# Marine A. Denolle

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## 1. EMPLOYMENT HISTORY

2024- **Associate Professor**, Earth and Space Sciences, University of Washington
2021-2024 **Assistant Professor**, Earth and Space Sciences, University of Washington
2016-2021 **Assistant Professor**, Earth and Planetary Sciences, Harvard University
2014-2016 **Green Postdoctoral Fellow**, Institute of Geophysics and Planetary Physics, SIO, UC-San Diego
Supervisor: Dr. Peter Shearer

## 2. EDUCATION HISTORY

2014-2016 **Green Postdoctoral Fellow**, Institute of Geophysics and Planetary Physics, SIO, UC-San Diego,
Supervisor: Dr. Peter Shearer
2008-2014 **PhD** in Geophysics, Stanford University, USA
Supervisor: Dr. Gregory Beroza
Co-supervisors: Dr. Eric Dunham
Seismic Hazard Analysis using the Ambient Seismic field
2007-2008 **Master** in Geophysics, Ecole Normale Supérieure - IPGP , France
Supervisors: Dr. Satish Singh (IPGP), Dr. David Bercovici (Yale)
2006 **Bachelor** in Earth Sciences, Ecole Normale Supérieure, France
2004-2005 **License** in Physics-Mathematics (Classe Préparatoire aux Grandes Ecoles), Lycée Chateaubriand, France

## 3. AWARDS and FELLOWSHIPS

(* bold represents a national and international-level recognition )
2023 Invited Professorship - 1 month visit to the Ecole Normale Supérieure rue d'Ulm -Paris
2023- Data Science Fellow, eScience Institute, University of Washington
2019 **Charles F. Richter** Early Career award (Seismological Society of America)
2019 **Kavli Frontiers of Science Fellow** (National Academic of Sciences)
2019 **Radcliffe Assistant Professorship** Institute for Advanced Study Fellow
2018 **CAREER** award - NSF
2017 **The David and Lucile Packard Foundation** Fellowship
2016 Outstanding Reviewer citation for Geophysical Research Letters
2015 Outstanding Reviewer citation for Geophysical Journal International
2012 **AGU** Outstanding Student Paper Award
2012 **SSA** Student Presentation Award
2010 **AGU** Outstanding Student Paper Award

## 4. TEACHING

**Computational seismology** (grad level) - UW ESS 590, 563 - spring 2023, 2024
**Introduction to seismology** (undergrad/grad level) - UW ESS 412/512 - winter 2023
**Geophysics** (undergrad level) - UW ESS 314 - fall 2021, 2023
**Machine learning in the geosciences** (undergrad+grad level) - UW ESS 469/569 - spring 2021, fall 2022, fall 2023, fall 2024
**Machine Learning in Earth and Planetary Sciences** (graduate level seminar) - Harvard EPS268 - Fall 2019
**Induced Seismicity** (graduate level seminar) - Harvard EPS268 - Fall 2018
**Earthquakes and Faulting** (graduate level) - Harvard EPS203- Spring 2018, Spring 2020
**Earthquakes and Tectonics** (sophomore level) - Harvard EPS55- Fall 2017, Spring 2020
**Earthquake Sources** (graduate level) - Harvard EPS204- Fall 2016, Fall 2020
**Intro to Seismology**, substitute lecturer (senior undergraduate science major - beginning graduate level), - Stanford - Fall 2012-2013
**Earthquakes and Volcanoes**, Teaching Assistant (undergraduate level - non science major) - Stanford - Spring 2012
**Inverse Theory**, Teaching Assistant (graduate level) - Stanford - Fall 2010

## 5. PROFESSIONAL SERVICE

**Guest Lecturer**

2023 Guest Lecturer for a course in Victoria University of Wellington, New Zealand, “Big Data Seismology”

**Science community service**

| Year | Committee | Role |
|---|---|---|
| 2024- | Statewide California Earthquake Center - Science Steering Committee | Contribute to developing yearly RFP of the center seed grant program, review proposals, suggest yearly work plan. |
| 2024 | NSF GeoInformatics Review Panel | Reviewed 10 proposals, lead the discussion of 5, met the panel virtually. |
| 2023- | Earthscope Consortium - (invited) Chair of the Integration and Innovation Advisory Committee | Lead a group of 9, write reports to Earthscope Board about the frontiers in geophysics and funding opportunities to the facility or extended community. |
| 2021-2022 | member of the IRIS Data Service Standing Committee | 2 2days meetings/year |
| 2022, 2024 | Charles Richter Early career award committee | reviewed nominations, CVs, and met with committee |
| 2021- | member of Southern California Earthquake Center HPC standing committee | attending multiple virtual meetings and submitted a proposal as PI on behalf of the committee |
| 2020 | NSF Geophysics Review Panel | reviewed 7-10 proposals, attended the online panel review, wrote summary reports, and made recommendations |

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| 2018 | USGS - Review Panel | reviewed 3 proposals, attended online panel review, and wrote summary reports. |
| 2016 | USGS - Review Panel | reviewed 5-7 proposals, attended the in-person panel, and wrote summary reports. |
| 2011-2012 | Stanford Outdoors Education Program | led activities for the graduate ski club that took 100s of graduate students to ski lessons. |
| 2011 | Chair of the Graduate Student Council (Stanford University) | oversight of a $450k annual budget to distribute as student activities designed to improve student mental health and belonging, especially for international students, liaison between students and administration. |
| 2009 | Chair Graduate Student Advisory Council (School of Earth Sciences, Stanford University) | liaison between student and department administration, coordination of annual research symposium, ski trip, welcoming weekend, and regular activities. |

**Workshop and Summer School service**:

| Year | Workshop | Role |
|---|---|---|
| 2024 | SCOPED workshop for HPC and Data Science in seismology | Lead PI, workshop coordinator, lead instructor |
| 2023 | CyberTraining workshop for HPC and Data Science in seismology | Lead PI, workshop coordinator, lead instructor |
| 2018 | Modeling earthquake source processes: from tectonics to dynamic rupture | Co-organizer of workshop and member of the scientific committee for the writing report. |
| 2016 | SCEC-ERI VISES Summer School, Lake Arrowhead, CA | member of the scientific committee and instructor. |

**National Conference Session Organizer and Chair**:

2024 AGU, S43A: “Advances in Theoretical and Computational Seismology”
2019 SSA, “Environmental Seismology” and “Earthquake Ground Motions and Structural Response in Subduction Zones: A Focus on Cascadia ”
2018 AGU, Earthquake Source Physics Inferred from Macroscopic Source Parameters and Seismicity Parameters
2016 AGU, NH11A-NH14A Geophysical Methods in Urban Basins
2015 AGU, S24B Progress in Ambient Field Studies Driven by Complete Wavefields Initiatives
2014 AGU, S31F Physics of Subduction Earthquakes: From the Trench to the Transition Zone
2014 AGU, S11B Fault Mechanics at the Brittle-Ductile Transition of Subduction Zone

**Referee activities**:

2024- Editor at Geophysical Journal International, handling papers
2017-2020 Associate Editor for Geophysical Research Letters, handling/reviewing about 2 papers per month for 2 years.
2014-now Geophysical Journal International, Bulletin the Seismological Society of America, Nature Communications, Geophysical Research Letters, NSF, NASA, Tectonophysics, Journal of Geophysical Research, Science, Earth-Planets and Space, Solid Earth, Swiss National Foundation, $\geq 130$ reviews

## 6. UNIVERSITY SERVICE

2024 (at **UW/ESS)** Chair of Curriculum Committee
2023 (at **UW/ESS)** Royalty Research Fund - Reviewer
2022-2023 (at **UW/ESS)** Member Executive Committee
2022-2023 (at **UW/ESS)** Member Research Faculty Search Committee
2022- (at **UW/ESS)** Member of the Curriculum Committee and the Data Science Oversight Committee
2021- (at **UW/ESS)** Member of the search committee for the seismic Network Manager position, graduate preliminary exam committee
2016-2020 (at Harvard) Undergraduate Curriculum Committee, Graduate Student Council, IT Committee, Diversity Inclusion, and Belonging Committee, Department Colloquium Committee.

## 7. STUDENT ADVISEES

**Ph.D. Primary advisor**
(* 3 at UW)

| Year | Name | Level | Institution | Topics |
|---|---|---|---|---|
| 2022- | Manuela Kopefli | PhD pre-candidate | Earth and Space Sciences, **University of Washington** | geohazard |
| 2022- | Akash Kharita | PhD pre-candidate, | Earth and Space Sciences, **University of Washington** | geohazard. 1 in prep publication. |
| 2021- | Yiyu Ni | PhD candidate | Earth and Space Sciences, **University of Washington** | machine learning - big data seismology. 2 publications, 3 in review. |
| 2019- | Congcong Yuan | PhD candidate | Earth and Planetary Sciences, Harvard University | time-dependent seismology, solid-fluid interaction. 2 publications (2 in review). |

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| 2018-2023 (June) | Stephanie Olinger | PhD (recipient of the **Stanford Thompson Postdoctoral Fellowship**) | Earth and Planetary Sciences, Harvard University | cryo-seismology (* 50% co-advised with Brad Lipovsky). 3 publications, 1 in review. |
| 2016-2021 (Sept) | Tim Clements | Ph.D. (now a **Mendenhall Postdoc**) | Earth and Planetary Sciences, Harvard University | hydro-seismology, big-data seismology. 4 publications. |
| 2016-2022 (Jan) | Jiuxun Yin | Ph.D. (now **Caltech SCSN Postdoc**) | Earth and Planetary Sciences, Harvard University | earthquake seismology. 6 publications. |

**Graduate student co-advising**
(* 2 at UW, role are secondary advisor, primary advisor on one manuscript)
(**) advising resulted in a publication or to be submitted in spring 2023.
My total time commitment to these grad students is 1-2 hours per week.

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| 2024- | Andrew Sparks, **University of Washington** (co-advised with Renate Hartog). (**) |
| 2021- | Zoe Krauss, **University of Washington** (co-advised with William Wilcock). (**) |
| 2021- | Parker Sprinkle, **University of Washington** (co-advised) |
| 2018-2023 | Natasha Toghramadjian, Earth and Planetary Sciences, Harvard University. |
| 2018-2021 | Zhuo Yang, Harvard University. (**) |
| 2017-2019 | Manuel Florez, MIT, member of the dissertation committee |
| 2019 | Congcong Yuan, USTC China, master student visiting researcher (**) |
| 2019 | William Flanagan, Harvard University |
| 2018 | Philippe Danré, Master student, Ecole Normale Supérieure, Paris. (**) |
| 2017 | Thibault Pérol, Harvard University.(**) |

**International PhD Dissertation Reader** (dissertation and defense evaluative committee)

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|---|---|
| 2024 | Marius Isken, GFZ-Germany |
| 2023 | Luc Illien, GFZ-Germany |
| 2023 | Daniel Mattas, Geoazure, Université de Nice, France |
| 2023 | Zoe Renat, Université de Lorraine, France |
| 2022 | Reza Esfahani, GFZ-Germany (* I did not participate to his public defense) |
| 2019 | Kurama Okubo, IPGP-Paris |

**Postdocs**

2023- Dr. Kuan-Fu Feng, Earth and Space Sciences, **University of Washington**
2023- Dr. Ethan Williams, Earth and Space Sciences, **University of Washington**
2022- Dr. Qibin Shi, Earth and Space Sciences, **University of Washington**
2020-2022 Dr. Laura Ermert, Earth and Planetary Sciences, Harvard University
Earth and Space Sciences University of Washington
(now tenure track at Grenoble ISTerre)
2019-2020 Dr. Xiaotao Yang, Earth and Planetary Sciences, Harvard University
(now assistant professor at Purdue)
2019-2020 Dr. Kurama Okubo, Earth and Planetary Sciences, Harvard University
(now researcher at NIED, Japan)
2019 Dr. Zhitu Ma, Earth and Planetary Sciences, Harvard University
(now assistant prof at Tongji University - China)
2018-2019 Dr. Chengxin Jiang, Earth and Planetary Sciences, Harvard University
(now research associate at Australian National University)
2016-2017 Dr. Chris Van Houtte, Earth and Planetary Sciences, Harvard University
2016-2018 Dr. Loïc Viens, Earth and Planetary Sciences, Harvard University
(now researcher at Los Alamos National Lab)

**Undergraduate student advised**

(*) Resulted in a national conference presentation (**) resulted in a peer-reviewed publication (***) in-prep for peer-reviewed publication (+) Students received a GRFP with my letters written based on our collaborative research

| Year | Name | Institution | Research Topics |
|---|---|---|---|
| 2023-2024 | Anjani Mirchandani | UW | orca detection in DAS and hydrophones |
| 2023-2024 | Hiroto Bito | UW | ML-detection offshore earthquakes |
| 2023 | Nicholas Wolfe | UW | Earthquake magnitudes |
| 2023 | Informatics Capstone: Rona Guo, Nathan Limono, William Phan, Michael Yung, Matthew Herradura | UW | Distributed Acoustic Sensing web platform |
| 2022 | Lucas Swanson | UW | Distributed Acoustic Sensing web platform |
| 2022-2023 | Francesca Skene (*,***) | UW | Surface event cataloging: location and characterization |
| 2022-2024 | Nick Smoczyk (*,***) | UW-University of Minnesota | Volcano seismology: data mining using ML and template matching |
| 2020-2021 | Julian Schmitt (*,***,+) | Harvard University (now Ph.D. student at Caltech) | Ambient noise seismology in Julia - BASIN project |

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| 2019 | Jared Bryan (*,**,+) | SCEC program - Harvard University (now Ph.D. student at MIT) | Ambient noise monitoring of fault zones |
| 2018 | Albert Aguilar (*) | IRIS-subduction zone program - Harvard University (now Ph.D. student at Stanford) | Subduction-zone seismology / data mining |
| 2016 | Leore Lavin | Senior Thesis - Harvard University | Ambient noise seismology and ground motion prediction |
| 2014 | Roy Bowling | SCEC program - Scripps Institution of Oceanography - UCSD | Ambient noise seismology |
| 2012 | Tara Larrue | SURGE program - Stanford University | Ambient noise seismology |
| 2011 | Penprapa Wutthijuk | SURGE program -Stanford University | Ambient noise seismology |

## PUBLICATIONS

(*) denotes MD's graduate student or postdoc.

### Peer-reviewed

54. Ni, Y., **Denolle, M. A.**, Shi, Q., Lipovsky, B. P., Pan, S., Kutz, J. N. (2024). Wavefield reconstruction of distributed acoustic sensing: Lossy compression, wavefield separation, and edge computing. Journal of Geophysical Research: Machine Learning and Computation, 1, e2024JH000247, 10.1029/2024JH000247
53. P. Makus, **M. A. Denolle**,C. Sens-Schönfelder, M. Köpfli, and F. Tilmann, Analysing Volcanic, Tectonic, and Environmental Influences on the Seismic Velocity from 25 Years of Data at Mount St. Helens, Seismological Research Letters 95 (5): 2674–2688, doi.org/10.1785/0220240088
52. (*) (*) Koepli, M. , **Denolle M. A.**, Thelen W., Makus P., Malone S., Examining 22 Years of Ambient Seismic Wavefield at Mount St. Helens., Seismological Research Letters, 95 (5), 2622-2636, 10.1785/0220240079
51. Diewald, Fabian and **Denolle, Marine** and Timothy, Jithender J. and Gehlen, Christoph, Impact of Temperature and Relative Humidity Variations on Coda Waves in Concrete. Scientific Report, 14, 18861 (2024)./10.1038/s41598-024-69564-4
50. (*) Okubo K., Delbridge B., **Denolle M.**, Monitoring velocity change over 20 years at Parkfield Journal of Geophysical Research - Solid Earth , 129, e2023JB028084, 10.1029/2023JB028084
49. (*) Kharita, A., **Denolle, M.**, West M., Discrimination between icequakes and earthquakes in southern Alaska: an exploration of waveform features using random forest algorithm, Geophysical Journal International, https://doi.org/10.1093/gji/ggae106
48. (*) Olinger S. , Lipovsky B., **Denolle M.** "Ocean coupling controls rupture velocity of fastest observed ice shelf rift propagation event", AGU Advances, AGU Advances, 5, e2023AV001023, https://doi.org/10.1029/2

47. (*) Yuan C., Cochard T., **Denolle M.**, Gomberg J., Wech A., Xiao L., Weitz D. Laboratory hydrofracture as analogs to tectonic tremors, AGU Advances, 5, e2023AV001002. https://doi.org/10.1029/2023AV001002
46. T. Cochard, I. Svetlizky, G. Albertini, R. C. Viesca, S. M. Rubinstein, F. Spaepen, C. Yuan (*), **M. Denolle**, Y-Q. Song, L. Xiao , D. A. Weitz. Extended crack propagation by local nucleation and rapid transverse expansion, Nature Physics, Nat. Phys. (2024). https://doi.org/10.1038/s41567-023-02365-0
45. (*) Shi, Q, **Denolle M.** Improved observations of deep earthquake ruptures using machine learning,JGR , 128, e2023JB027334. https://doi.org/10.1029/2023JB027334
44. (*) Yuan C., (*) Ni, Y., **Denolle M.**, Better Together: Ensemble Learning for Earthquake Detection and Phase Picking Transactions on Geosciences and Remote Sensing - IEEE. vol. 61, pp. 1-17, 2023, Art no. 5920217, https://doi.org/10.1109/TGRS.2023.3320148 .
43. (*) Ni, Y, **Denolle M.**, Fatland R., Alterman N., Lipovsky L.P., Knuth F., An Object Storage for Distributed Acoustic Sensing. , Seismological Research Letters, XX, 1–13, doi: 10.1785/ 0220230172.
42. (*) Krauss Z., (*) Ni Y., Henderson S., **Denolle M**, 2023, Seismology in the cloud: guidance for the individual researcher, Seismica, Aug 25;2(2). https://doi.org/10.26443/seismica.v2i2.979
41. (*) Yiyu Ni, Alexander Hutko, Francesca Skene, **Marine Denolle**, Stephen Malone, Paul Bodin, Renate Hartog, Amy Wright, 2023, Curated Pacific Northwest AI-ready Seismic Dataset, Seismica, doi:10.26443/seismica.v2i1.368
40. (*) Ermert L, Cabral-Cano E, Chaussard E, Solano-Rojas D, Quintanar L, Morales Padilla D, Fernandez-Torres EA, **Denolle MA**. Probing environmental and tectonic changes underneath Mexico City with the urban seismic field. Earth , 14, 529–549, https://doi.org/10.5194/se-14-529-2023, 2023. **PDF**
39. (*) Clements T., **Denolle M.A.** , 2023, The Seismic Signature of California's Earthquakes, Droughts, and Floods, Journal of Geophysical Research: Solid Earth, 128, e2022JB025553, https://doi.org/10.1029/2022J **PDF**
38. (*) Yang, X.,(*) Bryan, J., (*)Okubo, J., (*)Jiang, C., (*) Clements, T., **Denolle, M.A.**, Optimal Stacking of Noise Cross-Correlation Functions, Geophysical Journal International, (2023) 232, 1600–1618 , ggac410, https://doi.org/10.1093/gji/ggac410, **PDF**
37. (*) Olinger, S., Lipovsky, B., **Denolle, M. A.**, Crowell, B., 2022,Tracking the Cracking: a Holistic Analysis of Rapid Ice Shelf Fracture Using Seismology, Geodesy, and Satellite Imagery on the Pine Island Glacier Ice Shelf, West Antarctica , Geophysical Research Letters,49, e2021GL097604, https://doi.org/10.1029/2021GL097604, **PDF**
36. (*) Jiang, C., **Denolle, M. A.**, 2022, Pronounced seismic anisotropy in Kanto sedimentary basin: A case study of using dense arrays, ambient noise seismology, and multi-modal surface-wave imaging. Journal of Geophysical Research: Solid Earth, 127, e2022JB024613, https://doi.org/10.1029/2022JB024613 **PDF**
35. (*) Yin, J., **Denolle, M.A.**, He, B., 2022, A multitask encoder–decoder to separate earthquake and ambient noise signal in seismograms, Geophysical Journal International, Volume 231, Issue 3, December 2022, Pages 1806–1822, https://doi.org/10.1093/gji/ggac290 **PDF**
34. Viens, L., Jiang, C., **Denolle, M. A.**, 2022, Imaging the Kanto Basin bedrock with earthquake and noise autocorrelation functions , Geophysical Journal International, pp:1080–1091, https://doi.org/10.1093/gji/ggac101 **PDF**

33. Yang, Z., (*)Yuan, C., **Denolle, M. A.**, 2022, Detecting Elevated Pore Pressure due to Wastewater Injection Using Ambient Noise Monitoring , The Seismic Record,2 (1): pp 38–49,doi: /10.1785/0320210036 **PDF**
32. Yin, J.(*), **Denolle, M. A.**, 2021, The Earth's Surface Controls the Depth-Dependent Seismic Radiation of Megathrust Earthquakes, AGU Advances, doi: 10.1029/2021AV000413, **PDF**
31. Yuan, C.(*), Bryan J.(*), **Denolle, M. A.**, 2021, Numerical comparison of time-, frequency- and wavelet-domain methods for coda wave interferometry, in Geophys. J. International, vol 226(2),pp 828–846, doi: 10.1093/gji/ggab140 **PDF**
30. Yin, J.(*), Li, Z., **Denolle, M. A.**, 2021, Source time function clustering reveals patterns in earthquake dynamics,Seismological Research Letters, 92(4), pp: 2343–2353, 10.1785/0220200403 **PDF**
29. Clements, T.(*), **Denolle, M. A.**, 2021, SeisNoise.jl: Ambient Seismic Noise Cross-Correlation on the CPU and GPU in Julia, Seism. Res. Letters, 92(1), p p" 517–527, doi: 10.1785/0220200192, **PDF**
28. Jones, J. P. , Okubo, K.(*), Clements, T.(*), **Denolle, M. A.**, 2020, SeisIO: a fast, efficient geophysical data architecture for the Julia language, Seism. Res. Letters, 92(1), 517–527, doi: 10.1785/0220190295 **PDF**
27. Jiang, C.(*), **Denolle, M. A.**, 2020, NoisePy: a high-performance tool in python for ambient noise seismology, Seism. Res. Letters, 91, pp: 1853–1866, doi: 10.1785/0220190364. **PDF**
26. Clayton, R. W., P. Persaud, **M. Denolle**, and J. Polet, 2019, Exposing Los Angeles's shaky geologic underbelly, Eos, 100, doi: 10.1029/2019EO135099.
25. Danré, P. (*), Yin J., Lipovsky B., **Denolle, M.**, Earthquakes Within Earthquakes: Patterns in Rupture Complexity, 2019, Geophys. Res. Lett., 43(13), pp 7352-7360, doi: 10.1029/2019GL083093 **PDF**
24. Viens, L. (*), **Denolle, M.**, Long-period ground motions from past and virtual megathrust earthquakes along the Nankai Trough, Japan, 2019, Bull. Seismol. Soc. Am., 109(4), pp 1312-1330, doi: 10.1785/0120180320 **PDF**
23. **Denolle, M.**, Energetic Onset of Earthquakes, 2019, Geophys. Res. Lett., 46(5), pp 2458-2466, doi: 10.1029/2018GL080687 **PDF**
22. Yin J. (*), **Denolle, M.**, Relating teleseismic backprojection images to earthquake kinematics, 2019, Geophys. J. Int., 217(2), pp 729–747, doi: 10.1093/gji/ggz048 **PDF**
21. Wang, Y., **Denolle, M.**, S. M. Day , Geometric Controls on Pulse-like Rupture in a Dynamic Model of the 2015 Gorkha Earthquake, 2019, J. Geophys. Res., 124(2), pp 1544-1568, doi: 10.1029/2018JB016602 **PDF**
20. Clements (*), T., **Denolle, M.**, Tracking ground water using the ambient seismic field, 2018, Geophys. Res. Lett., 123(4), pp 2923-294, doi: 10.1029/2018GL077706 **PDF**
19. **Denolle, M.**, P. Boué, N. Hirata, S. Nakagawa, G. C. Beroza, Strong Shaking Expected in Tokyo from an Expected M7+ Itoigawa-Shizuoka Earthquake, 2018, J. Geophys. Res., 123(5), pp 3968-3992, doi: 10.1029/2017JB015184 **PDF**
18. Van Houtte, C. (*), **M. Denolle**, Improved model fitting for the empirical Green's function approach using hierarchical models, 2018, J. Geophys. Res. 123(4), pp 2923-2942, doi: 10.1002/2017JB014943 **PDF**

17. Viens, L. (*), **M. Denolle**, S. Nakagawa, N. Hirata, Complex Near-Surface Rheology Inferred From the Response of Greater Tokyo to Strong Ground Motions, 2018, J. Geophys. Res. 123(7), pp 5710-5729, doi: 10.1029/2018JB015697 **PDF**
16. Yin, J. (*), **M. Denolle**, Yao, H., Spatial and Temporal Evolution of Earthquake Dynamics: Case Study of the Mw 8.3 Illapel Earthquake, Chile , 2018, J. Geophys. Res. 123(1), pp 344-367, doi: 10.1002/2017JB014265 **PDF**
15. Pérol, T. (*), **M. Denolle**, Gharbi, M., Convolutional Neural Network for Earthquake Detection and Location, Sciences Advances 4(2), pp e1700578, doi: 10.1126/sciadv.1700578 **PDF**

14. Sheng, Y., **M. Denolle**, G. C. Beroza, Multi-Component C3 Green's Functions for Improved Long-Period Ground Motion Prediction, 2017, Bull. Seismol. Soc. Am., 107(6), pp 2836-2845, doi: 10.1785/01201700 **PDF**
13. Viens, L. (*), **M. Denolle**, Miyake, H., Sakai, S., and Nakagawa, S., Retrieving impulse response function amplitudes from the ambient seismic field, 2017, Geophys. J. Int., 210(1), pp 210-222, doi: 10.1093/gji/ggx155 **PDF**
12. Boué, P., **M. Denolle**, N. Hirata, S. Nakagawa, G. C. Beroza, Beyond Basin Resonance: Characterizing Wave Propagation Using a Dense Array and the Ambient Seismic Field, 2016, Geophys. J. Int., 206(2) pp 1261-1272, doi: 10.1093/gji/ggw205 **PDF**
11. **Denolle, M.**, and P. M. Shearer, New perspective on self-similarity of shallow thrust earthquakes, 2016, J. Geophys. Res., 121(9), pp 6533-6565, doi: 10.1002/2016JB013105 **PDF**

10. **Denolle, M.**, W. Fan, and P. M. Shearer, Dynamics of the M7.8 2015 Nepal Earthquake, 2015, Geophys. Res. Lett., 42(18), pp 7467-7475, doi: 10.1002/2015GL065336 **PDF**
9. Lee, E-J, P. Chen, T. H. Jordan, P. B. Maechling, **M. Denolle**, G. C. Beroza, Full 3D Tomography (F3DT) for Crustal Structure in Southern California Based on the Scattering-Integral (SI) and the Adjoint-Wavefield (AW) Methods, 2014, J. Geophys. Res., 119(8), pp 6421-6451, doi: 10.1002/2014JB011236 **PDF**
8. **Denolle, M.**, H. Miyake, S. Nakagawa, N. Hirata, G. C. Beroza, Long-period seismic amplification in the Kanto Basin from the ambient seismic field, 2014, Geophys. Res. Lett., 41(18), pp 7467-7475, doi: 10.1002/2014/GL059425 **PDF**
7. **Denolle, M.**, Seismic Hazard Analysis using the Ambient Seismic Field, PhD Dissertation **PDF**
6. **Denolle, M.**, E. M. Dunham, G. A. Prieto, and G. C. Beroza, Strong Ground Motion Prediction using Virtual Earthquakes, 2014, Science, 343(6169), pp 399-403, doi: 10.1126/science.1245678 **PDF**
5. **Denolle, M.**, E. M. Dunham, G. A. Prieto, and G. C. Beroza, Ground Motion Prediction of Realistic Earthquake Sources Using the Ambient Seismic Field, 2013, J. Geophys. Res., 118(5), pp 2102-2118, doi: 10.1029/2012JB009603 **PDF**
4. Jesse F. Lawrence, **M. Denolle**, K. J. Seats, and G. Prieto A numeric evaluation of attenuation from ambient noise correlation functions, 2013, J. Geophys. Res., 118(12), pp 6134-6145, doi: 10.1002/2012JB009513 **PDF**
3. **Denolle, M.**, E. M. Dunham, and G. C. Beroza, Solving the Surface-Wave Eigenproblem with Chebyshev Spectral Collocation, 2012, Bull. Seismol. Soc. Am., 102(3), pp 1214-1223, doi: 10.1785/0120110183 **PDF**

2. Prieto, G. A., **M. Denolle**, J. F. Lawrence, and G. C. Beroza, On amplitude carried by the ambient seismic field, 2011, C. R. Geosci.. Thematic Issue: Imaging and Monitoring with Seismic Noise, 343, pp 600-614, doi: 10.1016/j.crte.2011.03.006 **PDF**

1. Singh, S., N. Hananto, A. Chauhan, H. Permana, **M. Denolle**, A. Hendriyana, and D. Natawidjaja, Evidence of active backthrusting at the NE Margin of Mentawai Islands, SW, Sumatra, 2010, Geophys. J. Int., 180(2), pp 703-714, doi: 10.1111/j.1365-246X.2009.04458.x **PDF**

## INVITED PRESENTATIONS

| Year | Type | Institution |
|---|---|---|
| 2025 | Department Colloquium | Washington University - San Louis |
| 2024 | CS4Env | UW |
| 2024 | CSE Faculty Luncheon | UW |
| 2024 | ML talk | Turing Institute |
| 2024 | Department Colloquium | Northern Arizona University |
| 2023 | Seismolab Seminar | UC Berkeley |
| 2023 | Séminaire Departemental | Ecole Normale Supérieure, Paris |
| 2023 | Data Science Seminar, eScience Institute | University of Washington |
| 2023 | Department Colloquium | Sandia National Lab - GNEM seminar series |
| 2022 | Invited to Conference (talk) | x2 American Geophysical Union |
| 2022 | Department Colloquium | University of New Mexico |
| 2021 | Seismo Colloquium | University of Oregon |
| 2021 | Seismo Colloquium | U Utah, Seismo Tea |
| 2021 | Department Colloquium | University of Wisconsin |
| 2021 | Department Colloquium | Colorado School of Mines |
| 2020 | Invited to Conference (talk) | Mexico a traves de los sismos |
| 2020 | Department Colloquium | U Washington |
| 2020 | Department Colloquium | UC Berkeley |
| 2019 | Department Colloquium | Yale University |
| 2019 | Seismo Colloquium | University of Washington, seismolunch |
| 2019 | Invited to Conference (talk) | EGU, annual meeting, Vienna. |
| 2019 | Department Colloquium | Michigan State University |
| 2019 | Public Lecture | Victoria University, of Wellington, SN Jepson Lecture, New Zealand |
| 2019 | Department Colloquium | GNS-Science, New Zealand |
| 2019 | Department Colloquium | Stanford University, Department of Geophysics |
| 2019 | Department Colloquium | Tufts University, department of Civil Engineering seminar |
| 2018 | Department Colloquium | Brown University |
| 2018 | Department Colloquium | Ecole Normale Superieure, Paris |
| 2017 | Invited Conference (talk) | AGU,New Orleans. |
| 2017 | Department Colloquium | University of Columbia - Lamont Doherty Earth Observatory |
| 2016 | Public Lecture | Harvard Museum of Natural History |
| 2016 | Department Colloquium | University of Oregon |
| 2016 | Department Colloquium | University of New Hampshire, Chapman Colloquium. |

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| 2016 | Department Colloquium | UC Santa Cruz, Institute of Geophysics and Planetary Physics seminar. |
| 2016 | Department Colloquium | Massachusetts Institute of Technology |
| 2015 | Department Colloquium | USGS, Menlo Park, Earthquake Hazard Program seminar. |
| 2015 | Department Colloquium | University of Victoria, BC, Canada |
| 2015 | Department Colloquium | Penn State, Geodynamics seminar. |
| 2015 | Department Colloquium | Harvard, Earth and Planetary Sciences |
| 2015 | Department Colloquium | UT Austin, Solid Earth seminar. |
| 2015 | Department Colloquium | UCLA, seismology/tectonics seminar. |
| 2015 | Invited Conference (talk) | HOKUDAN - International Symposium on Active Faulting in the Commemoration of the 20th Anniversary of the 1995 Great Hanshin-Awaji Earthquake, Awaji, Japan. |
| 2015 | Invited Conference (talk) | Information Theory and Applications workshop, La Jolla. |
| 2015 | Department Colloquium | IGPP-Scripps Institution of Oceanography, UCSD, Geophysics seminar. |
| 2015 | Department Colloquium | University of Southern California, Geophysics seminar. |
| 2014 | Invited Conference (talk) | Strong Motion, Site Effect, and Risk Evaluation Studies for Future Mega-Quakes, DPRI, Kyoto University, Japan. |
| 2014 | Invited Conference (talk) | AGU-SEG Summer Research workshop, Vancouver, Canada. |
| 2014 | Department Colloquium | San Diego State University, Department Colloquium. |
| 2014 | Department Colloquium | UC Santa Barbara, Department Colloquium. |
| 2014 | Department Colloquium | IGPP-Scripps Institution of Oceanography-UC San Diego, Geophysics seminar. |
| 2013 | Invited Conference (talk) | AGU, Meeting of the Americas, Cancun, Mexico. |
| 2012 | Department Colloquium | Berkeley Seismo Lab, Seismo seminar. |
| 2013 | Department Colloquium | Caltech Seismo Lab., Seismo seminar. |
| 2013 | Department Colloquium | USGS, Menlo Park. |
| 2013 | Department Colloquium | Stanford ICME seminar. |
| 2013 | Department Colloquium | Earthquake Research Institute, Tokyo University, Japan. |
| 2013 | Department Colloquium | Advanced Industrial Science and Technology, Japan. |
| 2013 | Department Colloquium | Disaster Prevention Research Institute, Japan. |
| 2012 | Invited Conference (talk) | ACOUSTICS, France |
| 2011 | Department Colloquium | Institut de Physique du Globe de Paris, Earthquake seminar. |

## GRANT SUPPORT

| Year | Sponsor | Type | Role | Total to PI | Title | Notes |
|---|---|---|---|---|---|---|
| 2025 | NSF | Grant | co-PI | $ 785,819 | “EXTension on the EN-Deavour Segment (EXTEND): Illuminating the seafloor spreading cycle” | lead PI Wilcock - Denolle leads data mining and ambient field study |
| 2024 | the Paul F Allen Family Foundation | Grant | co-PI | $ 1,443,500 | “Acoustic Monitoring of Marine Mam-mals with Distributed Acoustic Sensing (DAS): Ap-plications to Southern Resident Killer and Humpback Whales” | lead PI Abadi - Denolle leads edge computing and machine learning workflows |
| 2024 | NSF | Grant | co-PI | $ 198,069 | “RAPID: Mul-tiplexed Distributed Acoustic Sensing (DAS) at the Ocean Observatory Initiative (OOI)” | lead PI Lipovsky - Denolle leads ML edge deployment |

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| 2024 | NSF | Grant | PI | $ 226,022 | "Collaborative Research: Slippery when wet? A seismic investigation of slow slip and fault locking along the Alaska-Aleutian subduction zone" | lead institution U Wisconsin (Eva Golos).3 years. Support for DAS experiment in Alaska, crustal imaging, and phase picking. |
| 2023 | IRIS-DMC | Grant/Subaward | PI | $98,239 | "Developing a near-real-time shallow tomography model using DAS and broadband seismometers on the Cloud" | 2 years. Seismic software development with part support for my student. |
| 2023 | Ecole Normale Supérieure, Paris | Fellowship | PI | 3,500€ | Visiting Professorshop | 6/15/2023-7/15/2023. Will teach 2-3 lectures about ambient noise seismology and cloud computing and start collaboration. |
| 2022 | Southern California Earthquake Center | Grant | PI | $35,229 | "CyberTraining for Seismology: Data Science and HPC" | 2/1/2022-1/31/2023. Overall was $70K. 2 institutions. UW is lead. Supports a workshop. |

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| 2021 | Murdock Charitable Trust Fund | Equipment Facility | co-I | $950,000 | ”UW Photonic Sensing Facility” | UW PI Lipovsky is lead. My role has cost-share on computing and seismic instrumentation. My lead is the cyberinfrastructure of the data generated by the equipment. |
| 2021 | The Lucile and David Packard Foundation | Grant | lead-PI | $50,00 | ”URG2: URG2: Undergraduate Research in Geosciences for Under-Represented Groups” | 10/1/2021-9/30/2022. Overall was $180,000, 7 institutions. UW was lead, and I organized a 4-day workshop at Pack Forest, WA. Supports undergraduate research. |
| 2021 | National Science Foundation | Grant | co-I | $995,817 | ”CyberTraining: Implementation: Medium: GeoSMART: Developing a Machine Learning workforce for earth science studies through training and curriculum development” | 9/1/2021-8/31/2024. OAC-2117834 CSSI, lead PI Nicoleta Cristea. I have 2mos/year student, 0.8mo for me. I lead 1/3 of the project by developing a new graduate-level course (ESS 469/569) |

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| 2021 | National Science Foundation | Grant | PI | $660,591 | ”Collaborative Research: Frameworks: Seismic COmputational Platform for Empowering Discovery (SCOPED)” | 09/01/2021-8/30/2025. OAC-2103701, Multi-Institution grant. lead-PI Carl Tape (University of Alaska Fairbanks), total project budget $3.5M. UW leads the cloud workflows and training from observational seismology. |
| 2020 | Southern California Earthquake Center | Grant | PI | $33,307 | ”Aftershock patterns and co-seismic off-fault damage elucidate dynamic rupture processes on the 2019 Ridgecrest earthquake sequence” | #20010. 1 year. Declined. |
| 2019 | Harvard University David Rockefeller Center for Latin American Studies | Grant | PI | $85,00 | ”Monitoring Seismic Hazards in Mexico City using Grillo, a Low-Cost Earthquake Early Warning System” | 1 year. We purchased equipment for the non-profit Grillo. They ended up deploying in Haiti and Puerto Rico. |
| 2019 | Harvard Data Science Initiative | Grant | PI | $27,210 | ”Ambient-noise seismology using Cloud Computing” | Supported student to develop cloud workflows |

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| 2019 | National Science Foundation | Grant | PI | $167,804 | ”Collaborative Research: Cross-Validation of Empirical and Physics-based ground motion predictions” | . Multi-Institution with San Diego State University (Kim Olsen). Denolle was the lead PI. 04/15/2019-3/31/2021, EAR-1850015. $ 59,460.0 transferred to UW. |
| 2018 | Southern California Earthquake Center | Grant | PI | $28,085 | ”Data Collection for Virtual Earthquakes on Cajon Pass” | 2/1/2018-1/31/2019. #18125. Fieldwork support. |
| 2018 | National Science Foundation | Grant | PI | $504,315 | ”CAREER: Dynamics of surface rupturing thrust earthquakes” | EAR-1749556, 2124722 7/1/2018-6/30/2023. CAREER award, supported graduate student and postdoc research. $ 274,605.00 transferred to UW. |
| 2017 | Southern California Earthquake Center | Grant | PI | $25,000 | ”Static and dynamic source parameters of global strike-slip earthquakes” | 2/1/2018-1/31/2019. #16246. Support a visiting master student’s research. |

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| 2017 | National Science Foundation | Grant | PI | $324,495 | ”Collaborative Proposal - PREEVENTS Track 2: Cascadia Scenario Earthquakes: Source, Path, and implications for Earthquake Early Warning” | 08/01/2017-7/31/2020. Lead PI on the project is Yihe Huang (U Michigan). ICER-1663827. Support several years of postdocs for research. |
| 2017 | The Lucile and David Packard Foundation | Fellowship | PI | $875,000 | ”Changing Basin, Changing Hazards” | 11/15/2017-11/14/2023. supporting multiple postdocs and PI for research and a small amount for computing. $442,451 transferred to UW. |
| 2016 | Southern California Earthquake Center | Grant | PI | $26,173 | ”Epistemic uncertainties in ground motion prediction from virtual earthquakes” | #16246, 2/1/2016-1/31/2017. basic research. |
| 2016 | Southern California Earthquake Center | Grant | PI | $20,000 | ”Basin Response to Virtual Earthquakes on the San Jacinto Fault and the Itoigawa-Shizuoka Fault” | #15036, 2/1/2015-1/31/2016. basic research. |

## Non-Refeered materials reflecting scholarly and creative activities

**TEXTBOOK: Machine Learning in the Geoscience**: **Open-Access Jupyter Book** A jupyter-text book for a graduate-level machine learning class. Ongoing development includes asynchronous teaching

materials and curated data sets for homework. Associated Course **Github repository** with homework sets. The context for this work is that there is no textbook to teach machine learning in the geosciences and that most researchers learn on the fly. This textbook aims to formally introduce ML concepts and toolkits in the graduate-level classroom. The significance of this work will be the adoption of this material in other geoscience programs. The University of Arizona and UC Berkeley expressed interest in contributing to their own course.

**SOFTWARE: Ambient-noise seismology package** Open-source software in observational seismology is eclectic and mostly maintained by single users. I have written 2 proposals to the NSF to gather the community around a few flagship codes. We are the only group developing the Julia ecosystem in seismology and are developing core codes.

1. **noisepy**: A open-source python package to process ambient noise seismological data at large scale. As of 02/27/2024, the package was forked 68 times, starred 137, and is now maintained by 15 contributors, software engineers, and scientists. It is taught at virtual workshops.
2. **SeisNoise**: A open-source python package to process ambient noise seismological data at large scale in Julia. As of 04/2/2023, the package was forked 17 times, starred 50, and is now maintained by 1 contributor. SeisNoise represents the core cross-correlation package used by at least 3 group members. It is particularly powerful, but I am starting a community effort to develop the ecosystem.

**DATASETS: EarthML4PNW**: A GitHub organization with curated data sets for data relevant to Pacific Northwest geosciences. Our first package was published as a Seismic Data Set. We are using GitHub to version-control the curated data set and hope to improve the quality of the metadata through research investigation.