Niloofar Mesbah, The University of Texas at Dallas, Richardson, Texas, USA for her project: *Multiple isotopic systems constrain distinct lithium sources and enrichment mechanisms in low-temperature sedimentary basin brines.*

I am a Ph.D. student in Geosciences at The University of Texas at Dallas, working under the supervision of Dr. Kristina Butler. My research focuses on the geochemical processes that concentrate lithium in sedimentary-basin brines and on how multiple isotope systems can distinguish lithium sources and fluid histories.

My project examines lithium-rich formation waters, with a particular focus on Smackover Formation brines. By combining major- and trace-element geochemistry with lithium ($\delta^{7}Li$), strontium ($^{87}Sr/^{86}Sr$), oxygen ($\delta^{18}O$), and hydrogen (δD) isotopes, I aim to evaluate the roles of water-rock interaction, fluid mixing, mineral dissolution and alteration, and stratigraphic controls in producing lithium enrichment. I am especially interested in whether interaction with underlying siliciclastic units, including the Norphlet Formation, contributes lithium or modifies the isotopic signatures preserved in Smackover brines.

Core observations are an important complement to the geochemical data. At the 2026 STARR Smackover Workshop at the Bureau of Economic Geology at The University of Texas at Austin, I examined Smackover core samples to better connect fluid chemistry with lithology, mineralogy, and basin stratigraphy.

Support from the Lipman Student Research Grant will help fund isotopic and geochemical analyses needed to test these mechanisms and compare lithium-bearing brines across sedimentary settings. My broader goal is to improve geologic models for critical mineral resources and to better understand the processes that create economically significant lithium enrichment.

Examining Smackover core samples during the 2026 STARR Smackover Workshop, Bureau of Economic Geology, The University of Texas at Austin.

I earned a B.S. in Water Science and Engineering from Isfahan University of Technology and an M.S. in Geospatial Information Sciences from The University of Texas at Dallas. I am grateful to the Howard and Jean Lipman Foundation and the Geological Society of America for supporting my research.