Yinchu Li

PhD Candidate · Marine Geophysics

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Research Interests

Marine Geophysics, Geophysical inverse problem, Controlled-source electromagnetic imaging, Fluid-tectonic interactions at plate margins, Magnetotellurics, 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: Long-electrode electrical monitoring of shale gas fracturing
- Advisor: Dr. Dikun Yang

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

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

- **University of Naples Federico II**, Napoli, Italy — *Study Abroad Program*
- Thesis: Estimation of 2-D site amplification effects: the case of the historical centre of Napoli
- Advisor: Dr. Concettina Nunziata

Research Experience

Georgia Institute of Technology *Atlanta, GA, USA*

Graduate Researcher *Spring 2022 - Spring 2024*

- **Data** is collected by the NSF funded marine EM survey: *ElectroMagnetic Alaskan GeoPRISMS Experiment* (EMAGE)
- Controlled-source electromagnetic (CSEM) data processing and navigation.
- Inversion of the CSEM data collected from the Alaska Subduction Zone.
- Comprehensive interpretation of inversion results from the Shumagin Gap and Semidi segment.

Southern University of Science and Technology *Shenzhen, China*

Graduate Researcher *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*.
- Long-electrode electrical well integrity monitoring.

University of Naples Federico II *Napoli, Italy*

Visiting Undergraduate Student *Jan. 2018 - July 2018*

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

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: Andrew Newman, Georgia Institute of Technology and Dr. Spahr Webb, Lamont-Doherty Earth Observatory.

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 Univeristy Lamont-Doherty Earth Obs.

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.

Teaching Experience

Georgia Institute of Technology *Atlanta, GA, USA*

Teaching Assistant *Fall 2021, Fall 2024*

- EAS 2600: Earth processes, Lab session
- Participate in and help design/update some of the lab assignments.

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).

PUBLICATIONS

- 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.

Honors & Awards

2024 **26th EM Induction Workshop Financial Support**, 26th EM Induction 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)
2017 **First Prize**, China Undergraduate Mathematical Modeling Contest (Shandong Province)
2017 **Third Class Scholarship**, China University of Petroleum (East China) in 2016-2017 Academic Year
2016 **Second Class Scholarship**, China University of Petroleum (East China) in 2015-2016 Academic Year
2015 **Second Class Scholarship**, China University of Petroleum (East China) in 2014-2015 Academic Year

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.

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
Software	Adobe Illustrator, GMT, Geomap App
Geophysical inversion code	MARE2DEM
Machine learning frameworks	TensorFlow, Keras, Scikit-learn
Languages	Chinese (Native), English (Professional proficiency)

Professional Societies

- Society of Exploration Geophysicists
- American Geophysical Union