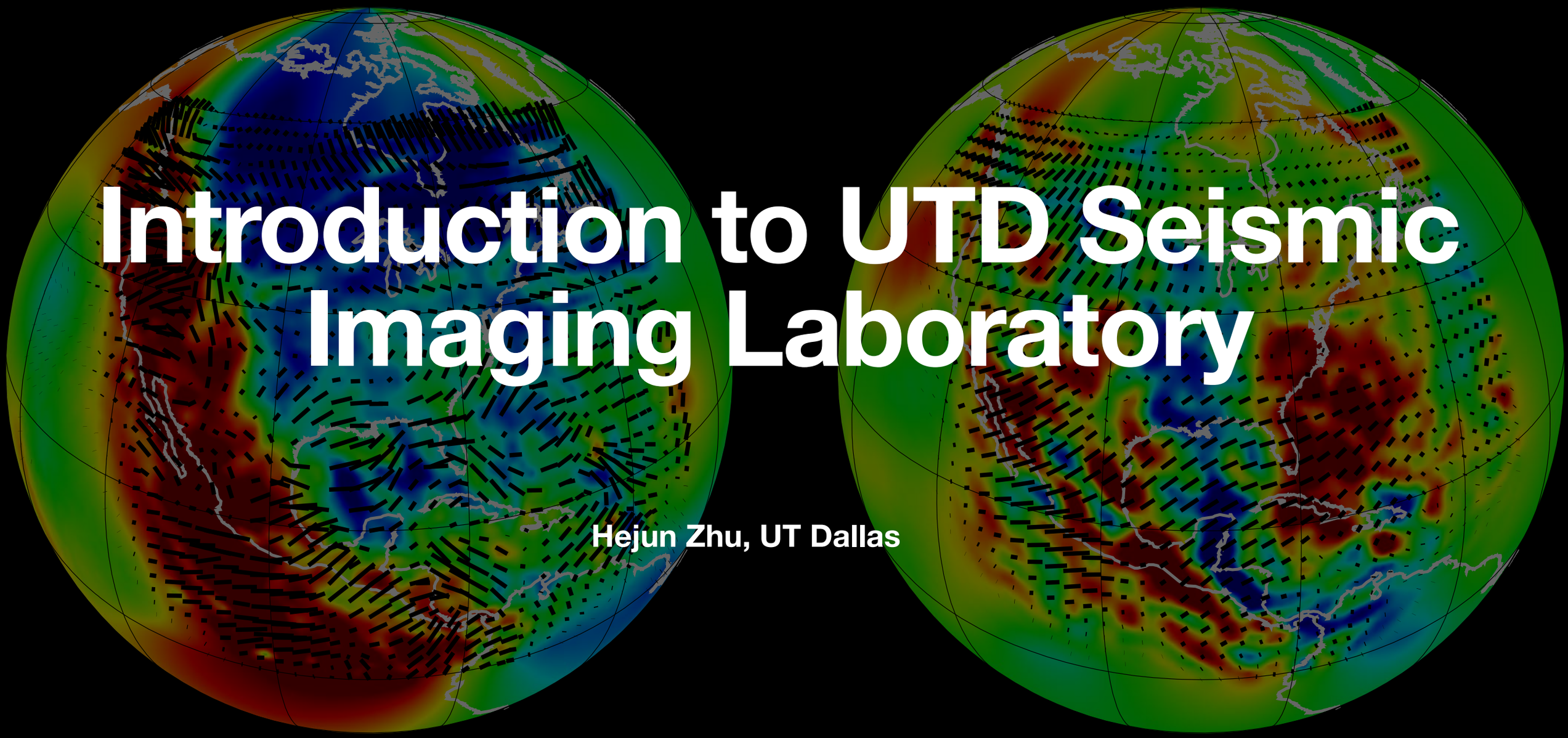
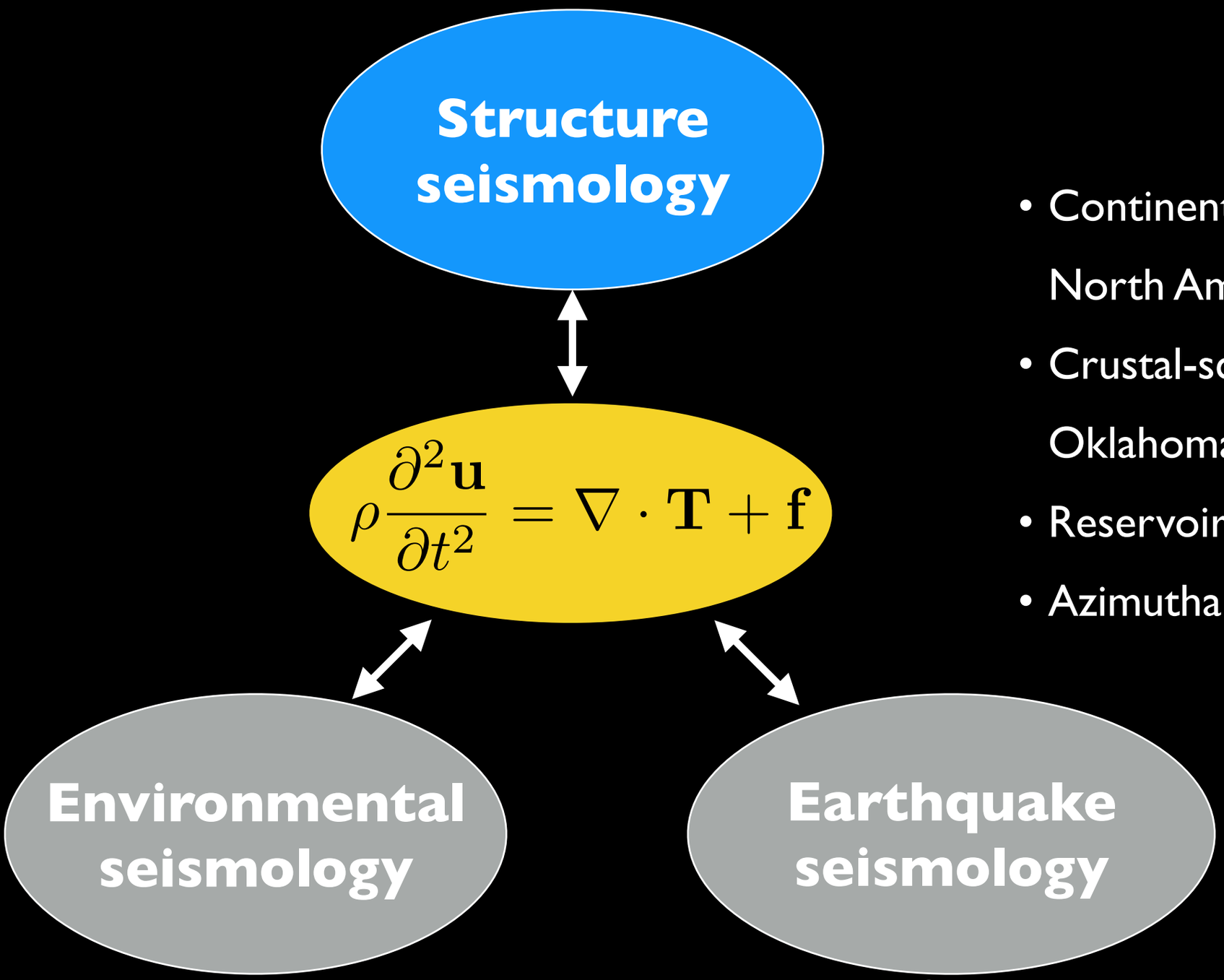


Introduction to UTD Seismic Imaging Laboratory

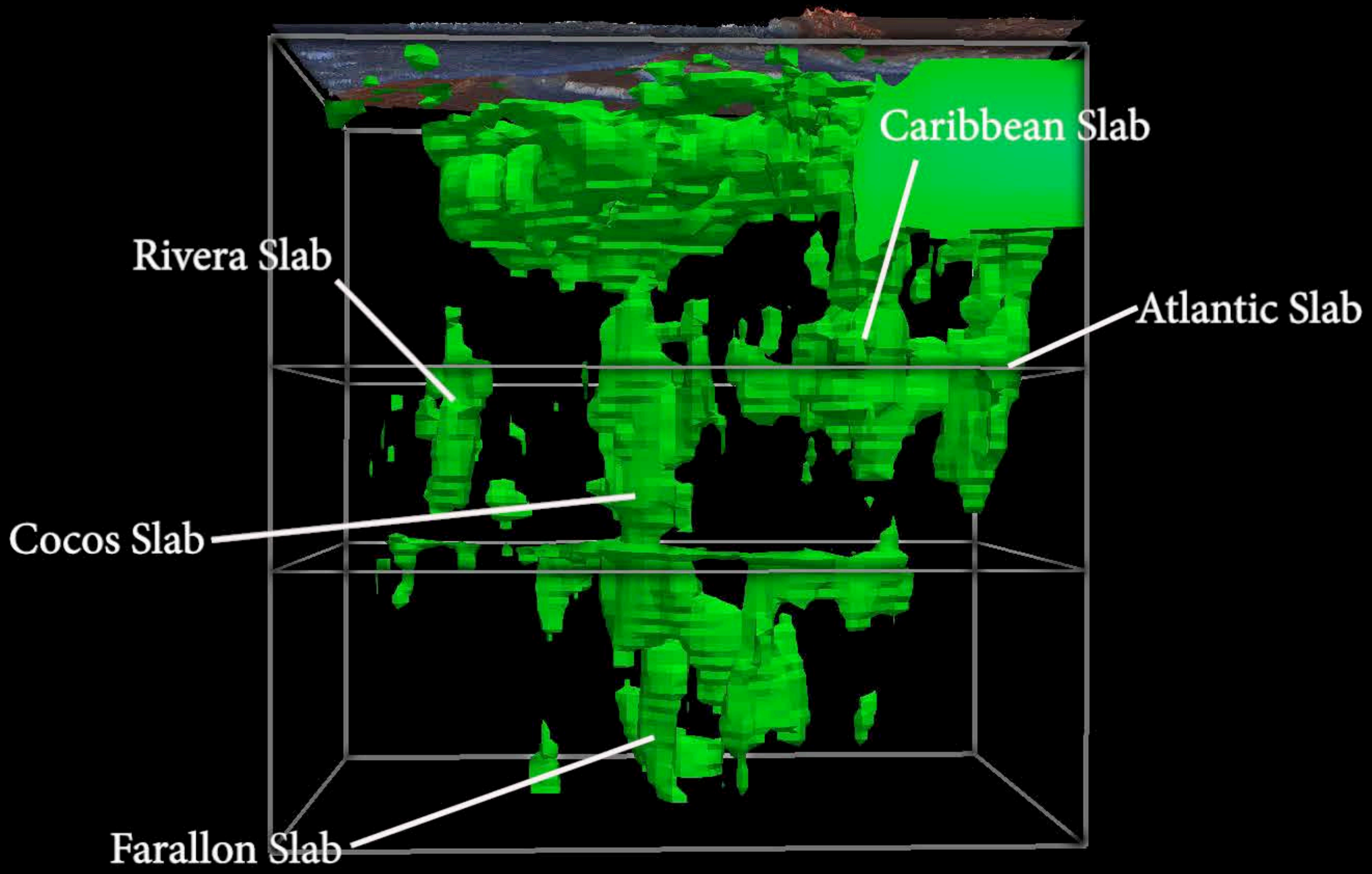
Hejun Zhu, UT Dallas

UTD Seismic Imaging Laboratory

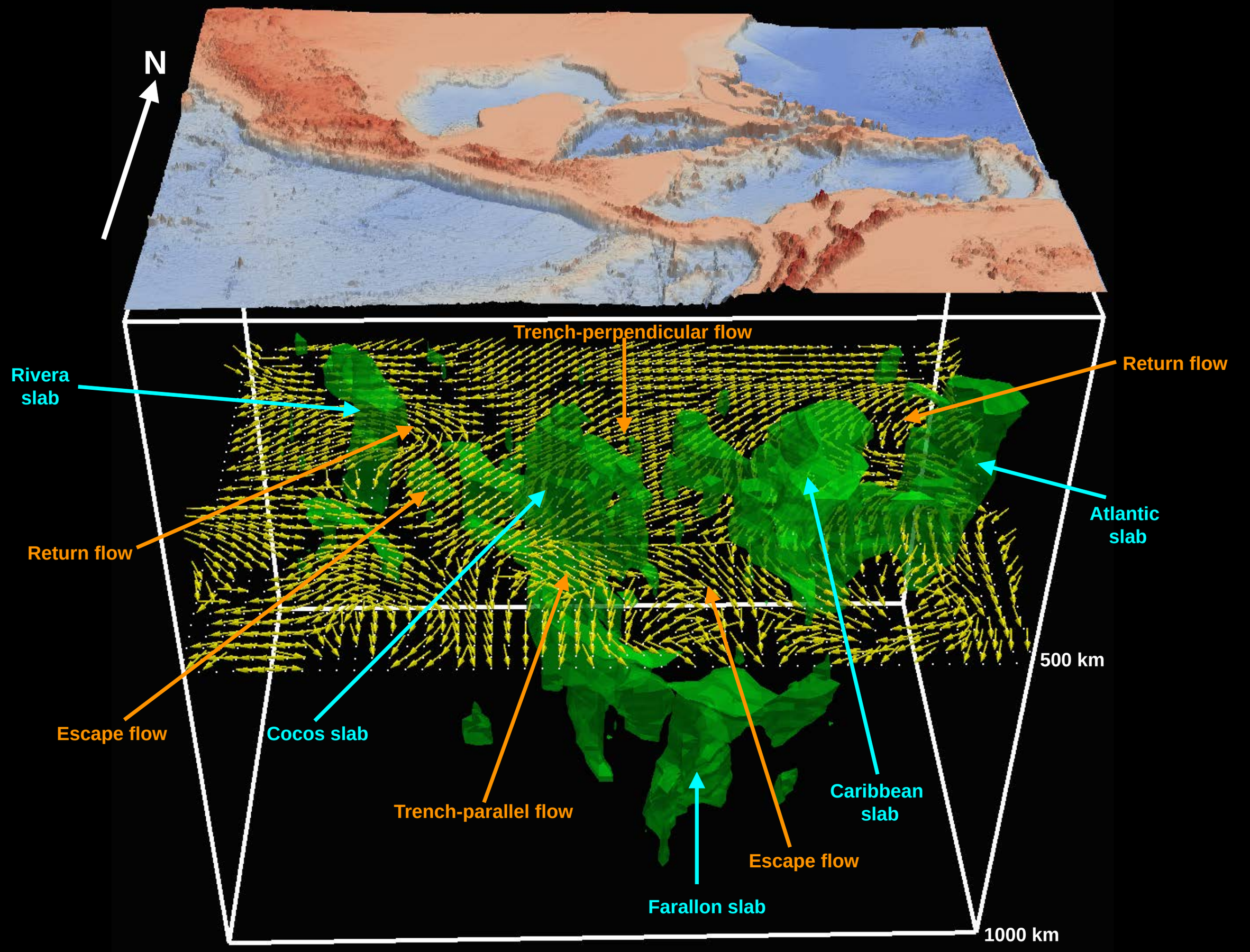
Mission: developing advanced seismic imaging technologies
to investigate tectonic/environmental processes, physical properties
of Earth's materials, and earthquake rupture processes



- Continental-scale tomography (Europe, North America, and Australia)
- Crustal-scale tomography (central Oklahoma and the Delaware Basin)
- Reservoir-scale imaging
- Azimuthal anisotropy and attenuation


Caribbean Slab
Rivera Slab
Atlantic Slab
Cocos Slab
Farallon Slab

3



(Zhu et al, Nature Communications, 2020)

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Structure seismology

$$\rho \frac{\partial^2 \mathbf{u}}{\partial t^2} = \nabla \cdot \mathbf{T} + \mathbf{f}$$

Environmental seismology

Earthquake seismology

Monitoring crustal response to

- Ice sheet melting
- Injection/withdraw of water

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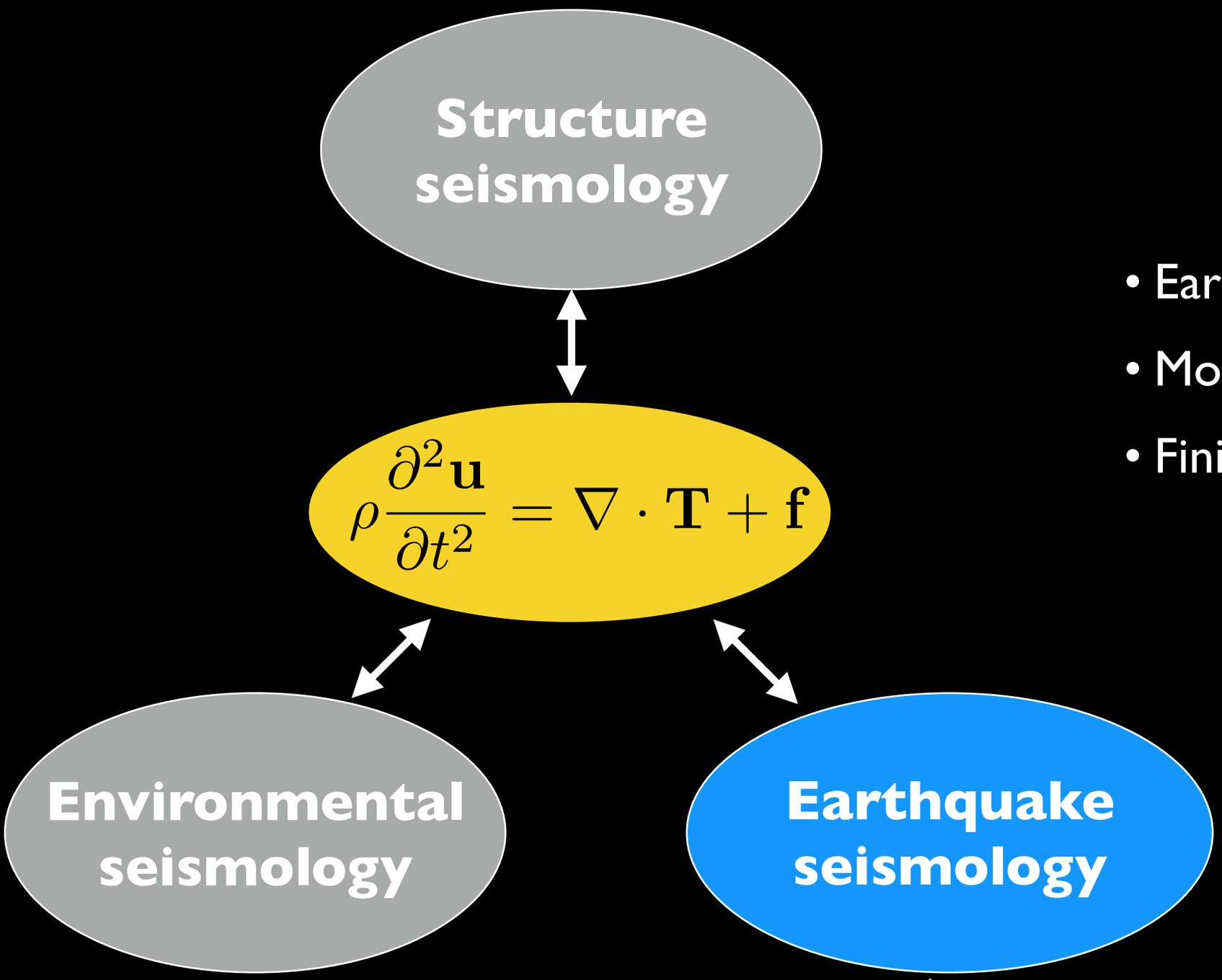
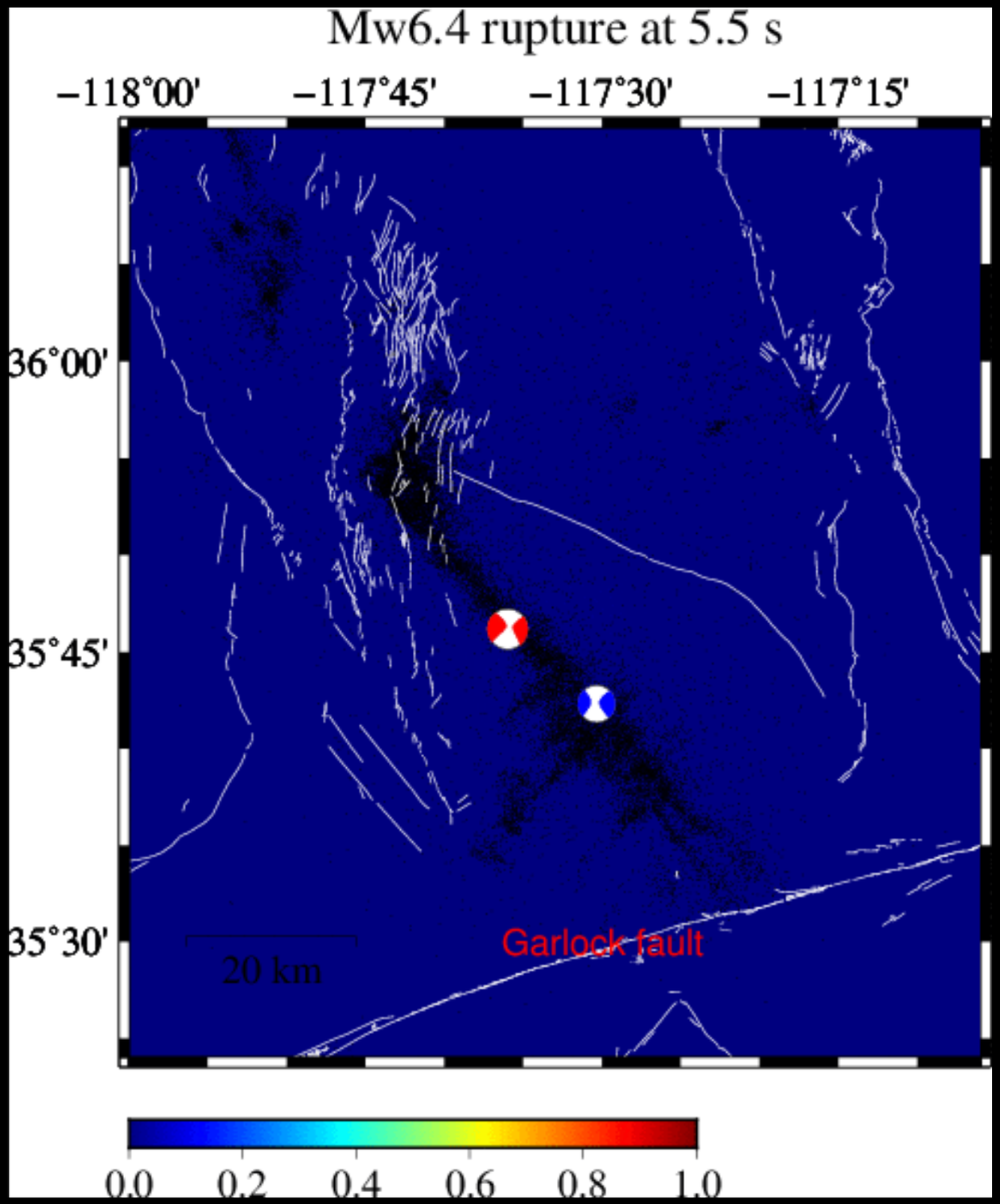


- Earthquake location
- Moment tensor inversion
- Finite fault rupture imaging

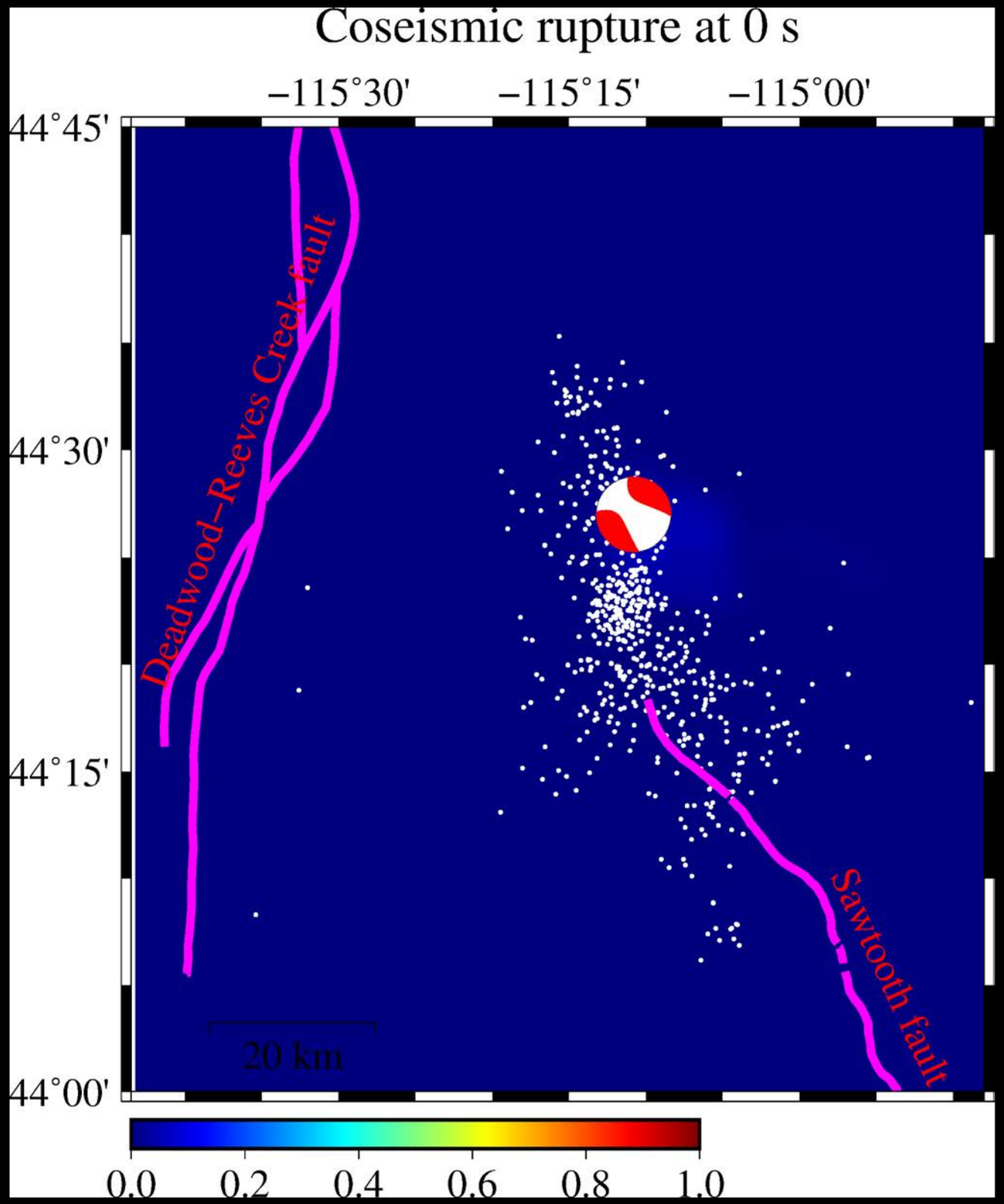
IN 3D EARTH!

Rupture processes for the fore and mainshocks

2019 Mw6.4 Ridgecrest, California earthquake



2020 Mw 6.5 Stanley, Idaho earthquake



(Yang et al, GRL, 2020, 2021)