ETTORE BIONDI

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Stanford University
Geophysics Department
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DEPARTMENTAL AND INSTITUTIONAL AFFILIATION

Assistant Professor (Tenure-Track), Department of Geophysics, Stanford University

DISCIPLINARY FIELDS

Geophysics; Seismology; Distributed Fiber-Optic Sensing (DAS); Computational Imaging; Inverse Problems; Photonic Instrumentation; Earth-System Monitoring and Hazard Warning

EDUCATIONAL BACKGROUND

PhD	**Stanford University**, *Geophysics*	Jan. 2021
Diploma	**Scuola Normale Superiore of Pisa**, *Chemistry*	Nov. 2013
MSc	**University of Pisa**, *Geophysics*	Dec. 2012
BS	**University of Genoa**, *Geology*	Jul. 2010

PROFESSIONAL POSITIONS HELD

Stanford University, Department of Geophysics 2025-present
Tenure-Track Assistant Professor of Geophysics

California Institute of Technology, Seismological Laboratory 2023-2025
Research Scientist at Southern California Seismic Network

California Institute of Technology, Seismological Laboratory 2021-2023
Postdoctoral researcher

Stanford University, Department of Geophysics 2014-2021
Graduate Researcher

Industry Research Internships Summers
Schlumberger (2019); Chevron (2018-2017); Shell (2016)

University of Milan, Department of Earth Sciences 2013-2014
Geophysics Researcher

HONORS AND AWARDS

Outstanding Reviewer, Geophysical Journal International 2025
Oxford University Press

EAGE and SPE's "Gustavo Sclocchi" Theses Awards – First Prize 2022
European Association of Geoscientists and Engineers

Top 25 presentation at the IMAGE 2021 Annual Meeting 2022
Society of Exploration Geophysicists

Best Student Paper Award 2019
Society of Exploration Geophysicists

Centennial Teaching Assistant Award 2019
Stanford University

EAGE and SPE's "Gustavo Sclocchi" Theses Awards 2013
European Association of Geoscientists and Engineers

SELECTED PUBLICATIONS

Journal Publications

- Maass R., Bean C., Gudnason E., Agustsdottir T., Mortensen A., Wolf J., Schwarz B., **Biondi E.** Geometry and thickness of the accidentally drilled Krafla magma body. Under review in Nature
- **E. Biondi**, Tepp, G., Yu, E., Saunders, J. K., Yartsev, V., Black, M., Husker, A. L. (2026). Real-time processing of distributed acoustic sensing data for earthquake monitoring operations. Seismological Research Letters. 2026) 97 (5): 3304–3316. https://doi.org/10.1785/0220250208
- Tepp, G., Artiaga, N., & **E. Biondi** (2026). Evaluation of distributed acoustic sensing phase pick quality and performance for operational earthquake monitoring. Seismological Research Letters. (2026) 97 (5): 3289–3303. https://doi.org/10.1785/0220250354
- McGuire, J.J., Barbour, A.J., Spica, Z.J., Rodríguez Tribaldos, V., Zhan, Z., Lipovsky, B.P., Mellors, R.J., **Biondi, E.**, Yoon, C., Karrenbach, M., Ringler, A.T., Atterholt, J., Nayak, A., Sawi, T., Viens, L., Martin, E.R., Husker, A.L., Bodin, P., Moschetti, M.P., Shi, Q., Miller, N.C. and Puri, P., 2025. Fiber-Optic Sensing for Earthquake Hazards Research, Monitoring, and Early Warning. Seismological Research Letters. https://doi.org/10.1785/0220250067
- Li, J., **E. Biondi**, Heimisson, E. R., Puel, S., Zhai, Q., Zhang, S., Zhan, Z. (2025). Minute-scale dynamics of recurrent dike intrusions in Iceland with fiber-optic geodesy. Science, 388(6752), 1189-1193.
- E. Bird, J. Atterholt, J. Li, **E. Biondi**, Q. Zhai, L. Li, Y. Yang, J. Fang, X. Wei, V. Hjörleifsdóttir, A. Klesh (2025) Constraining dike opening models with seismic velocity changes associated with the 2023–2024 eruption sequence on the Reykjanes Peninsula. AGU Advances, 6(1), p.e2024AV001516.
- Z. Shen, Y. Yang, X. Fu, K. H. Adams, **E. Biondi**, Z. Zhan (2024) Fiber-optic seismic sensing of vadose zone soil moisture dynamics. Nature Communications, 15(1), p.6432.
- Y. Yang, Z. Zhan, M. Karrenbach, A. Reid-McLaughlin**, E. Biondi**, D. A. Wiens, R. C. Aster (2024) Characterizing South Pole firn structure with fiber optic Sensing. Geophysical Research Letters, 51(13), p.e2024GL109183.
- Q. Zhai, A. Husker, Z. Zhan, **E. Biondi**, J. Yin, F. Civilini, L. Costa (2024) Assessing the feasibility of Distributed Acoustic Sensing (DAS) for moonquake detection, Earth and Planetary Science Letters, 635, p.118695.

- **E. Biondi**, J. C. Castellanos, and R. W. Clayton (2024) Imaging hidden faults using noise cross-correlations from the Seal Beach dense array: Seismological Research Letters https://doi.org/10.1785/0220230408
- W. Zhu, **E. Biondi**, J. Li, J. Yin, Z. E. Ross, and Z. Zhan (2023) Seismic Arrival-time Picking on Distributed Acoustic Sensing Data using Semi-supervised Learning: Nature Communications, 14(1), p.8192.
- **E. Biondi**, W. Zhu, J. Li, E. F. Williams, and Z. Zhan (2023) An upper-crust lid over the Long Valley magma chamber: Science Advances, 9 (42).
- J. Li, W. Zhu, **E. Biondi**, and Z. Zhan (2023) Earthquake focal mechanisms with distributed acoustic sensing: Nature Communications, 14, no. 1; https://doi.org/10.1038/s41467-023-39639-3
- J. Li, T. Kim, N. Lapusta, **E. Biondi**, and Z. Zhan (2023) The break of rupture asperities resolved by distributed acoustic sensing: Nature, 620; https://doi.org/10.1038/s41586-023-06227-w
- J. Yin, W. Zhu, J. Li, **E. Biondi**, Y. Miao, Z. Spica, L. Viens, M. Shinohara, S. Ide, K. Mochizuki, A. Husker, Z. Zhan (2023) Earthquake magnitude with DAS: a transferable data-based scaling relation: Geophysical Research Letters, 50(10), p.e2023GL103045; https://doi.org/10.1029/2023GL103045
- J. Fang, Y. Yang, Z. Shen, **E. Biondi**, X. Wang, E. F. Williams, M. W. Becker, D. Eslamian, and Z. Zhan (2023) Directional Sensitivity of DAS and Its Effect on Rayleigh Wave Tomography: A Case Study in Oxnard, California: Seismological Research Letters; doi: https://doi.org/10.1785/0220220235
- **E. Biondi**, E. F. Williams, X. Wang, and Z. Zhan (2023) Geolocalization of large-scale DAS channels using a GPS-tracked moving vehicle: Seismological Research Letters https://doi.org/10.1785/0220220169
- **E. Biondi**, M. A. Meadows and, B. Biondi (2021) True-amplitude migration through extended linearized waveform inversion: Geophysics 87, no. 1: 1-138.
- **E. Biondi**, G. Barnier, R. G. Clapp, F. Picetti, S. Farris (2021) An object-oriented optimization framework for large-scale inverse problems: Computers & Geosciences, 154, 104790.
- Lellouch, **E. Biondi**, B. Biondi, B. Luo, G. Jin, and M. A. Meadows (2021) Properties of a deep seismic waveguide measured with an optical fiber: Physical Review Research, 3(1), p.013164.

Conference Papers

- **E. Biondi**, Li, J., Bird, E. and Zhan, Z. (2025) Subsurface monitoring and imaging based on DAS. In 2025 Optical Fiber Communications Conference and Exhibition (OFC) (pp. 1-3). IEEE.
- **E. Biondi**, G. Barnier, B. Biondi, and R. Clapp (2021) Target-oriented elastic full-waveform inversion: Deep-water ocean-bottom-node field-data application: 2021 International Meeting for Applied Geoscience & Energy, Expanded Abstracts
- **E. Biondi**, and G. Barnier (2020) Elastic-parameter estimation by combining full-waveform inversion by model extension and target-oriented elastic inversion: 89th Annual International Meeting, SEG, Expanded Abstracts
- **E. Biondi**, M. A. Meadows and, B. Biondi (2019) Amplitude preserving migration through extended acoustic least-squares RTM: 88th Annual International Meeting, SEG, Expanded Abstracts

- **E. Biondi**, B. Biondi, and G. Barnier (2018) Target-oriented elastic full-waveform inversion through extended-migration redatuming: 87th Annual International Meeting, SEG, Expanded Abstracts

Patents

- **E. Biondi**, W. Zhu, J. Li, Z. Zhan, Fiber Fiber-seismic tomography: high-resolution subsurface imaging using the telecommunication infrastructure (US Patent App. 18/752,231)
- J. Li, W. Zhu, **E. Biondi**, Z. Zhan, Inverting earthquake focal mechanisms with distributed acoustic sensing (US Patent App. 18/770,303)

INVITED TALKS

- Invited Speaker at the 20th Stanford Annual Position Navigation and Time Symposium (Nov. 2026)
- "Distributed acoustic sensing for high-resolution subsurface imaging and earthquake monitoring" at Japan Geoscience Union (JpGU) 2026 and American Rock Mechanics Association (ARMA) 2026 meetings
- "Real-time distributed acoustic sensing for earthquake monitoring and early warning". Invited presentation, AGU Fall Meeting 2025, Session S14B-01, New Orleans, LA, December 2025
- "Leveraging conventional and DAS seismic networks through novel processing paradigms", AGU Fall Meeting 2025, Session NH33B-03, New Orleans, LA, December 2025
- "Distributed acoustic sensing for high-resolution subsurface imaging and real-time earthquake monitoring", invited at the UC Berkeley Seismological Laboratory Seminar (Berkeley, CA, September 2025), Michigan University Smith Lecture (Ann Arbor, MI, October 2025), Virginia Tech Dept. of Geosciences (Blacksburg, VA, November 2025), Colorado School of Mines Heiland Lecture (Golden, CO, November 2025)
- Invited speaker at the 2025 Optical Fiber Communications Conference and Exhibition (OFC) in the fiber sensing session.
- "An upper-crust lid over the Long Valley magma chamber revealed by fiber tomography", invited speaker at the USGS Volcano Science Center and Earthquake Science Center for their seminar series (Pasadena, CA, June 2024)
- Invited speaker at the 2024 EGU meeting at the session "Seismic Imaging of Volcanic Systems" (Vienna, Austria, April 2024)
- Invited speaker at the 2024 EGU meeting at the session "Innovative Approaches to Seismic Data Acquisition, Processing and Interpretation" (Vienna, Austria, April 2024)
- "Fiber seismic tomography for volcano and basin imaging", invited speaker at the 2023 AGU Fall meeting at the session "Innovations and Applications in Fiber-Optic Sensing" (San Francisco, CA, December 2023)
- "Second boiling of the Long Valley Caldera resolved by fiber-seismic tomography", invited speaker at the UC Santa Cruz Institute for Geophysics and Planetary Physics (IGPP) Seminar Series (Santa Cruz, CA, May 2023)
- "Fiber seismic tomography of the Long Valley Caldera", invited speaker at the 2022 AGU Fall meeting at the session "Volcano Seismology and Acoustics: Recent Advances in Understanding Volcanic Processes" (Chicago, IL, December 2022)

- “Challenges, opportunities, and discoveries of large-scale distributed acoustic sensing arrays”, keynote speaker at the 2022 SCEC meeting at the “Session 7: Computational Earthquake Science” (Palm Springs, CA, September 2022)
- “Tap test: mapping large-scale DAS array channels using moving vehicles”, invited speaker at the GAGE/SAGE 2021 community science workshop on “Distributed Acoustic Sensing: Scientific Frontiers and Community Needs” (Virtual; August 2021)
- “Extended imaging for robust velocity-model building and elastic target-oriented full-waveform inversion”, invited speaker at the Department of Earth Sciences within ETH (Zurich, Switzerland; Jan 2020)

PROFESSIONAL SERVICE

Editorial and Review Leadership:

- Associate Editor, Geophysics (SEG) (2023–present)
- Editorial Board Member, Journal of Seismology (Springer) (2026–present)
- Ad hoc reviewer for leading journals, including:
  Science, Science Advances, Nature Communications, Nature Communications Earth & Environment, Geophysical Journal International, Geophysics, Seismological Research Letters, Journal of Geophysical Research: Solid Earth, Transactions on Geoscience and Remote Sensing, Computers & Geosciences, Journal of Glaciology, Permafrost and Periglacial Processes, and Mathematical Geoscience.
- Panel reviewer for:
  National Science Foundation (CAREER and Geophysics programs), NASA (DALI and MDAP panels), Swiss National Science Foundation, Israel Science Foundation, Helmholtz Investigator Groups, and Breakthrough Energy.

Conference and Workshop Leadership:

- Convener, Solid Earth Session: “Optical Seismology and the Next Era in Seismic Sensing”, SSA Topical Meeting (2026)
- Organizer, DAS 101 Workshop, Seismological Society of America Annual Meeting (2026); Italian Institute of Geophysics and Volcanology (2026); Universidad de Concepcion, Chile (2026)
- Convener, “Understanding Earth Systems with Fiber-Optic Cables,” SSA Annual Meeting (2023)
- Co-organizer, “Fiber Sensing Using Deployed Telecom Networks,” IEEE Photonics Society Summer Topical Meetings (2023, 2024)
- Co-organizer, Optica Incubator on Next-Generation Fiber Sensing: Exploiting Telecom Infrastructure, Optica Headquarters (2025)

Scientific Committees and Advisory Roles:

- Member, USGS Distributed Acoustic Sensing Technical Committee (Powell Center) (2023–2024)
- Member, SEG Research Council (2021–present)
- Session Chair, AGU Fall Meeting (2022, 2024, 2025)
- Session Chair, SSA Annual Meeting (2024, 2025)

MENTORING AND RESEARCH SUPERVISION

Total supervised trainees: 10 Ph.D. students, 1 postdoctoral scholar, 3 undergraduate researchers, and 2 high-school intern across Stanford and Caltech.

Stanford Wave Sensing Lab – Stanford University (Group Leader):

Regina Maass — Postdoctoral Scholar (2026–present)
Rileigh Mansfield — Ph.D. Student (2026-present)
Congyi Wang — Ph.D. Student (2026-present)
Alina Belyalova — Ph.D. Student (2025–present)
Lingbo Duan — Co-advised Master's Student Electrical Engineering (2026-present)
Ivan Deiana — Ph.D. Candidate: secondary project (2025-present)
Natalia Berrios-Rivera — Ph.D. Candidate: secondary project (2025-present)
Lela Rose Hanson — Undergraduate researcher (2025-present)
Ruby Zhang — High-school intern (2025-present)

Senior mentor – California Institute of Technology:

Elijah Bird — PhD candidate (2022-present)
Nytica Artiaga — State-wide California Earthquake Center intern (2024)
Auden Reid-McLaughlin — Ph.D. student (2023-2025)
Armeet Jatyani — Summer Undergraduate Research Fellowships (2023)
Irenka Ni — High-school summer intern (2023)
Jiaqi Fang — PhD student (2021-2023)
Yan Yang — PhD student (2021-2023)

TEACHING EXPERIENCE

Stanford University:

- Computational Earth System Analysis — Instructor of Record (Spring 2026)
- Advanced Ultrasound Imaging — Guest Lecturer, Department of Radiology (2021)

California Institute of Technology:

- Earthquake Fellows Program — Guest Lecturer (Spring 2021)
- Advanced Seismology — Guest Lecturer, Seismological Laboratory (Spring 2021)

Community and Professional Training

- GAGE/SAGE Community Science Workshop — Short-course Lecturer (2023)