



中国地震局地震预测研究所
INSTITUTE OF EARTHQUAKE FORECASTING, CEA

学术报告

题目: Fault evolution, interaction, and earthquakes

主讲: 刘勉 教授

美国密苏里大学 地质科学系

时间: 2024 年 7 月 4 日 (星期四)

上午 9:30~12:00

地点: 预测所 506 会议室

(腾讯会议: 311-511-220)

主讲人简介:



刘勉 (Mian Liu) 教授, 美国密苏里大学 (University of Missouri) 地质科学系系主任, 密苏里大学董事会杰出教授和 William H. Byler 杰出讲席教授。南京大学学士, 加拿大麦吉尔大学硕士, 美国亚利桑那大学地球物理学博士。研究领域是地球动力学, 包括岩石圈-地幔动力学、大陆演化、活动构造、地震物理与灾害、岩浆与变质作用等。2023 年获美国地

质学会 George P. Woollard Award (地球物理奖)。

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地震预测重点实验室
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2024 年 6 月 26 日

Fault Evolution, Interaction, and Earthquakes

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Abstract

Earthquake models are based on elastic rebound, which predicts cyclic stress accumulation and release on fault planes. Consequently, attention has been focused on the rate of strain accumulation on individual faults to infer their stress evolution, which, together with earthquake history, forms the basis for assessing seismic hazard. Although much progress has been made, unanticipated devastating earthquakes have repeatedly reminded us of the need to improve current earthquake models. One such improvement may come from a better understanding of fault interactions, which cause stress transfer between faults. In this talk, I will review our numerical studies of fault evolution and interaction, and their impact on seismicity. I will show that present-day geodetic strain rates and seismicity reflect ongoing fault evolution; their spatiotemporal variability can be understood in the framework of fault evolution. Over the timescale of multiple earthquake cycles, stress interaction between faults influences the spatiotemporal variations of seismicity. Fault interaction also influences fault ruptures by perturbing the initial stress. Natural faults behave as complex dynamic systems, in which the rupture behavior of individual faults is difficult to predict, but useful insights can be obtained by studying the system behavior of the faults.