Irina Filina

Associate Professor
Department of Earth and Atmospheric Sciences
University of Nebraska at Lincoln
ifilina2@unl.edu; irafilina@yahoo.com

EDUCATION

2002 – 2007 Ph.D., Geophysics, University of Texas at Austin, USA

1995 – 1998 MS, Physics, Saint Petersburg State University, Russia

1991 – 1995 BS, Physics, Saint Petersburg State University, Russia

EMPLOYMENT HISTORY

Since **2016** **Assistant Professor**, **Associate Professor** (2024). University of Nebraska - Lincoln, USA

- Establish and direct the UNL Geophysics Lab with multiple research directions united by the methodology – integrated geophysical modeling
- Develop and teach the geophysics curriculum, as well as other foundation courses

2008 – 2016 **Geophysicist**, **Senior Geophysicist**, Hess Corporation, Houston, USA

- Member of the Technology and Excellence team
- One of the company's two specialists on non-seismic geophysics – gravity, magnetics, and electromagnetic methods

2008 **Science Research Associate V**, University of Texas at Austin, Institute for Geophysics, USA

- Gravity modeling for the Caribbean Basins Tectonics and Hydrocarbons (CBTH) project

2002 – 2007 **Graduate Research Assistant**, **Teaching Assistant,** Institute for Geophysics, Department of Geological Sciences, University of Texas at Austin, USA

- PhD Thesis "***Geophysical investigations of subglacial lakes Vostok and Concordia, East Antarctica***" under the supervision of Dr. C. Blankenship

1997 – 2002 **Geophysicist**, Polar Marine Geological Research Expedition, Saint Petersburg, Russia

- Processing and interpretation of airborne geophysical ice penetrating radar data over the Russian Arctic (Franz-Joseph Land and Novaja Zemlja Archipelagos), and East Antarctica
- Composing ice thickness and subglacial topography maps and writing technical reports

1995 – 1999 **Teacher**, Middle school N 21, Saint Petersburg, Russia

- Teaching mathematics, algebra and geometry

PUBLICATIONS

* and ** denote Filina's lab graduate or undergraduate student author respectively

Filina, I. and E. Beutel, **2025**, 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**, doi:10.1002/essoar.10511463.1

Sanfilippo, A. and **IODP402 Science Party**, **2025**, Heterogeneous Earth's mantle drilled at an embryonic ocean. *Nature Communications*, *16*(1), p.2016, doi.org/10.1038/s41467-025-57121-0

Malinverno, A. and **IODP402 Science Party**, **2025**, International Ocean Discovery Program, ***Proceedings of the International Ocean Discovery Program***, Tyrrhenian Continent–Ocean Transition: Tyrrhenian Magmatism and Mantle Exhumation (TIME), https://publications.iodp.org/proceedings/402/402title.html

Morris, A.M., Lambart, S., Stearns, M.A., Bowman, J., **IODP396 Science Party**, **2024,** Evidence for Low-Pressure Crustal Anatexis During the Northeast Atlantic Break-up, ***Geochemistry, Geophysics, Geosystems***, v. 25, no.7, e2023GC011413, doi.org/10.1029/2023GC011413

Filina, I., M. Fedi, J. Sun, A. Morgan, **2024**, Introduction to special section: Gravity, electrical, and magnetic methods, ***The Leading Edge***, v. 43, no 4, p. 208, doi/10.1190/tle43040208.1

AlBadi, S., **E. Jacobson, **I. Filina, **2023**, Locating an old well in eastern Nebraska with a low-cost drone-based magnetic surveying system, ***The Leading Edge***, manuscript TLE-2023-0059, December 2023, doi.org/10.1190/tle42120805.1

*Ashraf, A.**, I. Filina, 2023**, New 2.75-D gravity modeling reveals the low-density nature of propagator wakes in the Juan de Fuca plate, ***Tectonophysics***, v. 869, doi.org/10.1016/j.tecto.2023.230127

*Ashraf, A., **I. Filina**, **2023**, 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***, v. 24 (10), doi.org/10.1029/2023GC010943

*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/

Berndt, C., **IODP396 Science Party**, **2023**, Shallow-water hydrothermal venting linked to the Paleocene-Eocene Thermal Maximum, ***Nature Geosciences***, doi:10.1038/s41561-023-01246-8

Planke, S. and **IODP396 Science Party**, **2023**, Mid-Norwegian Margin Magmatism and Paleoclimate Implications, **Proceedings of the International Ocean Discovery Program**, v. 396, doi:10.14379/iodp.proc.396.105.2023

Tréhu, A., M. and **RR1718 science party**, **2022**, The hidden history of the south-central Cascadia subduction zone recorded on the Juan de Fuca plate offshore southwest Oregon, ***Geochemistry, Geophysics, Geosystems***, v. 23, no. 9, e2021GC010318, doi:10.1029/2021GC010318

Filina, I., Austin, J., Doré, T., Johnson, E., Minguez, D., Norton, I., Snedden, J. and Stern, R.J., **2022**, Opening of the Gulf of Mexico: What we know, what questions remain, and how we might answer them, ***Tectonophysics***, v. 822, p.229150, **Invited review paper,** doi:10.1016/j.tecto.2021.229150

Filina, I., **L. Hartford, **2021**, Subsurface structures along the western Yucatan from integrated geophysical analysis, ***Journal of Marine and Petroleum Geology***, v. 127, paper 104964, doi:10.1016/j.marpetgeo.2021.104964

Filina, I., R. Yalamanchili, S. Re, D. Colombo, A. Price, V. Egorov, and G. Liu, **2020**, Introduction to a special section "Integrated geophysical imaging", ***Interpretation***, v. 8, no. 4, pp. SSi–SSv, doi:10.1190/INT-2020-0921-SPSEINTRO.1

Filina, I., *M. Liu, E. Beutel, **2020**, Evidence of ridge propagation in the eastern Gulf of Mexico from integrated analysis of potential fields and seismic data, ***Tectonophysics***, v. 775, article 228307, doi:10.1016/j.tecto.2019.228307

Filina, I., E. K. Biegert, L. Sander, V. Tschirhart, N. Bundalo, and C. Schiek-Stewart, **2019**, Integrated imaging: A powerful but undervalued tool, ***The Leading Edge***, v. 38, no. 9, pp. 720-724, doi:10.1190/tle38090720.1

Filina, I., **2019**, Crustal architecture of the northwestern and central Gulf of Mexico from integrated geophysical analysis, ***Interpretation***, v. 7, no. 4, pp. T899–T910, doi:10.1190/INT-2018-0258.1

*Liu, M., **I. Filina**, and P. Mann, **2019**, Crustal structure of Mesozoic rifting in the northeastern Gulf of Mexico from the integration of seismic and potential fields data, ***Interpretation***, v. 7, no. 4, pp. T857–T867, doi:10.1190/INT-2018-0259.1

Burberry, C., J. Swiatlowski, M. Searls and **I. Filina**, **2018**, Joint and lineament patterns across the Midcontinent indicate repeated reactivation of basement-involved faults, ***Geosciences***, v. 8, no. 215, doi:10.3390/geosciences8060215

Filina, I., Delebo, N., Mohapatra, G., Coble, C., Harris, G., Layman, J., Strickler, M. and Blangy, J.P., **2015**, Integration of seismic and gravity data—A case study from the western Gulf of Mexico. ***Interpretation***, v. 3, no. 4, pp. SAC99-SAC106, doi.org/10.1190/INT-2015-0050.1

Filina, I., Ball, V., Morton, S., Terentyev, S., Prindle, K. and McCalla, M., **2012**, Estimates of the anomaly threshold in controlled-source electromagnetics. ***The Leading Edge***, *31*(4), pp.429-433, doi.org/10.1190/tle31040429.1

Thoma, M., Grosfeld, K., **Filina, I.** and Mayer, C., **2009**, Modelling flow and accreted ice in subglacial Lake Concordia, Antarctica, ***Earth and Planetary Science Letters***, 286(1-2), pp.278-284, doi.org/10.1016/j.epsl.2009.06.037

Filina, I., Blankenship, D., Thoma, M., Lukin, V., Masolov, V. and Sen, M., **2008**, New 3D bathymetry and sediment distribution in Lake Vostok: Implication for pre-glacial origin and numerical modeling of the internal processes within the lake, ***Earth and Planetary Science Letters***, 276(1-2), pp.106-114, doi.org/10.1016/j.epsl.2008.09.012

Filina, I., Lukin, V., Masolov, V. and Blankenship, D., **2007**, Unconsolidated sediments at the bottom of Lake Vostok from seismic data. ***U.S. Geological Survey and The National Academies, USGS OF-2007-1047***, Short Research Paper 031, doi:10.3133/of2007-1047.srp031

Filina, I., Blankenship, D., Roy, L., Sen, M., Richter, T. and Holt, J., **2006**, Inversion of airborne gravity data acquired over subglacial lakes in East Antarctica. ***Antarctica: Contributions to Global Earth Sciences***, pp.129-133, doi.org/10.1007/3-540-32934-X_15

RECENT CONFERENCE ABSTRACTS

Stowell, E., **I. Filina, **2025**, Investigating a Series of Propagation Features on the Kolbeinsey Ridge by Integrating Multiple Geophysical Datasets, ***American Geophysical Union*****,** paper T31A-0145

*Onyebum, T., **I. Filina**, F. Loreto, **2025**, Crustal Domains and Lithospheric Nature of the Tyrrhenian Basin: Insights from Integrated Analysis of Seismic, Potential Fields and Scientific Drilling, ***American Geophysical Union*****,** paper T41B-VR8995

*Salman, M. A., **I. Filina**, **2025**, Mapping and Classification of Seamounts in the Northern Atlantic: Integrating Bathymetry, Gravity, and Seismic Reflection Data, ***American Geophysical Union*****,** paper V41B-0065

*Mayeesha, A., **I. Filina**, **2025**, Tomographic Imaging of the Vøring Plateau and Vøring Spur: Appraising Crustal Interpretations, ***American Geophysical Union*****,** paper T31A-0144

Filina, I., and **IODP402 Science Party**, **2024**, Summary of Physical Properties of Rocks Collected During the IODP Expedition 402 in the Back-Arc Tyrrhenian Basin, ***American Geophysical Union***, paper T31E-3172

*Steinauer, K., **I. Filina**, **2024**, Correlating Repeated Gravity Readings to Seasonal Groundwater Level Changes in Nebraska, ***American Geophysical Union*****,** paper NS13A-1227

Lofton, H., **E. Stowell, **M. Madsen, **I. Filina, **2024**, Mapping Sedimentary Thickness and Interpreting Tectonic Elements in the Northern Atlantic Ocean from Public Domain Seismic Data, ***American Geophysical Union*****,** paper T31E-3176

*Clowdus, Z., **I. Filina**, **2024**, Integrated Geophysical Analysis of the Greenland-Iceland-Faroe Ridge, ***American Geophysical Union*****,** paper T31E-3164

Madsen, M., **I. Filina, **2024**, Assessing Crustal Heterogeneities due to Propagator Wakes in Cascadia via Integrated Geophysical Analysis. ***American Geophysical Union*****,** paper T01-25

Stowell, E., **I. Filina, **2024**, Revisiting the Tectonic Evolution of the Kolbeinsey Ridge via an Integrated Geophysical Approach, ***American Geophysical Union*****,** paper T31E-3166

Filina, I., *J. Wear, **2023**, What is the nature of the crust under the outer Voring Plateau and the Voring Spur? ***American Geophysical Union*****,** paper OS11C-1300

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, ***American Geophysical Union***, paper T43D-0287

*Wear, J. and **IODP396 Science Party**, **2023**, Modeling the Magnetic Signatures of Seaward Dipping Reflectors on the Norwegian Margin, ***American Geophysical Union***, paper OS11C-1294

Lofton, H., *J. Wear, **M. Madsen, **I. Filina, **2023**, Mapping tectonic elements and crustal thickness in the Northern Atlantic from public domain geophysical data, ***American Geophysical Union***, paper OS11C-1293

*Islam, A., **I. Filina**, **2023**, Tectonic History of Diebold Knoll on Juan de Fuca Plate from Integrated Geophysical Analysis, ***American Geophysical Union*****,** paper T43D-0286

Madsen,** M., **I. Filina**, **2023**, Previously Unrecognized Propagator Wake in the Southern Cascadia Subduction Zone? ***American Geophysical Union*****,** paper T53E-0191

I. Filina, *A. Fernandez, C. Huebscher, **2022**, Spatial analysis of potential fields over Bathymetrists Seamounts to quantify magmatic underplating and map major faults, ***American Geophysical Union***, paper T32B-07

*Ashraf, A., **I. Filina, 2022,** Linking key tectonic features of Juan de Fuca plate to observed seismicity in Cascadia Subduction zone, ***Geological Society of America Abstracts with Programs*****,** v. 54, no. 5, doi: 10.1130/abs/2022AM-383908

*Ashraf, A., **I. Filina, 2022,** Mapping seamounts of the Juan de Fuca plate and assessing their clustering from spatial analysis of potential fields, ***American Geophysical Union***, paper T32B-06

*Islam, A., **I. Filina, 2022,** Crustal architecture of the Diebold Knoll on Juan de Fuca plate from integrated geophysical analysis, ***American Geophysical Union***, paper T32B-04

UNL THESES composed under the supervision of Dr. Filina

*Clowdus, Z., **2025**, Modeling the Greenland-Iceland-Faroe Ridge Using Integrated Geophysical Analysis, ***MS Thesis***, https://digitalcommons.unl.edu/geoscidiss/180/

*Steinauer, K., **2025**, Exploring the Application of Repeated Microgravity Surveys to Monitor Groundwater Level Variations in Nebraska, ***MS Thesis***, https://digitalcommons.unl.edu/geoscidiss/175/

** Lofton, H., **2025**, Mapping Sedimentary and Crustal Thicknesses in the Northern Atlantic Ocean from Public Domain Geophysical Data, ***Undergraduate Senior Thesis***, https://digitalcommons.unl.edu/casundergrad/1/

Madsen, M., **2025, Integrated Geophysical Modeling of Newly Identified Pseudofaults within Southern Cascadia Subduction Zone, ***Undergraduate Honors Thesis***, https://digitalcommons.unl.edu/honorstheses/789/

*Islam, A., **2023**, Crustal Structures of Diebold Knoll and Adjacent Juan De Fuca Oceanic Crust from Integration of Seismic, Gravity and Magnetic Data, ***MS Thesis***, https://digitalcommons.unl.edu/geoscidiss/151/

*Guthrie, K., **2022**, Toward the Understanding of the 2018 Arnold, NE Earthquake Cluster: Relocation of Hypocenters and Establishment of New Gravity Base Stations, ***MS Thesis***, https://digitalcommons.unl.edu/geoscidiss/143/

Al Farsi, K., **2021, Developing a Database of Seismic Data Over the Cascadia Subduction Zone, ***Undergraduate Senior Thesis***, https://digitalcommons.unl.edu/geoscidiss/134/

*Ashraf, A., **2021**, Geological Structures and Crustal Architecture of the Cascadia Subduction Zone from the Integration of Multiple Geophysical Datasets, ***MS Thesis***, https://digitalcommons.unl.edu/geoscidiss/135/

Al Badi, S., **2021, Drone-based Magnetic Surveying in Eastern Nebraska, ***Undergraduate Senior Thesis***, https://digitalcommons.unl.edu/geoscidiss/133/

Fernandez, A., **2021, Integrated geophysical analysis over Bathymetrists seamounts and Sierra Leone Rise, ***Undergraduate UCARE Thesis***, https://digitalcommons.unl.edu/ucareresearch/261/

Jacobson, E., **2020, Developing a Low-Cost Aeromagnetic Surveying System, ***Undergraduate UCARE Thesis***, https://eas.unl.edu/filina/Jacobson_Senior_Thesis.pdf

Szopinski, P., **2019, Geophysical Analysis of the Midcontinent Rift's Subsurface Structure in Southeastern Nebraska, ***Undergraduate Honors Thesis***, https://digitalcommons.unl.edu/honorstheses/69/

Richardson, C., **2018, Integrated Geophysical Analysis of the New Caledonia Trough with Implications for the Geologic History and Continental Status of Zealandia, ***Undergraduate Honors Thesis***, https://digitalcommons.unl.edu/honorsembargoed/99/

*Liu, M., **2018**, Integrated Geophysical Analysis in the Northeastern Gulf of Mexico, ***MS Thesis***, https://digitalcommons.unl.edu/geoscidiss/109/

Guthrie, K., **2018, Geophysical analysis of Midcontinent Rift in Nebraska, ***Undergraduate Senior Thesis***

GRANTS

2024 **(awarded) Columbia University, post - IODP Exp. 402 award**

Title:	"Modeling geologic structures of the Tyrrhenian Sea based on Exp402"
PI:	**Irina Filina**
Total amount:	$19,999
Award period:	January 01, 2025 through December 31, 2025

2023 **(awarded) Columbia University, IODP Exp. 402 participation**

Title:	"Tyrrhenian Continent-Ocean Transition"
PI:	**Irina Filina**
Total amount:	$50,004
Award period:	February 01, 2024 through January 31, 2025

2023, 2024 (**awarded twice**) **Daugherty Water For Food Global Institute**

Title:	"Gravity and seismic measurements over Nebraska aquifers to detect seasonal changes in water level"
PIs:	**Irina Filina**, *Kaitlin Steinauer
Total amount:	$35,000 ($17,500 each)
Award period:	August 01, 2023 through July 31, 2024 August 01, 2024 through July 31, 2025

2023 (**awarded**) **National Science Foundation**

Title:	"CAREER: an integrated geophysical approach to research and education to solve the tectonic puzzle of the Northern Atlantic"
PI:	**Irina Filina**
Total amount:	$746,284
Award period:	March 01, 2023, through February 29, 2028

2022 (**awarded**) **Columbia University, post - IODP Exp. 396 award**

Title:	"Modeling magnetic signatures of the Voring margin based on magnetic properties of rocks recovered during IODP Expedition 396"
PI:	**Irina Filina**
Total amount:	$17,978
Award period:	September 01, 2022 through December 31, 2023

2022 (**awarded**) **Jane Robertson Layman Fund, University of Nebraska - Lincoln**

Title:	"Structures and crustal variations of the mid-Norwegian margin from integrated geophysical analysis"
PI:	**Irina Filina**
Total amount:	$9,997
Award period:	August 01, 2022 through July 31, 2023

2021 (**awarded**) **Columbia University, IODP Exp. 396 participation**

Title:	"Mid-Norwegian Margin Magmatism and Paleoclimate Implications"
PI:	**Irina Filina**
Total amount:	$39,622
Award period:	August 01, 2021 through September 30, 2022

2020 (**awarded**) **Jane Robertson Layman Fund, University of Nebraska - Lincoln**

Title:	"Structures and crustal variations of the Juan de Fuca plate from integrated geophysical analysis"
PI:	**Irina Filina**
Total amount:	$10,000
Award period:	January 01, 2017 through December 31, 2019

FIELD EXPERIENCE

2024	International Ocean Discovery Program (IODP) Expedition 402
2021	International Ocean Discovery Program (IODP) Expedition 396
2017	Early Career Seismic Chief Scientist Training Cruise, Cascadia subduction zone
2004 – 2005	Airborne geophysics over Amundsen Sea Embayment, West Antarctica
2002	Ground-based radar sounding over Lake Vostok, East Antarctica
1998 – 2000	Three seasons of airborne geophysics over Franz Josef Land Archipelago, Arctic

AWARD AND HONORS

2025	**Fulbright U.S. Scholar award**, The Fulbright Commission Iceland
2023	**Coffman Award in the Earth and Atmospheric Sciences**, the University of Nebraska - Lincoln
2022 – 2025	**Daugherty Water for Food Global Institute Faculty Fellow**, the University of Nebraska-Lincoln
2020 – 2021	**Family & Friends Recognition Awards**, the University of Nebraska-Lincoln Teaching Council and the UNL Parents Association
2019 – 2020	**Parent's Recognition Award**, the University of Nebraska-Lincoln Teaching Council and the UNL Parents Association
2005	**Antarctica Service Medal of the USA,** Service on the Antarctic Expedition, 2004-2005
2002	**Antarctica Service Sign of the Russian Federation,** Service on the Antarctic Expedition, 2001-2002

PROFESSIONAL SOCIETIES

Since **2020** American Association of Petroleum Geologists (AAPG)
- Faculty advisor to UNL AAPG Student Chapter

Since **2018** Nebraska Academy of Sciences (NAS)
- Chair of Earthe Sciences section

Since **2016** Nebraska Geological Society (NGS)
- Representing Nebraska in AAPG House of Delegates

Since **2008** Society of Exploration Geophysics (SEG)
- Faculty advisor to UNL SEG Student Chapter

Since **2002** American Geophysical Union (AGU)
- Convene sessions at annual conventions 2018, 2022, 2023, 2025