

## Curriculum Vitae

### I. Personal Data

*Name:* James Edward Gardner  
*Present Address* University of Texas at Austin  
Jackson School of Geosciences  
Austin, TX 78712  
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gardner@jsg.utexas.edu

*Date of Birth:* 29 March 1963  
*Marital Status:* Married  
*Present Position:* Professor

### II. Academic Degrees

Doctor of Philosophy (Ph.D.), 1993  
University of Rhode Island, Graduate School of Oceanography  
Narragansett, Rhode Island, U.S.A.  
Major Subject: Volcanology and Geological Oceanography

Master of Arts (M.A.) in Geology, 1987  
Washington University, Earth and Planetary Science Department  
St. Louis, Missouri, U.S.A.  
Major Subject: Geology and Geochemistry

Bachelor of Science (B.S.), 1985  
Southern Methodist University, Dallas, Texas, U.S.A.  
Major Subject: Geology

### III. Honors and Awards

2019 Fellow of the Mineralogical Society of America  
2017 Carolyn G. & G. Moses Knebel Undergraduate Course Teaching Award  
for outstanding teaching in an undergraduate course  
2015 Fellow of the Institute for Advanced Studies, Durham University, UK  
2002 Wager Medal from IAVCEI, Co-recipient  
1995 Alexander von Humboldt Fellowship

#### **IV. Professional Background**

Professor, from September 2011, to present

Department of Geological Sciences, Jackson School of Geosciences  
University of Texas at Austin, Austin, TX, USA

Associate Professor, from September 2003, to August 2011

Department of Geological Sciences, Jackson School of Geosciences  
University of Texas at Austin, Austin, TX, USA

Assistant Professor, from October 1998, to July 2003

Geophysical Institute and Department of Geology and Geophysics  
University of Alaska Fairbanks, Fairbanks, AK, USA

Post-Doctoral Research Associate, from August 1996, to September 1998

Department of Geological Sciences  
Brown University, Providence, RI, USA

Alexander von Humboldt Fellow, from June 1995, to July 1996.

GEOMAR, Abteilung Vulkanologie und Petrologie  
Christian-Albrechts-Universität zu Kiel, Kiel, Germany

Post-Doctoral Research Assistant, from May 1993, to May 1995.

Laboratoire de Dynamique des Systèmes Géologiques,  
Institut de Physique du Globe de Paris, Paris, France

Graduate Research Assistant, from September 1987, to May 1993.

University of Rhode Island, Graduate School of Oceanography  
Narragansett, Rhode Island, U.S.A.

Graduate Research Assistant, from September 1985, to August 1987.

Washington University, Earth and Planetary Science Department  
St. Louis, Missouri, U.S.A.

#### **V. Grant Support:**

Total Research Grant Support: \$2,656,992; Instrumentation Support: \$274,218

##### *Principal Investigator:*

NSF grant EAR-2211627, “NSF GEO-NERC: Collaborative Research: A general model for bubble nucleation and growth in volcanic systems” \$333,856, 3 years. [Active]

NSF grant EAR-1852449, “Collaborative Research: Experimental and Numerical Constraints on Density Evolution, Buoyancy Reversal, and Runout Distance in Pyroclastic Density Currents” \$366,022, 3 years. [Active]

NSF grant EAR-1725186, “Collaborative Research: What do obsidian pyroclasts tell us:

- Constraints from textures, volatiles, and experiments”, \$282,058, 3 years.
- NSF grant EAR-1049829, “Collaborative Research: The Dynamics of Rhyolite Lava Eruption and Emplacement Inferred from Micro-Textures, Decompression Experiments, and Numerical Modeling”, \$387,869, 3 years.
- NSF grant EAR-1053889, “Acquisition of a Piston Cylinder Apparatus for Research in Experimental Petrology and Mineral Physics”, \$40,355, 1 year.
- NSF grant EAR-0738664, “Bubble nucleation in magmas: Experimental constraints on the influence of gas and melt composition”, \$195,665, 3 years.
- NSF grant EAR-0711043, “The record of recharge, assimilation, and storage in the Popocatepetl magma system from Sr isotopes and glass inclusions in phenocrysts and experimental petrology”, \$254,388, 3 years
- NSF grant EAR-0447126, “Acquisition of a Fourier Transform Infrared (FTIR) Spectroscopy System: Measuring Volatiles in Magmatic and Ore-forming Systems”, \$107,400, 1 year.
- NSF grant EAR-0401784, “Sedimentary processes in pyroclastic density currents: insights from the deposits of Nevado de Toluca, Mexico”, \$96,604.00, 2 years.
- NSF grant EAR-0229290, “Experimental and textural constraints on the eruptive behavior of basic magmas in subduction zones”, \$181,863.00, 2 years.
- NSF grant EAR-0087853, “Magmatic Degassing: Experimental and Textural Constraints”, \$52,981.00, 1 year.
- NSF grant EAR-9804860, “Magmatic degassing: Experimental constraints on bubble nucleation, growth, and coalescence”, \$109,299.00, 2 years.
- NSF grant EAR-9910539, “Acquisition of externally heated TZM pressure vessel systems”, \$18,963.00, 2 years.

*Co-Investigator:*

- NSF grant EAR-1348050, “*Collaborative Research: A self-consistent model for bubble nucleation during Plinian volcanic eruptions*”, \$223,981, 3 years.
- NSF grant OCE-1333882, “*Collaborative Research: Degassing-based constraints on the dynamics of submarine eruptions*”, \$90,187, 2 years.
- NSF grant EAR-0946686, “Chlorine isotope geochemistry of altered oceanic crust: Empirical and experimental observations”, \$248,857, 3 years.
- NSF grant EAR-0732500, “Acquisition of a Solid-State 193-nm Laser-Ablation System”, \$97,500, 1 year.
- NSF grant EAR-0537168, “*Collaborative Research: Violent basaltic explosive volcanism II: conditions of basaltic Plinian eruptions*”, \$105,000, 2 years.
- NSF grant EAR-0408896, “*Collaborative Research: The record of recharge and storage in the El Chichon magma system through Ar isotopic and experimental petrologic constraints*”, \$91,923, 2 years.
- NSF grant EAR-0207316, “*Collaborative Research: Investigating the processes and timescales of andesite differentiation: A comprehensive petrological and geochemical study of Arenal volcano, Costa Rica*”, \$94,089, 2 years.
- NSF grant EAR-0106658, “Experimental Study of Plagioclase textures and Amphibole reaction rims: Implications for rates of magmatic processes”, \$172,040, 2 years.

## **VI. Supervision:**

### *Post-Doctoral Researchers:*

Dr. Célia Dalou (University of Texas at Austin, co-supervised with Jung-Fu Lin)

Research Assistant, University of Minnesota

Dr. Michael Rowe, (University of Texas at Austin, co-supervised with John Lassiter)

Professor, University of Tasmania

Dr. Alain Burgisser (University of Alaska Fairbanks); CNRS, Chambéry

Dr. Yuki Suzuki (University of Alaska Fairbanks); Faculty, Waseda University

### *Graduate Students:*

Rachel Blandon (M.S. candidate, University of Texas at Austin, in progress)

Wade Aubin (Ph.D. candidate, University of Texas at Austin, in progress)

Nicolas Meszaros (Ph.D. candidate, University of Texas at Austin, in progress)

Sean O'Donnell (Ph.D. candidate, University of Texas at Austin, in progress)

Nicole Guinn (M.S., University of Texas at Austin, graduated Summer, 2020)

Ph.D. candidate, University of Houston

Yining Wang (M.S., University of Texas at Austin, graduated Spring, 2018)

Associate Software Engineer, Austin, Texas

Kenneth Befus (Ph.D., University of Texas at Austin, graduated Spring, 2014)

Assistant Professor, Baylor University

Giovanni Sosa (Ph.D., University of Texas at Austin, graduated Summer, 2011)

Associate Professor, UNAM, Morelia, Mexico

Lindsay Szramek (Ph.D., University of Texas at Austin, graduated Summer, 2010)

Career Councilor, Whitman College.

Benjamin Andrews (Ph.D., University of Texas at Austin, graduated Spring, 2009)

Staff Scientist, Smithsonian Institution.

Katherine Goepfert (M.S., University of Texas at Austin, graduated Spring, 2008)

Nicole Myers (M.S., University of Texas at Austin, graduated Fall, 2006)

Robert Nicolson (M.S., University of Alaska Fairbanks, graduated Fall, 2003)

Brandon Browne (M.S., University of Alaska Fairbanks, graduated Summer, 2001)

Professor, Humboldt State University.

### *Undergraduate Honors Thesis Students (Supervised):*

Catherine Schmidt (University of Texas at Austin, in progress)

Matthew Wade (University of Texas at Austin, graduated Spring 2020)

Elizabeth Davis (University of Texas at Austin, graduated Spring 2018)

Samantha Abbott (University of Texas at Austin, graduated Spring 2010)  
Casey Huff (University of Texas at Austin, graduated Fall, 2008)  
Patrick Shamberger (NSF REU student, University of Alaska Fairbanks)

## **VII. Teaching**

*Courses Taught (University of Texas at Austin):*

*Undergraduate Courses:*

GEO 302J Crises of a Planet (lower division, for non-science undergraduates)  
GEO 416K Earth Materials (lower division undergraduate)  
GEO 426P Igneous and Metamorphic Petrology (lower division undergraduate)  
GEO 338J Marine Geology (upper division undergraduate)  
GEO 358K Volcanology (upper division undergraduate)  
GEO 660 Field Methods (upper division undergraduate)  
GEO 171C Conference Course (upper division undergraduate)

*Graduate Course:*

GEO 386K Graduate Igneous Petrology  
GEO 381C Marine Geology  
GEO 391 Seminar in Volcanology  
GEO 391 Thermodynamics of Petrological Systems

*Courses Taught (University of Alaska Fairbanks):*

*Undergraduate Courses:*

GEOS 120 Glaciers, Earthquakes, Volcanoes (team taught, lower division undergraduate)  
GEOS 475 Presentation Techniques in the Geosciences (co-taught)

*Graduate Course:*

GEOS 606 Volcanology  
GEOS 621 Advanced Petrology (co-taught)  
GEOS 672 Integrated Case Studies of Volcanic Eruptions (co-taught)  
GEOS 675 Presentation Techniques in the Geosciences (co-taught)

## VIII. Bibliography (Google Scholar h-index: 42; i10-index: 93)

*Ph.D. Thesis:* Compositional Diversity in Volcanic Deposits: Implications for Processes Operating Within Magma Chambers and the Withdrawal of Magma During Explosive Plinian Eruptions.

*M.A. Thesis:* Trace-Element and Nd-Isotope Evidence for the Origin of the Stratifications of the Endion Sill, Duluth, Minnesota.

### *Books and Book Chapters*

Berlo, K., Gardner, J.E., and Blundy, J.D., Timescales of Magma Degassing, in, Dosseto, A., Turner, S.P., and Orman, J.A. (eds.), *Timescales for Magmatic Processes*, Wiley-Blackwell, 231-256, 2010.

### *Volcano Hazards Report:*

\* Stelling, P., Beget, J.E., Gardner, J.E., and Schaefer, J.R., Preliminary volcano-hazard assessment for Fisher volcano, Unimak Island, Alaska. Alaska Division of Geological and Geophysical Surveys, Report 2014–5, 39 p., 2014.

### *Refereed Journal Articles (\* = papers authored or co-authored by graduate or undergraduate students)*

#### *Submitted or In Press:*

Gardner, J.E., Wadsworth, F.B., Carley, T., Llewellyn, E.W., Kusumaatmaja, H., and Sahagian, D., Bubble formation in magma. *Ann. Rev. Earth Planet. Sci.*, in review. **Invited Paper**

\* Hajimirza, S., Gonnermann, H.M., and Gardner, J.E., Reconciling classical nucleation theory with homogeneous bubble nucleation experiments in rhyolite. *J. Volcanol. Geotherm. Res.*, in review.

\* O'Donnell, and Gardner, J.E., Microlite crystallization during eruptions at Mt. Mazama: Implications for magma ascent. *Contrib. Mineral. Petrol.*, in review.

#### *Published:*

107. \* Guinn, N., Gardner, J.E., and Helper, M.A., Dynamic pressure evolution within the 18 May 1980 Mount St. Helens pyroclastic density current: evidence from tree damage. *Bull. Volcanol.*, 84:38, 2022.

106. \* Hajimirza, S., Gardner, J.E., and Gonnermann, H.M., Experimental demonstration of continuous bubble nucleation in rhyolite. *J. Volcanol. Geotherm. Res.*, 421, 107417, <https://doi.org/10.1016/j.jvolgeores.2021.107417>, 2021.

105. \* Hajimirza, S., Gonnermann, H.M., and Gardner, J.E., Reconciling bubble nucleation in explosive eruptions with geospeedometers. *Nature Communications*, 12, 1-8,

- <https://doi.org/10.1038/s41467-020-20541-1>, 2021.
104. \* Gu, J., Fu, S., Gardner, J.E., Yamashira, S., Okuchi, T., and Lin, J.F., Non-linear Effects of Hydration on Sound Velocities of Rhyolitic Glasses up to 3 GPa. *Am. Mineral.*, 106, 1143–1152, <https://doi.org/10.2138/am-2021-7597>, 2021.
  103. Giachetti, T., Trafton, K.R., Wiejaczka, J., Gardner, J.E., Watkins, J.M., Shea, T., and Wright, H.M.N., The products of primary magma fragmentation finally revealed by pumice aggregates. *Geology*, 49, <https://doi.org/10.1130/G48902.1>, 2021
  102. \* Wang, Y., Gardner, J.E., and Hoblitt, R.P., Formation of dense pyroclasts by sintering of ash particles during the preclimactic eruptions of Mt. Pinatubo in 1991. *Bull. Volcanol.*, 83, 6, <https://doi.org/10.1007/s00445-020-01427-y>, 2021
  101. Wadsworth, F.B., Vasseur, J., Llewellyn, E.W., Brown, R., Tuffen, H., Gardner, J.E., Kendrick, J., Lavalley, Y., Dobson, K., Heap, M., Dingwell, D., Hess, K.-U., Schaubroth, J., von Aulock, F., Kushnir, A., and Marone, F., A model for permeability evolution during volcanic welding. *J. Volcanol. Geotherm. Res.*, 409, 107118, <https://doi.org/10.1016/j.volgeores.2020.107118>, 2021.
  100. Wadsworth, F.B., Llewellyn, E.W., Vasseur, J., Gardner, J.E., and Tuffen, H., Explosive-effusive volcanic eruption transitions caused by sintering. *Science Advances*, 6(39), eaba7940, <https://doi.org/10.1126/sciadv.aba7940>, 2020.
  99. Macias, J.L., Arce, J.L., Garcia, F., Sosa-Ceballos, G., and Gardner, J.E., Source and behavior of pyroclastic density currents generated by Vulcanian-style explosions of Popocatepetl volcano (Mexico) on 22 January 2001. *J. Volcanol. Geotherm. Res.*, 406, 107071, 2020.
  98. Coumans, J., Llewellyn, E., Wadsworth, F., Humphreys, M., Mathias, S.A., Yelverton, B., and Gardner, J., An experimentally validated numerical model for bubble growth in magma. *J. Volcanol. Geotherm. Res.*, 402, 107002, <https://doi.org/10.1016/j.jvolgeores.2020.107002>, 2020.
  97. Wadsworth, F., Vasseur, J., Schaubroth, J., Llewellyn, E.W., Dobson, K.J., Havard, T., Scheu, B., von Aulock, F.W., Gardner, J.E., Dingwell, D.B., Hess, K.U., Colombier, M., Marone, F., Tuffen, H., and Heap, M.J., A general model for welding of ash particles in volcanic systems validated using in situ X-ray tomography. *Earth Planet. Sci. Lett.*, 525, 115726, <https://doi.org/10.1016/j.epsl.2019.115726>, 2019.
  96. Gardner, J.E., Wadsworth, F.B., Llewellyn, E.W., Watkins, J.M., and Coumans, J.P., Experimental constraints on the textures and origin of obsidian pyroclasts. *Bull. Volcanol.*, 81, 22, <https://doi.org/10.1007/s00445-019-1283-z>, 2019.
  95. \* Giachetti, T., Gonnermann, H.M., Gardner, J.E., Burgisser, A., Hajimirza, S., Earley, T.C., Truong, N., and Toledo, P., Bubble coalescence and percolation threshold in expanding rhyolite magma. *Geochem. Geophys., Geosys.*, 20 (2), 1054–1074, <https://doi.org/10.1029/2018GC008006>, 2019.
  94. \* Hajimirza, S., Gonnermann, H.M., Gardner, J.E., and Giachetti, T., Predicting homogeneous bubble nucleation in rhyolite. *J. Geophys. Res.*, 124 (3), 2395–2416, 2019.
  93. Gardner, J.E., Nazworth, C., Helper, M.A., and Andrews, B.J., Inferring the nature of pyroclastic density currents from tree damage: The 18 May 1980 Blast Surge of Mount St. Helens. *Geology*, 46 (9), 795–798, 2018.
  92. Gardner, J.E., Hajimirza, S., Webster, J.D., and Gonnermann, H.M., The impact of dissolved fluorine on bubble nucleation in hydrous rhyolite melts. *Geochim. Cosmochim. Acta*, 226, 174–181, 2018.
  91. Gardner, J.E., Wadsworth, F.B., Llewellyn, E.W., Watkins, J.M., and Coumans, J.P.,

- Experimental sintering of ash at conduit conditions and implications for the longevity of tuffisites. *Bull. Volcanol.*, 80, 23, <https://doi.org/10.1007/s00445-018-1202-8>, 2018.
- \* 90. Dygert, N., Lin, J.-F., Marshall, E.W., Kono, Y., and Gardner, J.E., A low viscosity lunar magma ocean forms a stratified anorthitic flotation crust with mafic poor and rich units. *Geophys. Res. Lett.*, 44, 11282–11291, 2017.
  - \* 89. Macias, J.L., Sosa-Ceballos, G., Arce, J.L., Gardner, J.E., Saucedo, R., and Valdez-Moreno, G., Storage conditions and magma processes triggering the 1818 A.D. Plinian eruption of Volcán de Colima. *J. Volcanol. Geotherm. Res.*, 340, 117–129, 2017.
  - 88. Siebe, C., Arana-Salinas, L., Salinas, S., Macias, J.L., Gardner, J., and Bonasia, R., The ~23,500 y 14C BP White Pumice plinian eruption and associated debris avalanche and Tochimilco lava flow of Popocatepetl volcano, Mexico. *J. Volcanol. Geotherm. Res.*, 333–334, 66–95, 2017.
  - 87. Burgisser, A., Chevalier, L., Gardner, J.E., and Castro, J.M., The percolation threshold and permeability evolution of ascending magmas. *Earth Planet. Sci. Lett.*, 470, 37–47, 2017.
  - \* 86. Watkins, J.M., Gardner, J.E., and Befus, K.S., Non-equilibrium degassing, regassing, and vapor fluxing in magmatic feeder systems. *Geology*, 45, 183-186, 2017.
  - \* 85. Gardner, J.E., Andrews, B.J., and Dennen, R., Liftoff of the 18 May 1980 surge of Mount St. Helens (USA) and the deposits left behind. *Bull. Volcanol.*, 79(1), 1-12, 2017.
  - \* 84. Gardner, J.E., Llewellyn, E.W., Watkins, J.M., and Befus, K.S., Formation of obsidian pyroclasts by sintering of ash particles in the volcanic conduit. *Earth Planet. Sci. Lett.*, 459, 252-263, 2017.
  - 83. Gardner, J.E., Can we gain evidence about volcanic pyroclastic flows from those who survive them? *Insights*, 9(2), Article 2, 2016.
  - \* 82. Gardner, J.E., Befus, K., Watkins, J., and Clow, T., Nucleation rates of spherulites in natural rhyolitic lava. *Am. Mineral.*, 101, 2367-2376, 2016.
  - \* 81. Gardner, J.E., Jackson, B., Gonnermann, H., and Soule, S.A., Rapid Ascent and Emplacement of Basaltic Lava During the 2005-06 Eruption of the Mid-Ocean Ridge Inferred from CO<sub>2</sub> Contents. *Earth Planet. Sci. Lett.*, 453, 152–160, 2016.
  - \* 80. Befus, K., Gardner, J.E., Magma storage and evolution of the most recent eruptions from Yellowstone Caldera. *Contrib. Mineral. Petrol.*, 171:30; doi 10.1007/s00410-016-1244-x, 2016.
  - 79. Gardner, J.E., and Webster, J.D., The impact of dissolved CO<sub>2</sub> on bubble nucleation in water-poor rhyolite melts. *Chem. Geol.*, 420, 180–185, 2016.
  - 78. Mackay, H., Hughes, P.D., Jensen, B.J., Langdon, P.G., Pyne-O'Donnell, S.D., Plunkett, G., Froese, D.G., Coulter S., and Gardner, J.E., A mid to late Holocene cryptotephra framework from eastern North America. *Quat. Sci. Rev.*, 132, 101–113, 2016.
  - 77. Colleary, C., Dolocan, A., Gardner, J., Singh, S., Wuttke, M., Rabenstein, R., Habersetzer, J., Schaal, S., Feseha, M., Clements, M., Jacobs, B., Currano, E., Jacobs, L., Sylvestersen, R., Gabbott, S., and Vinther, J., Chemical, experimental, and morphological evidence for diagenetically altered melanin in exceptionally preserved fossils. *Proceedings of the National Academy of Sciences*, 112, 12592–12597, 2015.
  - \* 76. Ghanbarzadeh, S., Hesse, M.A., Prodanovic, and Gardner, J.E., Field evidence for deformation-assisted fluid flow below the equilibrium percolation threshold. *Science*, 350, 1069–1072, 2015.
  - \* 75. Befus, K., Manga, M., Gardner, J.E., and Williams, M., Ascent and emplacement dynamics of obsidian lavas inferred from microlite textures. *Bull. Volcanol.*, 77:88, 2015.



74. Giachetti, T., Gonnermann, H.M., Gardner, J.E., Shea, T., and Gouldstone, A., Discriminating secondary from primary water in rhyolitic matrix-glass of volcanic pyroclasts using thermogravimetric analysis, *Geochim. Cosmochim. Acta*, 148, 457-476, 2015.
- \* 73. Befus, K., Watkins, J., Gardner, J.E., Richard, D., Befus, K.M., Miller, N.R., and Dingwell, D.B., Spherulites as in-situ recorders of thermal history in lava flows. *Geology*, 43, 647-650, 2015.
- \* 72. Gardner, J.E., Befus, K.S., Gualda, G.A.R., and Ghiorso, M.S., Experimental constraints on Rhyolite-MELTS and the Bishop Tuff magma body, *Contrib. Mineral. Petrol.*, 168, DOI: 10.1007/s00410-014-1051-1, 2014.
- \* 71. Sosa-Ceballos, G., Gardner, J.E., and Lassiter, J.C., Intermittent mixing processes occurring at Popocatepetl volcano, Mexico: Insights from textural-compositional variations in plagioclase and Sr-Nd-Pb isotopes. *Contrib. Mineral. Petrol.*, 167, 966-985, 2014.
- \* 70. Gardner, J.E., Befus, K.S., Miller, N.R., and Monecke, T., Cooling rates of mid-ocean ridge lava deduced from clinopyroxene spherulites, *J. Volcanol. Geotherm. Res.*, 282, 1-8, 2014.
- \* 69. Befus, K.S., Zincke, R.W., Jordan, J.S., Manga, M., and Gardner, J.E., Pre-eruptive storage conditions and eruption dynamics of a small rhyolite dome: Douglas Knob, Yellowstone volcanic field, USA., *Bull. Volcanol.*, 76, 1-12, 2014.
68. Mora, J.C., Gardner, J.E., Macias, J.L., and Meriggi, L., Magmatic controls on eruption dynamics of the 1,950 yr B.P. eruption of San Antonio volcano, Tacaná Volcanic Complex, Mexico-Guatemala, *J. Volcanol. Geotherm. Res.*, 262, 134-152, 2013.
67. Gonnermann, H.M., and Gardner, J.E., Homogeneous bubble nucleation in rhyolitic melt: Experiments and non-classical theory. *Geochemistry, Geophysics, Geosystems*, 14, doi: 10.1002/ggge.20281, 2013.
66. Arce, J.L., Gardner, J.E., and Macías, J.L., Pre-eruptive conditions of the 21.7 ka Plinian event at Nevado de Toluca volcano, Central Mexico, *Bull. Volcanol.*, 249, 49-65, 2013.
65. Gardner, J.E., Ketcham, R.A., and Moore, G., The dynamics of bubble nucleation in hydrous mafic magmas. *J. Volcanol. Geotherm. Res.*, 267, 68-74, 2013.
- \* 64. Befus, K.S., Gardner, J.E., and Zincke, R.W., Analyzing water contents in unexposed glass inclusions in quartz crystals, *Am. Mineral.*, 97, 1898-1904, 2013.
63. Rueda, H., Macias, J.L., Arce, J.L., Gardner, J.E., and Layer, P.W., The ~31 ka rhyolitic Plinian to sub-Plinian eruption of Tlaloc Volcano, Sierra Nevada, central Mexico, *J. Volcanol. Geotherm. Res.*, 252, 73-91, 2013.
62. Carazzo, G., Tait, S., Kaminski, E., and Gardner, J.E., The recent Plinian explosive activity of Mt. Pelée volcano (Lesser Antilles): The P1 AD 1300 eruption, *Bull. Volcanol.*, 74, 2187-2203, 2012.
- \* 61. Gardner, J.E., K.S. Befus, J. Watkins, M. Hesse, and N. Miller, Compositional gradients surrounding spherulites in obsidian and their relationship to cooling and spherulite growth, *Bull. Volcanol.*, 74, 1865-1879, 2012.
- \* 60. Sosa-Ceballos, G., Gardner, J.E., Siebe, C., and Macias, J.-L., A caldera forming eruption ~14100 14C yr BP at Popocatepetl volcano, Mexico: Insights from eruption dynamics and magma mixing, *J. Volcanol. Geotherm. Res.*, 213, 27-40, 2012.
59. Arce, J.L., Macias, J.L., Gardner, J.E., and Rangel, E., Reconstruction of the Sibinal Pumice, an andesitic subplinian-Plinian eruption at Tacaná Volcanic Complex, Mexico-Guatemala, *J. Volcanol. Geotherm. Res.*, 217-218, 39-55, 2012.
58. Gardner, J.E., Surface tension and bubble nucleation in phonolite magmas, *Geochim. Cosmochim. Acta*, 76, 93-102, 2012.

57. Gardner, J.E., and R.A. Ketcham, Bubble nucleation in rhyolite and dacite melts: Temperature dependence of surface tension, *Contrib. Mineral. Petrol.*, 162, 929-943, doi: 10.1007/s00410-011-0632-5, 2011.
- \* 56. Nicholson, R.S., Gardner, J.E., and Neal, C.A., Variations in eruption style during the 1931 A.D. eruption of Aniakchak volcano, Alaska, *J. Volcanol. Geotherm. Res.*, doi:10.1016/j.jvolgeores.2011.08.002, 2011.
- \* 55. Andrews, B.J., and Gardner, J.E., Effects of caldera collapse on magma decompression rate: An example from the 1800 <sup>14</sup>C yr BP eruption of Ksudach Volcano, Kamchatka, Russia, *J. Volcanol. Geotherm. Res.*, 198, 205-216, 2010.
54. Saucedo, R., Macias, J.L., Gavilanes, J.C., Arce, J.L., Komorowski, J.C., Gardner, J., and Valdez-Moreno, G., Eyewitness, stratigraphy, chemistry, and eruptive dynamics of the 1913 Plinian eruption of Volcán de Colima, Mexico. *J. Volcanol. Geotherm. Res.*, 191, 149-166, 2010.
- \* 53. Szramek, L., J.E. Gardner, and M. Hort, Cooling-induced crystallization of microlite crystals in two basaltic pumice clasts. *Am. Mineral.*, 95, 503-509, 2010.
- \* 52. Goepfert, K., and Gardner, J.E., Influence of pre-eruptive storage conditions and volatile contents on explosive Plinian style eruptions of basic magma, *Bull. Volcanol.*, DOI 10.1007/s00445-010-0343-1, 2010.
- \* 51. Andrews, B.J., and Gardner, J.E., Turbulent dynamics of partially collapsing volcanic eruption columns, *Geology*, 37, 895-898, 2009.
50. Gardner, J.E., The impact of pre-existing gas on the ascent of explosively erupted magma, *Bull. Volcanol.*, 71, 835-844, 2009.
- \* 49. Andrews, B.J., Gardner, J.E., and Housh, T.B., Repeated recharge, assimilation, and hybridization in magmas erupted from El Chichon as recorded by plagioclase and amphibole phenocrysts, *J. Volcanol. Geotherm. Res.*, 175, 415-426, 2008.
48. Castro, J.M., and Gardner, J.E., Did ascent rate control the explosive-effusive transition at the Inyo volcanic chain, California?, *Geology*, 36, 279-282, 2008.
- \* 47. Andrews, B., Gardner, J.E., Tait, S., Ponomareva, V.V., and Melekestsev, I.V., Dynamics of the 1800 <sup>14</sup>C yr. B.P. caldera-forming eruption of Ksudach volcano, Kamchatka, Russia, *AGU Monograph Series*, 172, 325-342, 2007.
46. Gardner, J.E., Bubble coalescence in rhyolitic melts during decompression from high pressure, *J. Volcanol. Geotherm. Res.*, 166, 161-176, 2007.
- \* 45. Gardner, J.E., A. Burgisser, and P. Stelling, Eruption and Deposition of the Fisher Tuff: evidence for the evolution of pyroclastic density currents, *J. Geol.*, 115, 417-435, 2007.
44. Gardner, J.E., Heterogeneous Bubble Nucleation in Highly Viscous Silicate Melts During Instantaneous Decompression from High Pressure, *Chem. Geol.*, 236, 1-12, 2007.
43. Suzuki, Y., J.E. Gardner, and J.F. Larsen, Experimental constraints on syneruptive magma ascent related to the phreatomagmatic phase of the 2000 A.D. eruption of Usu volcano, Japan, *Bull. Volcanol.*, *Bull. Volcanol.*, 69, 4232-4244, 2007.
- \* 42. Arce, J.L., J.L. Macias, J.E. Gardner, and P.W. Layer, A 2.5 ka history of dacitic magmatism at Nevado de Toluca, Mexico: Petrological, <sup>40</sup>Ar/<sup>39</sup>Ar dating, and experimental constraints on petrogenesis, *J. Petrol.*, 47, 457-479, 2006.
- \* 41. Szramek, L., J.E. Gardner, and J. Larsen, Degassing and microlite crystallization of basaltic andesite magma erupting at Arenal volcano, Costa Rica, *J. Volcanol. Geotherm. Res.*, 157, 182-201, 2006.
- \* 40. Browne, B., and J.E. Gardner, The influence of magma ascent path on the texture, mineralogy,

- and formation of hornblende reaction rims, *Earth Planet. Sci. Lett.*, 246, 161-176, 2006.
39. Gardner, J.E., A. Burgisser, M. Hort, and M. Rutherford, Experimental and model constraints on degassing of magma during ascent and eruption, in Siebe, C., Macias, J.L., and Aquirre-Diaz, G.J., Neogene-Quaternary continental margin volcanism: A perspective from Mexico. *Geol. Soc. Am. Bull. Spec. Pap.* 402, 99-114, 2006.
- \* 38. Burgisser, A., and J.E. Gardner, Using hydraulic equivalences to discriminate transport processes of volcanic flows, *Geology*, 34, 157-160, 2006.
37. Castro, J.M., D.B. Dingwell, A. Nichols, and J.E. Gardner, New insights on the origin of flow bands in obsidian, in Manga, M. and Ventura, G., Kinematics and dynamics of lava flows, *Geol. Soc. Am. Spec. Pap.* 396, 55-66, 2005.
- \* 36. Browne, B.L., and J.E. Gardner, Transport and deposition of pyroclastic material from the ~1000 A.D. caldera-forming eruption of Volcán Ceboruco, Nayarit, Mexico, *Bull. Volcanol.*, 67, 469-489, DOI: 10.1007/s00445-004-0390-6, 2005.
- \* 35. Burgisser, A., and J.E. Gardner, Experimental constraints on degassing and permeability in volcanic conduit flow, *Bull. Volcanol.*, 67, 42-56, DOI: 10.1007/s00445-004-0356-8, 2005.
- \* 34. Stelling, P., J.E. Gardner, and J. Beget, Eruptive history of Fisher Caldera, Alaska, USA, *J. Volcanol. Geotherm. Res.*, 139, 163-183, 2004.
33. Larsen, J.F., and J.E. Gardner, Experimental study of water degassing from phonolite melts: Implications for volatile oversaturation during magmatic ascent, *J. Volcanol. Geotherm. Res.*, 134, 109-124, 2004.
- \* 32. Larsen, J.F., M.-H. Denis, and J.E. Gardner, Experimental study of bubble coalescence in rhyolitic and phonolitic melts, *Geochim. Cosmochim. Acta*, 68, 333-344, 2004.
- \* 31. Coombs, M., and J.E. Gardner, Reaction rim growth on olivines in silicic melts: Implications for magma mixing, *Am. Mineral.*, 89, 748-758, 2004.
- \* 30. Browne, B.L., and J.E. Gardner, The nature and timing of caldera collapse as indicated by accidental lithic fragments from the ~1000 A.D. eruption of Volcan Ceboruco, Mexico. *J. Volcanol. Geotherm. Res.*, 130, 93-105, 2004.
- \* 29. Harms, E., J.E. Gardner, and H.-U. Schminke, Phase equilibria in the Laacher See Tephra (East Eifel, Germany): Constraints on pre-eruptive storage conditions of a phonolitic magma reservoir. *J. Volcanol. Geotherm. Res.*, 134, 125-138, 2004.
- \* 28. Gardner, J.E., and M.H. Denis, Rates of Heterogeneous Bubble Nucleation in Silicate Melts, *Geochim. Cosmochim. Acta*, 68, 3587-3597, 2004.
- \* 27. Izbekov, P., J.E. Gardner, and J.E. Eichelberger, Comagmatic granophyre and dacite from Karymsky volcanic centre, Kamchatka: experimental constraints for magma storage conditions, *J. Volcanol. Geotherm. Res.*, 131, 1-18, 2004.
- \* 26. Chertkoff, D.G., and J.E. Gardner, Nature and timing of magma interactions before, during, and after the caldera-forming eruption of Volcán Ceboruco, Mexico, *Contribs. Mineral. Petrol.*, 146, 715-735, 2004.
- \* 25. Stelling, P., J. Begét, C. Nye, J. Gardner, J.D. Devine, and R. George, Geology and petrology of ejecta from the 1999 eruptions of Shishaldin Volcano, Alaska, *Bull. Volcanol.*, 64: 548-561, 2002.
24. Gardner, J.E., P.W. Layer, and M.J. Rutherford, Phenocrysts versus xenocrysts in the Toba Tuff: Implications for the petrogenesis of 2800 km<sup>3</sup> of magma, *Geology*, 30, 347-350, 2002.
23. Layer, P.W., and J.E. Gardner, Excess argon in Mount St. Helens plagioclase as a recorder of magmatic processes, *Geophys. Res. Lett.*, 28, 4279-4281, 2001.
- \* 22. Coombs, M.L., and J.E. Gardner, Shallow storage conditions for the rhyolite of the 1912

- eruption at Novarupta, Alaska, *Geology*, 29, 775–778, 2001.
21. Larsen, J.F., and J.E. Gardner, Experimental constraints on bubble interactions in rhyolitic melts: Implications for vesicle size distributions, *Earth Planet. Sci. Lett.*, 180, 201-214, 2000.
  20. Gardner, J.E., and S. Tait, The caldera forming eruption of Volcán Ceboruco, Mexico, *Bull. Volcanol.*, 62, 20-33, 2000.
  19. Gardner, J.E., M. Hilton, and M.R. Carroll, Bubble growth in highly viscous silicate melts during continuous decompression from high pressure, *Geochim. Cosmochim. Acta*, 64, 1473-1483, 2000.
  18. Hort, M., and J.E. Gardner, Constraints on degassing of pumice clasts during Plinian volcanic eruptions based on model calculations, *J. Geophys. Res.*, 105, 25981-26001, 2000.
  17. Rutherford, M.J., and J.E. Gardner, Rates of Magma Ascent, In Sigurdsson, H., ed., *Encyclopedia of Volcanoes*, Academic Press, pp. 207-218, 2000.
  16. Gardner, J.E., M. Hilton, and M.R. Carroll, Experimental Constraints on Degassing of Magma: Isothermal Bubble Growth During Continuous Decompression from High Pressure, *Earth Planet. Sci. Lett.*, 168, 201-218, 1999.
  - \* 15. Cottrell, E., J.E. Gardner, and M.J. Rutherford, Dynamic movement and changing storage conditions of large silicic magma bodies: Evidence from the Minoan rhyodacite, Santorini, Greece. *Contrib. Mineral. Petrol.*, 135, 315-331, 1999.
  14. Gardner, J.E., S. Carey, and H. Sigurdsson, Plinian eruptions at Glacier Peak and Newberry volcanoes, USA: Implications for volcanic hazards in the Cascades Volcano Range, *Geol. Soc. Am. Bull.*, 110, 173-187, 1998.
  13. Devine, J.D., M.J. Rutherford, and J.E. Gardner, Petrologic determination of magma ascent rates for the 1995-97 Soufriere Hills Volcano andesitic magma. *Geophys. Res. Lett.*, 25, 3673-3676, 1998.
  12. Devine, J.D., M.D. Murphy, M.J. Rutherford, J. Barclay, R.S.J. Sparks, M.R. Carroll, S.R. Young, and J.E. Gardner, Petrologic evidence for pressure-temperature conditions and magma mixing in the new dome at Soufriere Hills Volcano, Montserrat. *Geophys. Res. Lett.*, 25, 3673-3676, 1998.
  11. Barclay, J., M.R. Carroll, M.J. Rutherford, M.D. Murphy, J.D. Devine, J.E. Gardner, and R.S.J. Sparks, Experimental phase equilibria constraints on pre-eruptive storage conditions of the Soufriere Hills magma. *Geophys. Res. Lett.*, 25, 3437-3440, 1998.
  10. Tait, S., R.M.E. Thomas, J.E. Gardner, and C. Jaupart, Constraints on cooling rates and permeabilities of pumice in an explosive eruption jet from colour and magnetic mineralogy, *J. Volcanol. Geotherm. Res.*, 86, 79-91, 1998.
  9. Gardner, J.E., R.M.E. Thomas, C. Jaupart, and S. Tait, Fragmentation of magma during volcanic plinian eruptions, *Bull. Volcanol.*, 58, 144-162, 1996.
  8. Gardner, J.E., S. Carey, M.J. Rutherford, and H. Sigurdsson, Influence of magma composition on the eruptive activity of Mount St. Helens, Washington, *Geology*, 23, 523-526, 1995.
  7. Gardner, J.E., S. Carey, M. Rutherford, and H. Sigurdsson, Petrologic diversity in Mount St. Helens dacites during the last 4,000 years: implications for magma mixing, *Contrib. Mineral. Petrol.*, 119, 224-238, 1995.
  6. Gardner, J.E., M. Rutherford, S. Carey, and H. Sigurdsson, Experimental constraints on pre-eruptive water contents and changing magma storage prior to explosive eruptions of Mount St. Helens volcano, *Bull. Volcanol.*, 57, 1-17, 1995.
  5. Devine, J.D., J.E. Gardner, H.P. Brack, G.D. Layne, and M.J. Rutherford, Comparison of microanalytical methods for estimation of H<sub>2</sub>O contents of silicic volcanic glasses, *Am.*

- Mineral.*, 80, 319-328, 1995.
4. Carey, S., J.E. Gardner, and H. Sigurdsson, The intensity and magnitude of post-glacial plinian eruptions of Mount St. Helens Volcano, *J. Volcanol. Geotherm. Res.*, 66, 185-202, 1995.
  3. Laj, P., J.M. Palais, J.E. Gardner, and H. Sigurdsson, Modified HNO<sub>3</sub> seasonality in volcanic layers of a polar ice core: snow-pack effect or photochemical perturbation?, *J. Atmospher. Chem.*, 16, 219-230, 1993.
  2. Gardner, J.E., H. Sigurdsson, and S. Carey, Eruption dynamics and magma withdrawal during the plinian phase of the Bishop Tuff eruption, Long Valley Caldera, *J. Geophys. Res.*, 96, 8097-8111, 1991.
  1. Carey, S., H. Sigurdsson, J.E. Gardner, and W. Criswell, Variations of column height and magma discharge during the May 18, 1980 eruption of Mount St. Helens, *J. Volcanol. Geotherm. Res.*, 43, 99-112, 1990.

### **Invited Presentations**

Department of Earth Sciences, University of Oregon, January 2018. “Investigating the Dynamics of Pyroclastic Flows from the Damage They Leave Behind.” and “From Ash to Obsidian: Making Lava in Volcanic Conduits.”

Institute for Hazards, Risk, and Resilience, Durham University, November 2015. “The End of a Plinian Affair: Observations and Speculations on How and Why Explosive Eruptions Stop.”

Institute for Advanced Studies, Durham University, October 2015. “Evidence for the Biggest Volcanic Eruptions from the Smallest Bubbles and Crystals.”

American Museum of Natural History, January 2012. “Spherulites as Proxy Thermometers in Lavas: Constraints on Obsidian Lavas Erupted in Yellowstone National Park.”

American Geophysical Union, Fall Meeting, December 2008. “Experimental constraints on non-equilibrium degassing of bubbly magmas.”

European Geophysical Union, General Assembly, April 2008. “The impact of a pre-existing gas phase on the degassing of magma during explosive eruptions.”

The 25th Commemorative Conference of El Chichòn volcano, March 23-25, 2007, San Cristobal de las Casas, Chiapas, Mexico. “Dynamics of the El Chichon Magma System as Recorded by Compositional Zonations in Plagioclase Phenocrysts”

American Geophysical Union, Fall Meeting, December 2005. “Experimental Constraints on the Development of Permeability in Bubbly Magma.”

Institute for Geophysics, April 24, 2004, UNAM, Mexico City, Mexico. “Experimental Petrology: The Reasons for Doing Experiments and the Reasoning Behind Them”.

Penrose Conference, Geological Society of America, Neogene-Quaternary continental margin volcanism, January 12-16, 2004, Metepec, Puebla, Mexico. “The Dynamics of Bubble Formation in Magmas”.

Conference on Drilling Unzen Volcano, January 20, 2002, Shinabara, Japan. “Bubble Nucleation, Growth, and Coalescence”.

IVGG, July 31, 2001, Petropavlosk-Kamchatsky, Russia. “Modeling Caldera Collapse”.

Institute for Geophysics, November 9, 1999, UNAM, Mexico City, Mexico. “Cooling of Pumices: Implications on Degassing”.

## **IX. Service**

### *University of Texas at Austin Service*

Chair, Graduate Support and Admissions Committee, 9/01/2012-present

Chair, Space and Facilities Committee, Department of Geological Sciences, 9/01/2016-present

Chair, Search Committee for Faculty Position in Petrology, 9/01/2019-present

Faculty Oversight, ICP-MS Facility, Department of Geological Sciences, 9/01/2015-present.

Member, Jackson School Equipment Committee, 9/01/2019-present

Member, University of Texas Graduate Education Task Force, 9/01/2018-12/31/19

Chair, Search Committee for Faculty Position in Petrology, 9/01/2013-8/31/2015

Chair, Jackson School Petrology and Mineral Physics Discipline, 9/01/2011-8/31/2012

Chair, Jackson School Petrology Education and Research Group, 9/01/2003-8/31/2011

Chair, Search Committee for Electron Microbeam Facilities Manager, 5/01/2008-12/31/2009

Chair, Review Committee of the Bachelor's in Science degree in Geological Sciences, Option I. General Geology, 9/01/2007-12/31/2007

Member, Jackson School Endowment Committee, 9/01/09-8/31/14

Member, Jackson School Graduate Admissions and Support Committee, 9/01/2003-8/31/2011

Member, Search committee for Jackson School Crust/Mantle/Core Theme Search, 3/31/2007-5/30/2009

*National and International Service*

Editor-in-Chief, Journal of Volcanology and Geothermal Research, 1/1/17–present.

Associate Editor, Bulletin of Volcanology, 10/01/2011-12/31/2016

Associate Editor, Journal of Geophysical Research, Solid Earth, 2/06/2003-12/31/2005

Deputy Secretary General of IAVCEI, 2000-2003

National Science Foundation, EAR Proposal Review Panel, 9/2005

Continuing consultation for developing experimental petrology laboratory at UNAM, Project

Funded by CONOCyT for Dr. Jose Luis Macias and Dr. Jose Luis Arce

Reviewer of research proposals to National Science Foundation proposals, Swiss National Science Foundation, NERC, and Israel Science Foundation

Reviewer of submitted manuscripts to Earth and Planetary Science Letters, Journal of Geophysical Research, Bulletin of Volcanology, Journal of Volcanology and Geothermal Research, Geophysical Research Letters, Contributions to Mineralogy and Petrology, Geology, European Journal of Mineralogy, Lithos, Bulletin of Geological Society of America, American Mineralogist

*University of Alaska Fairbanks Service*

Faculty Council and Chair, Graduate and Professional Activities Committee, 7/01/1999-5/07/2001

Geology and Geophysics Departmental Accreditation Notebook, 7/01/2000-6/30/2001

Member, Graduate Admissions Committee, 9/01/1999-5/31/2003

Staff scientist with Alaska Volcano Observatory, 9/01/1998-5/31/2003