Curriculum Vitae

I. Personal Data

Name: James Edward Gardner

Present Address University of Texas at Austin
Jackson School of Geosciences
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Date of Birth: 29 March 1963

Marital Status: Married

Present Position: Associate Professor

II. Academic Degrees

Doctor of Philosophy (Ph.D.), 1993
University of Rhode Island, Graduate School of Oceanography
Narragansett, Rhode Island, U.S.A.

Masters of Art (M.A.) in Geology, 1987
Washington University, Earth and Planetary Science Department
St. Louis, Missouri, U.S.A.

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

III. Honors and Awards

2002 Wager Medal from IAVCEI, Co-recipient
1995 Alexander von Humboldt Fellowship

IV. Academic History

Ph.D. Degree: University of Rhode Island, Graduate School of Oceanography
Narragansett, Rhode Island, U.S.A.
from September 1987, to May 1993.
Major Subject: Volcanology and Geological Oceanography

M.S. Degree: Washington University, Earth and Planetary Science Department
St. Louis, Missouri, U.S.A.
from September 1985, to August 1987.
Major Subject: Geology and Geochemistry

B.S. Degree: Southern Methodist University
Dallas, Texas, U.S.A.
from September 1981, to May 1985.
Major Subject: Geology

V. Professional Background

Associate Professor, from September 2003, to present
Department of Geological Sciences, Jackson School of Geosciences
University of Texas at Austin, Austin, TX, USA

Assistant Professor, from October 1998, to August 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.

VI. Grant Support (Recent or Active):

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", $91,923.00, 2 years.

NSF grant EAR-0309703, "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-0207316, "*Collaborative Research:* Investigating the processes and timescales of andesite differentiation: A comprehensive petrological and geochemical study of Arenal volcano, Costa Rica", $94,089.00, 2 years.

NSF grant EAR-0106658, "Experimental Study of Plagioclase textures and Amphibole reaction rims: Implications for rates of magmatic processes", $172,040.00, 2 years.

NSF grant EAR-0087853, "Magmatic Degassing: Experimental and Textural Constraints", $52,981.00, 1 year

NSF grant EAR-9996015, "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.

U.S.G.S. Dept. Interior grant, "Central Aleutian Volcano Monitoring"

U.S.G.S. Dept. Interior grant, "Cook Inlet Volcano Monitoring"

VII. Bibliography

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.

Refereed Journal Articles

39. Castro, J.M., D.B. Dingwell, A. Nichols, and J.E. Gardner, New insights on the origin of flow bands in obsidian, *Geol. Soc. Am. Spec. Pub.*, submitted.
38. Stelling, P., J.E. Gardner, and J. Beget, Eruptive history of Fisher Caldera, Alaska, USA, *J. Volcanol. Geotherm. Res.*, *139*, 163-183, 2004.
37. 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., DOI: 10.1007/s00445-004-0390-6.*

36. Gardner, J.E., A. Burgisser, M. Hort, and M. Rutherford, Experimental and model constraints on degassing of magma during ascent and eruption, *Geol. Soc. Am. Bull.*, submitted.
35. Burgisser, A., and J.E. Gardner, The significance of cross-stratified deposits from dilute pyroclastic density currents, *Geology*, submitted.
34. Burgisser, A., and J.E. Gardner, Experimental constraints on degassing and permeability in volcanic conduit flow, *Bull. Volcanol.*, 64, 42-56, 2004. *DOI: 10.1007/s00445-004-0356-8*.
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^3 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. Cosmos. 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_2O 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_3 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.

Published Abstracts

57. Gardner, J.E., Bubble nucleation in highly viscous silicate melts during instantaneous decompression from high pressure, *EOS Transactions AGU*, 2004.
56. Andrews, B., Gardner, J.E., and Izbekov, P., Ksudach, *EOS Transactions AGU*, 2004.
55. Szramek, L.A., Gardner, J.E., and Larsen, J., Decompression induced crystallization of basaltic andesite magma: Constraints on the eruption of Arenal volcano, Costa Rica [abstract], *EOS Transactions AGU*, 2004.

54. Burgisser, A., and Gardner, J.E., The significance of cross-bedded surge deposits [abstract], *EOS Transactions AGU*, 84(46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

53. Castro, J.M., and Gardner, J.E., Phase equilibria and kinetic crystallization experiments on the Inyo Domes rhyolite [abstract], *EOS Transactions AGU*, 84(46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

52. Izbekov, P., Gardner, J.E., Andrews, B., Ponomareva, V.V., Melekestsev, I.V., Petrology of Holocene caldera-forming eruptions at Ksudach, Kamchatka [abstract], *EOS Transactions AGU*, 84(46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

51. Browne, B.L., Gardner, J.E., and Larsen, J., Amphibole reaction rims in response to decompression compared to heating: an experimental approach [abstract], *EOS Transactions AGU*, 84(46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

50. Szramek, L.A., Gardner, J.E., and Larsen, J., Experimental constraints on the magma chamber conditions and degassing of Arenal volcano, Costa Rica [abstract], *EOS Transactions AGU*, 84(46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

49. Andrews, B.J., Gardner, J.E., and Izbekov, P.E., Eruption dynamics and conduit processes of the circa 240 A.D. eruption of Ksudach volcano, Kamchatka, Russia [abstract], *EOS Transactions AGU*, 84(46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

48. Stelling, P., Gardner, J.E., and Beget, J., Remotely induced eruptions: the Caldera-forming eruption of Fisher volcano [abstract], *EOS Transactions AGU*, 84(46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

47. Layer, P.W., Gardner, J.E., Mora, J.C., and Arce, J.L., Argon isotopes as recorders of magmatic processes [abstract], *EOS Transactions AGU*, 84(46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

46. Mora, J.C., J.L. Macias, and J.E. Gardner, Experimental petrology applied in deposits of the 550 yr. B.P. eruption at El Chichon volcano, Chiapas [abstract], *EOS Transactions AGU*, 83, F1463, 2002.

45. Gardner, J.E., S. Tait, B.J. Andrews, V. Ponomareva, and I.V. Melekestsev, Eruption dynamics of the KS1 caldera eruption of Ksudach volcano, Russia [abstract], *EOS Transactions AGU*, 83, F1468, 2002.

44. Nicholson, R., J.E. Gardner, and C.A. Neal, The 1931 eruption of Aniakchak volcano, Alaska [abstract], *EOS Transactions AGU*, 83, F1465, 2002.

43. Miller, T.P., C.R. Waythomas, and J. Gardner, Multiple Late Quaternary Caldera-Forming Eruptions at Mount Veniaminof Volcano, Alaska Peninsula Russia [abstract], *EOS Transactions AGU*, 83, F1465, 2002.

42. Browne, B., and J.E. Gardner, Experimental calibration of amphibole breakdown rates in response to decompression and heating [abstract], *EOS Transactions AGU*, 83, F1464,

2002.

41. Suzuki, Y., and J.E. Gardner, Experimental Constraints on Magma Ascent during the Usu 2000 Eruption, Japan [abstract], *EOS Transactions AGU*, 83, F1418, 2002.
40. Snyder, D., A. Burgisser, and J.E. Gardner, Volcanic fall deposits on Mars: A linear response theory approach to modeling sedimentation [abstract], *Lunar Planet. Sci., XXXIII*, 2002.
39. Churikova, T., B. Ivanov, J. Eichelberger, S. Trusov, J. Gardner, A. Belousov, B. Browne, P. Izbekov, and G. Werner, Kizimen Volcano: An Unzen-like Magma System in Kamchatka [abstract], *EOS Transactions AGU*, 82, F1381, 2001.
38. Layer, P.W., J.E. Gardner, and M.J. Rutherford, Argon Isotopic and Experimental Petrologic Evidence for Phenocrysts Versus Xenocrysts in the Youngest Toba Tuff [abstract], *EOS Transactions AGU*, 82, F1319, 2001.
37. Browne, B., and J.E. Gardner, Late-stage Pyroclastic Flow and Fall Deposits From Volcán Ceboruco, Mexico: Insights From a Small Volume Caldera-Forming [abstract], *EOS Transactions AGU*, 82, F1381, 2001.
36. Denis, M.-H., and J.E. Gardner, Nucleation rates of bubbles in magmas [abstract], *EOS Transactions AGU*, 82, F1366, 2001.
35. Gardner, J.E., A. Burgisser, and P.J. Shamberger, Experimental constraints on degassing and permeability in volcanic conduit flow [abstract], *EOS Transactions AGU*, 82, F1300, 2001.
34. Harms, E., and J.E. Gardner, Pre-eruptive storage conditions of the highly differentiated phonolitic Laacher See magma (East Eifel, Germany) [abstract], *TERRA nova*, 2001.
33. Larsen, J., and J.E. Gardner, Experimental Investigation of Bubble Nucleation in Sub-Liquidus Silicate Melts [abstract], *EOS Transactions AGU*, *81*, F1293, 2000.
32. Tait, S., J.E. Gardner, and G. Russo, The formation of calderas during explosive volcanic eruptions [abstract], *EOS Transactions AGU*, *81*, F1336, 2000.
31. McNutt, S., J. Dehn, and J.E. Gardner, Phreatic Explosions at Shishaldin Volcano, Alaska, September 1999 to August 2000 [abstract], *EOS Transactions AGU*, *81*, F1376, 2000.
30. Browne, B.L., and J.E. Gardner, Transport and Deposition of Pyroclastic Material during the Caldera-Forming Eruption of Volcan Ceboruco (Mexico) [abstract], *EOS Transactions AGU*, *81*, F1332, 2000.
29. Burgisser, A., G.W. Bergantz, and J.E. Gardner, Implications of Self-Organization in Pyroclastic Density Currents [abstract], *EOS Transactions AGU*, *81*, F1333, 2000.
28. Izbekov, P., J.E. Gardner, and J. Eichelberger, The 6,600 BP caldera forming eruption at Karymsky: Experimental constraints on pre-eruptive storage conditions [abstract], *EOS Transactions AGU*, *81*, F1352, 2000.

27. Coombs, M.L., and J.E. Gardner, Disequilbrium reactions between mafic phenocrysts and rhyolite melt: Implications for magma mixing [abstract], *EOS Transactions AGU, 81*, F1291, 2000.
26. Stelling, P. L., and J. E. Gardner, Eruptive and Compositional Evolution of Fisher Caldera, Alaska, USA [abstract], *EOS Transactions AGU, 81*, F1352, 2000.
25. Chertkoff, D.G., and J.E. Gardner, Timing Between Mixing and the Caldera-Forming Eruption of Volc·n Ceboruco, Mexico [abstract], *EOS Transactions AGU, 81*, F1294, 2000.
24. Gardner, J.E., and M. Coombs, Magma Storage Conditions for the Rhyolite of the 1912 Eruption of Katmai, Katmai National Park, Alaska [abstract], *EOS Transactions AGU, 80*, F1105, 1999.
23. Larsen, J.F., J.E. Gardner, H.R. Westrich, and J.C. Eichelberger, Experimental study of bubble growth and interactions in rhyolitic melts [abstract], *EOS Transactions AGU, 80*, F1109, 1999.
22. Layer, P.W., and J.E. Gardner, What is the Significance of Excess Argon in Mount St. Helens Plagioclase? [abstract], *EOS Transactions AGU, 80*, F1129, 1999.
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20. Gardner, J.E., M.J. Rutherford, and M. Hort, Degassing of trace gases during volcanic eruptions [abstract], *EOS Transactions AGU, 79*, F936, 1998.
19. Hort, M., and J.E. Gardner, Degassing of pumices during volcanic eruptions [abstract], *EOS Transactions AGU, 79*, F936, 1998.
18. Weitz, C.M., and J.E. Gardner, The Stealth deposit on Mars: Is it a volcanic deposit? [abstract], *Lunar Planet. Sci., XXIV*, 1998.
17. Gardner, J.E., and M.J. Rutherford, Gas Pressures and Phase Equilibria in the Toba Tuff Magma [abstract], *EOS Transactions AGU, 78*, F792, 1997.
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15. Blundy, J.D., and J.E. Gardner, Origin of Mount St. Helens dacites by partial melting of underplated Cascades basalts [abstract], *Journal of Conference Abstracts , 2*, 16, 1997.
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12. Hort, M., and J. Gardner, On the longevity of conduits [abstract], *EOS Transactions AGU*,

77, F819, 1996.

11. Jaupart, C., J. Gardner, M. Stasiuk, S. Tait, and R. Thomas, Field constraints on the physics of ascent, degassing and fragmentation of magma [abstract], *TERRA nova*, *7*, 133, 1995.
10. Gardner, J.E., M. Carroll, and C. Jaupart, Experimental constraints on degassing of magma during volcanic eruptions [abstract], *EOS Transactions AGU*, *75*, 728, 1994.
9. Blank, J.G., J.E. Gardner, C. Jaupart, and Z. Sharp, Degassing and fragmentation histories of erupted magmas: Evidence from matrix glasses in pumice [abstract], *EOS Transactions AGU*, *75*, 719, 1994.
8. Carey, S., J.E. Gardner, M.J. Rutherford, and H. Sigurdsson, Influence of magma mixing on the eruptive activity of Mount St. Helens [abstract], *EOS Transactions AGU*, *75*, 750, 1994.
7. Blundy, J.D., and J.E. Gardner, Trace element variation in matrix and inclusion glasses from Mount St. Helens dacites, 1480-1980 A.D. [abstract], *EOS Transactions AGU*, *75*, 733, 1994.
6. Gardner, J.E., M. Rutherford, S. Carey, H. Sigurdsson, and G. Layne, Changing volatile content and magmatic storage of dacitic magma at Mount St. Helens [abstract], *EOS Transactions AGU*, *73*, 367, 1992.
5. Gardner, J.E., S. Carey, H. Sigurdsson, M. Rutherford, and G. Layne, Influence of changing magmatic properties and storage on explosive volcanism at Mount St. Helens [abstract], *EOS Transactions AGU*, *72*, 576, 1991.
4. Carey, S., J.E. Gardner, and H. Sigurdsson, Intensity and magnitude of post-glacial plinian eruptions of Mount St. Helens [abstract], *N.M. Bur. Mines Mineral. Res.*, *131*, 43, 1989.
3. Gardner, J.E., H. Sigurdsson, and S.N. Carey, Magma withdrawal and eruption dynamics during the plinian phase of the Long Valley Caldera eruption, California [abstract], *N.M. Bur. Mines Mineral. Res.*, *131*, 103, 1989.
2. Gardner, J.E., L.A. Haskin, and J.C. Brannon, Trace element and Nd isotopic behavior in the Endion Sill, Duluth, Minn. [abstract], *Geol. Soc. Am. Abstrs. Progs.*, *19*, 390, 1987.
1. Gardner, J.E., L.A. Haskin, and J.C. Brannon, Possible assimilation by a mafic magma: the Endion Sill, Duluth, Minnesota [abstract], *Lunar Planet. Sci.*, *XVIII*, 312-313, 1987.

VII. Research Experience

Laboratory Experience

Electron Microprobe at University of Alaska Fairbanks, Brown University, Institut de Physique du Globe (Paris), and GEOMAR, Kiel

Secondary Ion Mass Spectrometry at Woods Hole Oceanographic Institute and CRPG-CNRS, Nancy, France

Cold-Seal Rene and TZM Pressure Bombs and High Pressure Piston Cylinder at University of Alaska Fairbanks, Brown University, University of Bristol, and Christian-Albrechts-Universität zu Kiel, including building a complete experimental petrology laboratory at University of Alaska Fairbanks

Fourier Transform Infrared Spectroscopy at University of Bristol, Bristol, England

X-ray Fluorescence at University of Rhode Island

Instrumental Neutron Activation Analysis at University of Rhode Island, including developing an INAA laboratory for the volcanological group of Sigurdsson and Carey

Digital Image Analysis at University of Alaska Fairbanks, University of Rhode Island, Institut de Physique du Globe and GEOMAR, Kiel

Fieldwork Experience

Mapping and sampling pyroclastic deposits at Ksudach Caldera, Russia: August 2002

Mapping and sampling pyroclastic deposits at Aniakchak Caldera, Alaska: July 2002

Mapping and sampling pyroclastic deposits at Fisher Caldera, Alaska: August 2001

Mapping and sampling pyroclastic deposits at Veniaminof Caldera, Alaska: July 2001

Mapping and sampling pyroclastic deposits at Fisher Caldera, Alaska: July 2000.

Mapping and sampling pyroclastic deposits at Volcán Ceboruco and Nevado de Toluca, Mexico: October 1999.

Mapping and sampling pyroclastic deposits at Fisher Caldera, Alaska: August 1999.

Mapping and sampling pyroclastic deposits at Volcán Ceboruco, Mexico: December 1996.

Mapping and sampling pyroclastic deposits at Glacier Peak, Washington; Newberry Caldera, Oregon: August 1996.

Mapping and sampling pyroclastic deposits at Santorini, Greece: October, 1993 and September and October 1995.

Mapping and sampling lava flows and pyroclastic deposits at Chain des Puys volcanoes, Sancy volcano, and Cantal volcano, Massif Central, France: May, 1994 and May, 1995.

Mapping and sampling pyroclastic deposits at Masaya Caldera, Nicaragua: March, 1994.

Mapping and sampling pyroclastic deposits at Vesuvius, Italy: June, 1993.

Mapping and sampling pyroclastic deposits at Teide and Montaña Blanca, Tenerife, Canary

Islands: May, 1993.

Mapping and sampling pyroclastic deposits at Mount St. Helens, Washington; Glacier Peak, Washington; Yellowstone National Park, Wyoming: June-July, 1989.

Mapping and sampling pyroclastic deposits at Long Valley Caldera, California; Newberry Caldera, Oregon; Mount St. Helens, Washington: August-September, 1988.

Mapping and sampling lava flows and intrusives in (Proterozoic) North Shore Volcanic Group, Minnesota: September, 1986.

Mapping and sampling pyroclastic deposits at Valles Caldera, New Mexico: June, 1985.

Mapping lava flows in Rio Grande Rift, New Mexico, Kilauea and Mauna Loa, Hawaii: May-June, 1985.