

Jarek Trela

Curriculum Vitae

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Phone (Cell): (847) 565-9191
Citizenship: American

Education

2013-2017: Ph.D. Geosciences at Virginia Tech (VT), Blacksburg VA
2011-2013: M.S. Geology at Southern Illinois University (SIU), Carbondale IL
2007-2011: B.S. Geology at Illinois State University (ISU), Normal IL

Professional Experience

2021-present: Economic Geologist, Illinois State Geological Survey, Carbondale, IL
Research and mapping of REE, critical mineral, and fluorspar deposits in Illinois

2017-2021 Geologist, Brierley Associates Corporation, USA
Geologic mapping, mine reclamation, hydrogeology, tunneling, field-based investigations

2017 Postdoctoral Associate, Cornell University, Department of Earth and Atmospheric Sciences
Research on the Galapagos mantle plume, teaching, academic advisement

2016 Contract Laboratory Technician, Virginia Tech
Prepared/analyzed rock/mineral samples using XRF and LA-ICP-MS for clients

2013 Contract Geologist, Steffen, Robertson & Kirsten (SRK) Consulting, Philippines
Gold-copper exploration/feasibility study Mindanao, Philippines

2012 Contract Geologist, Steffen, Robertson & Kirsten (SRK) Consulting, Alaska
Gold exploration/feasibility study in Livengood, Alaska

2011 Geologist, Alta Drilling International, Salta, Argentina
Lithium exploration in the Salar del Rio Grande, NW Argentina

2008 Intern, Illinois State Geological Survey, Champaign IL
Seismic surveying to map the extent of the Mahomet aquifer, Illinois

Research Experience

2021-present *Geochemistry of REE-bearing Permian igneous rocks in the Illinois Basin*
Lead investigator at the Illinois State Geological Survey

2013-2017 *Geochemical and thermal evolution of the Galapagos mantle plume: From LIP to OIB*
PhD dissertation advised by Dr. Esteban Gazel, VT

2012-2017 *Geochemistry, mineralogy, and origin of Martian shergottite NWA 6963*
Collaboration with Dr. Justin Filiberto, SIU

2011-2013 *Magmatic accretion of superfast spread crust (ODP Hole 1256D)*
M.S. thesis advised by Dr. Eric C. Ferré, SIU

2010 *Geochronology and drainage patterns of volcanoclastic sediments, NW Wyoming*
Collaboration with Dr. David Malone, ISU

2008-2010 *Efficiency of constructed wetlands in removing nitrate from groundwater*
Undergraduate research project advised by Dr. Stephen Van der Hoven, ISU

2008-2010 *Analyzed samples to determine groundwater anion concentrations via ion chromatography*
Laboratory technician, The Nature Conservancy of Illinois, ISU

Teaching Experience

Volcanic Processes, Cornell (2017)	Field Mapping, VT (2017)
Field Mapping, VT (2016)	Volcanic Processes, VT (2015)
Volcanic Processes, VT (2014)	Physical Geology, VT (2013)
Structural Geology, SIU (2013)	History of the Earth, SIU (2012)
Structural Geology, SIU (2012)	History of the Earth, SIU (2011)

Field Experience

2021-present	Mapping and sampling critical mineral and fluorspar deposits in Southern Illinois and Kentucky
2017-2021	Subsurface geologic investigations throughout the United States for mining/tunneling projects
2016-2017	Instructed undergraduates on geologic field methods in the Appalachian Mountains, VT
2014	Field investigations of the Tortugal picrite suite in Costa Rica for dissertation, VT
2014	Field investigations basalts in the Azuero Peninsula, Panama for dissertation, VT
2013	Field investigations of the Mt. Maggiore ophiolite, Corsica, France, SIU
2013	Structural and tectonic studies of the Santa Rosa mountains, California, SIU
2012	Tectonics of the Blue Ridge ophiolites, North Carolina, SIU
2011	West Texas/New Mexico, ISU
2010	Wyoming and the Black Hills, South Dakota, six-week field camp, ISU
2010	Big Bend National Park, one-week field trip, ISU
2009	Conducted hydrogeological tracer tests at Demo Farm Lexington, IL, ISU
2008	Southern Arizona, one-week field trip, ISU

Publications (h-index = 7)

- Gazel, E., **Trela, J.**, Bizimis, M., Sobolev, A., Batanavo, V., Class, C., Jicha, B., 2018. Long-lived source heterogeneities in the Galapagos mantle plume. *Geochemistry, Geophysics, Geosystems*. v. 19, issue 8, 2764-2779.
- Filiberto, J., Gross, J., Udry, A., **Trela, J.**, Wittman, A., Cannon, K.M., Penniston-Dorland, S., Hamilton, V., Ash, R., Jolliff, B., Carpenter, P., Ferré, E.C., Mustard, J., 2018. Shergottite North West Africa 6963: A Pyroxene-Cumulate Martian Gabbro. *Journal of Geophysical Research: Planets*. v. 123, 1823-1841.
- Trela, J.**, Gazel, E., Sobolev, A., Moore, L., Bizimis, M., Jicha, B., Batanova, V., 2017. The hottest lavas of the Phanerozoic and the survival of ancient Archaean reservoirs: *Nature Geoscience*. NGE02954.
- Malone, D.H., Craddock, J.P., Garber, K.L. **Trela, J.**, 2017. Detrital zircon geochronology of the Aycross Formation (Eocene) near Togwotee Pass, western Wind River Basin, Wyoming: *The Mountain Geologist (Special Issue)*. v. 54 (2), 69-85.
- Zamboni, D., **Trela, J.**, Gazel, E., Sobolev, A., Cannatelli, C., Lucchi, F., Batanova, V.G., De Vivo, B., 2017. New insights into the Aeolian Islands and other arc source compositions from high-precision olivine chemistry: *Lithos*. v. 272-273, 185-191.
- Zamboni, D., Gazel, E., Ryan, J. G., Cannatelli, C., Lucchi, F., Atlas, Z. D., **Trela, J.**, Mazza, S. E. and De Vivo, B., 2016. Contrasting sediment melt and fluid signatures for magma components in the Aeolian Arc: Implications for numerical modeling of subduction systems: *Geochem. Geophys. Geosyst.* v.17, doi:10.1002/2016GC006301.
- Trela, J.**, Vidito, C., Gazel, E., Herzberg, C. Class, C., Whalen, W., Jicha, B., Bizimis, M., Alvarado, G. 2015. Recycled crust in the Galapagos Plume source at 70 Ma: Implications for plume evolution: *EPSL*. v.425, 268-277.
- Trela, J.**, Ferré, E.C., Launeau, P., Bartz, D., and Morris, A. 2015, Magmatic accretion and thermal convection at the sheeted dikes-gabbros boundary in superfast spreading crust, ODP Hole 1256D: *Tectonophysics*. v. 660, 107-116.
- Filiberto, J., Gross, J., **Trela, J.**, and Ferré, E.C., 2014, Gabbroic Shergottite Northwest Africa 6963: an intrusive sample of Mars: *American Mineralogist*. v. 99, 601-606.

Manuscripts in preparation

- Trela, J.**, Gazel, E., Freiburg, J.T., Yu, M., Maria, A., Lundstrom, C., Wilson, K., Nuelle, L., Lukoczki, G: A mantle source origin for lamprophyres, carbonatites, and rare earth element bearing mineralized breccia in the Illinois Basin. *In preparation for Geology*.
- Trela, J.**, Gazel, E., Sobolev, A.V., Bizimis, M., Jicha, B.R. The evolution of the Galapagos mantle plume: insights from Al-in-olivine thermometry. *In preparation for EPSL*.

Invited Talks

- 2022 A mantle source origin for lamprophyres, carbonatites, and rare earth element bearing mineralized breccia in the Illinois Basin: Australian National University, Canberra, AUS
- 2018 Underground construction from the geological perspective. Cornell University, Ithaca NY

2012 Shape-preferred orientation of oceanic gabbros from IODP Hole 1256D: Illinois State University, Normal IL

Grants (awarded and co-authored)

2022 Continued 3D Mapping and Geochemical Investigation of the Illinois-Kentucky Fluorspar District and the Midwest Permian Ultramafic District (exact funds TBD)

2018 Collaborative Research: The Onset of the Galapagos Plume as a Window into Deep Earth (\$354,941 for PI Gazel). Award No. EAR 1826673. Petrology and Geochemistry Program, National Science Foundation

2014 Geological Society of America / Graduate Student Research Grant - \$2,500 - Evolution of the Galapagos mantle plume: from LIP to OIB (awarded \$1,500).

2014 Department of Geoscience at VT/Aubrey and Eula Orange Scholarship-\$2,000 - Evolution of the Galapagos mantle plume: from LIP to OIB (awarded \$1,772)

2012 American Federation of Mineralogical Societies / Graduate Student Fellowship- \$3,500- Shape-preferred orientation (SPO) of oceanic gabbros at IODP Hole 1256D and implications for magmatic processes (awarded \$3,500).

Honors

2016 Outstanding Graduate Presentation: Geosciences Symposium, VT

2014 Tillman Award: Outstanding instruction of undergrad geology courses, VT

Specific Technical Skills/Knowledge

<i>Surface/subsurface geologic mapping</i>	<i>Drilling operations: logistics, siting, and logging</i>
<i>Abandoned mine land reclamation</i>	<i>Forensic claims consulting (mining/tunnels)</i>
<i>Structural geology</i>	<i>Igneous petrology/geochemistry</i>
<i>Economic geology</i>	<i>Groundwater hydrogeology/geochemistry</i>
<i>Carbonate/reef facies stratigraphy</i>	<i>Feasibility studies for mines/tunnel</i>
<i>Analytical geochemistry and instrumentation</i>	<i>REE analysis/modeling</i>
<i>Teaching and outreach</i>	<i>Proposal/grant development</i>

Synergistic and extracurricular activities

2016-2017 1) AAPG-VT Chapter: Vice President
2) Graduate Student Research Symposium-VT: Helped organize, plan, and execute event

2015 1) Co-advised undergraduate at VT (Independent research, Ian Godwin) with Dr. Esteban Gazel
2) Virginia Science Festival, VT. Community outreach to educate the public about volcanoes and volcanic processes.

2014 1) Co-advised visiting undergraduate from U. Virginia (Multicultural Academic Opportunity Program, Christopher Owusu-Sampah) with Dr. Esteban Gazel.
2) Advised non-departmental undergraduate for the Kids Tech University science exhibit “Hokie Stone: The building block of Virginia Tech” (Victor Weiss).
3) Virginia Science Festival, VT. Community outreach to educate the public about volcanoes and volcanic processes.
4) Graduate Student Research Symposium-VT: Helped organize, plan, and execute event

2011-2012 Geology Club, SIU

2010 Student Representative, Faculty Search Committee for Stratigrapher, ISU

2007-2011 Geology Club, ISU

Selected Press Coverage

Hot mantle rising. 2017. *Nature Geoscience News & Views*.
Exploring the rocks that join the Americas. 2014. *State of the Planet. Earth Institute-Columbia University*

Professional Affiliations

2014-Present Geochemical Society
2012-Present American Geophysical Union
2008-Present Geological Society of America

Licenses and Certificates

NTIS (National Tunnel Inspection Standards)

GIT (New York State)

Languages

English (fluent), Polish (fluent), Spanish (conversant)