, C.-F., Sobota, I., Giletycz, S. J., & **Zheng, W.** Empowering Resilient Communities: Interactive Strategies for Asia and Arctic Futures [session]. In: SRI 2024 (June 10-14). Helsinki, Finland, 2024, June.
- 3 Pritchard, M. E., **Zheng, W.**, Willis, M. J., & Howat, I. M. ArcticDEM-derived elevation change of all Arctic glaciers during 2012-2021 in high spatial resolution. In: 2023 AGU Fall Meeting (December 11-15). San Francisco, USA, 2023, December.
- 4 Snow, T., Millstein, J. D., Sauthoff, W., Scheick, J., Colliander, J., Leong, W. J., Munroe, J., Perez, F., Felikson, D., Sutterley, T. C., Fisher, M., Sapienza, F., Abrahams, E., **Zheng, W.**, & Siegfried, M. Accelerating scientific discovery for NASA Cryosphere communities with the CryoCloud JupyterHub. In: 2023 AGU Fall Meeting (December 11-15). San Francisco, USA, 2023, December.
- 5 Abrahams, E., Snow, T., Lee, E., **Zheng, W.**, Field, M., Savidge, E., Sapienza, F., Grigsby, S., Taylor, J., Siegfried, M., & Pérez, F. Automated detection of West Antarctic persistent polynas using physics-featurized neural networks. In: 2022 AGU Fall Meeting (December 12-16). Chicago, USA, 2022, December.
- 6 Lobos, D. A., Delgado, F., **Zheng, W.**, & Pritchard, M. E. Emplacement, growth and evolution of the Cordón Caulle, Chile laccolith from 2011-2022. In: 2022 AGU Fall Meeting (December 12-16). Chicago, USA, 2022, December.
- 7 **Zheng, W.**, Pérez, F., Holdgraf, C., Sundell, E., Siegfried, M. R., Snow, T., Grigsby, S., Sapienza, F., Taylor, J., & Executable Books Community. Jupyter book-based supplemental material: A FAIR practice to connect research articles with scientific data. In: 2022 AGU Fall Meeting (December 12-16). Chicago, USA, 2022, December.

- 8 **Zheng, W.**, Sapienza, F., Siegfried, M. R., Grigsby, S., Snow, T., Pérez, F., & Taylor, J. Mapping dynamic mass loss by fully decomposing glacier elevation change. In: 2022 AGU Fall Meeting (December 12–16). Chicago, USA, 2022, December.
- 9 **Zheng, W.**, Pérez, F., Abrahams, E., Grigsby, S., Sapienza, F., Siegfried, M. R., Snow, T., & Taylor, J. Recent thinning and speed-up may make the upper Pine Island Glacier more prone to diffusive thinning. In: 2022 WAIS Workshop (September 26–29). Estes Park, CO, USA, 2022, September.
- 10 Huang, S.-Y., ..., **Zheng, W.**, & Lai, L. S.-H. Parachute Science in Taiwan? In: 2022 Taiwan Geosciences Assembly (June 7–10). Taipei, Taiwan, 2022, June.
- 11 **Zheng, W.**, Holdgraf, C., Pérez, F., Sundell, E., Siegfried, M. R., Snow, T., Grigsby, S., Sapienza, F., Taylor, J., & Executable Books Community. Let supplemental material be FAIR: using narrative and reusable Jupyter Book to complement your journal paper. In: 2022 EarthCube Annual Meeting (June 14–16). La Jolla, CA, USA, 2022, June.
- 12 Meyer, G. S., **Zheng, W.**, & Pritchard, M. E. Geomorphological and topographic characteristics of Brain Terrain in the Ismenius Lacus Quadrangle, Mars. In: In *53rd Lunar and planetary science conference (March 7–11)*. 2022, March.
- 13 Grigsby, S., Sapienza, F., **Zheng, W.**, Taylor, J., Snow, T., Savidge, E., Pérez, F., & Siegfried, M. Mission in a minute: Complex Spatial Query and Data Access in the Cloud for the ICESat-2 Mission. In: In *2021 AGU fall meeting (December 13–17)*. New Orleans, USA, 2021, December.
- 14 Lobos, D. A., Delgado, F., **Zheng, W.**, Reath, K., & Pritchard, M. E. Time-series of Laccolith evolution during and after the 2011–12 eruption of CordonCaulle volcano, Chile, from satellite feature-tracking, elevation, and thermal data. In: In *2021 AGU fall meeting (December 13–17)*. New Orleans, USA, 2021, December.
- 15 Sapienza, F., Grigsby, S., **Zheng, W.**, Taylor, J., Snow, T., Pérez, F., & Siegfried, M. Spectral Unmixing of Antarctic Snow Grain Size Distribution: A Data-Driven Perspective. In: In *2021 AGU fall meeting (December 13–17)*. New Orleans, USA, 2021, December.
- 16 Snow, T., Sapienza, F., Grigsby, S., Taylor, J., Savidge, E., **Zheng, W.**, Alley, K. E., Pérez, F., & Siegfried, M. Basal channel outflow inferred from persistent polynya variability at the Eastern Thwaites Ice Shelf. In: In *2021 AGU fall meeting (December 13–17)*. New Orleans, USA, 2021, December.
- 17 Sundell, E., Azari, A., Banihirwe, A., Fortin, F.-A., Panda, Y., **Zheng, W.**, & Perez, F. How a cloud based JupyterHub can scaffold researchers' scientific workflows and teaching activities. In: In *2021 AGU fall meeting (December 13–17)*. New Orleans, USA, 2021, December.
- 18 **Zheng, W.**, Bhushan, S., Van Wyk de Vries, M., Kochtitzky, W. H., & Shean, D. E. GFTT: an open-source tool for evaluating remotely sensed glacier velocity products. In: In *2021 AGU fall meeting (December 13–17)*. New Orleans, USA, 2021, December.
<https://doi.org/10.1002/essoar.10509355.1>
- 19 **Zheng, W.** The long-term instability of glacier dynamics due to a sudden change of basal lubrication. In: In *2020 AGU fall meeting (December 7–11)*. 2020.
- 20 **Zheng, W.**, Delgado, F., Pritchard, M. E., & Reath, K. Laccolith evolution during and after the 2011–12 eruption of Cordon Caulle volcano, Chile, from satellite feature-tracking, elevation, and thermal observations. In: In *2020 AGU fall meeting (December 7–11)*. 2020.
- 21 **Zheng, W.**, Delgado, F., Grandin, R., & Pritchard, M. E. Evidence for Episodic Magma Injection at Cordón Caulle Volcano (Southern Andes, Chile) During 2004–2019: New Insights from InSAR Time Series and Finite Element Models. In: In *2019 AGU fall meeting (December 9–13)*. San Francisco, USA, 2019.

- 22 **Zheng, W.**, Pritchard, M. E., Gaherty, J. B., Henderson, S. T., & Shillington, D. Observations of the Karonga earthquake sequence in northern Lake Malawi (Nyasa) using InSAR, seismicity, and surface rupture, as constraints on rifting mechanisms. In: In *2018 UNAVCO science workshop (March 27-29)*. Denver, USA, 2018.
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- 26 Willis, M. J., Pritchard, M. E., **Zheng, W.**, Durkin, W. J., Ramage, J. M., Dowdeswell, J. A., Benham, T. J., & Bassford, R. P. Rapid Thinning and Acceleration at the Cold-based Vavilov Ice Cap, Severnaya Zemlya, Russia. In: In *47th Arctic workshop 2017 (March 23-25)*. Buffalo, New York, USA, 2017.
- 27 **Zheng, W.**, Pritchard, M. E., & Willis, M. J. Monitoring Land-ice Elevation Changes in Franz Josef Land Using Remote Sensing. In: In *47th Arctic workshop 2017 (March 23-25)*. Buffalo, New York, USA, 2017.
- 28 Pritchard, M. E., Elliott, J., Durkin, W. J., **Zheng, W.**, Saria, E., Ntambila, D., & Chindandali, P. R. GPS and InSAR observations of ground deformation in the northern Malawi (Nyasa) rift from the SEGMeNT project. In: In *2016 AGU fall meeting (December 12-16)*. San Francisco, USA, 2016.
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- 30 Willis, M. J., **Zheng, W.**, Pritchard, M. E., Melkonian, A. K., Morin, P., Porter, C., Howat, I. M., Noh, M. J., & Jeong, S. Ice Mass Changes in the Russian High Arctic from Repeat High Resolution Topography. In: In *EGU general assembly 2016 (April 17-22)*. Vienna, Austria, 2016.
- 31 Chao, B. F., Chang, E. T.-Y., & **Zheng, W.** On possible physical sources of the common mode error (CME) “signal” in GPS solutions. In: In *2015 Taiwan geosciences assembly (May 13-14)*. Taipei, Taiwan, 2015.
- 32 Willis, M. J., Pritchard, M. E., & **Zheng, W.** How can we Optimize Global Satellite Observations of Glacier Velocity and Elevation Changes? In: In *2015 AGU fall meeting (December 14-18)*. San Francisco, USA, 2015.
- 33 Chang, E. T.-Y., Chao, B. F., Wu, T.-R., Lai, P.-Y., & **Zheng, W.** Examining the focal mechanism of the 2009 Samoa earthquakes by means of tsunami observation and simulation. In: In *Geodynamics and Environment in East-Asia (GEEA) 7th France-Taiwan earth sciences symposium (November 12-18)*. Hualien, Taiwan, 2014.
- 34 **Zheng, W.**, Chang, E. T.-Y., Lai, P.-Y., Chao, B. F., & Wu, T.-R. Study of large earthquake by means of tsunami wave simulation – the 2009 Samoa earthquake. In: In *Geodesy symposium 2014 (September 10-12)*. Nantou, Taiwan, 2014.

- 35 **Zheng, W.**, Ip, W.-H., & Teng, L. S. Elastic flexure model of Iapetus' equatorial ridge. In: In *EGU general assembly 2012 (April 22-27)*. Vienna, Austria, 2012.
- 36 Huang, L.-C., Ip, W.-H., Zhu, M., & **Zheng, W.** Physical Characteristics of the River Valleys of the Hellas Basin on Mars. In: In *AOGS 8th annual meeting (August 8-12)*. Taipei, Taiwan, 2011.

Grants

- 2024–2027 The Arctic Joint Research Program, NSTC Taiwan (大地科北極研究聯合助攻計畫)
Transdisciplinary study on the mechanisms and environmental impacts driven by accelerating warming in the Arctic area
Co-investigator; PI: Chuen-Fa Ni (NCU)
NT TWD\$30M (~USD\$920k)
- 2023–2027 Cross-Generation Young Scholars Program, NSTC Taiwan (跨世代年輕學者方案)
Decomposing ice flow dynamics of the Greenland Ice Sheet and Arctic glaciers using multiple satellite observations and statistical learning
Principal investigator
NT TWD\$12M (~USD\$380k)

Unsuccessful Proposals

The following are proposals that were submitted but not awarded. I include these as they demonstrate collaborations and project ideas that have been initiated to the point of pursuing funding.

- 2020 AGU Cryosphere Section Innovation Award
Potentials and limits of glacier feature tracking: an intercomparison project for achieving velocity maps with high spatial and temporal resolution.
Team: Whyjay Zheng (Cornell), Will Kochtitzky (U. of Ottawa), Maximillian Van Wyk De Vries (U. of Minnesota), Shashank Bhushan (U. of Washington), David Shean (U. of Washington)
- NASA Research Opportunities in Space and Earth Sciences
Rapid transitions in glacier dynamics as revealed by satellite measurements of sub-annual elevation changes.
PI: Matthew Pritchard (Cornell); Postdoc: Whyjay Zheng (Cornell); Institution-PI: Alex Gardner (NASA-JPL); Collaborator: Indrani Das (LDEO)
- 2019 Future Investigators in NASA Earth and Space Science and Technology
Understanding fast ice-wasting mechanisms of marine-terminating ice caps in the Russian Arctic and Svalbard from multi-satellite observations
PI: Matthew Pritchard (Cornell); Future Investigator: Whyjay Zheng (Cornell)
- 2018 NASA Earth and Space Science Fellowship
Measuring surface change during intense rainfall events in the Atacama Desert, Chile using multispectral imagery and Synthetic Aperture Radar
PI: Matthew Pritchard (Cornell); Fellowship recipient: Whyjay Zheng (Cornell)

Skills

Coding Python, MATLAB, Shell scripting, Fortran

Skills (continued)

Software	Git, Jupyter, QGIS, ArcGIS, Gdal, GMT, CorelDraw, Adobe Illustrator, Latex, NASA Ames Stereo Pipeline (ASP), InSAR Scientific Computing Environment (ISCE), Generic InSAR Analysis Toolbox (GIAN-T), Icepyx
Languages	Mandarin Chinese (Traditional characters, native speaker), English (Professional working level), Spanish (Intermediate level), Taiwanese (Heritage speaker at intermediate level), Japanese (Beginner level with higher competency of reading)

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