NICHOLAS J. DYGERT

Department of Earth and Planetary Sciences, University of Tennessee, Knoxville, TN 37996
ndygert1@utk.edu | (865) 974 6022 | https://dygert.utk.edu/ | 477 Citations | h-index = 12

Research Interests

Using experiments, analyses of natural materials, numerical models, and field observations to understand dynamic processes in planetary interiors and crusts. Petrogenesis and high-temperature geochemistry. Melt migration and melt-rock reaction. Rheological properties of minerals and melts, two phase flow. Silicate and oxide-melt trace element partitioning. Planetary science.

Academic Appointments

2019 – Present **Larry and Dawn Taylor Assistant Professor of Planetary Geosciences**
Department of Earth and Planetary Sciences, University of Tennessee, Knoxville

2017 – 2019 **Assistant Professor of Planetary Science**
Department of Earth and Planetary Sciences, University of Tennessee, Knoxville

2015 – 2017 **Distinguished Postdoctoral Fellow**
Department of Geological Sciences, Jackson School of Geosciences,
University of Texas at Austin
Mentors: Whitney M. Behr, Marc A. Hesse, Jung-Fu (Afu) Lin

Academic Preparation

2015 **Ph.D.,** Brown University
Experimental petrology, geochemistry, rock deformation
Advisors: Yan Liang and Greg Hirth; Committee: Steven W. Parman, E. Marc Parmentier, Peter B. Kelemen
Thesis: Experimental and field constraints on the physicochemical evolution of the terrestrial and lunar mantles

2007 **B.S.,** *cum laude*, University of Rochester
Major: Geochemistry, Minor: History
Advisors: Asish R. Basu and Carmala N. Garzione
Thesis: Petrochemistry of the Jayu Khota crater, Bolivian Altiplano

Publications

‡ indicates graduate student supervised by Dygert; † indicates undergraduate; § indicates postdoc

26. Wilbur, Z.E., Udry, A., McCubbin, F.M., Vander Kaaden, K.E., DeFelice, C., Ziegler, K., Ross, D.K., McCoy, T.J., Gross, J., Barnes, J.J., **Dygert**, N., Ziegler, R.A., Turrin, B.D., McCoy, C., 2022. The effects of highly reduced magmatism revealed through aubrites. *Meteoritics and Planetary Science*, doi:10.1111/maps.13823.
25. Ren, J., Hesse, M.A., §Lucas, M.P., **Dygert**, N.J., 2022. On the cooling rate evolution of asteroidal fragments. *Icarus*, doi:10.1016/j.icarus.2022.114905.
24. Kourim, F., Rospabé, M., **Dygert**, N., Chatterjee, S., Takazawa, E., Wang, K-L., Godard, M., Benoit, M., Giampoura, M., Teagle, D. A., Kelemen, P. B., Oman Drilling Project Phase 2 Science Party 2022. Melt/fluid-rock interaction beneath oceanic spreading centers: Insights from the geochemical characterization of the Oman Crust-Mantle transition zone, holes CM1A and CM2B. *Journal of Geophysical Research – Solid Earth* (Oman Drilling Project special issue), doi:10.1029/2021JB022694.
23. ‡Grambling, N.L., **Dygert**, N., †Boring, B., Jean, M.M., Kelemen, P.B., 2022. Thermal history of lithosphere formed beneath fast spreading ridges: Constraints from the Mantle Transition Zone of the East Pacific Rise at

Hess Deep and Oman Drilling Project, Wadi Zeeb, Samail ophiolite. *Journal of Geophysical Research – Solid Earth* (Oman Drilling Project special issue), doi:10.1029/2021JB022696.

22. ‡Mouser, M.D., **Dygert**, N., §Anzures, B.A., ‡Grambling, N.L., Hurbiak, R., Kono, Y., Shen, G., Parman, S., 2021. Experimental investigation of Mercury's magma ocean viscosity: Implications for the formation of Mercury's cumulate mantle, its subsequent dynamic evolution, and crustal petrogenesis. *Journal of Geophysical Research – Planets*, doi:10.1029/2021JE006946.
21. Kourim, F., Wang, K.-L., Beinlich, A., Chieh, C.-J., **Dygert**, N., Lafay, R., Kovach, V., Michibayashi, K., Yarmolyuk, V., Izuka, Y., 2021. Metasomatism of the off-cratonic lithospheric mantle beneath Hangay Dome, Mongolia: Constraints from trace-element modelling of lherzolite xenoliths. *Lithos*, doi:10.1016/j.lithos.2021.106407.
20. Moriarty, D.P., **Dygert**, N., Valencia, S.N., Watkins, R.N., Petro, N.E., 2021. The Search for Lunar Mantle Rocks Exposed on the Surface of the Moon. **Invited review** for *Nature Communications*, doi:10.1038/s41467-021-24626-3.
19. Moriarty, D.P., Watkins, R.N., Valencia, S.N., Kendall, J.D, Evans, J.A., **Dygert**, N., Petro, N.E., 2021. Evidence for a stratified upper mantle preserved within the South Pole Aitken Basin. *Journal of Geophysical Research – Planets*, doi:10.1029/2020JE006589.
18. Tokle, L., Hirth, G., Raterron, P., Liang, Y., **Dygert**, N., 2021. The effect of pressure and Mg-content on ilmenite rheology: Implications for lunar cumulate mantle overturn. *Journal of Geophysical Research – Planets*, doi:10.1029/2020JE006494.
17. §Lucas, M., **Dygert**, N., Ren, J., Hesse, M., Miller, N., McSween, H., 2020. Evidence for early fragmentation-reassembly of ordinary chondrite (H, L, and LL) parent bodies from REE-in-two-pyroxene thermometry. *Geochimica et Cosmochimica Acta*, doi:10.1016/j.gca.2020.09.010.
16. **Dygert**, N., Draper, D., Rapp, J., Lapen, T., Fagan, A. Neal, C.R., 2020. Experimental determinations of trace element partitioning between plagioclase, pigeonite, olivine and lunar basaltic melts and an fO_2 dependent model for plagioclase-melt Eu partitioning. *Geochimica et Cosmochimica Acta*, doi:10.1016/j.gca.2020.03.037.
15. Zhang, Y., Nelson, P., **Dygert**, N., Lin, J.F., 2019. Fe alloy slurry and a compacting cumulate pile across Earth's inner-core boundary. *Journal of Geophysical Research – Solid Earth*, doi:10.1029/2019JB017792.
14. Li, H., Zhang, N., Liang, Y., Wu, B., **Dygert**, N., Huang, J., Parmentier, E.M., 2019. Lunar Cumulate Mantle Overturn: A New Model Constrained by Ilmenite Rheology. *Journal of Geophysical Research – Planets*, doi:10.1029/2018JE005905.
13. **Dygert**, N., Bernard, R.E., Behr, W.M., 2019. Great Basin mantle xenoliths record deformation associated with active lithospheric downwelling. *Geochemistry, Geophysics, Geosystems*, doi:10.1029/2018GC007834.
12. Catlos, E.J., †Pease, E.C., **Dygert**, N., Brookfield, M., Bhutani, R., Pandle, K., Schmitt, A., 2019. Nature, age, and emplacement of the Spongtang ophiolite, Ladakh, NW India., *Journal of the Geological Society of London*, doi:10.1144/jgs2018-085.
11. **Dygert**, N., Jackson, C.R.M., Hesse, M.A., Tremblay, M.M., Shuster, D.L., †Gu, J.T., 2018. Plate tectonic cycling modulates Earth's $^{3}He/^{22}Ne$ ratio. *Earth and Planetary Science Letters*, doi:10.1016/j.epsl.2018.06.044.
10. **Dygert**, N., Marshall, E., Lin, J.F., Kono, Y., Gardner, J., 2017. A low viscosity lunar magma ocean forms a stratified anorthitic flotation crust with mafic poor and rich units. *Geophysical Research Letters*, doi:10.1002/2017GL075703.
9. **Dygert**, N., Kelemen, P., Liang, Y., 2017. Spatial variations in cooling rate in the mantle section of the Samail ophiolite in Oman: Implications for formation of lithosphere at mid-ocean ridges. *Earth and Planetary Science Letters*, doi:10.1016/j.epsl.2017.02.038.
8. Zhang, N., **Dygert**, N, Liang, Y., Parmentier, M., 2017. The effects of ilmenite viscosity on the dynamics and evolution of an overturned lunar cumulate mantle. *Geophysical Research Letters*, doi: 10.1002/2017GL073702.
7. **Dygert**, N., Liang, Y., Kelemen, P., 2016. Formation of plagioclase lherzolite and associated dunite-harzburgite-lherzolite sequence by multiple episodes of melt percolation and melt-rock reaction: An example from Trinity ophiolite. *Journal of Petrology*, doi:10.1093/petrology/egw018.

6. **Dygert**, N., Hirth, G., Liang, Y., 2016. A flow law for ilmenite in dislocation creep: Implications for lunar cumulate mantle overturn. *Geophysical Research Letters*, doi:10.1002/2015GL066546.
5. Wang, C., Liang, Y., **Dygert**, N., Xu, W., 2016. Formation of orthopyroxenite by reaction between peridotite and hydrous basaltic melt: An experimental study. *Contributions to Mineralogy and Petrology*, doi:10.1007/s00410-016-1287-z.
4. **Dygert**, N. and Liang, Y., 2015. Temperatures and cooling rates recorded in REE in coexisting pyroxenes in ophiolitic and abyssal peridotites. *Earth and Planetary Science Letters*, doi:10.1016/j.epsl.2015.02.042.
3. **Dygert**, N., Liang, Y., Sun, C., Hess, P., 2014. An experimental study of trace element partitioning between augite and Fe-rich basalts. *Geochimica et Cosmochimica Acta*, doi:10.1016/j.gca.2014.01.042.
2. Wang, C.G., Liang, Y., Xu, W.L., **Dygert**, N., 2013. Interaction between pyroxenite-derived melt and peridotite: laboratory dissolution experiments with applications to mineral compositional variations in mantle xenoliths from the North China Craton. *Contributions to Mineralogy and Petrology*, doi:10.1007/s00410-013-0938-6.
1. **Dygert**, N., Liang, Y., Hess, P., 2013. The importance of melt TiO_2 in affecting high field strength element partitioning between Fe-Ti oxides and lunar picritic glass melts. *Geochimica et Cosmochimica Acta*, doi:10.1016/j.gca.2012.12.005.

Manuscripts in Revision

§Lucas, M.P., **Dygert**, N., Ren, J., Hesse, M.A., Miller, N.R., McSween, H.Y. Thermochemical evolution of the acapulcoite-lodranite parent body: Evidence for fragmentation-disrupted partial differentiation. *Meteoritics and Planetary Science*.

Manuscripts in Review

‡Ji, D., **Dygert**, N. Trace element evidence for serial processing of the lunar flotation crust and a depleted bulk Moon.

Submitted Manuscripts

Dygert, N., Ustunisik, G.K., Nielsen, R.L. Europium in plagioclase reveals mantle melting modulates oxygen fugacity.

Manuscripts in Preparation

Ren, J., Hesse, M.A., §Lucas, M.P., **Dygert**, N.J. Model for asteroid thermal evolution with fragmentation and reassembly.

‡Mouser, M.D., **Dygert**, N. On the potential for cumulate mantle overturn in planet Mercury.

‡Mouser, M.D., **Dygert**, N. Structural characterization of reduced, Fe-free silicate melts utilizing multi-angle energy-dispersive X-ray diffraction and Raman spectroscopy.

‡Grambling, N.L., Tokle, L., **Dygert**, N., Hirth, G., Liang, Y. Rheological and microstructural analysis of ilmenite-olivine aggregates deformed in shear: Implications for lunar mantle convection.

Grambling, T.A., Jessup, M.J., **Dygert**, N., Newell, D.L., ‡Grambling, N.L., Hiett, C.D. Protracted magmatism and variable crustal thickness leading into synconvergent extension above the Peruvian flat slab.

Unrefereed Publications and White Papers

Neal, C., Pieters, C., Abbud-Madrid, A., Burns, J., Donaldson Hanna, K., **Dygert**, N., et al., 2021. Long-Term Commitment to Explore and Sustain our Earth-Moon Environment. Planetary Science and Astrobiology Decadal Survey 2023-2032 White Paper 401, *Bulletin of the American Astronomical Society*, doi:10.3847/25c2cfeb.200ff1a8.

Kelemen, P.B., Matter, J.M., Teagle, D.A.H, Coggon, J.A. and the **Oman Drilling Project Science Team**, 2021. Site CM2: Crust-Mantle Transition Zone and into upper mantle. In: *Proceedings of the Oman Drilling Project*, doi:10.14379/OmanDP.proc.2020.

Dygert, N., 2020. Exploration of lunar dynamic evolution using samples returned from the lunar South Pole. *Artemis Science Definition Team White Papers*, #2085.

Lassiter, J., **Dygert**, N., et al., 2016. What makes a planet "habitable" for the long haul? *UT Austin 'Bridging Barriers' program*.

Conference Abstracts

‡Mouser, M.M., **Dygert**, N., 2022. From magma ocean to crust: Understanding Mercury's internal evolution and subsequent crustal formation through experiments and models. GSA Fall Meeting, #376941.

§Anzures, B.A., McCubbin, F.M., **Dygert**, N., Barnes, J.J, Boyce, J.W., 2022. Elucidating the origin and evolution of winonaite and IAB iron meteorite parent bodies through application of silicate geospeedometry and apatite characterization. *85th Meteoritical Society Meeting* (submitted).

†Hooper, N.J., **Dygert**, N., Hrubiak, R., Monteleone, B.D., §Anzures, B.A., 2022. Experimental evidence for liquid iron alloy flotation on silicate melt. *Lunar and Planetary Science Conference, LIII*, #2724.

‡Grambling, N.L., Tokle, L., **Dygert**, N., Hirth, G., Chin, E., Liang, Y., Meyers, C., 2022. Rheological and microstructural investigation of ilmenite-olivine aggregates deformed in shear: Implications for lunar mantle cumulate overturn. *Lunar and Planetary Science Conference, LIII*, #2673.

§Anzures, B.A., **Dygert**, N., §Lucas, M.P., 2022. Thermochemical evolution of the Winonaite and IAB iron meteorite parent body. *Lunar and Planetary Science Conference, LIII*, #2696.

Ren, J., Hesse, M.A., Lucas, M.P., **Dygert**, N., 2022. Constraints on thermal evolution of asteroid fragments from high temperature cooling rates. *Lunar and Planetary Science Conference, LIII*, #2266.

‡Ji, D., **Dygert**, N., 2022. Serial processing after lunar anorthositic crust formation indicated by rare earth elements in plagioclase. *Lunar and Planetary Science Conference, LIII*, #1229.

‡Mouser, M.D., **Dygert**, N., 2022. Clinopyroxene-melt trace element partitioning in Fe- and Al-rich basaltic systems: Application to Nakhlite Petrogenesis. *Lunar and Planetary Science Conference, LIII*, #1100.

‡Scholpp, J.L., **Dygert**, N., 2022. Hybridization of the Lunar Mantle: Insights from Melt-Rock Reaction Experiments. *Lunar and Planetary Science Conference, LIII*, #1015.

Moriarty, D.P., Petro, N.E., Watkins, R.N., Valencia, S.N., Kendall, J.D., **Dygert**, N., Kean, J.T., 2021. Ancient lunar mantle ejecta preserved on the lunar farside. LPI Lunar Surface Science Workshop, #8022.

Grambling, T.A., Jessup, M.J., **Dygert**, N., Newell, D.L., ‡Grambling, N.L., Hiett, C., 2021. Over dispersion of zircon crystallization ages in the Cordillera Blanca batholith, Central Peru: Lead loss or prolonged magmatism and protracted crystallization? AGU Fall Meeting, V15A-0082.

Dygert, N., Ustunisik, G.K., Lewis, K., Nielsen, R.L., 2021. Application of a Eu-in-plagioclase-melt oxybarometer to phenocryst-host pairs and melt inclusions in MORBs reveals resolvable heterogeneity in oxygen fugacity. AGU Fall Meeting, DI23A-07.

Ren, J., **Dygert**, N., §Lucas, M.P., Hesse, M.A., McSween, H.Y., 2021. Rapid cooling of H, L, and LL chondrites and lodranite meteorites suggests collisional fragmentation of their parent bodies at peak or near-peak temperatures and long (10s-10,000s y) reassembly timescales. AGU Fall Meeting, DI35E-0092.

‡Ji, D., **Dygert**, N., 2021. Eu anomalies in lunar plagioclase reflect secondary processing by subsolidus reequilibration and introduction of a KREEP component. *Goldschmidt Conference*, #3219.

Parman, S., Anzures, B., Cukjati, J., Cooper, R., **Dygert**, N., Mouser, M., Ohldag, H., 2021. Silicon Bonding in Mercury's Magmas. *Mercury Exploration Analysis Group Meeting*, #6029.

§Lucas, M.P., **Dygert**, N., Miller, N.R., McSween, H.Y., 2021. New Major and Trace Element Data from Acapulcoite-Lodranite Clan Meteorites: Evidence for Melt-Rock Reaction Events and Early Collisional Fragmentation of the Parent Body. *Lunar and Planetary Science Conference, LII*, #1307.

‡Mouser, M.D., **Dygert**, N., 2021. Gravitational Instabilities in Mercury's Mantle Produce Diverse Volcanic Source Regions. *Lunar and Planetary Science Conference, LII*, #1482.

Ren, J., Hesse, M.A., §Lucas, M.P., **Dygert**, N., 2021. Asteroid Thermal Evolution with Fragmentation and Reassembly into a Rubble Pile. *Lunar and Planetary Science Conference, LII*, #2620.

Dygert, N., ‡Ji, D., Fagan, A.L., Neal, C.R., Draper, D.S., Rapp, J.F., Lapen, T.J., 2021. Petrogenesis of and Subsolidus Reequilibration within Lunar Ferroan Anorthosites: Two Demonstrations of a New fO_2-Dependent Model for Plagioclase-Melt Europium Partitioning. *Lunar and Planetary Science Conference, LII*, #2352.

‡Mouser, M.D., **Dygert**, N., Anzures, B.A., ‡Grambling, N.L., Hrubiak, R., Kono, Y., Shen, G., Parman, S.W., 2020. Viscosity of the Mercurian magma ocean: Implications for the Mineralogical Stratigraphy of Mercury's Juvenile Mantle and Crustal Petrogenesis. AGU Fall Meeting, P088-05.

§Lucas, M.P., **Dygert**, N., Ren, J., Hesse, M.A., Miller, N.R., McSween, H.Y., 2020. Evidence for fragmentation-reassembly of ordinary chondrite (H, L, and LL) parent bodies from REE-in-two pyroxene thermometry. GSA Fall Meeting, #354714.

‡Grambling, N.L., Boring, B., **Dygert**, N., Jean, M.M., 2020. Emplacement and cooling of the lower crust and upper mantle beneath two fast spreading ridge segments: A quantitative comparison of crustal gabbros and mantle peridotites from Oman Drilling Project site CMA-1 and IODP Expedition 345 – Hess Deep, AGU Fall Meeting, V020-0002.

Ren, J., Hesse, M.A., §Lucas, M.P., **Dygert**, N., 2020. Asteroid thermal evolution with fragmentation and reassembly into a rubble pile. AGU Fall Meeting, P032-0004.

§Lucas, M.P., **Dygert**, N., Miller, N.R., McSween, H.Y., 2020. An application of REE-in-two-pyroxene thermometry to primitive achondrites: Illuminating the thermal histories of partially differentiated asteroids. *Lunar and Planetary Science Conference, LI,* #2699.

‡Mouser, M.D., **Dygert**, N., Hrubiak, R., Kono, Y., Shen, G., Anzures, B.A., ‡Grambling, N.L., Parman, S.W., 2020. Viscosity of the Mercurian magma ocean: Implications of sulfur-free and sulfur-bearing magma oceans for differentiation and crustal petrogenesis. *Lunar and Planetary Science Conference, LI,* #2098.

Dygert, N., Bernard, R.E., Behr, W.M., 2020. Strain localization and dynamic weakening within Rayleigh-Taylor instabilities: Insights from a terrestrial instability and implications for lunar cumulate mantle overturn. *Lunar and Planetary Science Conference, LI,* #1165.

†Hicks, T., **Dygert**, N., 2020. Exploring the Tectonic Controls on Thermal History of the Mantle Lithosphere of the Southwest of North America using Xenolith Geochemistry. Southeastern GSA Meeting, #344576.

‡Grambling, N.L., Tokle, L., **Dygert**, N., Hirth, G., Liang, Y., 2019. Rheological and microstructural analysis of ilmenite-olivine aggregates deformed in shear: Implications for lunar mantle convection. AGU Fall Meeting, MR51B-0057.

†Boring, B., **Dygert**, N., Harvey, R., Smye, A., 2019. Lithospheric Xenoliths Record Thermal and Magmatic Signature of Rift Development Beneath Ross Island, Antarctica. AGU Fall Meeting, V51F-0116.

Dygert, N., McCanta, M.C., 2019. Application of a new Eu-in-plagioclase-melt oxybarometer to MORBs and arc magmas. AGU Fall Meeting, V23B-04.

§Lucas, M.P., **Dygert**, N., Miller, N.R., McSween, H.Y., 2019. Evidence for fragmentation-reassembly of ordinary chondrite (H, L, and LL) parent bodies from REE-in-two pyroxene thermometry. AGU Fall Meeting, V51F-0115.

‡Mouser, M.D., **Dygert**, N., ‡Grambling, N.L., Anzures, B.A., Kono, Y., Shen, G., Parman, S., 2019. Viscosity of the Mercurian magma ocean: Implications for crystal fractionation and crustal petrogenesis. *Lunar and Planetary Science Conference, L,* #2030.

§Lucas, M.P., **Dygert**, N., Patchen, A.D., Miller, N.R., McSween, H.Y., 2019. An application of REE-in-two-pyroxene thermometry to H Chondrites: Evidence for early fragmentation-reassembly of the H Chondrite parent body. *Lunar and Planetary Science Conference, L,* #2495.

Dygert, N., Liang, Y., Hirth, G., Zhang, N., 2019. Viscous flow of ilmenite-bearing cumulates during lunar magma ocean solidification: Consequences for lunar evolution. *Lunar and Planetary Science Conference, L,* #2798.

Dygert, N., Bernard, R.E., Behr, W.M., 2018. Xenolith constraints on deformation conditions and mechanisms in lithospheric Rayleigh-Taylor instabilities. AGU Fall Meeting, MR41A-05 (**invited**).

‡Grambling, N.L., **Dygert**, N., Jean, M.M., 2018. Rapid cooling of the crust and mantle at Hess Deep is consistent with the Sheeted Sill model for accretion of oceanic crust, AGU Fall Meeting, V11B-05.

Python, M, Kopke, J., Payot, B.D., Guotana, J.-M., **Dygert**, N., ‡Grambling, N., Johnson, K.T.M., Park, G., Teagle, D.A.H., Takazawa, E., 2018. Drilling the crust-mantle transition at Oman Drilling Project sites CM1 and CM2. AGU Fall Meeting, V13E-0144.

Kourim, F., Rospabé, M., Giampouras, M., Chatterjee, S., Ishii, K., Tamura, A., **Dygert**, N., Oyangi, R., Wang, K.-L.., Benoit, M., Teagle, D.A.H., Takazawa, E., Kelemen, P.B., Coggon, J.A., 2018. First geochemical and mineralogical results of Oman crust-mantle transition: Holes CM1A and CM2B characterization aboard DV-Chikyu, Oman Drilling Project, Phase 2 Leg 3. AGU Fall Meeting, V13E-0166.

Dygert, N., Jackson, C.R.M., Hesse, M.A., Tremblay, M.M., Shuster, D.L., †Gu, J.T., 2018. Plate tectonic cycling modulates Earth's $^{3}He/^{22}Ne$ ratio, AGU Fall Meeting, V11G-0090.

Dygert, N., Bernard, R.E., Behr, W.M., 2018. Mantle xenoliths record deformation associated with active lithospheric downwelling beneath central Nevada. Southeast GSA Meeting, #312076.

Dygert, N., Patchen, A.D., Miller, N.R., McSween, H.Y., 2018. An application of REE-in-two-pyroxene thermometry to LL Chondrites: Evidence for multistage metamorphism and a rubble pile parent body. *Lunar and Planetary Science Conference, XLIX*, #1750.

†Pease, E., **Dygert**, N., Catlos, E.J., Brookfield, M., 2017. Timing of obduction, tectonic affinity, and cooling history of the Spongtang ophiolite, Northwest India, Himalaya. GSA Fall Meeting, #85-12.

Dygert, N., Bernard, R., Behr, W., 2017. Great Basin mantle xenoliths record deformation associated with active lithospheric downwelling. AGU Fall Meeting, DI22A-02.

Dygert, N., Liang, Y., 2017. REE and isotopic compositions of lunar basalts demonstrate partial melting of hybridized mantle sources after cumulate overturn is required. AGU Fall Meeting, V14B-03, (**invited**).

Dygert, N., Liang, Y., Kelemen, P.B., 2017. Formation of dunite-harzburgite-lherzolite-plagioclase lherzolite sequences by multiple episodes of melt migration and melt-rock reaction. *27th Goldschmidt Conference* (**invited**).

Dygert, N., Lin, J.F., Marshall, E., Kono, Y., Gardner, J., 2017. Viscosity and structure of a late lunar magma ocean liquid: Implications for the purity of ferroan anorthosites and the partially molten layer around the core. *Lunar and Planetary Science Conference, XLVII*, #2421.

Tokle, L., Hirth, G., Raterron, P., **Dygert**, N., Liang, Y., Holyoke, C., 2017. The pressure and Mg# dependence of ilmenite and ilmenite-olivine aggregate rheology: Implications for lunar cumulate mantle overturn. *Lunar and Planetary Science Conference, XLVII*, #2070.

†Pease, E., **Dygert**, N., Catlos, E.J., Brookfield, M., 2017. New geochemical and thermochronologic constraints on the tectonic affinity, cooling history, and timing of obduction of the Spongtang ophiolite, northwest India. GSA South Central Meeting, #289437.

†Gu, J.T., **Dygert**, N., 2017. $^{3}He/^{22}Ne$ variations among ocean island, mid-ocean ridge, and backarc basalts. GSA South Central Meeting, #289252.

Dygert, N., Jackson, C.R.M., Hesse, M., Tremblay, M., Shuster, D., Gu, J., 2016. Plate tectonic cycling and whole mantle convection modulate Earth's $^{3}He/^{22}Ne$ ratio. AGU Fall Meeting, D11A-2343.

Lin, J.F., **Dygert**, N., Marshall, E., Kono, Y., Gardner, J., 2016. Viscosity and structure of a late lunar magma ocean liquid: Implications for the purity of ferroan anorthosites and the dynamics of a crystallizing magma ocean. AGU Fall Meeting, V41A-3115.

Tokle, L., Hirth, G., Raterron, P., Holyoke, C., **Dygert**, N., 2016. The role of ilmenite content on the rheology of olivine aggregates. AGU Fall Meeting, MR23A-2673.

Li, H., Zhang, N., **Dygert**, N., 2016. Revisit the lunar overturn model with ilmenite rheology experiment results. AGU Fall Meeting, DI33A-08.

Dygert, N., Kelemen, P., Liang, Y., 2015. A gradient in cooling rate beneath the Moho at the Oman ophiolite: Fresh insights into cooling processes beneath mid-ocean ridges from REE thermometry. AGU Fall Meeting, V11E-02 (**invited**).

Tokle, L., **Dygert**, N., Liang, Y., Hirth, G., 2015. Rheology of ilmenite-bearing dunite: A weak phase in a strong matrix. AGU Fall Meeting, MR21C-2627.

Liang, Y., Sun, C., Yao, L., **Dygert**, N., Wang, C., 2015. Some remarks on the interpretation of the REE-in-two-mineral thermobarometers. AGU Fall Meeting, V13A-3093.

Dygert, N., Jackson, C.R.M., Hesse, M., 2015. The role of plate tectonic cycling in modulating Earth's $^{3}He/^{22}Ne$ ratio. *25th Goldschmidt Conference*, #2628.

Dygert, N., Hirth, G., Liang, Y., 2015. Rheology of ilmenite and ilmenite-olivine aggregates: Implications for lunar cumulate mantle overturn. *Lunar and Planetary Science Conference, XLVI*, #2058.

Dygert, N. and Liang, Y., 2014. A possible difference in cooling rates recorded in REE in coexisting pyroxenes in peridotites from ophiolites and mid-ocean ridges. *Sixth International Lherzolite Conference, Marrakech*.

Dygert, N. and Liang, Y., 2014. Decoupling among trace elements and Ni during melt migration and melt-rock reaction in the mantle: An example from a dunite-harzburgite-lherzolite sequence from Trinity Ophiolite. *Sixth International Lherzolite Conference, Marrakech*.

Dygert, N., Liang, Y., Kelley, K., 2013. A possible difference in cooling rates recorded in REE in coexisting pyroxenes in peridotites from supra-subduction ophiolites and mid-ocean ridges. AGU Fall Meeting, T11A-2412.

Liang, Y., Wang, C., Saper, L., **Dygert**, N., Xu, W., 2013. Melt-rock reaction in the asthenospheric mantle: Perspectives from laboratory dissolution experiments. AGU Fall Meeting, V23D-03.

Dygert, N., Liang, Y., Hess P., 2013. An experimental study of REE and other trace element partitioning between augite and Fe-rich basalts: A parameterized model for planetary applications. *Lunar and Planetary Science Conference, XLIV*, #1582.

Dygert, N., Meyers, C., Hirth, G., Liang, Y., 2013. Weakness of ilmenite revealed by new rheological measurements with implications for lunar cumulate mantle overturn. *Lunar and Planetary Science Conference, XLIV*, #1591.

Dygert, N., Liang, Y., Hess, P., 2012. The effect of melt TiO_2 on Fe-Ti oxide-picritic basalt HFSE partitioning: parameterized models, lunar applications. *Lunar and Planetary Science Conference, XLIII*, #2033.

Dygert, N., Liang, Y., Kelemen, P., 2011. Trace element abundances in pyroxenes from a dunite-harzburgite-lherzolite sequence at the Trinity ophiolite: Evidence for multiple episodes of melt migration and melt-rock reaction. AGU Fall Meeting, V31-D2557.

Dygert, N. and Liang, Y., 2011. Experimental evidence for high field strength incompatibility in titaniferous phases in equilibrium with high titanium mare basalts and picritic glass melts. *Lunar and Planetary Science Conference, XLII*, #1956.

Dygert, N. and Liang, Y., 2010. Compaction driven melt localization in dunites and associated rocks in the mantle: Field observations and numerical experiments. AGU Fall Meeting, T23A-2229.

Yao, L., **Dygert**, N., Peterson, M., Sun, C., Wetzel, D., Liang, Y., 2010. "A bundle of columns" model for trace element fractionation during melting and melt migration in a vertically upwelling, chemically and lithologically heterogeneous mantle. AGU Fall Meeting, V11A-2258.

Funding:

Active: $1,082,285 in research; $343,456 in outreach
Awarded to date: $1,295,035 in research; $343,456 in outreach

Proposals in preparation

CAREER: Toward reconciling oxygen fugacity in Earth's oceanic mantle and crust: New insights from development and application of experimentally calibrated Eu-based oxybarometers
To be submitted to the NSF Marine Geology and Geophysics Program

Experimental investigation of lunar mantle rheology: Critical parameters for understanding cumulate mantle overturn and the thermochemical evolution of the Moon
To be submitted to the NASA Solar System Workings Program
Co-PI with Greg Hirth (PI), Yan Liang.

Submitted proposals

Petrogenesis of basalt lavas from the Tristan and Gough hotspot: Insights from mineral and melt inclusion chemistry
United States Science Support Program (on contract from NSF), Request: $17,991 to PI Dygert; Science PI PhD student J. Scholpp

Research (Active)

2022 **Participation of Jesse Scholpp on IODP Expedition 391**
United States Science Support Program (on contract from NSF)
$6,426 to PI Dygert; Science PI PhD student J. Scholpp

2021 – 2024 **Collaborative Research: Magmatic and Mechanical Extension of the Challenger Deep Forearc Segment: Insights into Subduction Initiation**

NSF OCE Marine Geology and Geophysics Program, $122,481 to Co-I Dygert; PI Bob Stern (UT Dallas)

2020 – Present **Oak Ridge National Laboratory / University of Tennessee Science Alliance**
$29,349.

2020 – 2023 **Experimental geochemistry and model constraints on lunar mantle dynamics**
NASA Solar System Workings Program, $261,128
PI Dygert.

2018 – 2023 **New constraints on thermal evolution, thermal structure, and magmatism on asteroids: Application of a REE-in-two pyroxene thermometer to meteorites and development of next-generation thermal models,** and a **post-COVID19 Funded Extension request**
NASA SMD Post-COVID Recovery Program, $110,907 to PI Dygert;
NASA Solar System Workings Program, $329,619 total; $254,734 to PI Dygert; Co-PIs Harry Y. McSween, Marc A. Hesse.

2017 – 2022 **Rheology of an evolving lunar mantle: New experimental constraints and generalized mantle viscosity models.**
NASA Solar System Workings Program, $222,375 to Dygert
Co-PI with Greg Hirth (PI), Yan Liang.

Outreach (Active)

2020 – 2024 **University of Tennessee Space Outreach Activities in East Tennessee**
NASA Space Grant Program, $326,556 + $16,900 in augmentations
Institutional PI Dygert (Lead PI A. Strauss, Vanderbilt)

Research (Completed)

2021 **Geochemical Interaction between CO_2 and Caprock for Safe Carbon Sequestration**
University of Tennessee Institute for a Secure & Sustainable Environment (ISSE), $45,000, Co-I with Khalid Alshibli (PI).

2015 – 2017 **Melt migration dynamics revealed by two-dimensional geochemical mapping of tabular dunites at the Bay of Islands Ophiolite, Newfoundland**
Jackson School of Geosciences Distinguished Postdoctoral Fellowship, $140,000

2016 **Effective viscosity of planetary mantles: Developing predictive models from experimental observations**
Jackson School of Geosciences Seed Grant, $13,750
Co-I with Whitney Behr

2014 **International Travel Grant**
6th Lherzolite Conference, Marrakech, $2,000
Dissertation Fellowship
Brown University

2012 – 2013 **Rheology of ilmenite and ilmenite-bearing harzburgite**
Rhode Island Space Grant Graduate Fellowship, ~$12,000

Honors

2020 **A Most Downloaded Paper in 2019:** Journal of Geophysical Research – Solid Earth

2019 **Endowment: Larry and Dawn Taylor Professorship in Planetary Geosciences**

2019 **Outstanding Teacher Award**, University of Tennessee Geoclub
For commitment to service as an educator and mentor to both graduate and undergraduate students

2015 **Dissertation Prize**, Sigma Xi, Brown Chapter

2014 **Distinguished Postdoctoral Fellowship**, University of Texas at Austin

2012 **Rhode Island Space Grant Graduate Fellowship**

2012 **Inducted into Sigma Xi**

2008	**Admirable Apexian** (nominated)
2007	**McNair Fellowship**, Florida International University
2007	**B.S. awarded with High Distinction and High Honors in Research** University of Rochester
2007	**Inducted into Sigma Gamma Epsilon** (Earth Science honor society)
2003 – 2007	**Dean's List 7/8 eligible semesters** University of Rochester

Teaching Experience

University of Tennessee, Knoxville

2019; 2022	**Geochemical Modeling (GEOL 490/590)** Three credits. Overall student evaluation 4.85 / 5 (2019; taught as an independent study for three students in 2022)
2017 – 2021	**Mineralogy (GEOL 310)** Four credits. Overall student evaluations 4.53; 4.70; 4.45; 4.48; 4.52 / 5 (2017; 2018; 2019; 2020; 2021)
2018 – 2021	**Scientific Presentations (GEOL 596)** One credit. Overall student evaluations 4.46; 4.19; 4.43; 4.36 / 5 (2018; 2019; 2020; 2021)
2021	**New Views of the Moon (GEOL 630)** Three credit graduate-level seminar. Overall student evaluation 4.78 / 5
2020	**Exploring the Planets (GEOL 104)** Four credit introductory course. Overall student evaluation 3.80 / 5

University of Texas at Austin

2016	**Guest Lecture**, Experimental Methods in Structural Geology

Brown University

2014	**Mineralogy** Teaching Assistant Overall student evaluation 4.7 / 5
2012	**Structural Geology** Teaching Assistant Overall student evaluation 4.8 / 5
2010	**Introductory Geology** Teaching Assistant Overall student evaluation 4.6 / 5

University of Rochester

2007	**Historical Geology** Teaching Assistant

Pedagogical, Professional, and Diversity, Equity and Inclusion Training

2021	University of Tennessee Safe Zone Training
2019	SERC Career Development Workshop for Early Career Geoscience Faculty
2019	University of Tennessee Initiative for the Future Faculty Mentoring Program
2018	University of Tennessee Strategies and Tactics for Recruiting to Improve Diversity and Excellence Training
2017	University of Tennessee New Faculty Teaching Institute
2016	SERC Preparing for an Academic Career in the Geosciences Workshop
2014	Sheridan Center for Teaching and Learning, Brown University Certificate I, Reflective Teaching

Invited Seminars

2022	Michigan State University (department seminar)

	Pennsylvania State University (department seminar)
	University of Mississippi (department seminar)
2021	South Dakota School of Mines and Technology (department seminar)
2020	Purdue University (department seminar)
	Fermilab (lab colloquium, canceled because of COVID-19)
	University of Chicago (department seminar)
2018	Case Western Reserve University (department seminar)
	University of Georgia (department seminar)
	Centre National de la Recherche Scientifique, Toulouse, France (Solid Earth group seminar)
2017	University of Tennessee, Knoxville (department seminar)
	Western Carolina University (department seminar)
2016	NASA, Johnson Space Center
	Southern Methodist University (department seminar)
2015	Institute for Geophysics, UT Austin (department seminar)
	Jackson School of Geosciences, UT Austin (department seminar)
	Rice University (department seminar)
	University of Texas at Arlington (department seminar)
2014	Geophysical Laboratory, Carnegie Institution of Washington
2013	Woods Hole Oceanographic Institution (marine geology group seminar)
	Massachusetts Institute of Technology (planetary group seminar)

Conference Talks

2021	AGU Fall Meeting, New Orleans
	52nd Lunar and Planetary Science Conference
2019	AGU Fall Meeting, San Francisco
	50th Lunar and Planetary Science Conference
2018	AGU Fall Meeting, Washington DC (**invited**)
	67th GSA Southeast Section Meeting, Knoxville
	49th Lunar and Planetary Science Conference
2017	AGU Fall Meeting, New Orleans (two talks; one **invited**)
	27th Goldschmidt Conference, Paris (**invited**)
	48th Lunar and Planetary Science Conference
2015	AGU Fall Meeting, San Francisco (**invited**)
	25th Goldschmidt Conference, Prague
	46th Lunar and Planetary Science Conference
2014	6th International Lherzolite Conference, Marrakech
2013	44th Lunar and Planetary Science Conference
2011	42rd Lunar and Planetary Science Conference

Field Experience

2023 (scheduled)	**Shipboard Co-Investigator for NSF-funded project, Collaborative Research: Magmatic and Mechanical Extension of the Challenger Deep Forearc Segment: Insights into Subduction Initiation** This expedition will sample mantle and crustal rocks from the Challenger Deep forearc by robotic submersible to observe thermal and geochemical signatures of subduction initiation. June 3rd-25th, 2023, Guam-Guam, aboard RV Thomas G. Thompson. Two UT graduate students under Dygert's supervision are expected to participate.
2018	**Oman Drilling Project core description, igneous team, Japan** Described primary drill core mineralogy and thin sections, calculated mineral modes, presented findings and coauthored igneous team report

	Oman Drilling Project coring operation, active serpentinization hole, Oman
	Described, scanned and processed serpentinized peridotite drill core
2016	**Lunar Crater volcanic field, central Nevada**
	Planned, organized and led a successful sampling campaign
	Bay of Islands ophiolite, Newfoundland
	Participated in a semester-long tectonics seminar culminating in a two-week field trip led by John Dewey and Jack Casey
2015	**Bohemian massif, Czech Republic**
	Sampled peridotite and eclogite xenoliths in Cenozoic alkaline volcanics
2014	**Beni Bousera peridotite, Morocco**
	Sampled massif peridotites in a traverse across the margin of the body
2011	**CRUML anorthosite belt, Charlevoix impact crater, Quebec**
	Planned, organized and led a week-long field trip with ~15 participants
2009	**Trinity and Josephine ophiolites, California**
	Located and sampled shear zones and pyroxenites
2006	**Jayu Khota Crater, Oruro Department, Bolivian Altiplano**
	Independently planned and conducted successful field campaign
2005	**Bolivian Altiplano and Yungas**
	Served as field assistant to Prof. Carmala Garzione sampling surface waters, paleosols and fossils

Beamtime Awards at National Laboratories

In Preparation

Beamline 12.3.2, Advanced Light Source. Request: 18 shifts

Completed

2021	**GUP-74737**: Beamline 16BM-B, Advanced Photon Source. Award: 6 shifts
2020	**GUP-69721**: Beamline 16BM-B, Advanced Photon Source. Award: 9 shifts
2019	**GUP-65862**: Beamline 16BM-B, Advanced Photon Source. Award: 15 shifts
2018	**GUP-59593**: Beamline 16BM-B, Advanced Photon Source. Award: 15 shifts
2018	**GUP-56580**: Beamline 16BM-B, Advanced Photon Source. Award: 12 shifts
2016	**GUP-46492**: Beamline 16BM-B, Advanced Photon Source. Award: 12 shifts

Professional and Industry Experience

2008 – 2009	**Environmental Scientist**, Apex Companies
2008	**Field Geologist**, McPhail Associates Geotechnical Consultants
2007	**IAESTE Intern**, Manipal Institute of Technology, Karnataka, India
	McNair Fellow, Florida Center for Analytical Electron Microscopy

Service

Recent manuscript reviews

2022	Science Advances (×2)
	Contributions to Mineralogy and Petrology
	Geochimica et Cosmochimica Acta
2021	Science Advances
	Journal of Geophysical Research – Solid Earth (×2)
	Geochimica et Cosmochimica Acta
	Geochemistry Geophysics Geosystems (×3)
2020	Journal of Petrology
	Journal of Geophysical Research – Solid Earth

	Physics and Chemistry of Minerals
	Journal of Geophysical Research – Planets (×2)
	Geochemistry Geophysics Geosystems (×2)
	Elements Magazine
2019	Nature Geoscience
	Science Advances
	Contributions to Mineralogy and Petrology
	Geochemistry Geophysics Geosystems
	Geochimica et Cosmochimica Acta (×2)
	Geochemical Perspectives Letters
	International Geology Review (×2)
	Journal of Geophysical Research – Planets
	Tectonics
2018	Earth and Planetary Science Letters (×2)
	Geochimica et Cosmochimica Acta (×2)
	Journal of the Geological Society of London
	Lithos
2017	Contributions to Mineralogy and Petrology
	Geology
	Lithos

Professional

2022	**Panelist**, NASA ROSES Program
2021	**Panelist**, NSF OCE Program
2017; 2019; 2021	**Session Chair**, Lunar and Planetary Science Conference
2017; 2019; 2021	**Judge**, AGU Outstanding Student Presentation Award
2016 – 2021	**External reviewer**, NASA ROSES Program (×7)
2021	**Session Convener**, Goldschmidt Conference, Lyon France *Chemical geodynamics throughout the Solar System — Combining insights from observations, experiments, analogues, and models*
2020	**Panelist**, NASA ROSES Program
2020	**Reviewer**, Internal Proposal at an EU Institution
2019	**Primary Session Convener**, AGU Fall Meeting *Rates and Timescales of Magmatic and Dynamic Processes: Insights from Thermobarometry and Geospeedometry*
2019	**Ad-hoc (external) reviewer**, NSF OCE Program (×2)
2018 – Present	**Secretary**, Geoconclave organizing committee
2018	**Panelist**, NASA ROSES Program
2018	**Lead Organizer**, Geoconclave Jamboree
2017	**Lunar and Planetary Science Conference Program Committee**
2015; 2019	**Judge**, Dwornik Award, Lunar and Planetary Science Conference
2015 – 2017	**Coordinator**, AGU Outstanding Student Paper Award, VGP Section
2015	**Primary Session Convener**, AGU Fall Meeting *Peridotite Records of Mantle Dynamics*

Departmental

University of Tennessee

2021 – Present	**Graduate Admissions and Program Committee Member**
2021	**Developed New Planetary Geoscience Concentration**
2021 – 2022	**Member of Search Committee** for Isotope Geochemist
2021	**Member of Search Committee** for Department Head

2021	**Attained Vol Core Engaged Inquiries Designation** for Mineralogy
2020 – Present	**Undergraduate Advisor**, Geology Concentration
2019 – Present	**PI and Director**, University of Tennessee, Knoxville Space Grant Consortium
2019 – Present	**Student Success (Discretionary Fund) Committee Member**
2019 – 2021	**Undergraduate Program Committee Member**
2019	**Member of Search Committee** for Isotope Geochemist
2019	**Judge**, EURēCA Undergraduate Research Symposium
2019	**Department Faculty Representative**, Geoconclave Jamboree
2017 – 2019	**Tennessee Space Grant Consortium Advisory Committee Member**
2017 – 2019	**Strong Hall Space Committee Member**
2018 – Present	**Co-Supervisor**, Scanning Electron Microscope (with M. McCanta)
2018	**Member of Search Committee** for Teaching Assistant Coordinator
2017 – Present	**Supervisor**, X-ray Diffractometer

Jackson School of Geosciences

2017	**Electron Microprobe Manager** (interim)
2016; 2017	**Judge**, Jackson School of Geosciences Research Symposium
2016	**Geoscience Leadership Organization for Women (GLOW) Scholarship Committee**
2015 – 2016	**Invited and hosted** three visiting seminar speakers

Brown University

2010 – 2012	**Electron Microprobe Manager** (interim)
2011	**Leader and Organizer** of graduate student field trip (Quebec)
2011	**Organizer** of the geochemistry seminar

Social Media — Dygert is active in science communication on the social media platform Twitter (@NickDygert). His posts focus on science, teaching, and outreach, and advocacy for his lab group and the Department of Earth and Planetary Sciences at the University of Tennessee.

Professional Affiliations

American Geophysical Union
Geochemical Society
Mineralogical Society of America
National Association of Geoscience Teachers

Advising and Mentoring

Graduated

Summer 2022	**Nadine Grambling** (PhD) Dissertation: Natural, Experimental, and Educational Explorations of the Interiors of Terrestrial Planetary Bodies (successfully defended, dissertation approved pending revisions)
Fall 2020	**Megan Mouser**, MS (Concurrent) Thesis: Experimental investigation of Mercury's magma ocean viscosity: Implications for the formation of Mercury's cumulate mantle, its subsequent dynamic evolution, and crustal petrogenesis

Current graduate advisees

2021 – Present	**Dian Ji** (MS track), physical evolution of the lunar anorthositic crust and cumulate mantle inferred from trace element geochemical modeling

2021 – Present	**Jena Samano** (MS track, co-advised with Molly McCanta), oxidation and thermal history of lithospheric mantle associated with rifting and plume-lithosphere interaction
2020 – Present	**Jesse Scholpp** (PhD track), experimental investigation of melt rock reaction in the lunar mantle, oxygen fugacity of basalts from Walvis ridge
2018 – Present	**Megan Mouser** (PhD track, transitioned from MS track in June 2019), Experimental investigation of magma ocean liquid properties and trace element fractionation during magma ocean solidification under high P-T conditions, defense to be held in Fall 2022.

Postdocs

2021	**Brendan Anzures**, Thermal-chemical-fO_2 evolution of the Winonaite and IAB iron meteorite parent body → Postdoctoral Research Associate, NASA Johnson Space Center
2018 – 2021	**Michael P. Lucas**, Thermal histories of H, L, LL, and acapulcoite-lodranite parent asteroids: evidence for collisional fragmentation-reassembly → Postdoctoral Research Associate, Notre Dame

Professional Staff

2019 – Present	**Robert Jacobsen**, PhD, Assistant Director, University of Tennessee Space Grant

Undergraduate research advisees at the University of Tennessee

Summer 2022	**Máté Garai**, Thermal history of asteroid Vesta (Máté is a visiting researcher from Sewanee)
2021 – 2022	**Noah Hooper**, Effective metal flotation on magma oceans → Graduate School, Brown University (PhD track)
2018 – 2021	**Beau Boring**, Dynamic evolution of lithosphere beneath Ross Island, Antarctica, Major element chemistry of peridotites from the Oman ophiolite, and Experimental Petrology → Graduate School, Brown University (PhD track)
2019 – 2021	**Taryn Hicks**, Thermal history and trace element geochemistry of mantle xenoliths from the southwest US → Graduate School, Auburn University (MS track)
2019 – 2020	**Kenley Prescher**, Trace element partitioning in Mercurian systems
2018 – 2019	**Joseph Nuttall**, Thermal and deformation history of mantle xenoliths from the southwest US → Geospatial Analyst, Wiser Consultants
Summer 2018	**Warren Eherenfried**, Thermal and deformation history of Siberian mantle xenoliths → GIS Consultant, Atmos Energy
Summer 2018	**Christopher Wilson**, Petrography and mineralogy of impactites from the Flynn Creek structure, Middle Tennessee → Environmental Scientist, Dallas Texas

Undergraduate research advisees at the University of Texas

Summer 2017	**Riley Winebarger**, High temperature low pressure piston cylinder experiments → Graduate School, Colorado School of Mines (MS track)
2016 – 2017	**Emily Pease**, Tectonic history of the Spongtang ophiolite → Graduate school, University of Texas at Austin (MS track)
2016 – 2017	**Jesse Gu**, $^{3}He/^{22}Ne$ systematics of oceanic basalts → Graduate School, Harvard (PhD track)

Undergraduate research advisee at Brown University

Summer 2013	**Reed Mershon**, Analytical methods in geochemistry, field geology, experimental petrology, rock deformation → Graduate School, Hebrew University of Jerusalem (PhD track)

Thesis committees (active)

2021 – Present	**Clarissa (CJ) Leight**, University of Tennessee, PhD advisor Molly McCanta
2021 – Present	**Jialong Ren**, Department of Geological Sciences, University of Texas at Austin, PhD advisor Marc A. Hesse
2020 – Present	**Kaitlyn Gauvey**, University of Tennessee, PhD advisor Linda Kah
2019 – Present	**Cole Nypaver**, University of Tennessee, PhD advisor Bradley Thomson

Thesis committees (completed)

2022	**Julie Coulombe**, University of Tennessee, MS advisor Molly McCanta
2022	**Carsen Adams**, University of Tennessee, MS advisor Micah Jessup
2022	**Tyler Grambling**, University of Tennessee, Knoxville, PhD advisor Micah Jessup
2022	**Micki Recchuiti**, University of Tennessee, MS advisor Molly McCanta
2021	**Corey Flynn**, University of Tennessee, MS advisor Micah Jessup
2021	**Robert Reid**, University of Tennessee, MS advisor Molly McCanta
2021	**Ammar Elhassan**, University of Tennessee, Knoxville, PhD advisor Z. John Ma (Civil Engineering)
2021	**Fiona Clark**, University of Cape Town, South Africa, MS advisor Phil Janney
2020	**Lucas McClure**, University of Tennessee, BS Honors thesis, advisor Sean Lindsay (Physics)
2020	**Hannah Teffeteller**, University of Tennessee, MS advisor Molly McCanta
2019	**Sarah Roberts**, University of Tennessee, PhD advisor Molly McCanta
2019	**Jennifer Harding**, Institute for Geophysics, University of Texas at Austin, PhD advisors Harm van Avendonk and Nick Hayman
2018	**Rachel Bernard**, University of Texas at Austin, PhD advisor Whitney Behr
2018	**Mathieu Rospabé**, Université Paul Sabatier, Toulouse France, PhD advisors Georges Culeneer and Patrick Pinet

Senior Design Projects

2020 – 2021	**Kah Choong, Kate Eikel, Cole Frantz, Noah Sloan**, Materials Science and Engineering, University of Tennessee. Co-supervised with Chris Wetteland, Kurt Sickafus. Design of a High-Temperature Vacuum Furnace for Replication of Chondrite Formation Conditions in Space

Graduate mentoring

2014; 2017	**Pamela Speciale**, University of Texas at Austin**,** Rock deformation in the Griggs apparatus; piston cylinder experiments and microanalysis.

Community Outreach

Assessed unknown materials for community members

2022	6 evaluations
2021	10 evaluations
2020	13 evaluations
2019	8 evaluations
2018	6 evaluations
2017	2 evaluations

Speaking engagements

2021	University of Tennessee Science Forum
2019	Knoxville Gem and Mineral Society
2018	Oak Ridge Isochronous Observation Network

2017	U. Texas Planetary Organization for Space Science and Exploration

Media releases

2021	**Moon's largest crater holds clues about early lunar mantle** https://eos.org/research-spotlights/moons-largest-crater-holds-clues-about-early-lunar-mantle
2020	**Chaotic early Solar System collisions resembled 'Asteroids' arcade game** https://www.jsg.utexas.edu/news/2020/12/chaotic-early-solar-system-collisions-resembled-asteroids-arcade-game/
2019	**Scientists find iron snow in Earth's core** https://www.jsg.utexas.edu/news/2019/12/scientists-find-iron-snow-in-earths-core/
2018	**Plate tectonics may have been active on Earth since the very beginning** https://www.eurekalert.org/pub_releases/2018-09/uota-ptm092618.php
2017	**Water in Earth's crust** https://www.jsg.utexas.edu/news/2017/11/water-in-the-earths-crust/
2017	**Moon's crust underwent resurfacing after forming from magma ocean** https://www.jsg.utexas.edu/news/2017/11/moons-crust-underwent-resurfacing-after-forming-from-magma-ocean/