

# 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

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

PhD in Geophysics, GPA: 4.0/4.0

Atlanta, GA, USA

Aug. 2021 -

- Advisor: Dr. Samer Naif

### Southern University of Science and Technology

MSc in Mechanics (Geophysics), GPA: 3.76/4.0

Shenzhen, China

Sept. 2018 - June 2020

- Thesis: Long-electrode electrical monitoring of shale gas fracturing
- Advisor: Dr. Dikun Yang

### China University of Petroleum (East China)

BSc in Applied Geophysics, GPA: 3.72/4.0

Qingdao, China

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

Graduate Researcher

Atlanta, GA, USA

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

Graduate Researcher

Shenzhen, China

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

Visiting Undergraduate Student

Napoli, Italy

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

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## 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 University 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

Graduate Student

Eastern Tibetan Plateau, China

Spet. 2020

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

## Field trip

Undergraduate Student

Xinwen, China

June 2015

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

## TEACHING EXPERIENCE

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### Georgia Institute of Technology

Teaching Assistant

Atlanta, GA, USA

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

Teaching Assistant

Shenzhen, China

Feb. - June 2019

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

## PUBLICATIONS

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- 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

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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

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- 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

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- **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 Workshop: 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 interactive parameter estimation method”. *SEG International Exposition and 89th Annual Meeting*, San Antonio, TX (Oral)

## SKILLS

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<b>Programming languages</b>	MATLAB, Python, Typescript, C, Fortran
<b>Software</b>	Adobe Illustrator, GMT, Geomap App
<b>Geophysical inversion code</b>	MARE2DEM
<b>Machine learning frameworks</b>	TensorFlow, Keras, Scikit-learn
<b>Languages</b>	Chinese (Native), English (Professional proficiency)

## PROFESSIONAL SOCIETIES

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- Society of Exploration Geophysicists
- American Geophysical Union