Yinchu Li

PhD Candidate · Marine Geophysics

School of Earth and Atmospheric Sciences, Georgia Institute of Technology Atlanta, GA, 30318, USA

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Research Interests

Controlled-source electromagnetic imaging, Magnetotellurics methods, Geophysical inverse problem, Marine Geophysics, Fluid-tectonic interactions at plate margins, Deep learning for geosciences

Education

Georgia Institute of Technology *Atlanta, GA, USA*

PhD in Geophysics, GPA: 4.0/4.0 *Aug. 2021 -*

- Advisor: Dr. Samer Naif

Southern University of Science and Technology *Shenzhen, China*

MSc in Mechanics (Geophysics), GPA: 3.76/4.0 *Sept. 2018 - June 2020*

- Thesis: Deep learning-based electrical imaging monitoring of shale gas fracturing using steel well casings as long electrodes
- Advisor: Dr. Dikun Yang

China University of Petroleum (East China) *Qingdao, China*

BEng in Applied Geophysics, GPA: 3.72/4.0 *Sept. 2014 - June 2018*

- Thesis: Estimation of 2-D site amplification effects: the case of the historical centre of Napoli
- Advisor: Dr. Concettina Nunziata (University of Naples Federico II)

Research Experience

Georgia Institute of Technology *Atlanta, GA, USA*

Graduate Research Assistant *Spring 2022 - Spring 2024*

- Controlled-source electromagnetic (CSEM) and Magnetotellurics (MT) data collected by the NSF funded marine EM survey: *ElectroMagnetic Alaskan GeoPRISMS Experiment* (EMAGE)
- CSEM data processing and navigation.
- Inversion of the CSEM and MT data at the Alaska Subduction Zone jointly and individually.
- Comprehensive interpretation of inversion results from the Shumagin Gap and Semidi segments, Alaska-Aleutian subduction zone.

Southern University of Science and Technology *Shenzhen, China*

Graduate Research Assistant *Aug. 2020 - June 2021*

- Long-electrode electrical monitoring of shale gas fracturing and well casing integrity using surface electrical data and deep learning approaches. The work is a part of the National Natural Science Foundation of China funded research: *High Resolution Imaging Monitoring of Shale Gas Fracturing Fluid using Long Electrode Electromagnetic Method*.

University of Naples Federico II *Napoli, Italy*

Visiting Undergraduate Student *Jan. 2018 - July 2018*

- Study Abroad Scholarships
- Finished Bachelor thesis focusing on 2D site amplification effects modeling of the historical centre of Napoli under the supervision of Dr. Concettina Nunziata.

Honors & Awards

2025 **2025 School of Earth and Atmospheric Sciences Departmental Travel Fund**
2025 **2025 NSF GAGE/SAGE Community Science Workshop Travel Scholarship**
2024 **26th EM Induction Workshop Financial Support**, 26th EM Induction Workshop
2021 **Best Presentation**, The 15th China International Geo-electromagnetism Workshop
2020 **Best Student Presentation**, 2nd SEG Borehole Geophysics Workshop
2020 **SEG Travel Grant (virtual registration grant)**, SEG International Exposition and 90th Annual Meeting
2019 **Outstanding Student Paper**, Annual Meeting of Chinese Geoscience Union
2019 **SEG Travel Grant (Qualified before VISA)**, SEG International Exposition and 89th Annual Meeting
2018 **Outstanding graduate**, China University of Petroleum (East China)

Field Experience

Near Trench Community Geodetic Experiment
Alaska-Aleutian Trench

Graduate Student
June/July 2024

- Participation in 13-days seafloor geodetic instruments deployment at sea aboard the R/V Sikuliaq under *Near-Trench Community Geodetic Experiment*.
- Deployed multiple GNSS-Acoustic benchmarks and transponders for measuring deformation and coupling along the Alaska-Aleutian megathrust. Two wavegliders were deployed for GNSS-A surveys and conductivity, temperature, and depth (CTD) data was collected for a sound speed profile.
- PIs on board: Dr. Andrew Newman, Georgia Institute of Technology, Dr. Spahr Webb, Lamont-Doherty Earth Observatory and Dr. Surui Xie, University of Houston.

Kivu Project
Western Rwanda

Graduate Student
May/June 2023

- Participation in 22-days land Magnetotellurics field work under an NSF funded collaborative research: *Constraining transient magma intrusion processes in the Nyiragongo-Kivu continental rift zone*.
- PIs: Dr. Andrew Newman and Dr. Samer Naif, Georgia Institute of Technology.

Seismology field work
Summerville, SC, USA

Graduate Student
May 2023

- Participation in 4-days nodal seismic deployment for understanding seismicity distribution within the South Eastern United States.
- PI: Dr. Zhigang Peng, Georgia Institute of Technology.

Oceanographic field study
Savannah, GA, USA

Graduate Student
May 2023

- Participation in Ocean Science and Engineering (OSE) retreat and collaborative communication with the Skidaway Institute of Oceanography (SkIO), University of Georgia.
- One day on board the R/V Savannah to learn the basic practical knowledge of oceanography.

Seismology class field trip
Columbia, SC, USA

Graduate Student
Oct. 2022

- Participation in 4-days nodal seismic deployment near the town of Elgin to study the tremors
- EAS 6314/4314 Seismology (Fall Semester 2022) given by Dr.Zhigang Peng, Georgia Institute of Technology.

Marine electromagnetic survey HT-RESIST *Hikurangi Trench*

Graduate Student *Feb. 2019*

- Participation in 2nd cruise of the *Hikurangi Trench Regional Electromagnetic Survey to Image the Subduction Thrust* (HT-RESIST) aboard R/V Roger Revelle.
- Ocean bottom electromagnetic stations recovery.
- PIs: Dr. Samer Naif and Dr. Kerry Key, Columbia University, Lamont-Doherty Earth Observatory.

Long-electrode electrical monitoring of shale gas fracturing *Weiyuan, China*

Graduate Student *May/June 2021*

- Software development and test for the long-electrode electrical monitoring method.
- Real-time hydraulic fracturing electrical monitoring data collection, collaborating with BGP.

Long-electrode electrical method validation experiment *Huaibei, China*

Graduate Student *Apr. 2021*

- 3-days field work for collecting long-electrode electrical data with collaborators from China University of Mining and Technology.

Field work *Eastern Tibetan Plateau, China*

Graduate Student *Spet. 2020*

- Participation in scouting part of the MT field work: India-Asia collision process through a study of Gongga Shan.

Field trip *Xinwen, China*

Undergraduate Student *June 2015*

- 12 days field trip for undergraduate course: Fundamentals of Geology.

Publications

- **Li**, Y., S. Naif, K. Key, S. Constable, R. L. Evans, D. J. Shillington, A. Becel, and D. Cordell (submitted). "Insufficient fluids to explain weak plate coupling along the shallow megathrust at the Shumagin Gap".
- Hu, Y., D. Yang, Y. **Li**, Z. Wang, and Y. Lu (2022). "3-D Numerical Study on Controlled Source Electromagnetic Monitoring of Hydraulic Fracturing Fluid With the Effect of Steel-Cased Wells". *IEEE Transactions on Geoscience and Remote Sensing*, 60, pp. 1–10. DOI: 10.1109/TGRS.2021.3100774.
- **Li**, Y. and D. Yang (2021). "Electrical imaging of hydraulic fracturing fluid using steel-cased wells and a deep-learning method". *Geophysics*, 86, 4, E315–E332. DOI: 10.1190/geo2020-0178.1.

Conference Abstracts

- **Li**, Y., S. Naif, D. Cordell, K. Key, R. L. Evans, S. Constable, D. J. Shillington, and A. Becel (2024). "Megathrust heterogeneity revealed by Electromagnetic Data at the Aleutian-Alaska Subduction Zone". *The 26th EM Induction Workshop 2024*.
- **Li**, Y., S. Naif, D. Cordell, K. Key, R. L. Evans, S. Constable, D. J. Shillington, and A. Becel (2023). "Electromagnetic Study of Fluid Distribution at the Aleutian-Alaska Subduction Zone". AGU23.
- Wang, Z., Y. Lu, Y. Hu, Y. **Li**, K. Wang, and D. Yang (2022). "3D real-time imaging for electromagnetic fracturing monitoring based on deep learning". *Second International Meeting for Applied Geoscience & Energy*, pp. 702–706. DOI: 10.1190/image2022-3737841.1.

- Naif, S., Y. **Li**, K. Key, R. Evans, S. Constable, and D. Cordell (2021). "Preliminary results from the Electromagnetic Alaskan GeoPRISMS Experiment (E-MAGE)". *AGU Fall Meeting Abstracts*. Vol. 2021, GP25A–0402.
- **Li**, Y. and D. Yang (2020a). "Imaging of steel casing's conductivity using surface electrical data and a deep learning approach". *SEG Technical Program Expanded Abstracts 2020*, pp. 636–640. DOI: 10.1190/segam2020-3426575.1.
- **Li**, Y. and D. Yang (2020b). "Monitoring the integrity of steel well casings using electrical data on the surface". *SEG 2020 Workshop: 2nd SEG Borehole Geophysics Workshop*, pp. 152–156. DOI: 10.1190/bhgp2020-41.1.
- **Li**, Y. and D. Yang (2019). "Fast electrical imaging of injected fluid in hydraulic fracturing using a practical interactive parameter estimation method". *SEG Technical Program Expanded Abstracts 2019*, pp. 1024–1028. DOI: 10.1190/segam2019-3215758.1.
- Yang, D. and Y. **Li** (2019). "Monitoring directional fluid flow in shale gas hydraulic fracturing through electrically energized steel well casings". *International Workshop on Gravity, Electrical & Magnetic Methods and Their Applications, Xi'an, China, 19–22 May 2019*, pp. 45–48. DOI: 10.1190/GEM2019-012.1.
- Yang, D., Y. **Li**, X. Liu, F. Zhu, and J. Zhang (2019). "Feasibility Study of Electrical Monitoring of In-situ Thermal Desorption in Remediation of Contaminated Soil". *AGU Fall Meeting Abstracts*. Vol. 2019, NS21C–0831.

Teaching Experience

Georgia Institute of Technology *Atlanta, GA, USA*

Teaching Assistant *Fall 2021, Fall 2024, Summer 2025*

- EAS 2600: Earth processes, Lab session
- EAS 1600: Introduction to Environmental Science, Lab session
- Participate in and help design/update some of the lab assignments.
- Gave a guest lecture in a EAS 1600 class

Southern University of Science and Technology *Shenzhen, China*

Teaching Assistant *Feb. - June 2019*

- ESS 302: Applied Geophysics II (Gravity, Magnetic, Electrical, Electromagnetic and Well Logging).

Presentations

- **Li, Y.**, S. Naif, D. Cordell, K. Key, R. L. Evans, S. Constable, D. J. Shillington, and A. Becel (2024). "Megathrust heterogeneity revealed by Electromagnetic Data at the Aleutian-Alaska Subduction Zone". The 26th EM Induction Workshop 2024, Beppu, Japan (Oral)
- **Li, Y.**, S. Naif, D. Cordell, K. Key, R. L. Evans, S. Constable, D. J. Shillington, and A. Becel (2023). "Electromagnetic Study of Fluid Distribution at the Aleutian-Alaska Subduction Zone". AGU Annual Meeting 2023, San Francisco, CA (Oral)
- Naif, S., **Y. Li**, K. Key, R. Evans, S. Constable, and D. Cordell (2021). "Preliminary results from the Electromagnetic Alaskan GeoPRISMS Experiment (E-MAGE)". AGU Fall Meeting 2021, New Orleans, LA (Poster)
- **Li, Y.** and D. Yang (2020), Monitoring the integrity of steel well casings using electrical data on the surface". SEG 2020 Work- shop: 2nd SEG Borehole Geophysics Workshop, Virtual (Poster)

- **Li, Y.** and D. Yang (2020). "Imaging of steel casing's conductivity using surface electrical data and a deep learning approach". SEG International Exposition and 90th Annual Meeting, Virtual (Poster)
- **Li, Y.** and D. Yang (2019). "Fast electrical imaging of injected fluid in hydraulic fracturing using a practical inter- active parameter estimation method". SEG International Exposition and 89th Annual Meeting, San Antonio, TX (Oral)

Skills

Programming languages	MATLAB, Python, Typescript, C, Fortran
Visualization	GMT, ParaView, PyQt/PySide, PyVista, Adobe Illustrator, Geomap App
Geophysical inversion code	MARE2DEM, OCCAM1DCSEM
Machine learning frameworks	TensorFlow, Keras, Scikit-learn
Languages	Chinese (Native), English (Professional proficiency)

Professional Services

Peer-reviewer

GEOPHYSICS, Journal of Applied Geophysics

Affiliations

- American Geophysical Union
- Society of Exploration Geophysicists