

Kenneth S. Befus

CONTACT

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HIGHLIGHTS

- + Awarded **\$532k NSF CAREER** to study strain in tectonic crystals
- + Blaustein Visiting Scholar at **Stanford University** (2014-2015)
- + Published **20+papers** (12 first author)
- + 5th year Assistant Professor at Baylor University with NSF funding to date >**\$850k**

APPOINTMENTS

2015 – Present	Assistant Professor, Geosciences, Baylor University, Texas
2014 – 2015	Blaustein Visiting Professor, Stanford University, California
2009 – 2014	Teaching and Research Assistant, Jackson School of Geosciences, University of Texas at Austin, Texas
2007 – 2008	K-12 Teacher, Bear Creek School, Redmond, Washington
2005 – 2006	Teaching Assistant, Geology Department, Texas Christian University, Texas

PUBLICATIONS (h-index=12, citations=327)

Andrews, B. J., **Befus, K. S.**, 2020, Supersaturation nucleation and growth of plagioclase: a numerical model of decompression induced crystallization, *Contributions to Mineralogy and Petrology*, v. 175, p. 1-20.

Leggett, T.N. (iGraduate student paper!), **Befus, K.S.**, Kenderes, S.M., 2020, Rhyolite lava emplacement dynamics inferred from surface morphology, *Journal of Volcanology and Geothermal Research*, v. 395, 106850.

Bassoo, R. (iGraduate student paper!), **Befus, K.S.**, Forman, S.L, Kopylova, M., Paragenesis and provenance of Guyana's diamonds, *American Mineralogist*, *accepted and in press*.

Singleton, J., Rahl, J., Befus, K.S., 2020, Rheology of a coaxial shear zone in the Virginia Blue Ridge: Wet quartzite dislocation creep at ~200-280 C, *Journal of Structural Geology*, *accepted and in press*.

Cisneros, M., **Befus, K.S.**, Darnell, K., New potential applications of elastic thermobarometry: insights from elastic modeling of inclusion-host pairs and example case studies, *G-Cubed*, *in review*.

Sun, N., Brandon, A.D., Forman, S.L., Waters, M.R., **Befus, K.S.**, Stafford, T.W., Osmium isotope and highly siderophile element evidence for a volcanic origin of the Younger Dryas event, *Scientific Reports*, *in review*.

Befus, K.S., Manga, M., Stan, C., Tamura, N., 2019, Volcanoes erupt stressed quartz crystals, *Geophysical Research Letters*, v. 46, p. 8791-8800.

Befus, K.S., Manga, M., 2019, Lava Creek Tuff and the hollow reentrants, *Geology*, v. 47(8), p. 710-714.

Befus, K. S., & Andrews, B. J., 2018, Crystal nucleation and growth produced by continuous decompression of Pinatubo magma, *Contributions to Mineralogy and Petrology*, v. 173(11), p. 92.

Befus, K.S., Lin, J-F., Cisneros, M., Fu, S., 2018, Feldspar Raman shift and application as a magmatic thermobarometer, *American Mineralogist*, v.103, p. 600-609.

EDUCATION

Ph.D. in Geology
University of Texas at Austin
August 2014

M.S. in Geology
Texas Christian University
August 2006

B.S. in Geology
Texas Christian University
December 2003

GRANTS

NSF (Awarded 2020). Are embayments faithfully wedded to magma ascent?
\$144,600

NSF CAREER (Awarded 2020). Measuring the tectonic and volcanic stresses preserved in crystals
\$532,850

NSF (Awarded 2017). Residual stress preserved in crystals from explosive and effusive eruptions
\$128,100

NSF (Awarded 2017). An integrated study of silicic lava flow emplacement
\$46,700

PUBLICATIONS (cont.)

- Gardner, J.E., Llewellyn, E.W., Watkins, J.M., **Befus, K.S.**, 2017, Formation of obsidian pyroclasts by sintering of ash particles in the volcanic conduit, *Earth and Planetary Science Letters*, v. 459, p. 252-263.
- Watkins, J.M., Gardner, J.E., **Befus, K.S.**, 2017, Nonequilibrium degassing, regassing, and vapor fluxing in magmatic feeder systems, *Geology*, 45, p. 252-263.
- Gardner J.E., **Befus, K.S.**, Watkins, J.M., Clow, T, 2016, Nucleation Rates of Spherulites in Natural Rhyolitic Lava, *American Mineralogist*, v. 101, p. 2367-2376.
- Befus, K.S.**, 2016, Natural crystallization kinetics in rhyolitic melts using oxygen isotope thermometry: *Geophysical Research Letters*, v. 43(2), p. 592-599.
- Befus, K.S.**, and Gardner, J.E., 2016, Magmatic storage conditions of the most recent eruptions at Yellowstone Caldera: *Contributions to Mineralogy and Petrology*, v. 171(4), p. 30.
- Befus, K.S.**, Manga, M., Gardner, J.E., Williams, M., 2015, Ascent and emplacement dynamics of obsidian lavas inferred from microlite textures: *Bulletin of Volcanology*, v. 77(10), p. 88.
- Befus, K.S.**, Watkins, J., Gardner, J.E., Richard, D., Befus, K.M., Miller, N.R., and Dingwell, D.B., 2015, Spherulites as geospeedometers in lava flows: *Geology*, v. 43, p. 647-650.
- Gardner, J.E., **Befus, K.S.**, Ghiorso, M.S., Gualda, G.A.R., 2014, Experimental Constraints on Rhyolite-MELTS and the Bishop Tuff Eruption: *Contributions to Mineralogy and Petrology*, v. 168(2), p. 1051.
- Gardner, J.E., **Befus, K.S.**, Miller, N.R., and Monecke, T., 2014, Cooling rates of Mid-Ocean ridge lava deduced from clinopyroxene spherulites: *Journal of Volcanology and Geothermal Research*, v. 282, p. 1-8.
- Prather, T.J., Barnes, J.D., Cisneros, M., **Befus, K.S.**, Gardner, J.E., and Larson, T.E., 2014, Stable chlorine isotope behavior during volcanic degassing of H₂O and CO₂ at Mono Craters, CA: *Bulletin of Volcanology*, v. 76(3), p. 805.
- Befus, K.S.**, Zinke, R.W., Jordan, J., Manga, M., Gardner, J.E., 2014, Pre-eruptive storage conditions and eruption dynamics of Douglas Knob lava dome, Yellowstone volcanic field: *Bulletin of Volcanology*, v. 73, p. 1-12.
- Befus, K.S.**, Gardner, J.E., and Zinke, R., 2012, Analyzing volatile contents in unexposed glass inclusions in quartz crystals: *American Mineralogist*, v.97, p. 1898-1904.
- Gardner, J.E., **Befus, K.S.**, Watkins, J., Hesse, M., and Miller, N., 2012, Compositional gradients surrounding spherulites in obsidian and their relationship to cooling and spherulite growth: *Bulletin of Volcanology*, v. 74, p. 1865-1879.
- Befus, K.S.**, Hanson, R.E., Breyer, J.A., Busbey, A.B., Miggins, D.P., 2009, Nonexplosive and explosive magma/wet-sediment interaction during emplacement of Eocene intrusions into Cretaceous to Eocene strata, Trans-Pecos igneous province, West Texas: *Journal of Volcanology and Geothermal Research*, v.181, 155-172.
- Befus, K.S.**, Hanson, R.E., Lehman, T., and Griffen, W.R., 2008, Cretaceous basaltic phreatomagmatic volcanism in West Texas: maar complex at Peña Mountain, Big Bend National Park: *Journal of Volcanology and Geothermal Research*, v. 173, p. 245-264.

PRESENTATIONS: Meetings and Invited Talks

Meetings

- 2019 – Long Valley and Yellowstone calderas erupt stressed quartz crystals (GSA)
- 2019 – Supersaturation nucleation and growth of plagioclase (GSA - invited)
- 2018 – Lava Creek Tuff love (Goldschmidt)
- 2017 – Chair session “Conduit and surface dynamics of silicic magmas and lavas.” (AGU)
- 2017 – Chair session “What can inclusions tell us? Certainly more than pyroclasts.” (AGU)
- 2017 – Crystal textures produced by continuous decompression of Pinatubo magma (AGU)
- 2017 – Bringing Raman barometry to the people (IAVCEI)
- 2017 – Residual stresses in zircon from Bishop Tuff record volcanic stresses (IAVCEI)
- 2016 – Raman barometry for magmatic systems using feldspar and pyroxene (GSA)
- 2016 – Quartz phenocrysts preserve volcanic stresses at Long Valley and Yellowstone calderas (AGU)
- 2015 – Magma storage and evolution of the Central Plateau Member Rhyolites, Yellowstone (AGU)
- 2014 – Natural spherulite crystallization kinetics in rhyolitic melts (AGU)
- 2014 – Magmatic volatile contents of Yellowstone (GSA)
- 2013 – Microscopic and macroscopic assessment of the emplacement of obsidian lavas (AGU)
- 2012 – Eruption dynamics of high silica rhyolite inferred from pyroxene and feldspar microlites (AGU)
- 2011 – Spherulites and cooling histories of obsidian lavas, Yellowstone (AGU)
- 2010 – Storage and eruption of large volumes of rhyolite lava: Example from Solfatara Plateau, Yellowstone (AGU)
- 2009 – Cretaceous basaltic phreatomagmatic volcanism in West Texas (GSA)

Invited Talks

- 2020 – University of Texas – Measuring the tectonic and magmatic stresses preserved in crystals
- 2019 – Geological Society of America Meeting – Supersaturation nucleation and growth of plagioclase
- 2019 – University of Arizona – Raman and X-ray diffraction of gems and volcanic crystals
- 2017 – Texas Christian University – Yellowstone caldera: Volcanic history and recent activity
- 2016 – Austin Geological Society – Spherulites in Obsidian: more than a curiosity
- 2015 – USGS Menlo Park Volcanology seminar series
- 2014 – Miami University of Ohio – Geology Department seminar series
- 2014 – Stanford University – Chain Gang Hard Rock brown bag
- 2013 – USGS Menlo Park Volcanology seminar series
- 2013 – Presented lecture at UT Quest Lifelong Learning Institute

Professional Service

Ad-hoc reviewer for the following:

- + Journals: *Contributions to Mineralogy and Petrology*, *Frontiers in Earth Science*, *Geology*, *Journal of Volcanology and Geothermal Research*, *GSA Bulletin*, *Earth and Planetary Science Letters*, *Bulletin of Volcanology*, *American Mineralogist*
- + Funding Agencies: *National Science Foundation*
- + Becoming involved with service at Mineralogical Society of America and United States Faceting Guild

Classes Taught

- + Volcanology – graduate level, pre-eruptive magmatic triggers, conduit ascent, fragmentation, dispersal
- + Dynamic Earth – introduction to geosciences for majors and non-majors.
- + Mineralogy – geology majors learn theory and application of crystallography, mineral formation and systematic mineralogy
- + Igneous and Metamorphic Petrology – geology majors learn the formation and tectonic implications of high temperature rocks
- + Volcanology Seminar – graduate level topical discussions and literature review
- + Gems and Gem Minerals – introduction to optics, gemology, and mineralogy to non-majors