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1. Study Findings from University of Texas Austin Advance Knowledge in Geoscience (DL-AWI: Adaptive Full Waveform Inversion Using a Deep Twin Neural Network)

## [Study Findings from University of Texas Austin Advance Knowledge in Geoscience \(DL-AWI: Adaptive Full Waveform Inversion Using a Deep Twin Neural Network\)](#)

NewsRx Science Daily

March 17, 2026 Tuesday

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**Section:** SCIENCE - GEOSCIENCE

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### **Body**

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2026 MAR 17 (NewsRx) -- By a News Reporter-Staff News Editor at NewsRx Science Daily -- New study results on geoscience have been published. According to news originating from Austin, Texas, by NewsRx editors, the research stated, "Full waveform inversion (FWI) iteratively improves the accuracy of the model by minimizing the discrepancies between the predicted and the observed data."

Funders for this research include The Texas Seismological Network And Seismology Research (Texnet) And The State of Texas.

The news reporters obtained a quote from the research from University of Texas Austin: "However, FWI commonly suffers from cycle skipping when the initial model is poor, leading to an erroneous result. To mitigate this problem, we propose deep-learning-backed adaptive waveform inversion (DL-AWI), which introduces a deep twin neural network to precondition the waveforms and compare the ratio of two signals with a zero-lag spike, thereby enhancing the stability of the inversion process. DL-AWI can project the synthetic and observed signals into an extended latent space via several convolutional neural networks (CNNs) with shared weights, which can accelerate the data matching. Compared with classic FWI methods, the proposed DL-AWI provides a wider space for model updates, significantly decreasing the risk of being trapped in local minima."

According to the news editors, the research concluded: "We use synthetic and field examples to validate its efficiency in subsurface model inversion, and the results show that DL-AWI is robust even when a poor initial model is provided."

For more information on this research see: DL-AWI: Adaptive Full Waveform Inversion Using a Deep Twin Neural Network. *Geosciences*, 2026,16(2):65. (*Geosciences* - <http://www.mdpi.com/journal/geosciences>). The publisher for *Geosciences* is MDPI AG.

A free version of this journal article is available at <https://doi.org/10.3390/geosciences16020065>.

Our news journalists report that more information may be obtained by contacting Chao Li, ***Bureau of Economic Geology***, John A. and Katherine G. Jackson School of Geosciences, University of Texas Austin, Austin, TX 78712, United States. Additional authors for this research include Yangkang Chen.

Study Findings from University of Texas Austin Advance Knowledge in Geoscience (DL-AWI: Adaptive Full  
Waveform Inversion Using a Deep Twin Neural Network)

Keywords for this news article include: University of Texas Austin, Austin, Texas, United States, North and Central America, Geoscience, Networks, Neural Networks, Risk and Prevention, Science.

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## Classification

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