

D. NICOLAS ESPINOZA, PhD

(a) Education

Georgia Institute of Technology	Ph.D. Civil Engineering	2011
Georgia Institute of Technology	M.Sc. Civil Engineering	2008
Universidad Nacional de Córdoba	Diploma Civil Engineering	2005

(b) Appointments

The University of Texas at Austin	Associate Professor	2019-present
The University of Texas at Austin	Assistant Professor	2013-2019
École des Ponts ParisTech	Postdoctoral Researcher	2012-2013
Georgia Institute of Technology	Graduate Research Assistant	2006-2011
Universidad Nacional de Córdoba	Undergraduate Research Assistant	2005-2006

(c) Products and Projects

Selected Publications Related to Carbon Geological Storage & Utilization and Geothermal Energy

1. Fuchs S. J., Crandall D. C., Moore J. E., Sivaguru M., Fouke B. W., Espinoza D. N., Akono A.-T., Werth C. J. “Geochemically induced shear slip in dolomite- and clay-cemented sandstone fractures”. (2021). *International Journal of Greenhouse Gas Control*, October 111, 103448. <https://doi.org/10.1016/j.ijggc.2021.103448>
2. Sun Z., Xu J., Espinoza D. N., Balhoff D. N. “Optimization of subsurface CO₂ injection based on neural network surrogate modeling”. (2021). *Computational Geosciences*. <https://doi.org/10.1007/s10596-021-10092-9>
3. McLean M. L., Espinoza D. N. “Depth dependent thermo-poro-elastic response of geothermal reservoirs during heat extraction”. In 55th US Rock Mechanics/Geomechanics Symposium to be held in Houston, Texas, USA, 28 June-1 July 2021. ARMA 21-1622. <https://www.onepetro.org/conference-paper/ARMA-2021-1622>
4. Zheng X. and Espinoza D. N. “Measurement of unloading pore volume compressibility of Frio sand under uniaxial-strain stress path and implications on reservoir pressure management”. (2021). *Rock Mechanics and Rock Engineering*. <https://doi.org/10.1007/s00603-021-02571-3>
5. Jung H., Hosseini S. A., Espinoza D. N. “Wellbore injectivity response to step-rate CO₂ injection: coupled thermo-poro-elastic analysis in a vertically heterogeneous formation”, (2020). *International Journal of Greenhouse Gas Control*, 102, 103156. <https://doi.org/10.1016/j.ijggc.2020.103156>
6. Espinoza D. N., Jung H., et al., “Rock mechanical alteration due to flow of CO₂-charged brine: strength and stiffness of outcrop samples from the Crystal Geyser analog”, (2018), *Int. J. Greenhouse Gas Control* 73, 16-28. <https://doi.org/10.1016/j.ijggc.2018.03.017>

Selected Completed and Ongoing Projects

1. Global Scholar: CO₂ Migration through Complex Plumbing Systems in Sedimentary Basins, June 2021-July 2022.
2. Hildebrand Research Seed Grant 2020, Deep Geothermal Energy, January 2021-August 2022.
3. Poroelastic Monitoring of Carbon Dioxide Storage Sites, Dr. Cécile DeWitt-Morette France-UT Endowed Excellence Grants, September 2019-September 2020.
4. UT-ExxonMobil CO₂ sequestration research project (geologic CO₂ storage engineering), ExxonMobil, April 2014-March 2020.
5. Center for Frontiers of Subsurface Energy Security (CFSES I and CFSES II), Department of Energy, September 2009-August 2018.
6. Development of geomechanical screening tools to identify risk: an experimental and modeling approach for secure CO₂ storage, Department of Energy, September 2014-August 2017.