

Eileen R. Martin  
she/her

eileenrmartin@vt.edu  
eileenrmartin@mines.edu  
(540)231-6397  
474 McBryde Hall  
225 Stanger St. Blacksburg, VA 24060  
<https://eileenrmartin.github.io/>

**Academic  
Appointments**

**Research Assistant Professor**, Colorado School of Mines, Golden, CO  
- Department of Geophysics Jun. 2021 - present  
- Incoming Assistant Professor in Geophysics and AMS beginning Jan. 2022

**Assistant Professor**, Virginia Tech, Blacksburg, VA Aug. 2018 - present  
- Department of Mathematics (primary appointment)  
- Program in Computational Modeling and Data Analytics  
- Department of Geosciences (affiliate faculty since Dec. 2019)

**Affiliate**, Lawrence Berkeley National Laboratory, Berkeley, CA 2016-2020  
- Earth and Environmental Sciences Area, Geophysics Department

**Education**

**Ph.D. Computational and Mathematical Engineering, Stanford University**  
Dissertation: June 2018  
*Passive Imaging and Characterization of the Subsurface with Distributed Acoustic Sensing*  
Readers: Biondo Biondi (advisor), Jonathan Ajo-Franklin, George Papanicolaou

**M.S. Geophysics Stanford University**  
Masters research presentation: June 2017  
*Stanford DAS Array: Ambient Noise and Earthquake Recordings*  
Committee: Biondo Biondi (advisor) and Greg Beroza

**B.S. Dean's Scholars Honors Mathematics, University of Texas at Austin**  
Dean's Honored Graduate, graduated with high honors May 2012  
Honors thesis: *Global Coordinate Systems: Continuously Moving Finite-Dimensional Unit Norm Tight Frames on Smooth Manifolds*  
Advisor: Daniel Freeman (advisor)

**B.S. Computational Physics University of Texas at Austin**  
Graduated with high honors May 2012

**Honors,  
Awards,  
Fellowships**

**Luther and Alice Hamlett Junior Faculty Fellow** 2019-present  
Fellowship in Virginia Tech's Academy of Integrated Science

**Gene Golub Dissertation Award** 2018  
Top dissertation, Institute for Computational and Mathematical Engineering, Stanford

**Best student poster paper at SEG Annual Meeting, co-author** 2017  
Awarded for Huot et al., *Automatic Noise Exploration in Urban Areas*

**Schlumberger Innovation Fellowship** 2016-2017

**DOE Computational Science Graduate Fellowship** 2012-2016

**Stanford ICME Student Leadership Award** 2014

**NSF Graduate Research Fellowship Program** award offered 2012

**Dean's Honored Graduate, UT-Austin College of Natural Sciences** 2012

**Barry M. Goldwater Scholarship** 2011-2012

**External  
Funding**

NSF 2046387, Office of Advanced Cyberinfrastructure

Amount: \$398,024 awarded to date (\$509,722 total intended)  
*CAREER: Scalable Computational Seismology for All*  
PI: E.R. Martin  
Period of Performance: 7/1/21 - 6/30/26

**Subcontract 3437-AFR-2S+, Luna Innovations, Inc.**

Amount to Virginia Tech: \$100,000  
*Swift and QUIet Airfield Assessment Device (SQUAAD), Phase II*  
PI: R. Green (Virginia Tech, Civil & Environmental Engineering), Co-PI: E.R. Martin  
Period of Performance: 3/1/21-2/1/22

**NSF 2034366, Signals in the Soil Program**

Amount to Virginia Tech: \$216,167  
*SitS: Collaborative Research: Understand and Forecast Long-term Variations of In-situ Geophysical and Geomechanical Characteristics of Degrading Permafrost in the Arctic*  
PI: M. Xiao (Penn State, Civil & Environmental Engineering), Co-PIs: E.R. Martin, D. Nicolsky (University of Alaska Fairbanks, Geophysical Institute), T. Zhu (Penn State, Geosciences), A. Jensen (University of Alaska Fairbanks, Anthropology)  
Period of performance: 1/1/21-12/31/23

**DOE DE-FE0091786, Office of Fossil Energy**

Amount: \$1,874,999 total = \$1,499,999 DOE + \$375,000 non-DOE  
*Fully Distributed Acoustic and Magnetic Field Monitoring via a Single Fiber Line for Optimized Production of Unconventional Resource Plays*  
Lead PI: G. Pickrell (Virginia Tech, Materials Science and Engineering), PIs: L. Ma (Sentek Instrument LLC), E.R. Martin  
Period of performance: 10/1/19-6/30/22

**MAA Tensor Women and Mathematics Grant**

Amount: \$6,000  
*SURE: Speakers and Undergraduate Research Engagement*  
PI: G. Matthews (Virginia Tech, Math), Co-PI: E.R. Martin  
Period of performance: 6/1/21-5/31/22

**Subcontract 4000175567, UT-Batelle, LLC for Oak Ridge National Laboratory**

Amount: \$94,985  
*Fast Comparative Algorithms for Sensor Array Summaries*  
PI: E.R. Martin  
Period of Performance: 11/11/19-8/15/21

**NSF 1937984, Engineering for Civil Infrastructure program**

Amount: \$157,973  
*EAGER: Exploration of an Interdisciplinary Approach to Resolving a Critical Issue in Evaluating Liquefaction Hazard of Challenging Soil Sites*  
PI: E.R. Martin, Co-PIs: A. Yerro Colom and R. Green (both Virginia Tech Civil & Environmental Engineering)  
Period of Performance: 8/1/19-7/31/22

**MAA Tensor Women and Mathematics Grant**

Amount: \$6,000  
*SURE: Speakers and Undergraduate Research Engagement*  
PI: G. Matthews (Virginia Tech Math), Co-PIs: E.R. Martin and L. Zietsman (Virginia Tech Math)  
Period of performance: 6/1/19-5/31/20

**DE-SC0019630, DOE Phase I STTR with Luna Innovations**

Amount to Virginia Tech: \$51,433

*Advanced Computational Methods Towards High-Resolution Fiber Optic Distributed Acoustic Sensing*

PI: D. Rountree (Luna Innovations), Co-PI: E.R. Martin

Period of performance: 2/19/19-11/18/19

**Internal  
Funding**

**Luther and Alice Hamlett Undergraduate Research Support, AIS**

Total amount: \$6,000

*Spring 2019: Data compression for next-generation seismic sensor networks*

*Spring 2020: Footstep removal to protect resident privacy in urban seismology data*

*Summer 2021: Compression and Data Product Streams in Permafrost Thaw Monitoring*

PI: E.R. Martin

Period of performance: 1/14/19-6/30/25

**Luther and Alice Hamlett Junior Faculty Fellowship, AIS**

Amount varies annually depending on investment fund returns.

Period of performance: 8/19 - 7/22

**Seed Grant from Penn State Institute of Energy and the Environment**

Amount: \$50,000 (at Penn State)

*Lighting Up the Subsurface for Tomorrow's City: Initiating a Penn State DAS Array for Mapping Near-Surface Geology*

PI: T. Zhu (Penn State Geosciences), Co-PIs: E.R. Martin, A. Nyblade (Penn State Geosciences), P. Fox (Penn State Civil & Env. Engineering)

Period of performance: 3/1/19-12/31/19

**Articles Under  
Review**

1. K. Yost, A. Yerro, R.A. Green, **E.R. Martin**, J. Cooper, 2021, *MPM Modeling of Cone Penetrometer Testing for Multiple Thin-Layer Effects in Complex Soil Stratigraphy*, under review.
2. W. Trainor-Guitton, **E.R. Martin**, V. Rodríguez Tribaldos, N. Taverna, V. Dumont, 2021, *Distributed Sensing and Machine Learning Hone Seismic Listening*, under review.

**Journal  
Articles**

1. J. Cooper, **E.R. Martin**, K.M. Yost, A. Yerro, R.A. Green, 2021, *Robust identification and characterization of thin soil layers in cone penetration data by piecewise layer optimization*, accepted to Computers and Geotechnics, code at <https://github.com/jonc7/Soil-Layer-Optimization>, preprint at <https://vtechworks.lib.vt.edu/handle/10919/104628>.
2. J.Kump, **E.R. Martin**, 2021, *Multichannel Analysis of Surface Waves Accelerated (MASWAccelerated): Software for Efficient Surface Wave Inversion Using MPI and GPUs*, accepted to Computers & Geosciences, preprint at <https://arxiv.org/abs/2003.02256>, code at <https://github.com/jlk9/MASWA>.
3. K.M. Yost, R.A. Green, S. Upadhyaya, B.W. Maurer, A. Yerro-Colom, **E.R. Martin**, J. Cooper, 2021, *Assessment of the Efficacies of Correction Procedures for Multiple Thin Layer Effects on Cone Penetration Tests*, Soil Dynamics and Earthquake Engineering, 144, 106677.
4. N.J. Lindsey, **E.R. Martin**, 2021, *Fiber-optic Seismology*, Annual Review of Earth and Planetary Sciences, 49, pp. 309-336.
5. T. Zhu, J. Shen, **E.R. Martin**, 2021, *Sensing Earth and Environment Dynamics by Telecommunication Fiber-optic Sensors: An Urban Experiment in Pennsylvania USA*, Solid Earth, 12(1), pp. 219-235.

6. **E.R. Martin**, 2021, *A Linear Algorithm for Ambient Seismic Noise Double Beamforming Without Explicit Crosscorrelations*, Geophysics, 86(1), pp. IJF-V89.  
Code available at <https://github.com/eileenrmartin/doubleBeamforming>.
7. G. Fang, Y.E. Li, Y. Zhao, **E.R. Martin**, 2020, *Urban Near-surface Seismic Monitoring using Distributed Acoustic Sensing*, Geophysical Research Letters, 47(6), e2019GL086115.
8. Z.J. Spica, M. Perton, **E.R. Martin**, G.C. Beroza, B.L. Biondi, 2020, *Urban Seismic Site Characterization by Fiber-Optic Seismology*, Journal of Geophysical Research: Solid Earth, 125(3), e2019JB018656.
9. **E.R. Martin**, F. Huot, Y. Ma, R. Cieplik, S. Cole, M. Karrenbach, B.L. Biondi, 2018, *A Seismic Shift in Scalable Acquisition Demands New Processing: Fiber-Optic Seismic Signal Retrieval in Urban Areas with Unsupervised Learning for Coherent Noise Removal*, IEEE Signal Processing Magazine, **35**(2), pp. 31-40.
10. N.J. Lindsey, **E.R. Martin**, S. Cole, D. Dreger, S. James, B. Freifeld, B. Biondi, J. Ajo-Franklin, 2017, *Fiber-Optic Network Observations of Earthquake Wavefields*, Geophysical Research Letters, **44**(23), pp. 11792-11799.
11. S. Dou, N. Lindsey, A. Wagner, T. Daley, B. Freifeld, M. Robertson, J. Peterson, C. Ulrich, **E.R. Martin**, J. Ajo-Franklin, 2017, *Distributed Acoustic Sensing for Seismic Monitoring of the Near Surface: A Traffic-Noise Interferometry Example*, Scientific Reports, 7, article 11620.
12. Y. Li, H. Yang, **E.R. Martin**, K.L. Ho, L. Ying, 2015, *Butterfly Factorization*, Multi-scale Model. Simul., 13, pp. 714-732.
13. D. Freeman, R. Hotovy, **E.R. Martin**, 2014, *Moving Finite Unit Norm Tight Frames for  $S^n$* , Illinois J. of Math, 58, pp. 311-322.

## Professional Periodicals

1. A. Titov, A. Girard, **E.R. Martin**, 2021, *Research Committee Update: Working with – and for – early-career researchers*, The Leading Edge, 40(6), pp. 464-464.
2. S. Jakkampudi, J. Shen, W. Li, A. Dev, T. Zhu, **E.R. Martin**, 2020, *Footstep Detection in Urban Seismic Data with a Convolutional Neural Network*, The Leading Edge, 39(9), pp. 654-660.
3. **E.R. Martin**, 2020, *Research Committee Update: Shining a Light on Cities with Seismic Data*, The Leading Edge, 39(6), pp. 437-437.
4. **E.R. Martin**, C. Castillo, S. Cole, S. Sawasdee, S. Yuan, R. Clapp, M. Karrenbach, B. Biondi, 2017, *Seismic Monitoring Leveraging Existing Telecomm Infrastructure at the Stanford Distributed Acoustic Sensing Array: Active, Passive and Ambient Noise Analysis*, The Leading Edge, 36(12), pp. 1025-1031.

## Book Chapters

1. **E.R. Martin**, N.J. Lindsey, B. Biondi, J.B. Ajo-Franklin, *Introduction to Interferometry of Fiber Optic Strain Measurements* accepted to AGU book on DAS. Preprint available at <https://eartharxiv.org/sx9zt/>.
2. B. Biondi, S. Yuan, **E.R. Martin**, F. Huot, R.G. Clapp, *Using telecommunication fiber infrastructure for earthquake monitoring and near-surface characterization*, accepted to upcoming AGU book on DAS.

## Conference Papers

1. E.R. Martin, J. Kump, S. Morgan, T. Zhu, *Analyzing Massive, Passive DAS Data in Wavelet-compressed Form*, 2021, SEG — AGU Advances in Distributed Sensing for Geophysics Workshop, online, 8-9 Feb.
2. F. Huot, **E.R. Martin**, Z. Spica, B. Biondi, *Distributed Acoustic Sensing (DAS) for large-scale urban monitoring and geologic hazard mitigation using preexisting telecommunication infrastructure*, 2019, SEG/EAGE Workshop on Geophysical Aspects of Smart Cities, Singapore, 10-12 Dec.
3. T. Zhu, **E.R. Martin**, J. Shen, *New Signals in Massive Data Acquired by Fiber Optic Seismic Monitoring Under Pennsylvania State University*, 2019, SEG/EAGE Workshop on Geophysical Aspects of Smart Cities, Singapore, 10-12 Dec., [preprint](#).
4. **E.R. Martin**, *Scalable Seismic Acquisition and Algorithms for Next-Generation Engineering Geophysics*, (invited) 2019, International Conference on Engineering Geophysics, Al Ain, United Arab Emirates, 9-12 Oct.
5. **E.R. Martin**, *A Scalable Algorithm for Cross-correlations of Compressed Ambient Seismic Noise*, 2019, 89th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: [10.1190/segam2019-3216637.1](https://doi.org/10.1190/segam2019-3216637.1)
6. **E.R. Martin**, B. Biondi, *Eighteen months of near-surface monitoring with ambient noise at the Stanford Fiber Optic Seismic Observatory*, 2018, 88th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: [10.1190/segam2018-2997853.1](https://doi.org/10.1190/segam2018-2997853.1)
7. F. Huot, **E.R. Martin**, B. Biondi, *Automated ambient-noise processing applied to fiber-optic seismic acquisitions (DAS)*, 2018, 88th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: [10.1190/segam2018-2997880.1](https://doi.org/10.1190/segam2018-2997880.1)
8. **E.R. Martin** and B.L. Biondi, *Ambient noise interferometry across two-dimensional DAS arrays*, 2017, 87th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: [10.1190/segam2017-17677759.1](https://doi.org/10.1190/segam2017-17677759.1)
9. B. Biondi, **E.R. Martin**, S. Cole, M. Karrenbach, N. Lindsey, *Earthquakes analysis using data recorded by the Stanford DAS array*, 2017, 87th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: [10.1190/segam2017-17745041.1](https://doi.org/10.1190/segam2017-17745041.1)
10. F. Huot, Y. Ma, R. Cieplik, **E.R. Martin**, B. Biondi, *Automatic noise exploration in urban areas*, 2017, 87th Ann. Internat. Mtg. SEG Expanded Abstracts (awarded best student poster paper). doi: [10.1190/segam2017-17774369.1](https://doi.org/10.1190/segam2017-17774369.1)
11. J.B. Ajo-Franklin, S. Dou, N. Lindsey, T. Daley, B. Freifeld, **E.R. Martin**, C. Ulrich, T. Wood, I. Eckblaw, A. Wagner, M. Robertson, *Timelapse surface wave monitoring of permafrost thaw using distributed acoustic sensing and a permanent automated seismic source*, 2017, 87th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: [10.1190/segam2017-17774027.1](https://doi.org/10.1190/segam2017-17774027.1)
12. **E.R. Martin**, B. Biondi, M. Karrenbach, S. Cole, *Ambient noise interferometry from DAS array in underground telecommunications conduits*, 2017, EAGE Annual Meeting Proceedings. doi: [10.1190/segam2017-17774027.1](https://doi.org/10.1190/segam2017-17774027.1)
13. **E.R. Martin**, B.L. Biondi, M. Karrenbach, S. Cole, *Continuous Subsurface Monitoring by Passive Seismic with Distributed Acoustic Sensors- The "Stanford Array" Experiment*, 2017, Extended Abstracts of the 1st EAGE Workshop on Practical Reservoir Monitoring. doi: [10.3997/2214-4609.201700017](https://doi.org/10.3997/2214-4609.201700017)
14. **E.R. Martin**, P. Wills, D. Hohl, J.L. Lopez, *Using machine learning to predict production at a Peace River thermal EOR site*, Proceedings of the 2017 SPE Reservoir Simulation Conference. SPE-192696-MS. doi: [10.2118/182696-MS](https://doi.org/10.2118/182696-MS)
15. **E.R. Martin**, N.J. Lindsey, S. Dou, J.B. Ajo-Franklin, A. Wagner, K. Bjella, T.M. Daley, B. Freifeld, M. Robertson, C. Ulrich, *Interferometry of a roadside DAS array*

in Fairbanks, AK, 2016, 86th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: [10.1190/segam2016-13963708.1](https://doi.org/10.1190/segam2016-13963708.1)

16. **E.R. Martin**, J. Ajo-Franklin, N. Lindsey, T.M. Daley, B. Freifeld, M. Robertson, C. Ulrich, S. Dou, A. Wagner, *Interferometry of ambient noise from a trenched distributed acoustic sensing array*, 2015, 85th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: [10.1190/segam2015-5902207.1](https://doi.org/10.1190/segam2015-5902207.1)
17. J. Ajo-Franklin, N. Lindsey, T.M. Daley, B. Freifeld, **E.R. Martin**, M. Robertson, C. Ulrich, A. Wagner, *A field test of distributed acoustic sensing for ambient noise recording*, Expanded Abstracts of the 2015 SEG Ann. Internat. Mtg. doi: [10.1190/segam2015-5926936.1](https://doi.org/10.1190/segam2015-5926936.1)

## Technical Reports

1. **E.R. Martin**, *Eighteen months of continuous near-surface monitoring with DAS data collected under Stanford University*, SEP 172, 2018.
2. F. Huot, **E.R. Martin**, B. Biondi, *Automated ambient noise processing applied to fiber optic seismic acquisition*, SEP 172, 2018.
3. **E.R. Martin**, B. Biondi, G. Fabient-Ouellet, R.G. Clapp, *Sensitivity analysis of distributed acoustic sensing arrays*, SEP 170, 2017.
4. **E.R. Martin**, B. Biondi, *Time-lapse changes in ambient noise interferometry and dispersion analysis at the Stanford DAS Array*, SEP 170, 2017.
5. R. Clapp, S. Farris, T. Dahlke, **E.R. Martin**, *C++11 non-linear solver*, SEP 170, 2017.
6. **E.R. Martin**, B. Biondi, S. Cole, M. Karrenbach, *Overview of the Stanford DAS Array-1 (SDASA-1)*, SEP 168, 2017.
7. B. Biondi, **E.R. Martin**, S. Cole, M. Karrenbach, *Earthquakes analysis using data recorded by the Stanford DAS Array*, SEP 168, 2017.
8. **E.R. Martin**, B. Biondi, *Ambient noise interferometry on two-dimensional DAS arrays*, SEP 168, 2017.
9. F. Huot, Y. Ma, R. Cieplik, **E.R. Martin**, B. Biondi, *Automatic noise exploration in urban areas*, SEP 168, 2017.
10. E. Williams, **E.R. Martin**, *Detection and removal of coherent anthropogenic noise from passive seismic data*, SEP 165, 2016.
11. **E.R. Martin**, N. Lindsey, S. Dou, J. Ajo-Franklin, A. Wagner, K. Bjella, T. Daley, B. Freifeld, M. Robertson, C. Ulrich, *Interferometry of a roadside DAS array in Fairbanks, AK*, SEP 163, 2016.
12. **E.R. Martin**, J. Ajo-Franklin, N. Lindsey, T. Daley, B. Freifeld, M. Robertson, C. Ulrich, S. Dou, A. Wagner, *Applying interferometry to ambient seismic noise recorded by a trenched distributed acoustic sensing array*, SEP 158, 2015.
13. **E.R. Martin**, *Compression for effective memory bandwidth use in forward modeling*, SEP 152, 2014.
14. **E.R. Martin**, R. Clapp, H. Le, C. Leader, D. Nichols, *SEPVector: a C++ inversion library*, SEP 152, 2014.
15. M. Denolle, S. de Ridder, J. Chang, **E.R. Martin**, T. Dahlke, H. Arevalo-Lopez, Sr., S. Levin, *Scholte-wave excitation*, SEP 150, 2013.



## Selected Talks

- (Upcoming) Compressing the computing requirements of fiber optic seismic monitoring,*  
GAGE/SAGE Virtual Workshop Aug. 2021
- Scalable algorithms for ambient noise seismology,* Caltech Seismo Lab Seminar  
remote, audience in Pasadena, CA, Apr. 2021
- Why we love arrays for data science,* Women in Data Science Worldwide Workshops  
remote, global audience, Mar. 2021
- The growth of fiber optic sensing in seismology,* IRIS Board of Directors Meeting  
remote, audience across US, Feb. 2021
- Overcoming Computational Hurdles in Large-scale Passive Seismology,* Colorado School  
of Mines Heiland Lecture remote, audience in Golden, CO, Feb. 2021
- Understanding sensitivity of distributed acoustic sensing integrated with velocity data,* AGU  
Fall Meeting session on Observation of Rotation, Strain and Translation in  
Seismology - Applications, Instrumentation and Theory (invited)  
remote, original location San Francisco, CA, Dec. 2020
- Scalable algorithms to pull signals from noise recorded by large sensor networks,*  
Scientific Computing and Numerics Seminar at Cornell University  
remote, audience in Ithaca, NY, Nov. 2020
- Passive Seismic Processing with Artificial Intelligence and Scalable Algorithms,* Applied  
Geophysics Research Seminar at ExxonMobil Upstream Research Company  
remote, audience in Spring, TX, Aug. 2020
- Scalable algorithms for signal processing and imaging with vibration data,* Mathematics  
and Computer Science Division at Argonne National Laboratory  
remote, audience in Lemont, IL, July 2020
- New Methods in Engineering Geophysics: Distributed Acoustic Sensing and Machine  
Learning,* US Geological Survey Earthquake Science Center Seminar  
remote, audience in Menlo Park, CA, July 2020
- Urban Seismology with Fiber Optics,* Institute of Geophysics seminar at University of  
Hamburg remote, audience in Hamburg, Germany, June 2020
- What changes when we use ambient noise recorded by fiber optics?,* EGU General Assembly  
session: Ambient noise seismology: Topics, targets, tools & techniques (invited)  
remote, original location Vienna, Austria, May 2020
- New Signals in Massive Data Acquired by Fiber Optic Seismic Monitoring Under  
Pennsylvania State University,* [SEG/EAGE Workshop on Geophysical Aspects  
of Smart Cities](#) Singapore, Dec. 2019
- High-throughput seismology: new sensors, new signals, new algorithms,* [Women in Data  
Science at Stanford Earth](#) (invited) Stanford, CA, Nov. 2019
- Scalable Seismic Acquisition and Algorithms for Next-Generation Engineering Geophysics,*  
International Conference on Engineering Geophysics (invited) Al Ain, UAE, Oct. 2019
- Seismology at Unprecedented Scale,* BiSEPPS Seminar at Harvard University  
Cambridge, MA, May 2019
- Fast Algorithms for Ultra-high-resolution Ambient Noise Interferometry,* Solid Earth  
Brownbag Seminar at Princeton University Princeton, NJ, May 2019
- An Introduction to Seismology with Distributed Acoustic Sensing* (tutorial talk)  
AGU Fall Meeting, [video of material on YouTube](#) Washington, DC, Dec. 2018
- Beyond cosine squared: understanding trends in passive DAS data,* SEG Annual Meeting  
Workshop on DAS Anaheim, CA, Oct. 2018
- Pushing for Continuous, Dense, Urban Seismic Monitoring at the Stanford Fiber Optic  
Seismic Observatory* (plenary talk) IRIS Workshop: Foundations, Frontiers and Future  
Facilities for Seismology Albuquerque, NM, Jun. 2018
- Scalable seismic monitoring with fiber optics beneath our feet,* Heiland Lecture at  
Colorado School of Mines Golden, CO, Jan. 2018
- Active and passive recording at the Stanford DAS Array,* SEG Annual Meeting Workshop:  
DAS, a vision of the future? Houston, TX, 2017
- DAS in existing telecommunications conduits on the Stanford campus,* SPE Workshop

on Distributed Fiber-Optic Sensing Denver, CO, 2017  
*Urban ambient noise: from dense nodes to DAS*, EAGE Annual Meeting: Workshop on  
linking active and passive seismics Paris, France, 2017  
*Repurposing our Telecommunications Infrastructure for Seismology*, Lawrence Livermore  
National Laboratory Seismology Seminar Livermore, CA, 2017  
*Dirt Cheap Surveys: near surface monitoring with ambient seismic noise collected by DAS*,  
EAGE Annual Meeting: workshop on reservoir monitoring with distributed fibre-optic  
sensing Vienna, Austria, 2016  
*Near-surface monitoring using DAS + ambient noise*, SEG Annual Meeting: distributed  
acoustic sensing workshop New Orleans, LA, 2015

## Research Advising

### Graduate Student Theses Supervised

Joseph Kump, Mathematics M.S. student VT, degree awarded May 2021  
Sarah Morgan, Mathematics M.S. student VT, Aug. 2020 - present  
Julius Grimm (coadvised), Applied Geophysics M.S. student  
Joint program: TU Delft, ETH Zurich, RWTH Aachen, Nov. 2020 - present

### Undergraduate Students Supervised

Samantha Paulus, CMDA and Nanoscience major VT, Spring 2021-present  
Firaol Woldemariam, CMDA major VT, Spring 2021-present  
Tony Artis, CMDA major VT, Spring 2020-present  
Anu Trivedi, Mathematics major VT, Fall 2019-May 2021  
Srikanth Jakkampudi, Mathematics and CMDA major VT, Fall 2019-Spring 2020  
Sarah Morgan, Mathematics major VT, Fall 2019-Spring 2020  
Tarun Nadipalli, CMDA major VT, Spring 2019  
Ethan Williams (coadvised, B. Biondi) Geophysics & Music major, Stanford, Summer 2016

### Graduate Thesis Committee Member

Joseph Mjehovich, M.S. student of G. Jin in Geophysics CSM, degree in progress  
Junzhu Shen, Ph.D. student of T. Zhu in Geosciences Penn State, degree in progress  
Nhat Nguyen, Ph.D. student of L. Massa in AOE VT, degree in progress  
Zachary Hileman, Ph.D. student of G. Pickrell in MSE VT, degree in progress  
Kaleigh Yost, Ph.D. student of R. Green in CEE VT, degree in progress  
Amin Baghbadorani, Ph.D. student of J. Hole in Geosciences VT, degree in progress  
ThaoVy Nguyen, M.S. student of R. Hewett in Math VT, degree awarded May 2021  
Taewon Cho, Ph.D. student of J. Chung in Mathematics VT, degree awarded May 2021

## Teaching

**Instructor**, BEPUR: Broadening Engagement and Participation in Undergraduate  
Research (VT, MATH 2984) Fall 2021  
**Instructor**, BEPUR: Broadening Engagement and Participation in Undergraduate  
Research (VT, MATH 2984) Spring 2021  
**Instructor**, CS Foundations for CMDA (VT, CMDA 3634) 2 sections, Fall 2020  
**Instructor**, CS Foundations for CMDA (VT, CMDA 3634) Spring 2020  
**Instructor**, [Extreme-Scale Inverse Problems](#) (VT, MATH 5984) Fall 2019  
**Instructor**, Integrated Quantitative Science I (VT, CMDA 2005) Fall 2019  
**Project Mentor**, Capstone Project (VT, CMDA 4864) Fall 2019  
Senior team project on removing footstep signals from urban seismic data  
**Instructor**, CS Foundations for CMDA (VT, CMDA 3634) Spring 2019  
**Instructor**, Integrated Quantitative Science I (VT, CMDA 2005) Fall 2018  
**ICME Teaching Fellow** 2016-2018, status to recognize student teaching experience  
**Course assistant**, Intro. to Scientific Computing (Stanford, CME 108) Winter 2016  
**Project Mentor**, Projects in App. & Comp. Math (Stanford, CME 181) Spring 2015  
Undergrad project on statistical analysis of bicycle sharing network data



	<b>Instructor</b> , Introduction to Scientific Python (Stanford, CME 193)	Winter 2015
	<b>Instructor</b> , Short course on Python at SIAM Conference on Geosciences,	June 2015
	<b>Project Mentor</b> , Projects in App. & Comp. Math (Stanford, CME 181)	Winter 2014
	Undergrad project on tsunami modeling using Hawaiian bathymetry	
	<b>STEM Tutor</b> , Longhorn Center for Academic Excellence	Aug. 2011-May 2012
	UT-Austin Division of Diversity and Community Engagement	
	Tutored students in introductory math, statistics, physics, and chemistry courses	
	Documented tutoring and workshops for grant application materials	
<b>Professional Service, Outreach</b>	<b>Associate editor</b> , <i>Computers &amp; Geosciences</i>	Nov. 2018-present
	<b>Guest Editor</b> , IEEE CiSE: DOE Computational Science Graduate Fellowship Research Showcase	Jun. 2021-present
	<b>Member</b> , SEG JEDI Committee	Apr. 2021-present
	<b>Committee member</b> , SEG Research Committee	Oct. 2018-present
	<b>Member</b> , Virginia Tech Math Department Colloquium Committee	Aug. 2020 - present
	<b>Advisor</b> , Undergraduate Mathematics Majors, Traditional Option	Aug. 2020 - present
	<b>Member</b> , CMDA Computing Curriculum Committee	Aug. 2018 - present
	<b>Steering Committee Member</b> , NSF DAS Research Coordination Network	
	Co-leader of Machine Learning Working Group	Feb. 2020-present
	Co-leader of RCN-affiliated virtual workshop	
	<b>Co-organizer</b> , <a href="#">Speakers and Undergraduate Research Engagement</a>	Feb. 2019 - present
	Program to guide female undergrad math students through first research projects, and bring diverse women mathematicians for research talks and career path discussions	
	<b>Reviewer</b> : <i>Seismological Research Letters</i> , <i>American Geophysical Union Books</i> , <i>Geophysical Journal International</i> , <i>Geophysics</i> , <i>Computers &amp; Geosciences</i> , <i>Marine Geophysical Research</i> , <i>Journal of Computational Science</i> , <i>Journal of Environmental and Engineering Geophysics</i> , <i>Interpretation</i> , <i>PASC Conference</i> , <i>Geophysical Research Letters</i> , <i>Bulletin of the Seismological Society of America</i> , <i>SEG Annual Meeting Technical Program</i> , <i>The Leading Edge</i>	
	<b>Instructor</b> , Remote Online Sessions for Emerging Seismologists (ROSES) lesson on Distributed Acoustic Sensing	July 2021
	<b>Co-convenor</b> , AGU Fall Meeting session “Observing Wave Field Gradients in Seismology-Applications, Instrumentation and Theory”	to occur Dec. 2021
	<b>Co-organizer</b> , SEG Post-convention workshop “Distributed Fiber-Optic Sensing in Applied Geophysics”	Oct. 2021
	<b>Panelist</b> , AGU EPSP Connects: Surface processes applications of environmental seismology and distributed acoustic sensing (DAS) Q&A	May 2021
	<b>Member</b> , SEG Equity in Process Task Force	Aug. 2020-Apr. 2021
	<b>Faculty sponsor/organizer</b> , 3rd Women in Data Science Blacksburg at Virginia Tech conference	April 2021
	<b>Panelist</b> , Virginia Tech Assoc. for Women in Computing research panel	Mar. 2021
	<b>Member</b> , DOE CSGF Screening Committee	2020, 2021
	<b>Session Co-Chair</b> , AGU Fall Meeting session on Data Science and Machine Learning for Natural Hazard Sciences	Dec. 2020
	<b>Panelist</b> , discussion on women in geosciences for Diversity and Inclusion in Geoscience course at University of Wyoming	Oct. 2020
	<b>Co-Organizer</b> , SEG Annual International Meeting Post-convention Workshop on DAS: Advances in Fiber Optic Sensing Over the Last Decade	Oct. 2020
	<b>Speaker</b> , UT-Austin Dean’s Scholars Honors Program Friday Lunch Talk	Sep. 2020
	<b>Co-Lead</b> , DAS Virtual Workshop and Tutorial	Aug. 2020
	Three-afternoon <a href="#">virtual workshop and tutorial</a> supported by DAS RCN and IRIS; 8 speaker presentations with extensive discussion, and 150-250 participants/day; Developed new Jupyter notebooks for hands-on coding with public DAS data; Managed Slack channel for participants to network/discuss with 10 Workshop Guides.	

**Member**, Virginia Tech Math Dept. Technology Committee Aug. 2018 - Aug. 2020  
**Judge**, Virginia Tech Socially Determined COVID-19 Social Data Project Apr. 2020  
**Faculty sponsor/organizer**, 2nd Women in Data Science Apr. 2020  
 Blacksburg at Virginia Tech [conference](#) (converted to online event with 3 speakers)  
**Panelist**, Virginia Tech Assoc. for Women in Mathematics internship panel Feb. 2020  
**Session co-chair**, SEG/EAGE Workshop on Geophysical Aspects of Smart Cities,  
 session on Fiber-based Distributed Acoustic Sensing Dec. 2019  
**Co-Organizer**, SEG Annual International Meeting Post-convention Workshop on  
 Real-time Processing for Large-Scale Streaming Seismic Data, [agenda](#) Sep. 2019  
**Chair**, Session on ‘Distributed Acoustic Sensing: VSP, Modeling and Imaging Approaches’  
 at SEG Annual International Meeting Sep. 2019  
**Mentor**, DOE CSGF [High Performance Computing Workshop](#) Jul. 2019  
**Panelist**, [Early Career Panel](#), DOE CSGF Annual Program Review Jul. 2019  
**Mentor**, Student mentoring program run by Virginia Tech Sep. 2018 - May 2019  
 chapter of American Women in Mathematics  
**Co-Organizer**, Session on ‘Photonic and Noninertial Seismology’ at Seismological  
 Society of America Annual Meeting Apr. 2019  
**Speaker**, Virginia Tech Undergraduate Math Club Apr. 2019  
**Volunteer**, ASA DataFest at Virginia Tech Apr. 2019  
**Faculty sponsor/organizer**, [1st Women in Data Science conference at VT](#) Feb. 2019  
**Organizer**, Session on ‘Computational Advances for Large-Scale Geophysical Data’  
 at SIAM CS&E Feb. 2019  
**Judge**, CMDA Fall Data Competition at Virginia Tech Nov. 2018  
**Panelist**, UT-Austin Association for Women in Mathematics career panel Nov. 2018  
**Speaker**, UT-Austin Undergraduate Math Club Nov. 2018  
**Special section associate editor**, *Interpretation* 2018  
 Special issue on ‘Distributed Acoustic Sensing and its Oil Field Potential’  
**Mentor**, ICME first-year mentoring program Sep. 2017-Jun. 2018  
**Co-organizer**, Stanford Computational Geosciences Seminar Jan.-Mar. 2018  
 Brought in 9 speakers from outside Stanford, organized 1 hr. course EARTH 310  
**Co-chair**, Session on ‘Earth Model Building Strategies and Inputs’ at SEG Annual  
 International Meeting Sep. 2017  
**Co-organizer**, SEG Data Analytics Post-Convention Workshop Sep. 2017  
 Invited early-career speakers and moderated panel on data science education  
**Student panel** Stanford Aeronautics & Astronautics faculty search Spring 2017  
**Mentor**, Stanford Women in Math Mentoring Oct. 2016-Jun. 2017  
**President**, Stanford SEG student chapter 2014-2015

## Skills

Preferred programming languages: C/C++ and Python  
 HPC tools: MPI, openMP, CUDA, TBB  
 Profiling tools: Tau, HPM, NVCC, Vampir  
 Scientific tools: MATLAB, Mathematica, COMSOL, IDL  
 Environment and development tools: Docker, Singularity, Doxygen, Git, Jupyter  
 Notebooks, Google Cloud Compute Engine, Amazon Web Services

## Industry Experience

**High Performance Computing Internship** Summer 2016  
*Schlumberger, Menlo Park, CA*  
 Mentored by A. Lichniewsky and R.G. Clapp, and supervised by C. Boneti  
 Benchmarked, co-developed, and tested compression scheme for HPC applications  
  
**Areal Monitoring Internship** Summer 2015  
*Shell Projects & Technology, Houston, TX*  
 Mentored by J. Lopez and supervised by P. Wills

Applied machine learning techniques to analyze data and predict production at  
steam-driven bitumen field in Peace River  
Regularly consulted with reservoir engineer to develop useful products

**DOE CSGF Practicum in Weapons & Complex Integration** Summer 2014  
*Lawrence Livermore National Laboratory, Livermore, CA*

Supervised by S. Langer

Improved memory performance of pf3D laser-plasma code by combining physics operators  
Evaluated hardware compression needs

**Computational Physics Internship** 2010-2011  
*Nanohmics, Inc. Austin, TX*

Project funded through U.S. Department of Defense, PI B. Zollars

Implemented unstructured adaptive mesh methods for finite element code to model  
liquid erosion of coated lenses