

Earthquake Research

The **Center for Earthquake Research and Information** (CERI) is a Tennessee Center of Excellence created to perform state-of-art scientific research into the nature of earthquakes in continental interiors, monitor earthquakes within the central and southeastern United States, and to provide accurate information on earthquake effects and hazards. CERI's interdisciplinary teams employ advanced data processing techniques, computational modeling, theoretical developments, and observational studies to address open problems in earthquake research.

-Capabilities, Infrastructure & Contributions-

CERI maintains a large seismic network in the central and southeastern United States to monitor earthquakes and its technical staff operate and maintain over 144 seismic stations in 10 states in the region from Arkansas to Virginia. This seismic network is part of the Advanced National Seismic System (ANSS) through our partner, the U.S. Geological Survey.

CERI faculty have active geodesy field study sites in the Central and southern Andes Mountain of South America, Antarctica, the Andaman-Nicobar region, and the New Madrid seismic zone (U.S.A.). In addition, the team engages in exploration seismology focused on growth, tectonic evolution and deformation of continents, and attenuation and nonlinear dynamics of soft Embayment sediments in the Mississippi Embayment.

Results of scientific research by the CERI faculty have led to crucial changes in the National Seismic Hazards maps for the Central and Eastern U.S. that are used to mitigate hazards due to earthquakes.



-CERI Research Interests-

Seismology

- Wave propagation
- Crustal and mantle velocity and anisotropy structure
- Seismic source physics
- Seismotectonics
- Seismic hazard analysis
- Engineering seismology
- Near-surface velocity structure
- Reflection seismology
- Induced seismicity
- Advanced data processing techniques

Computational Tectonic Modeling

- Modeling fault formation and evolution associated with plate boundary processes
- Coupling tectonic and surface processes
- Developing simulation codes with advanced numerical techniques

Earthquake Processes & Tectonic Modeling

- Mechanics of faults at geologic time scales
- Microscopic and macroscopic physics of faults' ruptures
- Propagation and amplification of seismic waves, basin and local-site response

Engineering Seismology

- Geotechnical and structural earthquake engineering
- Structural dynamics
- Structural health monitoring
- Probabilistic seismic hazard risk analysis

Mechanics & Physics of Earthquakes

- Modeling tectonic tremor
- Stick-slip instabilities
- Strain localization in dynamic rupture simulations
- Modeling nonlinear frictional interactions on faults

For more information please visit:

<http://www.memphis.edu/ceri/>

Charles A. Langston, Director

clangstn@memphis.edu

(901) 678-4869