

Sarah E. Gelman

EDUCATION

University of Washington

Master of Science in Earth and Space Sciences

Thesis: Evolution of the Taupo Volcanic Center, New Zealand: Petrological and thermal constraints from the Omega Dacite

Advisor: Olivier Bachmann

Seattle, WA

June 2014

Massachusetts Institute of Technology

Bachelor of Science in Geoscience and Planetary Science; Minor in Literature

Thesis: Effects of stellar flux on tidally-locked terrestrial planets: Degree-1 mantle convection and local magma ponds

Advisors: Lindy Elkins-Tanton (Thesis) and Sam Bowring (Academic)

Cambridge, MA

June 2009

PROFESSIONAL EXPERIENCE

United States Geological Survey

Geologist

Specialist in basin modeling and energy resource assessments; natural hydrogen resources; detailed projects in the Williston Basin, Permian Basin, SW Wyoming Green River Basin

Central Energy Resources Science Center

Raleigh, NC

Denver, CO

Oct 2020 -

Present

ExxonMobil

Geologist & Research Geologist

Specialist in basin modeling, basin analysis, energy assessments, seismic interpretation. Detailed projects: offshore Brazil salt basins, Tobago Basin (Caribbean), offshore Colombia, Flemish Pass (Canada), offshore Malvinas

Upstream Research Company, Exploration Company

Houston, TX

June, 2014 -

Oct 2020

ETH Zurich

Graduate PhD Student

Thermal and geochemical modeling of supervolcanic magma reservoirs

Advisor: Olivier Bachmann

Zurich, CH

Jan 2014 -

June 2014

University of Washington

Research Assistant, Teaching Assistant

Advisor: Olivier Bachmann

Seattle, WA

Aug 2009 -

Dec 2013

MIT Undergraduate Research Assistant

Research Assistant (UROP)

Cambridge, MA

June 2006 -

June 2009

Caltech Summer Undergraduate Researcher

Summer Undergraduate Researcher

Remote sensing and geology mapping of Martian surface geology

Pasadena, CA

Summer 2007

HONORS/AWARDS

NSF Graduate Research Fellowship (2010-2013)
University of Washington Top Scholar Award (2009)
MIT EAPS Goetze Prize in Undergraduate Research (2009)
Boston Undergraduate Research Symposium, Plenary Speaker (2009)
Caltech Summer Undergraduate Research Fellowship (2007)

TEACHING

USGS: Fundamentals of Basin Modeling I: Theory (2021; developed & instructed)
USGS: Fundamentals of Basin Modeling II: Practical (2021; developed & instructed)
ExxonMobil: Bighorn Basin Exploration Geology Field School (2018-2020; co-instructed)
ExxonMobil: 3D Basin Modeling Workshop (2017; developed & instructed)
ExxonMobil: Fundamentals of Basin Modeling (2015; co-instructed)
UW: Physical Process of the Earth (Fall 2013; TA)
UW: Intro to Geological Sciences (Spring 2010; TA)
UW: Geomechanics (Winter 2010; TA)
MIT: Discover EAPS Undergrad TA (Yellowstone 2006, 2009; Climate Change & Fossils 2008)

FIELD EXPERIENCES

Iceland Volcanology, Oceanic Rifts, Seaward Dipping Reflectors (1 week, 2020)
Bighorn Basin (2 weeks each, 2020, 2019, 2018)
Sequence Stratigraphy Field School, Ainsa Basin, Spain (2 weeks, 2015)
Kos Volcanic Field School, Greece (1 week, 2014)
Eifel Volcanic Field School, Germany (1 week, 2013)
Chilean Andes Volcanoes and Plutons (fumarole sampling, AMS samples; 2 months, 2012)
Turkey Creek Caldera, Peach Springs Tuff (sampling; 1 week, 2011)
Hutton Post-Conference Field School on granitic rocks (1 week, 2011)
MIT Undergrad Field Camp, Metamorphic Structural Mapping (4 weeks, 2009)

SKILLS, TECHNICAL SOFTWARE

Basin Modeling: PetroMod, Trinity, Permedia
Seismic Interpretation: Petrel, HampsonRussel
Well log Interpretation: Kingdom
Scientific Computing: Matlab, Python, Fortran
General: ArcGIS

PEER-REVIEWED JOURNAL PUBLICATIONS

- (9) **Gelman, S.E.** (2023) Modeling the maturation history of the stacked petroleum systems of the Williston Basin, USA. *Marine and Petroleum Geology* 155, 106390.
- (8) Forni, F., Bachmann, O., Mollo, S., De Astis, G., **Gelman, S.E.**, Ellis, B.S. (2016) The origin of a zoned ignimbrite: Insights into the Campanian Ignimbrite magma chamber (Campei Flegrei, Italy). *Earth and Planetary Science Letters* 449, 259-271.
- (7) Kennedy, B., Stix, J., Hon, K., Deering, C., **Gelman, S.E.** (2016) Magma storage, differentiation, and interaction in Lake City caldera, Colorado, USA. *GSA Bulletin* 128 (5-6), 764-776.
- (6) Payacan, I., Gutierrez, F., **Gelman, S.E.**, Bachmann, O., Parada, M.A. (2014) Comparing magnetic and magmatic fabrics to constrain the magma flow record in La Gloria pluton, central Chile. *Journal of Structural Geology* 69, 32-46.
- (5) **Gelman, S.E.**, Deering, C.D., Bachmann, O., Huber, C. Gutierrez, F.J. (2014) Identifying the crystal graveyards remaining after large silicic eruptions. *Earth and Planetary Science Letters* 403, 299-306.
- (4) **Gelman, S.E.**, Deering, C.D., Gutierrez, F.J., Bachmann, O. (2013) Evolution of the Taupo Volcanic Zone, New Zealand: Petrological and thermal constraints from the Omega Dacite. *Contributions to Mineralogy and Petrology* 166:1355-1374.
- (3) **Gelman, S.E.**, Gutierrez, F.J., Bachmann, O. (2013) On the longevity of large upper crustal silicic magma reservoirs. *Geology*, 41 (7).
- (2) Gutierrez, F., Payacan, I., **Gelman, S.E.**, Bachmann, O., Parada, M.A. (2013) Late-stage magma flow in a shallow felsic reservoir: Merging the anisotropy of magnetic susceptibility record with numerical simulations in La Gloria Pluton, central Chile. *Journal of Geophysical Research: Solid Earth*, 118 (5) 1984-1998.
- (1) **Gelman, S.E.**, Elkins-Tanton, L.T., Seager, S. (2011) Effects of stellar flux on tidally-locked terrestrial planets: Degree-1 mantle convection and local magma ponds. *The Astrophysical Journal* 735:72.

USGS SERIES PUBLICATIONS

Schenk, C.J., Mercier, T.J., Woodall, C.A., Le, P.A., Cicero, A.D., Drake, R.M., II., Ellis, G.S., Finn, T.M., Gardner, M.H., **Gelman, S.E.**, Hearon, J.S., Johnson, B.G., Lagesse, J.H., Leathers-Miller, H.M., Marra, K.R., Timm, K.K., Young, S.S., 2022, Assessment of undiscovered

conventional oil and gas resources of the Montana Thrust Belt Province, 2021: *U.S. Geological Survey Fact Sheet 2022-3048*, 2p.

Marra, K.R., Mercier, T.J., **Gelman, S.E.**, Schenk, C.J., Woodall, C.A., Cicero, A.D., Drake, R.M., II., Ellis, G.S., Finn, T.M., Gardner, M.H., Hearon, J.S., Johnson, B.G., Lagesse, J.H., Le, P.A., Leathers-Miller, H.M., Timm, K.K., Young, S.S., 2021, Assessment of undiscovered oil resources in the Bakken and Three Forks Formations of the Williston Basin Province, North Dakota and Montana, 2021: *U.S. Geological Survey Fact Sheet 2021-3058*, 4 p.