

UNL Geophysics Team newsletter

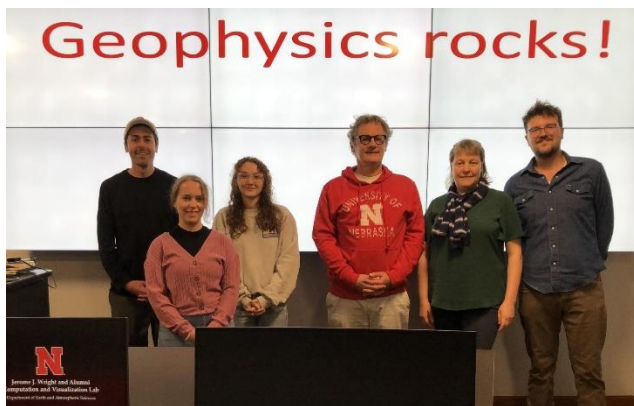
academic year of 2023-2024

GEOFYSICS ROCKS!

Highlights of the academic year 2023-2024

September 2023

Dr. Filina was awarded the *J. B. Coffman Excellence Award for Teaching and Research in Geology*

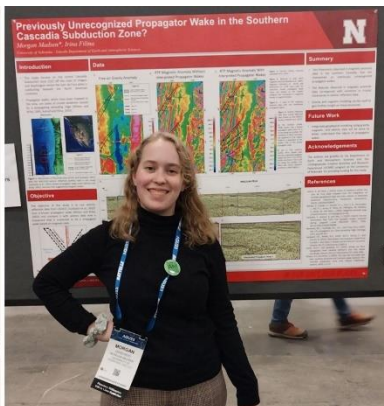
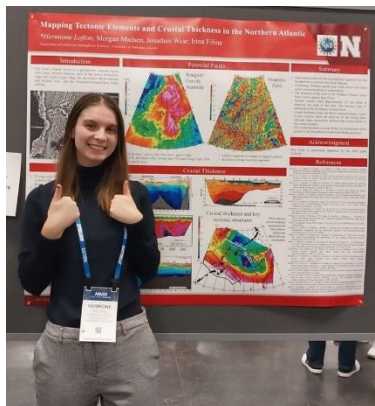
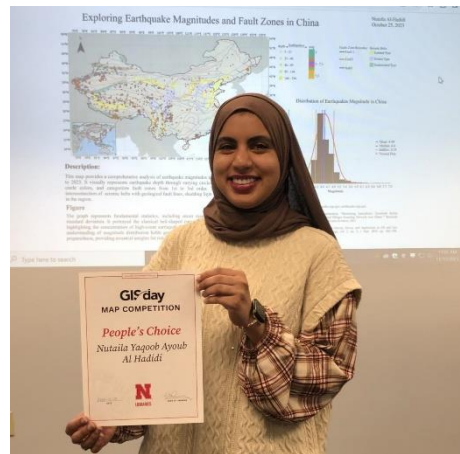


October 2023

UNL Geophysics team hosted the visit of [Dr. Christian Hübscher](#) from the University of Hamburg. We continue our great collaboration with the Marine Geophysics team there.

November 2023

Nutaila Al Hadidi won the **People's Choice Award** in [the GIS Day Map Competition](#)! Nutaila took the **GEOL/METR/453/853 GIS in Earth and Atmospheric Sciences** taught by **Dr. Filina**, and winning this award represents a great success for both her and the entire class.

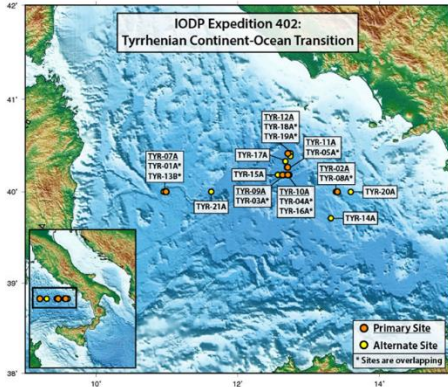
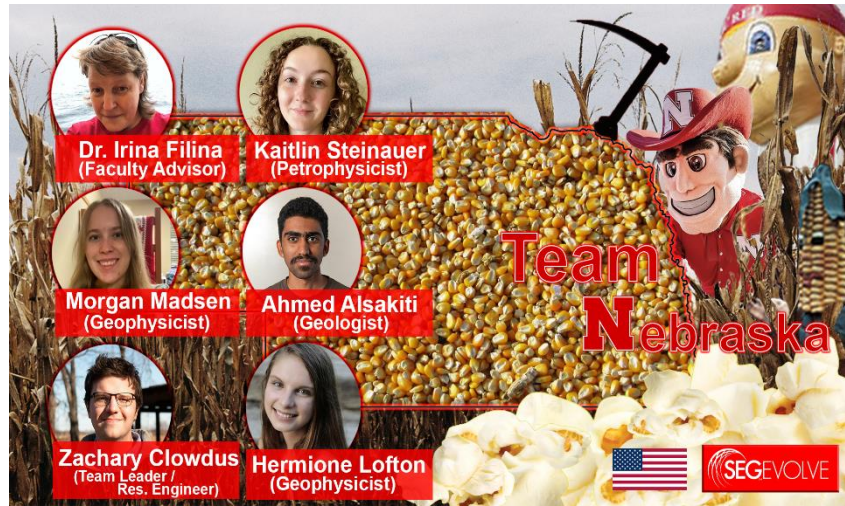


December 2023

The team presented six posters at the annual convention of the **American Geophysical Union** in San Francisco, CA. Our students did an awesome job presenting their research and had a marvelous time!

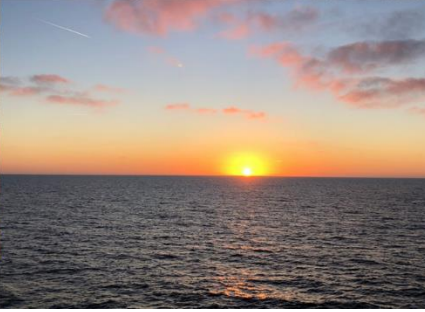
January 2024

Our team (**Team Nebraska**) participated in the [SEG EVOLVE](#) program for the first time! We were one of 12 teams accepted into this “virtual internship”. The team conducted the exploration exercise using state-of-the-art 3D seismic data in the Gulf of Mexico. The team did so well that they were invited (and sponsored) to present their results at the [IMAGE](#) convention in Houston!



February 2024

Dr. Filina participated in the [IODP402](#) cruise until April 2024. We have drilled six sites in the Tyrrhenian Sea and recovered a whole range of lithologies spanning from clastics and evaporites in the sedimentary section to granoids, very few basalts and many peridotites in the basement! The expedition drilled two sites over the exhumed mantle and revealed an astonishing heterogeneity of the mantle rocks! The paper is in review in **Nature**. This expedition established collaboration with our Italian colleagues and we are looking forward to expanding it.



March 2024



Katie Steinauer received the **Yatkola-Edwards fellowship** from the [Nebraska Geological Society](#) for the academic year 2024-2025.



Morgan Madsen received a best undergraduate research award from the College of Arts and Sciences at the **2024 Student Research Days**

April 2024



The UNL Geophysics team presented 6 talks at the upcoming annual meeting of the [Nebraska Academy of Sciences](#).

Katie Steinauer and **Zach Clowdus** received two out of three **best student presentation awards** sponsored by the [Nebraska Geological Society](#)!



May 2024

Our award shower continued with **Katie Steinauer** receiving funding from [Daugherty Water for Food Global Institute](#) to work on her MS thesis. **Morgan Madsen**, **Ethan Stowell** and **Hermione Lofton** were awarded **UCARE stipends** for their undergraduate research projects.

CONGRATULATIONS!



Katie Steinauer



Morgan Madsen



Ethan Stowell



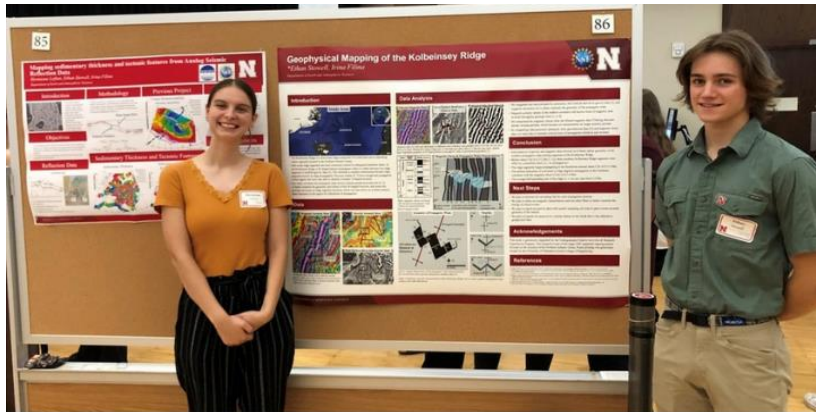
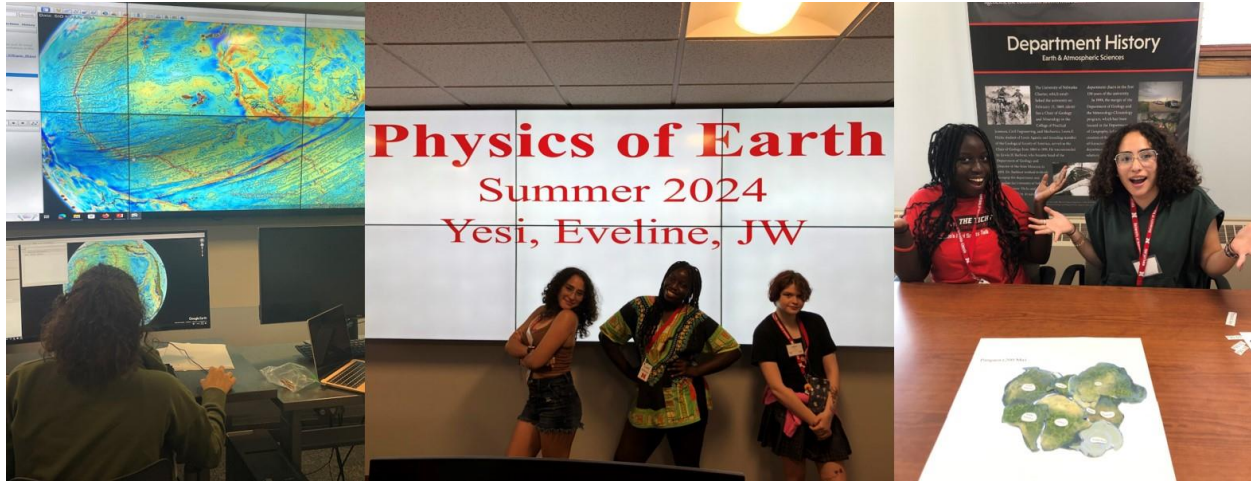
Hermione Lofton

We also started an outreach project in Oakland, NE with students from Oakland-Craig High to study the local aquifer. The students helped us to collect a seismic survey and several gravity readings. The project will continue in the upcoming academic year.



June 2024

Dr. Filina and her students taught the summer camp “**Discover Physics of Earth**” for high school students. This week-long summer class offers an opportunity to preview college life (students are hosted on campus for the entire week) and try college-level educational activities. This year the camp was offered to underrepresented girls from **Girls Inc. of Lincoln** and **Omaha** and was generously sponsored by the [National Science Foundation](#) through Dr. Filina’s CAREER grant. Here is a [fragment](#) from the final presentation, which we find very rewarding!



Hermione Lofton

Ethan Stowell

July 2024

Our undergrads **Hermione Lofton** and **Ethan Stowell** were working hard the whole summer on their research projects and presented their results at the **UNL Sumer Research Symposium!**

August 2024

Our team welcomes three new graduate students! We are so happy to have **Anika Mayeesha**, **Tochukwu Onyebum** and **Abdullah Salman** with us!



**Anika
Mayeesha**



**Tochukwu
Onyebum**



**Abdullah
Salman**

Heads-up for the academic year of 2024 - 2025

- The Northern Atlantic project remains our primary research direction. This project originated from Dr. Filina's [IODP396](#) cruise and is supported by the National Science Foundation through the [CAREER award](#). All our graduate students will be involved in this research, as well as two undergraduate students (**Hermione Lofton** and **Ethan Stowell**). **Dr. Filina** also embeds this research project in her **GEOL445/845 Advanced Geophysics** class that she offers in Fall 2024. We expect one MS thesis (**Zachary Clowdus**) and one senior thesis (**Hermione Lofton**) in Spring 2025, as well as one more in Spring 2026 (**Ethan Stowell**).
- We continue our investigation of the Cascadia Subduction Zone that started with Dr. Filina's [RR1718](#) cruise. **Morgan Madsen** is mapping propagator wakes developed in the subducting Juan de Fuca plate (honors thesis in Spring 2025). A manuscript from our last-year graduate (**Ariful Islam**) focused on the tectonic history of the Diebold Seamount is in process. We are also collaborating with colleagues in the US to secure the funding of this project. The incoming graduate student **Abdullah Salman** will continue the project by investigating the origin and evolution of seamounts in this region.
- We will expand our collaboration with our Italian colleagues following the [IODP402](#) cruise. **Tochukwu Onyebum** will lead this project focused on the tectonics of the Tyrrhenian Sea. We plan to integrate different types of geophysical data to develop a tectonic reconstruction of this exciting magma-poor margin.
- We will continue our successful collaboration with the **University of Hamburg** on the origin and tectonic history of the Bathymetrists seamounts in the equatorial Atlantic. We have presented two AGU abstracts on this project in 2023, and we are currently wrapping them into a research paper.
- Our local hydrogeology project is going very well (**Katie Steinauer**). Katie takes regular gravity measurements over two local aquifers in Nebraska. Each site has a water monitoring well that we will correlate with the time-lapse microgravity readings.
- We will continue to engage students in Geophysics through our two local students' chapters: **UNL SEG** (Society of Exploration Geophysicists) and **UNL AAPG** (American Association of Petroleum Geologists). We have enthusiastic and committed chapter presidents (**Katie Steinauer** and **Zachary Clowdus**) that are planning many exciting activities in the upcoming academic year.
- Our team has submitted six abstracts for the upcoming [AGU 2024](#), so we will be busy this fall getting ready for this conference in Washington DC in December.
- We now have an Instagram [@UNL_Geophysics](#). Please follow us!

Publications

- Filina, I.** and E. Beutel, Geological and geophysical constraints guiding new tectonic reconstruction of the Gulf of Mexico, in *Tectonic Processes: a Global View, Volume 1. Extensional Tectonics: Continental Breakup to Formation of Oceanic Basins*, editors I. Çemen, E. Catlos, published by Wiley-Blackley for AGU, **Invited book chapter, in press**, [doi:10.1002/essoar.10511463.1](https://doi.org/10.1002/essoar.10511463.1)
- Morris, A. M., Lambart, S., Stearns, M. A., Bowman, J. R., and IODP396 Science Party, 2024, Evidence for low-pressure crustal anatexis during the Northeast Atlantic break-up, *Geochemistry, Geophysics, Geosystems*, v. 25, e2023GC011413, <https://doi.org/10.1029/2023GC011413>
- Filina, I.**, M. Fedi, J. Sun and A. Morgan, Introduction to special section: Gravity, electrical, and magnetic methods, *The Leading Edge*, v. 43 (4), p. 208, <https://library.seg.org/doi/10.1190/tle43040208.1>
- Listen to the associated interview <https://doi.org/10.1190/seismic-soundoff-episode221> or read an abstract [Seismic Soundoff: The untapped potential of nonseismic methods](https://doi.org/10.1190/seismic-soundoff-episode221)
- ***Guthrie, K., I. Filina**, 2023, Two new absolute gravity base stations established in Lincoln, NE, *Transactions of the Nebraska Academy of Sciences*, v. 43, pp. 5–12, <https://digitalcommons.unl.edu/tnas/542/>
- ***Ashraf, A., I. Filina**, Zones of weakness within the Juan de Fuca plate mapped from the integration of multiple geophysical data and their relation to observed seismicity, *Geochemistry, Geophysics, Geosystems*, <http://dx.doi.org/10.1029/2023GC010943>
- ***AlBadi, S., *E. Jacobson, I. Filina**, Locating an old well in eastern Nebraska with a low-cost drone-based magnetic surveying system, *The Leading Edge*, v. 42 (12), p. 824-827, <https://doi.org/10.1190/tle42120805.1>

Presentations

American Geophysical Union (2023)

- Filina, I., *J. Wear**, What is the nature of the crust under the outer Voring Plateau and the Voring Spur? paper [OS11C-1300](#)
- ***J. Wear, I. Filina** and IODP396 Science Party, 2023, Modeling the Magnetic Signatures of Seaward Dipping Reflectors on the Norwegian Margin, paper [OS11C-1294](#)
- ***H. Lofton, *J. Wear, *M. Madsen, I. Filina**, 2023, Mapping tectonic elements and crustal thickness in the Northern Atlantic from public domain geophysical data, paper [OS11C-1293](#)
- I. Filina**, C. Huebscher, J. Preine, T. Häcker, M. Hartge, M. Radaelli, E. Seidel, H. Grob, F. van der Zwan, 2023, Crustal structures of the Bathymetrists Seamounts from integration of gravity, magnetic and seismic data, paper [T43D-0287](#)
- ***A. Islam, I. Filina**, 2023, Tectonic History of Diebold Knoll on Juan de Fuca Plate from Integrated Geophysical Analysis, paper [T43D-0286](#)
- ***M. Madsen, I. Filina**, 2023, Previously Unrecognized Propagator Wake in the Southern Cascadia Subduction Zone? paper [T53E-0191](#)

Nebraska Academy of Sciences (144th annual meeting, 2024)

- K. Steinauer**, I. Filina Using a relative gravimeter to measure seasonal fluctuations in Nebraska's groundwater levels, **One of three best student awards**
- Z. Clowdus**, I. Filina, An integrated geophysical approach to studying the crust of the Greenland-Iceland-Faroe Ridge, **One of three best student awards**
- M. Madsen**, I. Filina, Two newly identified propagator wakes in the Southern Cascadia
- H. Lofton**, E. Stowell, Z. Clowdus, I. Filina, Mapping sedimentary thickness in the Northern Atlantic Ocean from legacy seismic reflection data.