

Curriculum Vitae

# Sin-Mei Wu

8/26/2024

Assistant Professor

University of Hawaii at Manoa

Citizenship: Taiwan

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Google Scholar: <https://scholar.google.com.tw/citations?user=t4xmUVoAAAAJ&hl=en>

## Research Interests

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Seismic imaging and monitoring of geothermal, hydrothermal, and volcanic systems; seismic interferometry; environmental seismology; crustal dynamics; Earth's interior.

## Positions

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|---|-------------------|
| Assistant Professor at Department of Earth Sciences,<br>University of Hawaii at Manoa, USA                        | 2024.Aug–present  |
| Postdoctoral Scholar at Lawrence Berkeley National Laboratory, USA  | 2023.Jul–2024.Jul |
| Postdoctoral Scholar at Swiss Seismological Service, ETH Zürich, Switzerland                                      | 2021.Jun–2023.May |
| Postdoctoral Scholar at Seismograph Stations and Department of Geology and<br>Geophysics, University of Utah, USA | 2020.Dec–2021.May |
| Graduate Research Assistant, Department of Geology and Geophysics, University<br>of Utah, USA                     | 2015.Aug–2020.Dec |
| Graduate Research Assistant, Department of Geosciences, National Taiwan<br>University, Taiwan                     | 2012.Sep–2015.May |

## Education

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| Ph.D. in Geophysics, University of Utah, United States<br>Thesis: "Spatiotemporal Study of Naturally Eruptive Systems Using Seismic<br>Interferometry and Dense Nodal Arrays"<br>Advisor: Prof. Fan-Chi Lin                                      | 2015.Aug–2020.Dec |
| M.S. in Geosciences, National Taiwan University, Taiwan<br>Thesis: "Coseismic Velocity Reduction Correlated with Volumetric Strain<br>Change Induced by Recent Large Earthquakes in the Central Range of Taiwan"<br>Advisor: Prof. Shu-Huei Hung | 2012.Sep–2014.Jun |
| B.S. in Earth Sciences, National Central University, Taiwan  | 2008.Sep–2012.Jun |

## Research Supervision

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Junker, J. S. (2022). Master thesis: "*Seismic Monitoring Strategies for Carbon Dioxide Mineralization in Basalt*", ETH Zürich

## Manuscripts in Preparation

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## Peer-Reviewed Publications

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19. **Wu, S.-M.**, Sánchez-Pastor, P., Ágústsdóttir, T., Hersir, G., Mordret, M., Hjörleifsdóttir, V., Obermann, A. (2024). Crustal characterization of the Hengill geothermal fields: Insights from isotropic and anisotropic seismic noise imaging using a 500-node array, *Journal of Geophysical Research: Solid Earth*, <https://doi.org/10.1029/2024JB028915>
18. Sánchez-Pastor, P., **Wu, S.-M.**, Hokstad, K., Kristjánsson, B., Drouin V., Ducrocq, C., Gunnarsson, G., Rinaldi, A., Obermann, A., & Wiemer, S. (2023). Steam caps in geothermal reservoirs can be monitored using seismic noise interferometry, *Communications Earth & Environment*, <https://doi.org/10.1038/s43247-023-01122-8>
17. **Wu, S.-M.**, Huang, H.-H., Lin, F.-C., Farrell, J., & Schmandt, B. (2023). Extreme Anisotropy Indicates Shallow Accumulation of Magmatic Sills beneath Yellowstone Caldera, *Earth and Planetary Science Letters*, <https://doi.org/10.1016/j.epsl.2023.118244>
16. Pang, G., Koper, K., **Wu, S.-M.**, & Wang, W., Lasbleis, M., & G. Euler. (2023). Enhanced Inner Core Fine-Scale Heterogeneity toward the Earth's Center, *Nature*, <https://doi.org/10.1038/s41586-023-06213-2>
15. Liu., C.-N., Lin, F.-C., Manga, M., Farrell, J., **Wu, S.-M.**, Reed, M., Barth, A., Hungerford, J., & White, E. (2023). Short and long-term thumping cycle variations of Doublet Pool in Yellowstone National Park, USA, *Geophysical Research Letters*, <http://dx.doi.org/10.1029/2022GL101175>
14. Obermann, A., **Wu, S.-M.**, Agustsdottir, T., Duran, A., Diehl, T., Sánchez-Pastor, P., Kristjansdottir, S., Hjörleifsdóttir, V., Wiemer, S., & Hersir, G. (2022). Seismicity and 3-D body-wave velocity models across the Hengill geothermal field, SW Iceland, *Frontiers in Earth Science*, <https://doi.org/10.3389/feart.2022.96983>
13. Vera Rodriguez, I., Isken, M. P., Dahm, T., Kraft, T., Lamb, O. D., **Wu, S.-M.**, Kristjánssdóttir, S., Jónsdóttir, K., Sánchez-Pastor, P., Clinton, J., Wollin, C., Baird, A. F., Wüstefeld, A., Booz, B., Eibl, E. P. S., Heimann, S., Goertz-Allmann, B., Jousset, P., Oye, V., & Obermann, A. (2022). Acoustic signals of a meteoroid recorded on a large-N seismic network and fibre optic cables, *Seismological Research Letter*, <https://doi.org/10.1785/0220220236>
12. **Wu, S.-M.**, Pang, G., Koper, K., & Euler, G. (2022). A Search for Large-scale Variations in the Fine-Scale Structure of Earth's Inner Core, *Journal of Geophysical Research: Solid Earth*, <https://doi.org/10.1029/2022JB024420>
11. Obermann, A., Sánchez-Pastor, P., **Wu, S.-M.**, Wollin, C., Baird, A., Isken, M. P., Clinton, J., Gyger, L., Goertz-Allmann, B., Dahm, T., Wüstefeld, A., Jousset, P., Hjörleifsdóttir, V., & Wiemer, S. (2022). Combined large-N seismic arrays and DAS fibre optic cables across the Hengill geothermal field, Iceland, *Seismological Research Letter*, <https://doi.org/10.1785/0220220073>.
10. Rabade, S., **Wu, S.-M.**, Lin, F.-C., & Chambers, D. J. A. (2022). Isolating and tracking noise sources across an active longwall mine using seismic interferometry, *Bulletin of the Seismological Society of America*, 112 (5). <https://doi.org/10.1785/0120220031>.
9. **Wu, S.-M.**, Lin, F.-C., Farrell, J., Keller, W., White, E., & Hungerford, J. (2021). Imaging the Subsurface Plumbing Complex of Steamboat Geyser and Cistern Spring with Hydrothermal Tremor Migration using Seismic Interferometry, *Journal of Geophysical Research: Solid Earth*, 126, e2020JB021128. <https://doi.org/10.1029/2020JB021128>.
8. Reed, M. H., Muñoz-Saez, C., Hajimirza, S., **Wu, S.-M.**, Barth, A., Girona, T., Rasht-Behesht, M., White, E., Karplus, M. S., Hurwitz, S., & Manga, M. (2021). The 2018 reawakening and eruption dynamics of Steamboat Geyser, the world's tallest active geyser, *Proceedings of the National Academy of Sciences*, 118. <https://doi.org/10.1073/pnas.2020943118>.
7. **Wu, S.-M.**, Lin, F.-C., Farrell, J., Shiro, B., Karlstrom, L., Okubo, P., & Koper, K. (2020). Spatiotemporal Seismic Structure Variations Associated with the 2018 Kīlauea Eruption based on Temporary Dense Geophone Arrays, *Geophysical Research Letters*, 47, e2019GL086668. <https://doi.org/10.1029/2019GL086668>.
6. **Wu, S.-M.**, Lin, F.-C., Allam, A., & Farrell, J. (2019). Imaging the deep subsurface plumbing of Old Faithful geyser from low-frequency hydrothermal tremor migration, *Geophysical Research Letters*, 46. <https://doi.org/10.1029/2018GL081771>.
5. Xu, D., Song, B., Zhang, R., Xie, Y., **Wu, S.-M.**, Lin, F.-C., & Song, W. (2019). Low-rank matrix

- completion for distributed ambient noise imaging systems, *2019 53rd Asilomar Conference Signals, Systems, and Computers*, IEEE, 1059–1065.  
DOI: 10.1109/IEEECONF44664.2019.9049077.
4. Farrell, J., **Wu, S.-M.**, Ward, K. M., & Lin, F.-C. (2018). Persistent noise signal in the FairfieldNodal three-component 5-Hz geophones, *Seismological Research Letters*, 89(5), 1609-1617. doi: <https://doi.org/10.1785/0220180073>.
  3. He, Xi., Xie, Y., **Wu, S.-M.**, & Lin, F.-C. (2018). Sequential Graph Scanning Statistic for Change-point Detection, *2018 52nd Asilomar Conference on Signals, Systems, and Computers*, IEEE, 1317-1321. DOI: 10.1109/ACSSC.2018.8645505.
  2. Xie, L., Xie, Y., **Wu, S.-M.**, Lin, F.-C., & Song, W. (2018). Communication efficient signal detection for distributed ambient noise imaging, *2018 52nd Asilomar Conference Signals, Systems, and Computers*, IEEE, 1779–1783. DOI: 10.1109/ACSSC.2018.8645222
  1. **Wu, S.-M.**, Ward, K. M., Farrell, J., Lin, F.-C., Karplus, M., & Smith, R. B. (2017). Anatomy of Old Faithful from subsurface seismic imaging of the Yellowstone Upper Geyser Basin, *Geophysical Research Letters*, 44(20). doi:10.1002/2017GL075255.

### Other Publications

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- Caldera Chronicles (U.S. Geological Survey Yellowstone Volcano Observatory weekly column): "New views of how magma is stored beneath Yellowstone provided by hundreds of seismic sensors"  
[https://www.usgs.gov/observatories/yvo/news/new-views-how-magma-stored-beneath-yellowstone-provided-hundreds-seismic?utm\\_source=hootsuite&utm\\_medium=twitter&utm\\_term=86351cd2-ddb2-4e1b-81f6-df2d7ace368f&utm\\_content=usgsvolcanoes&utm\\_campaign=nh-volcanoes-fy23](https://www.usgs.gov/observatories/yvo/news/new-views-how-magma-stored-beneath-yellowstone-provided-hundreds-seismic?utm_source=hootsuite&utm_medium=twitter&utm_term=86351cd2-ddb2-4e1b-81f6-df2d7ace368f&utm_content=usgsvolcanoes&utm_campaign=nh-volcanoes-fy23)
- Caldera Chronicles (U.S. Geological Survey Yellowstone Volcano Observatory weekly column): "The complex plumbing systems of Steamboat Geyser and Cistern Spring".  
[https://www.usgs.gov/center-news/complex-plumbing-systems-steamboat-geyser-and-cistern-spring?qt-news\\_science\\_products=4#qt-news\\_science\\_products](https://www.usgs.gov/center-news/complex-plumbing-systems-steamboat-geyser-and-cistern-spring?qt-news_science_products=4#qt-news_science_products)
- Caldera Chronicles (U.S. Geological Survey Yellowstone Volcano Observatory weekly column): "A new view of Old Faithful's underground plumbing system".  
[https://volcanoes.usgs.gov/volcanoes/yellowstone/article\\_home.html?vaid=210](https://volcanoes.usgs.gov/volcanoes/yellowstone/article_home.html?vaid=210)
- Cover Image of 2018 Kīlauea Eruption for *Geophysical Research Letters* Volume47, Issue9  
<https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019GL086668>

### Invited Presentations

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| SeismoTea, Department of Geology and Geophysics, University of Utah       | October 2023   |
| Berkeley Seismology Lab Seminar   | September 2023 |
| School of Earth and Atmospheric Sciences, Georgia Institute of Technology | November 2022  |
| Institute of Geophysics, ETH Zurich                                       | October 2021   |
| Department of Earth and Planetary Sciences, Harvard University            | October 2020   |
| Department of Geosciences, National Taiwan University.                    | October 2019   |
| Institute of Earth Sciences, Academia Sinica, Taiwan.                     | October 2019   |
| Department of Earth Sciences, National Central University, Taiwan.        | October 2019   |
| Workshop on Frontiers in Seismic Interferometry, Taipei, Taiwan           | September 2019 |

### Selected Conference Presentations

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- Wu, S.-M.**, Sánchez-Pastor, P., Agustsdottir, T., Obermann, A., Hersir, G., Mordret, A. (2022), High-Resolution Seismic Tomography across Hengill Geothermal Field in SW-Iceland using a Large-N Nodal Array, AGU Fall Meeting.
- Wu, S.-M.**, Huang, H.-H., Lin, F.-C., Farrell, J., & Schmandt, B. (2022), Imaging the Shallow Yellowstone Volcanic System using a Dense Geophone Array, AGU Fall Meeting (Invited)
- Manga, M., Reed, M., Munoz-Saez, C., Hajimirza, S., **Wu, S.-M.**, Barth, A., Girona, T., Behesht, M.,

- White, E., Karplus, M., & Hurwitz, S. (2022), The reactivation and monitoring of Steamboat geyser, the tallest geyser on Earth, EGU General Assembly 2022, EGU22-1851, <https://doi.org/10.5194/egusphere-egu22-1851>.
- Wu, S.-M.**, Lin, F.-C., & Farrell, J. (2021), Imaging the Hydrothermal Plumbing Architecture of Steamboat Geyser Using a Dense Nodal Array and Seismic Interferometry. EGU. (Invited)
- Wu, S.-M.**, Lin, F.-C., Farrell, J., Keller, W., White, E., & Hungerford, J. (2020), Interferometric-Based Polarization Analysis: Implications of Geyser Architecture and Dynamics at Steamboat Geyser in Yellowstone National Park. AGU Fall Meeting, Abstract S017-08. (Oral)
- Lin, F.-C., **Wu, S.-M.**, Farrell, J., Shiro, B., & Karlstrom, L. (2020), High-Resolution Crustal Velocity Response to the 2018 Kīlauea Eruption Using Temporary Dense Geophone Arrays. AGU Fall Meeting, Abstract V006-02. (Oral, Invited)
- Reed, M. H., Barth, A., Girona, T., Hajimirza, S., Hurwitz, S., Karlstrom, L., Karplus, M. S. Manga, M., Muñoz-Saez, C., Rashtbehesh, S. H., & **Wu, S.-M.** (2019), Multiparameter Study of Eruptive Behavior at Steamboat Geyser, Yellowstone. AGU Fall Meeting, Abstract V33D-0196. (Poster)
- Wu, S.-M.**, Lin, F.-C., & Farrell, J. (2019), Studying the Deep Plumbing Geometry and Recharge Evolution at Old Faithful and Steamboat Geyser in Yellowstone. AGU Fall Meeting, Abstract V24B-01. (Oral)
- Wu, S.-M.**, Lin, F.-C., Farrell, J., Shiro, B., Karlstrom, L., & Okubo, P. (2019), Temporal Velocity Variations Associated with the 2018 Kilauea Summit Collapse based on Temporary Dense Geophone Arrays. AGU Fall Meeting, Abstract V43C-0203. (Poster)
- Pang, G., **Wu, S.-M.**, Koper, K. D., & Euler, G. (2019), Regional Variation of Fine-Scale Structure of Earth's Inner Core. AGU Fall Meeting, Abstract DI23B-0051. (Poster)
- Wu, S.-M.**, Lin, F.-C., Allam, A., & Farrell, J. (2018), Studying the Recharge Cycle of Old Faithful Geyser with Dense Seismic Arrays. AGU Fall Meeting, Abstract S12A-07. (Oral)
- Wu, S.-M.**, Ward, K. M., Farrell, J., Lin, F.-C., Karplus, M., & Smith, R. B. (2018), Anatomy of Old Faithful from subsurface seismic imaging of the Yellowstone Upper Geyser Basin, Seismology of the Americas Conference. (Poster)
- Wu, S.-M.**, Pang, G., Koper, K., & Euler, G. (2018), A Test of Hemisphericity in the Fine-Scale Structure of Earth's Inner Core. AGU Fall Meeting, Abstract DI43B-0027. (Poster)
- Wu, S.-M.**, Ward, K. M., Farrell, J., Lin, F.-C., Karplus, M., & Smith, R. B. (2017), Anatomy of Old Faithful from subsurface seismic imaging of the Yellowstone Upper Geyser Basin, AGU Fall Meeting Abstract 248798. (Oral)
- Pang, G., **Wu, S.-M.**, Koper, K. D., Mancinelli, N. J. & Euler, G. (2018), Simulations of Pre-critical PKiKP Coda Waves with Implications for Small-Wavelength Heterogeneity in Earth's Inner Core. AGU Fall Meeting, Abstract DI43B-0026. (Poster)
- Wu, S.-M.**, Lin, F.-C., Farrell, J., & Smith, R. B. (2016), Imaging subsurface hydrothermal structure using a dense geophone array in Yellowstone, AGU Fall Meeting Abstract S13B-2551. (Poster)
- Wu, S.-M.** and Hung, S.-H. (2015), Correlation of Coseismic Velocity and Static Volumetric Strain Changes Induced by the 2010 Mw6.3 Jiasian Earthquake under the Southern Taiwan Orogenic Belt, AGU Fall Meeting Abstract S41B-2749. (Poster)
- Wu, S.-M.** and Hung, S.-H. (2014), Coseismic Velocity Reduction Correlated with Volumetric Strain Change Induced by Recent Large Earthquakes in Central Range of Taiwan, AOGS Meeting Abstract SE31-A043. (Poster)
- Wu, S.-M.** and Hung, S.-H. (2013), The Potential Temporal Variations in Crustal Seismic Velocity Correlated with the 2010 Jiasian Earthquake and Non-Volcanic Tremors in Southern Central Range of Taiwan, AGU Fall Meeting Abstract S43B-2528. (Poster)

## Professional Service

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### *Journal reviewer*

Journal of Geophysical Research  
 Geophysical Research Letter  
 Seismological Research Letters  
 Bulletin of Volcanology

Geophysical Journal International  
Volcanica  
Journal of Volcanology and Geothermal Research  
Bulletin of the Seismological Society of America  
Comptes Rendus Géoscience

### **Awards**

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| Outstanding reviewer for JGR: Solid Earth  | 2022      |
| University of Utah The Stokes-Eardley Fellowship – Grant \$10,000                              | Fall 2020 |
| University of Utah Department of Geology and Geophysics Outstanding PhD Student Award          | 2019–2020 |
| University of Utah Graduate Research Fellowship – Grant \$18,700                               | 2019–2020 |
| The David S. and Inga M. Chapman Fund scholarship – Grant \$1,042                              | 2019      |
| Cooperative Institute for Dynamic Earth Research (CIDER) summer program                        | 2019      |
| Seismological Society of America Annual Meeting Travel Grant                                   | 2018      |
| IRIS US Array Data Processing and Analysis Short Course – recipient                            | 2016      |
| IRIS Workshop: Emerging Fields and Technologies in Seismology – scholarship recipient.         | 2016      |
| Excellent academic performance in the National Taiwan University 28 <sup>th</sup> Youth Forum  | 2014      |
| Excellent academic performance in the Taiwan College Student Earth Science project competition | 2011      |
| Presidential Award, National Central University  | 2010      |
| Presidential Award, National Central University  | 2009      |

### **Teaching**

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| Badan Meteorologi Klimatologi dan Geofisika Indonesia (BMKG)<br>seismic imaging training course– lecturer and co-convener | August 23–24, 2022 |
| Guest lecturer of Signal Processing GEO5320/6320, University of Utah  | Fall 2018          |
| Teaching assistant of Seismology GEO-5210, University of Utah   | Fall 2018          |
| Teaching assistant of Seismic Imaging GEO-5220, University of Utah  | Spring 2016 & 2017 |
| Teaching assistant of Geophysics, National Taiwan University  | Spring 2014        |

### **Research Experiences**

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| Visiting Scholar at Institute of Earth Sciences, Academia Sinica, Taiwan  | September 2022 |
| Visiting Scholar at Institute of Earth Sciences, Academia Sinica, Taiwan  | October 2019   |
| Graduate Research Assistant at University of Utah   | 2015–2020      |
| Graduate Research Assistant at National Taiwan University   | 2012–2014      |
| NSC College Student Participation in Research Projects<br>Title: Observation of Periodic Variations from GPS Data in Taiwan | 2011–2012      |
| Summer program of Earth Science in Academia Sinica, Taiwan<br>Title: Seismic Anisotropy in the Ryukyu Subduction System     | 2011           |
| College Student Earth Science project competition (Awarded)<br>Title: Nonlinear Optimization of Volcanic Source Models      | 2011           |

### **Field Experiences (Nodal Array Deployments)**

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| Cape Modern geothermal site, Milford, UT               | February 2024 |
| Hengill geothermal field, Iceland                      | August 2021   |
| Ridgecrest Post-Mainshock, Ridgecrest, CA              | July 2019     |
| Hawaii Lower East Rift Zone Array, Leilani Estates, HI | March 2019    |
| Cascadia Array, central Oregon, OR                     | August 2018   |
| Yellowstone Array, Yellowstone, WY                     | November 2017 |
| Old Faithful Transportable Array, Yellowstone, WY      | November 2016 |
| Porotomo Seismic Array, Brady Hot Springs, NV          | March 2016    |
| Upper Geyser Basin Array, Yellowstone, WY              | November 2015 |

## **Internship**

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Summer Internship in Exploration & Development Research Institute, CPC Corporation, Taiwan 2010

## **Skills & Abilities**

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Expertise in seismic array analysis, time-series analysis, seismic location, and high-resolution 4D imaging  
Proficient in programming of C, C++, Fortran, MATLAB, Python, and Shell scripting  
Experienced in CPU-based high-performance computation, parallel computing, and Linux environments  
Experienced in nodal array design, fieldworks (8 geophone deployments), and field team leadership  
Bilingual: fluent in English and Mandarin, both speaking and writing

## **Leadership & Outreach**

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| Co-convener of AGU fall meeting (session S006)                                   | 2024      |
| Co-convener of EGU General Assembly (session ERE2.4)                             | 2023      |
| Co-convener for the seismic imaging training course at BMKG, Indonesia           | 2022      |
| Student representative at G&G faculty meeting                                    | 2018–2019 |
| SeismoTea (Seminar) Event and lecture coordinator                                | 2018      |
| Open house of Department Geology & Geophysics                                    | 2018      |
| Environment and Sustainability Research Symposium                                | 2017      |
| President of Taiwanese Student and Scholar Association at the University of Utah | 2016–2017 |

## **Professional Society Membership**

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American Geophysical Union  
Seismological Society of America  
European Geosciences Union