



香港中文大學  
院士講座系列

# The 15<sup>th</sup> Lecture Series by Academicians from the Chinese Academy of Sciences (CAS)

*Jointly Organized by  
Department of Earth and Environmental Sciences  
China Engagement Office*

**Speaker:** Prof. NI Sidao  
Division of Earth Sciences  
Chinese Academy of Sciences  
中國科學院地學部倪四道院士

**Title:** Research Progress on Ultra-Shallow Earthquakes in  
Continental Regions  
大陸極淺源地震研究進展

**Language:** Putonghua

**Date:** Tuesday, 1 April 2025  
**Time:** 16:30 – 18:00  
**Venue:** LSB LT4, Lady Shaw Building  
**Registration:** <http://bit.ly/3FdP4fH>



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## Biography

Prof. Sidao Ni, Academician of the Chinese Academy of Sciences (CAS), Professor and Deputy Director of Institute of Geodesy and Geophysics, CAS. He is a recipient of the National Science Fund for Distinguished Young Scholars, a Changjiang Chair Professor, as well as Chief Scientist of the National 973 Program, and a Principal Investigator of Excellent Research Group Program supported by the National Natural Science Foundation of China (NSFC). He serves as Vice President of the Chinese Geophysical Society and Chair of its Seismology sub-Committee. He is on the editorial boards of Geophysical Journal International (GJI), Earth and Planetary Physics (EPP), Fundamental Research (FR), and Chinese Journal of Geophysics. Prof. Ni leads a research team focused on seismic wave propagation theory, forward and inverse modeling techniques, and studies on Earth's internal structures and earthquake source physics. He authored and co-authored over 200 publications in peer-viewed journals such as Science, Nature, and Science China. He has been recognized as a Highly Cited Researcher by Elsevier in China from 2021 to 2023. He won Hubei Provincial Natural Science Award and the First Prize and Scientific and Technological awards from the Chinese Geophysical Society.

## Abstract

Seismic hazards in continental regions pose a major threat to human society. A thorough understanding of the structure, state, and evolution of earthquake source zones is crucial for earthquake disaster prevention and hazard mitigation. Scientists have developed various seismogenic models through geophysical inversion and laboratory rock experiments. Although earthquake source zone (fault zone) drilling observations have been conducted for some major earthquakes worldwide, in-situ observations of earthquake rupture initiation zones remain scarce, making it difficult to validate the seismogenic theories. As most continental earthquakes occur at depths of around 10 km, precise determination of the rupture initiation place is challenging, making selection of optimal drilling location difficult and deep drilling for in-situ exploration extremely expensive. In recent years, thanks to advancements in geophysical and geodetic multi-modal observations and joint inversion techniques, scientists discovered ultra-shallow earthquakes occurring at depths of 3 km or even just a few hundred meters. The rupture initiation locations of these earthquakes have been reliably determined, providing a valuable opportunity for in-situ observations. Research on ultra-shallow earthquakes can help address frontier scientific questions in seismology and help national efforts in earthquake hazard mitigation.