SESSION 45- *Understanding earthquake physics to pave the way for better forecasts*

Conveners

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Session Description

For decades, statistical seismology has driven our understanding of earthquake occurrence and provided crucial frameworks for characterizing seismic clustering and triggering. However, this approach, as several others in earthquake science, is showing its weaknesses. The integration of various multi-physics techniques can open new frontiers thanks to a growing volume and quality of data, along with advances in computational power, facilitating the transition from purely descriptive models to a more predictive, physics-informed understanding of fault systems.

Merging different disciplinary approaches that have traditionally advanced in parallel, could pave the way for new advances in earthquake forecasting. Such evolution could be promoted by community-wide efforts merging multimodal data.

By combining statistics, physics, and computer simulations, we can better understand

earthquakes and improve our ability to predict them. With this session, we aim to foster a collaborative dialogue that may accelerate the development of a new generation of forecasting models with a stronger root in earthquake physics.

We welcome contributions that show innovative approaches in our understanding of earthquake physics and fault mechanics, with applications to hazard assessment, earthquake forecasting, and catalog simulation. We specifically encourage studies that include the analysis of multi-modal data, such as ground observations, geodetic data, marine observations, remote sensing data or rock imaging.