CURRICULUM VITAE

# Amanda Bachtell Clarke

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## Contents

# 1 Academic Training

- The Pennsylvania State University
  Ph.D. Geosciences, **2002**, supervised by Professor Barry Voight (NAE)
  Dissertation title: *Multi-phase fluid dynamics of pyroclastic phenomena*

- University of Notre Dame
  B.S. Aerospace Engineering, **1994**.
  B.A. Philosophy, **1994**.

# 2 Employment

- Arizona State University
  School of Earth and Space Exploration
  Professor
  **May, 2021 – present**

- Arizona State University
  School of Earth and Space Exploration
  Associate Professor
  **May, 2009 – 2021**

- Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Pisa
  Pisa, Italy
  Associated Researcher
  **2009 – present**

- Arizona State University
  Department of Geological Sciences
  Assistant Professor
  **July, 2003 – May, 2009**

- Royal Society Postdoctoral Research Fellow
  University of Bristol
  Bristol, UK
  Mentor Professor RSJ Sparks, FRS*, CBE**
  **2002 – 2003**

# 3 Research interests

The physics of volcanic eruptions, especially short-lived, highly-unsteady explosive eruptions and dome-building systems; fluid mechanics of multiphase volcanic systems, including viscous magmas and high-Reynolds number gas/solid mixtures; developing and using numerical models and laboratory experiments to understand volcanic systems; eruption prediction and hazards assessment; field and satellite observation of plumes and domes to understand physical processes; volcano deformation and its role in eruption prediction; interpretation of pyroclastic deposits on Earth and Mars; highly-explosive basaltic volcanism; cinder cone erosion and volcanic geomorphology; eruption triggering and interaction between geologic processes (e.g., earthquake-triggered volcanic activity; the interaction between volcanic plumes and Earth's atmosphere).

*FRS - Fellow of the Royal Society
**CBE - Commander of the Most Excellent Order of the British Empire

# 4 Honors and awards

- **Fulbright Scholar to Italy**
  Project Title: *Explosive Volcanic Eruptions: Etna, Stromboli, Sunset Crater and Mars*
  **2016**
- **Wager Medalist** WAGER MEDAL DESCRIPTION
  Awarded by IAVCEI, the International Association of Volcanology and Chemistry of the Earth's Interior
  "In recognition of outstanding contributions made to volcanology by a scientist up to 15 years after Ph.D. acquisition, particularly in the eight-year period prior to the Award."
  **2011**
- **Royal Society Fellowship**, University of Bristol, Bristol, UK.
  Mentor: Professor RSJ Sparks, FRS, CBE
  **2002-2003**
- **Exxon Graduate Fellow, Penn State University**
  **2001**
- **Academic Computing Fellow, Penn State University**
  **1997-2000**
- **Fulbright Scholar to the Philippines** hosted by the University of the Philippines and The Philippine Institute of Volcanology and Seismology
  Project Title: *Long-term socio-economic and cultural impacts of volcanic eruptions of Mayon volcano on nearby communities.*
  **1994-1995**

# 5 Publications

## 5.1 Peer-Reviewed Book Chapters and Reports

6. Michael Manga, Simon Carn, Katharine Cashman, **Amanda Clarke**, Charles Connor, Kari Cooper, Tobias Fischer, Bruce Houghton, Jeffrey Johnson, Terry Plank, Diana Roman, Paul Segall (2017) Eruptions, Repose, Unrest, Precursors, and Timing, by The Committee on Improving Understanding of Volcanic Eruptions. National Academies of Sciences, Engineering, and Medicine. Washington, DC: The National Academies Press. doi: https://doi.org/10.17226/24650.

5. **Clarke, A.B.**, T. Esposti-Ongaro, A. Belousov (2015) "Vulcanian Eruptions", In Sigurdsson, Houghton, McNutt, Rymer, and Stix, Encyclopedia of Volcanoes, 2nd edition, Academic Press, London.

4. **Clarke, A.B.**, "Vulcanian Eruptions" (2013) in *Modeling Volcanic Processes: The Physics and Mathematics of Volcanism* (textbook, eds. S. Fagents, T. Gregg, R. Lopes), Cambridge University Press, pp. 129-152.

3. Shervais, J.W., Evans, J.P., Toy, V.; Eichelberger, J.C., Kirkpatrick, J., and **Clarke, A.**, (2013) Drilling Active Tectonics and Magmatism (Volcanics, Geoprisms, Fault Zones Post-SAFOD) Proceedings of a Workshop. Geology Faculty Publications. Paper 387. hIp://digitalcommons.usu.edu/geology_facpub/387.

2. Fink, J.H. and **A.B. Clarke** (2012) "Volcanic Flows" in *Handbook of Environmental Fluid Dynamics* (ed. H.J.S. Fernando), pp. 189-206.

1. Valentine, G.A., Bonadonna C., Manzella I., **Clarke A.B.**, Dellino, P. (2011) Large-scale experiments on volcanic processes. Eos, Transactions, American Geophysical Union 92:89-96.

## 5.2 Refereed Journal Articles

* Clarke student/post-doctoral advisees at ASU.
** Student or post-doc at another institution.
+ Clarke secondary project advisee at ASU.
+++ An ASU graduate student or post-doc.

*Submitted or In Review*

- Allison*, C.M., K. Roggensack, **A.B. Clarke** (*in review*) MafiC-H: a general model for H2O-CO2 solubility in mafic magmas. *Contributions to Mineralogy and Petrology.*
- Smekens*, J-F, **A.B. Clarke**, M. de'Michieli Vitturi (*in review*) Explosive Eruption Cycles: insights from numerical modeling and field observations. *Bulletin of Volcanology.*
- Jarvis**, P., A. Fries, J. Lemus, C. Bonadonna, **A.B. Clarke**, I. Manzella, J.C. Phillips (*in review*) Kelvin-Helmholtz instabilities and mixing in surface-propagating gravity currents. *Physical Review Research.*

*2021*

62. Peters*, S.I., P. R. Christensen, **A.B. Clarke** (*2021*) Lava flow eruption conditions in the Tharsis Volcanic Province on Mars. *Journal of Geophysical Research: Planets*, 126, e2020JE006791. https://doi. org/10.1029/2020JE006791.
61. Fries**, A., J. Lemus**, P.A. Jarvis**, **A.B. Clarke**, J.C.Phillips, I. Manzella, C. Bonadonna (*2021*) The Influence of Particle Concentration on the Formation of Settling-Driven Gravitational Instabilities at the Base of Volcanic Clouds. *Front. Earth Sci.* 9:640090. doi: 10.3389/feart.2021.64009.
60. La Spina** G., F. Arzilli, E.W. Llewellin, M.R. Burton, **A.B. Clarke**, M. de'Michieli Vitturi, M. Polacci, M.E. Hartley, D. Di Genova, H.M. Mader (2021) Explosivity of basaltic lava fountains is controlled by magma rheology, ascent rate and outgassing. *Earth and Planetary Science Letters* (553) 116658. https://doi.org/10.1016/j.epsl.2020.116658.
59. Allison*, C.M., K. Roggensack, **A.B. Clarke** (2021) Volcanic gases in highly explosive basaltic eruptions. *Nature Communications.* 12:217. https://doi.org/10.1038/s41467-020-20354-2.

*2020*

58. Johnson+++, B.A., L. Ding+++, H.A. Zunino+++, R.J. Adrian, **A.B. Clarke** (2020) Velocity Measurements of Gas Escaping a Particle Bed during Shock-driven Expansion. *Experiments in Fluids.* 61:236. https://doi.org/10.1007/s00348-020-03069-4.
57. Keske+++, A.L., **A.B. Clarke**, M.S. Robinson, (2020) The Morphometry of Lunar Localized Pyroclastic Deposits. *Earth and Planetary Science Letters.* https://doi.org/10.1016/j.epsl.2020.116426.
56. Marliyani+++ G., H. Helmi+++, J.R. Arrowsmith **A.B. Clarke**, (2020) Volcano Morphology as an Indicator of Stress Orientation in Java Volcanic Arc, Indonesia. *Journal of Volcanology and Geothermal Research.* (400) 106912. https://doi.org/10.1016/j.jvolgeores.2020.106912.
55. Carr*, B. B., **A. B. Clarke**, M. de'Michieli Vitturi (2020) Volcanic conduit controls on effusive-explosive transitions and the 2010 eruption of Merapi Volcano (Indonesia). *Journal of Volcanology and Geothermal Research* **392** https://doi.org/10.1016/j.jvolgeores2019.106767.

*2019*

54. La Spina, G.**, **AB Clarke**, M de'Michieli Vitturi, M Burton, CM Allison*, K Roggensack, F Alfano (2019) Conduit dynamics of highly explosive basaltic eruptions: The 1085 CE Sunset Crater sub-Plinian events. *Journal of Volcanology and Geothermal Research.* v. 387, 106658.

53. Allison*, C.M., K. Roggensack, **A.B. Clarke** (2019) $H_2O$-$CO_2$ solubility in alkali-rich mafic magmas: new experiments at mid-crustal pressures. *Contributions to Mineralogy and Petrology*, 174: 58.

52. Zawacki, E.E.+, **A.B. Clarke**, JR Arrowsmith, C Bonadonna, DJ Lynch (2019) Tecolote volcano, Pinacate volcanic field (Sonora, Mexico): A case of highly explosive basaltic volcanism and shifting eruptive styles. *Journal of Volcanology and Geothermal Research.* v. 379, 23-44.

51. Carr*, B. B., **A. B. Clarke**, L. Vanderkluysen*, J R. Arrowsmith (2019) Mechanisms of lava flow emplacement during the effusive eruption of Sinabung Volcano (Sumatra, Indonesia). *Journal of Volcanology and Geothermal Research* (382) 137-148.

50. Carr*, B. B., **A. B. Clarke**, J R. Arrowsmith, L. Vanderkluysen*, B. Eko Dhanu (2019) The emplacement of the active lava flow at Sinabung Volcano, Sumatra, Indonesia, documented by structure-from-motion photogrammetry. *J. Volcanol. Geotherm. Res.* 382, 164-172.

49. Alfano*, F.A., M. Ort, L. Pioli, S. Self, S. Hanson, K. Roggensack, C. Allison*, R. Amos, and **A.B. Clarke** (2019) The sub-Plinian monogenetic basaltic eruption of Sunset Crater, Arizona, USA. *GSA Bulletin.* (131) 3-4, 661-674.

*2018*

48. Carr*, B. B., **A. B. Clarke**, M. de'Michieli Vitturi (2018) Earthquake induced variations in extrusion rate: a numerical modeling approach to the 2006 eruption of Merapi Volcano (Indonesia). *Earth and Planet. Sci. Lett.* **(482)** 377-387.

*2017*

47. La Spina**, G, M. de'Michieli Vitturi, **A.B. Clarke** (2017) Transient numerical model of magma ascent dynamics: application to the explosive eruptions at the Soufrière Hills Volcano. J. Volcanol. Geotherm. Res. (336) 118-139.

46. Bryan, S. **A.B. Clarke**, L. Vanderkluysen*, C. Groppi, S. Paine, D. W. Bliss, J. Aberle, P. Mauskopf (2017) Measuring Water Vapor and Ash in Volcanic Eruptions with a Millimeter-Wave Radar/Imager. IEEE Trans. on Geoscience and Remote Sensing 55 (6), 3177-3185.

45. Rader*, E., Vanderkluysen*, L., **A.B. Clarke** (2017) The role of unsteady effusion rates on inflation in long-lived lava flow fields.' Earth and Planet. Sci. Lett. (477) 73-83.

44. Polacci, M, M de'Michieli Vitturi, F Arzilli, MR Burton, L Caricchi, BB Carr*, M Cerminara, C Cimarelli, **AB Clarke**,S Colucci, A Costa, W Degruyter, T Druitt, S Engwell, T Esposti-Ongaro, D Giordano, L Gurioli, B Haddadi, JE Kendrick, U Kueppers, A Lamur, Y Lavallee, E Llewellin, HM Mader, N Metrich, C Montagna, A Neri, E Rivalta, G Saccorotti, F Sigmundsson, L Spina, J Taddeucci (2017) From magma ascent to ash generation: investigating volcanic conduit processes by integrating experiments, numerical modeling, and observations. Annals of Geophysics vol 60, issue 6, DOI: 10.4401/ag-7449.

*2015 - 2016*

43. Carr*, B. B., **A. B. Clarke**, L. Vanderkluysen* (2016) The 2006 lava dome eruption of Merapi Volcano (Indonesia): detailed analysis using MODIS TIR. J. Volcanol. and Geotherm. Res. 311, 60-71.

42. Smekens*, J-F, **A. B. Clarke**, M. R. Burton, A. Harijoko, and H. E. Wibowo (2015) $SO^2$ emissions at Semeru volcano, Indonesia: characterization and quantification of persistent and periodic explosive activity. J. Volcanol. Geotherm. Res. v. 300, 121-128: doi:10.1016/j.jvolgeores.2015.01.006.

41. Van Eaton*, A.R., L.G. Mastin, M. Herzog, H.F. Schwaiger, D.J. Schneider, K.L. Wallace and **A. B. Clarke** (2015) Hail formation as a mechanism of rapid aggregation in volcanic plumes. Nature Communications. 6:7860 — DOI: 10.1038/ncomms8860.

40. Chojnicki*, K.N., **A. B. Clarke**, J.C. Phillips, R. J. Adrian (2015) The evolution of volcanic plume morphologies from short-lived eruptions. *Geology*, doi:10.1130/G36642.1.

39. Smekens*, J-F, M. R. Burton, and **A.B. Clarke** (2015) Validation of the SO2 camera for high temporal and spatial resolution monitoring of SO2 emissions, J. Volcanol. Geotherm. Res. v. 300: 37-47: doi:10.1016/j.jvolgeores.2014.10.014.

38. Chojnicki*, K.N., **A.B. Clarke**, J.C. Phillips, R. J. Adrian (2015) Rise dynamics of unsteady laboratory jets with implications for volcanic plumes. *Earth and Planet. Sci. Lett.*, 412, 186-196.

*2014*

37. Chojnicki*, K. N., **A. B. Clarke**, R. J. Adrian, and J. C. Phillips (2014) The flow structure of jets from transient sources and implications for modeling short-duration explosive volcanic eruptions, *Geochem. Geophys. Geosyst.*, 15, 4831-4845, doi:10.1002/2014GC005471.

36. Brand*, B.D., D Gravley, **A.B. Clarke**, J. Lindsay, S.H. Bloomberg, J. Agustin-Flores, K. Németh (2014) A combined field and numerical approach to understanding dilute pyroclastic density current dynamics and hazard potential: Auckland Volcanic Field, New Zealand. J. Volcano. Geotherm. Res. 276, 215 - 232.

35. Ruff, S.W. P.B. Niles, F. Alfano*, and **A.B. Clarke** (2014) Evidence for a Noachian-aged playa lake in Gusev crater, Mars. Geology, 42, 359 - 362.

34. Vanderkluysen*, L., M.R. Burton, **A.B. Clarke**, H.E. Hartnett, and J-F Smekens* (2014) Composition and flux of explosive gas release at LUSI mud volcano (East Java, Indonesia) Geochemistry, Geophysics, Geosystems, 15(7), 2932 - 2946.

33. Voight B, RSJ Sparks, E Shalev, T Minshull, M Paulatto, C Annen, C Kenedi, J Hammond, TJ Henstock, L Brown, E Kiddle, P Malin, G Mattioli, C Ammon, E Arias-Dotson, A Belousov, K Byerly, L Carothers, **A Clarke**, S Dean, L Ellett, D Elsworth, D Hidayat, RA Herd, M Johnson, A Lee, V Miller, B Murphy, C Peirce, G Ryan, S Saldana, C Snelson, R Stewart, R Syers, J Taron, J Trofimovs, C Widiwijayanti, SR Young, W Zamora (2014) The SEACALIPSO volcano imaging experiment at Montserrat: plans, campaigns at sea and on land, scientific results, and lessons learned. *Geological Society, London, Memoirs*, v. 39, 253-289.

*2012-2013*

32. de'Michieli Vitturi, M., **A.B. Clarke**, A. Neri, and B. Voight (2013) Extrusion cycles during dome-building eruptions, *Earth and Planet Sci Lett*, 371, 37 - 48.

31. Brand*, B.D., and **A.B. Clarke** (2012) An Energetic Basaltic Phreatomagmatic Eruption at the Table Rock Complex in South-central Oregon (USA): Using deposit characteristics to constrain surge dynamics. *J. of Volcanol. Geotherm. Res.* 243-244: 81-90.

30. Esposti-Ongaro, T., **A.B. Clarke**, B. Voight, A. Neri, and C. Widiwijayanti (2012) Multiphase flow dynamics of pyroclastic density currents during the May 18, 1980 lateral blast of Mount St. Helens (USA). *J. Geophys. Res.*, JB 009081R.

*2010-2011*

29. Esposti-Ongaro, T., C. Widiwijayanti, **A.B. Clarke**, A. Neri, B. Voight (2011) Multiphase-flow numerical modelling of the May 18, 1980 lateral blast at Mount St. Helens (USA). *Geology*, June 2011; v. 39; no. 6; p. 535-538; doi:10.1130/G31865.1.

28. Neill**, O.K., Hammer, J.E., Izbekov, P.E., Belousova, M.G., Belousov, **A.B., Clarke**, A.B. and Voight, B. (2010) Influence of pre-eruptive degassing and crystallization on the juvenile products of laterally directed volcanic explosions. J. Volcanol. Geotherm. Res., 198(1-2), 264-274. doi:10.1016/j.jvolgeores.2010.09.011.

27. de'Michieli Vitturi, M., **A.B. Clarke**, A. Neri and B. Voight (2010) Transient effects of magma ascent dynamics along a geometrically variable dome-feeding conduit, *Earth and Planetary Science Letters*, 295, 541-553.

26. Genareau*, K.D., and **A.B. Clarke**, (2010) In situ measurements of plagioclase growth using SIMS depth profiles of 7Li/30Si: A means to acquire crystallization rates during short-duration decompression events. *American Mineralogist*, v. 95, 592-601.

25. Chardot, L., B. Voight, R. Foroozan, S. Sacks, A. Linde, R. Stewart, D. Hidayat, **A. Clarke**, D. Elsworth, N. Fournier, J.-C. Komorowski, G. Mattioli, R. S. J. Sparks, and C. Widiwijayanti (2010), Explosion dynamics from strainmeter and microbarometer observations, Soufrière Hills Volcano, Montserrat: 2008-2009, *Geophys. Res. Lett.*, 37, L00E24, doi:10.1029/2010GL044661.

24. Linde, A. T., S. Sacks, D. Hidayat, B. Voight, **A. Clarke**, D. Elsworth, G. Mattioli, P. Malin, E. Shalev, S. Sparks, and C. Widiwijayanti (2010), Vulcanian explosion at Soufrière Hills Volcano, Montserrat on March 2004 as revealed by strain data, *Geophys. Res. Lett.*, 37, L00E07, doi:10.1029/2009GL041988.

23. Voight, B., D. Hidayat, S. Sacks, A. Linde, L. Chardot, **A. Clarke**, D. Elsworth, R. Foroozan, P. Malin, G. Mattioli, N. McWhorter, E. Shalev, R. S. J. Sparks, C. Widiwijayanti, and S. R. Young (2010), Unique strainmeter observations of Vulcanian explosions, Soufrière Hills Volcano, Montserrat, July 2003, *Geophys. Res. Lett.*, 37, L00E18, doi:10.1029/2010GL042551.

22. Genareau*, K.D., **A.B. Clarke**, (2010) Heterogeneous clasts as windows into magma mingling at Soufrière Hills volcano. *Geophys. Res. Lett.*, 37, doi:10.1029/2009GL041968.

*2009*

21. Genareau*, K.D., **A.B. Clarke**, R.L. Hervig (2009) New insight into explosive volcanic eruptions: Connecting crystal-scale chemical changes with conduit-scale dynamics. *Geology*, 37(4): 367-370. doi: 10.1130/G25561A.

20. Brand*, B.D., **A.B Clarke** (2009) The architecture, eruptive history, and evolution of the Table Rock Complex, Oregon (USA): from a Surtseyan to an energetic maar eruption. J. Volcanol. Geotherm. Res. 180: 203-224. http://dx.doi.org/10.1016.

19. **Clarke, A.B.**, J.C. Phillips, K.N. Chojnicki* (2009) An Investigation of the Dynamics of Vulcanian Eruptions using Laboratory Analogue Experiments and Scaling Analysis. From: THORDARSON, T., SELF, S., LARSEN, G., ROWLAND, S. K. and HOSKULDSSON, A. (eds) Studies in Volcanology: The Legacy of George Walker. Special Publications of IAVCEI. 2, 155-166. Geological Society, London.

18. Brand*, B.D., **A.B. Clarke**, S.C. Semken (2009). Conditions and Depositional Processes of Narbona Pass Maar Volcano, Navajo Volcanic Field, Navajo Nation, New Mexico (USA). Bull. Volcanol. DOI: 10.1007/s00445-008-0209-2008.

*2008*

17. de'Michieli Vitturi, M., **A.B. Clarke**, A. Neri, B. Voight (2008). Effects of conduit geometry on magma ascent dynamics in dome-forming eruptions. *Earth and Planetary Science Letters*, 272: 567-578.

16. Esposti-Ongaro, T., **A.B. Clarke**, A. Neri, B.Voight, C. Widiwijayanti (2008). Fluid dynamics of the 1997 Boxing Day volcanic blast on Montserrat, W.I. *J. Geophys. Res. Solid Earth.* doi:10.1029/2006JB004898.

*2007*

15. Genareau*, K., R. Hervig, **A.B. Clarke** (2007). Geochemical variations in late-stage growth of volcanic phenocrysts revealed by SIMS depth-profiling. *American Mineralogist.* 92, 1374-1382.

14. **Clarke, A.B.**, S. Stephens**, R. Teasdale, R.S.J. Sparks, K. Diller* (2007). Petrological constraints on the decompression history of magma prior to Vulcanian explosions at the Soufrière Hills volcano, Montserrat. *J. of Volcanol. Geotherm. Res.* 161, 261-274.

*2006*

13. Chojnicki*, K.N., **A.B. Clarke**, J.C .Phillips (2006). A shock-tube investigation of the dynamics of gas particle mixtures: implications for explosive volcanic eruptions. *Geophys. Res. Lett.* 33, L15309, doi:10.1029/2006GL026414.

12. Diller*, K.D., **A.B. Clarke**, B. Voight, A. Neri (2006). Mechanisms for Conduit Plug Formation: implications for Vulcanian explosions. *Geophys. Res. Lett.* 33, L20302, doi:10.1029/2006GL027391.

11. Voight B., A.T. Linde, I.S. Sacks, G. S. Mattioli, R. S. J. Sparks, D. Elsworth, D. Hidayat, P. E. Malin, E. Shalev, C. Widiwijayanti, S. R. Young, V. Bass, **A. Clarke**, P. Dunkley, W. Johnston, N. McWhorter, J. Neuberg, and P. Williams (2006). Unprecedented pressure increase in deep magma reservoir triggered by lava-dome collapse. *Geophys. Res. Lett.* 33 L03312, doi: 10.1029/2005GL024870.

*2002-2005*

10. Widiwijayanti, C., **A.B. Clarke**, D. Elsworth, B. Voight (2005). Geodetic Constraints on the Shallow Magma System at Soufrière Hills Volcano, Montserrat. Geophys. Res. Lett. 32, L11309, doi:10.1029/2005GL022846.

9. **Clarke, A.B.**, A. Neri, G. Macedonio, B. Voight, T.H. Druitt (2002). Computational modelling of the transient dynamics of the August 1997 Vulcanian explosions at Soufrière Hills volcano, Montserrat: influence of initial conduit conditions on near-vent pyroclastic dispersal. In: Druitt, T.H. and Kokelaar, B.P. (eds) The eruption of Soufrière Hills Volcano, Montserrat, from 1995 to 1999. *Geological Society, London, Memoir* 21, 319-348.

8. Druitt, T.H., S. Young, B. Baptie, E. Calder, **A. Clarke**, P. Cole, C. Harford, R. Herd, R. Luckett, G. Ryan, S. Sparks, B. Voight (2002). Episodes of cyclic Vulcanian explosive activity with fountain collapse at Soufrière Hills volcano, Montserrat. In: Druitt, T.H. and Kokelaar, B.P. (eds) The eruption of Soufrière Hills Volcano, Montserrat, from 1995 to 1999. *Geological Society, London, Memoir* 21, 281-306.

7. Cole, P.D., E.S. Calder, R.S.J. Sparks, **A.B. Clarke**, T.H. Druitt, S.R. Young, R.A. Herd, C.L. Harford, G.E. Norton, R.E.A. Robertson (2002). Pyroclastic flow deposits formed during 1996-99 at Soufrière Hills volcano, Montserrat. In: Druitt, T.H. and Kokelaar, B.P. (eds) The eruption of Soufrière Hills Volcano, Montserrat, from 1995 to 1999. *Geological Society, London, Memoir* 21, 231-262.

6. Loughlin, S.C., E.S. Calder, **A.B. Clarke**, P.D. Cole, R. Luckett, M.T. Mangan, D.M. Pyle, R.S.J. Sparks, B. Voight, R.B. Watts (2002). Pyroclastic flows generated by the 25 June 1997 dome collapse, Soufrière Hills volcano, Montserrat. In: Druitt, T.H. and Kokelaar, B.P. (eds) The eruption of Soufrière Hills Volcano, Montserrat, from 1995 to 1999. *Geological Society, London, Memoir* 21, 191-209.

5. **Clarke, A.B.**, A. Neri, G. Macedonio, B. Voight (2002). Transient dynamics of Vulcanian explosions and column collapse. *Nature*, v. 415, 897-901.

*1999-2000*

4. **Clarke, A.B.** and B. Voight (2000). Pyroclastic current dynamic pressures from aerodynamics of tree or pole blow-down. *J. Volc. Geothermal Res.*, v. 100, No. 1 - 4, 395-412.

3. Watson, I.M., C.M.M. Oppenheimer, B. Voight, P.W. Francis, **A. Clarke**, J. Stix, A. D. Miller, D. Pyle, M.R. Burton, S.R. Young, G. Norton, S. Loughlin, B. Darroux (2000). The relationship between degassing and ground deformation at the Soufrière Hills Volcano, Montserrat. J. Volc. Geothermal Res., v.98, no.1-4, 117-126.

2. Voight B., R.S.J. Sparks, A.D. Miller, R.C. Stewart, R.P. Hoblitt, **A.B. Clarke**, J. Ewart, and MVO Staff (1999). Magma flow instability and cyclic activity at Soufrière Hills Volcano, Montserrat, *SCIENCE*, 283 (5405), 1138-1142.

1. Voight, B., R.P. Hoblitt, **A.B. Clarke**, A.B. Lockhart, A.D. Miller, L. Lynch, and J. McMahon (1998). Remarkable cyclic ground deformation monitored in real time on Montserrat and its use in eruption forecasting, *Geophys. Res. Lett.*, v. 25, No. 18, 3405-3408.

## 5.3 Other Publications

5. Scott, C.P., Scott, T., Lao-Davila, D.A., **Clarke, A.B.**, Arrowsmith, J R., and Lynch, D. (2018): Photogrammetric model of the Tecolote Volcano, Pinacate Volcanic Field, Sonora, Mexico (point cloud [563M points], orthophoto [4 cm/pix], and DEM [8 cm/pix]). Distributed by OpenTopography. Accessed May 30, 2018. https://doi.org/10.5069/G9028PFR

4. **Clarke, A.B.**, A. Neri, B. Voight, G. Macedonio, T.H. Druitt (2001). Computational modeling of the transient dynamics of the August 1997 vulcanian explosions at Soufriere Hills Volcano, Montserrat: Influence of initial conduit conditions on near-vent pyroclastic dispersal. Volcano Simulation Group, Gruppo Nazionale per la Vulcanologia, Istituto Nazionale di Geofisica e Vulcanologia. VSG Report No. 2001-5, 59 pp.

3. Montserrat Volcano Observatory Staff (1997). Special Report 04: The explosive eruptions of August 1997.

2. Montserrat Volcano Observatory Staff (1997). Special Report 03: The pyroclastic flow of June 25, 1997.

1. **Clarke A.B.**, D. Hidayat, B. Voight (1997). Navier-Stokes equations revisited: A review of the physics of explosive volcanism. IAVCEI Bulletin.

## 5.4 Additional Scientific Contributions

### 5.4.1 Short Films

LINK to Sunset Crater Films

- Sunset Crater: Introduction
- Sunset Crater: Plume Height
- Sunset Crater: Melt Inclusions

All produced in 2016 in collaboration with Merri Lisa Trigilio of Deep Time Productions

#### 5.4.2 Teaching materials

*A Dangerous World Laboratory* by **Amanda Clarke**, Kendall Hunt Publishing, 2017. ISBN 9781524917654.

### 5.5 ABSTRACTS

Link to Abstract Appendix

## 6 Other scientific activities

### 6.1 Selected Invited Presentations, since 2002

*One-hour seminar unless noted*

- CONVERSE (Community Network for Volcanic Eruption Response) Eruption Dynamics Workshop (*30-min*), **2019**
- COVE (Community Volcano Experiment) Workshop (*30-min*), University of New Mexico, **2019**
- Northern Arizona University, Dept. of Astronomy and Planetary Science, **2019**
- Stanford, Department of Geophysics, **2019**
- University of South Florida, School of Geosciences, **2018**
- University of Southern California, Department of Earth Sciences, **2015**
- International Association of Volcanology & Chemistry of the Earth's Interior General Assembly (*15-min*), Kagoshima, Japan, **2013**
- American Geophysical Union Fall Meeting (*15-min*), San Francisco, **2008, 2011 & 2012**
- Department of Terrestrial Magnetism, Carnegie Institution of Washington, **2012**
- Workshop on the Physics of Fluid Oscillations in Volcanic Systems(*30-min*), Waikoloa, Hawaii, **2009**
- Michigan Technical University, Geological Engineering and Sciences, **2009**
- University of Florida, Mechanical and Aerospace Engineering, **2009**
- American Society of Mechanical Engineers Annual Meeting(*15-min*), **2009**
- Center for GeoHazards Conference (*30-min*), SUNY Buffalo, **2008**
- Cascades Volcano Observatory, USGS, **2007**
- University of Michigan, **2007**
- New Mexico Tech, **2006**
- University of Arizona, **2006**
- Soufrière Hills Volcano – Ten-Years On Scientific Conference (*30-min*). Montserrat, B.W.I., Keynote, **2005**
- Arizona State University, Environmental Fluid Dynamics Seminar, Department of Mechanical & Aerospace Engineering, Arizona State University, **2004, 2005, 2006**
- Northern Arizona University, **2004**
- University of Washington, Department of Earth & Space Sciences, **2003**
- University of Leeds, Leeds UK, Department of Earth Sciences, **2003**
- University of Cambridge, Department of Applied Mathematics & Theoretical Physics, **2002**
- University of Bristol, Department of Earth Sciences, **2002**

### 6.2 Visiting Colleagues

- Mattia de'Michieli Vitturi (INGV-Pisa) Marie Curie Research Fellow (2011-2012)
- Alexander Belousov (Earth Observatory of Singapore) Mount St. Helens research (2007, 2012)
- Marina Belousova (Earth Observatory of Singapore) Mount St. Helens research (2007, 2012)
- Jeremy C. Phillips (U. of Bristol, UK) Laboratory experiments (multiple years)

## 7 Teaching

### 7.1 Course and Program Development

- **Summer 2018 and 2019**
  *Science and Society: Natural Disasters and Culinary Culture in Sicily*, ASU Study Abroad Program, Siracusa, Italy
- **Summer 2016**
  *Geologic Disasters of the Mediterranean*, ASU Study Abroad Program in Florence, Italy
- **Fall 2012 & Ongoing Development**
  GLG110/111 Dangerous World/Geologic Disasters, Online Course
  Quantitative Laboratory Science Credit (SQ); Global Awareness (G) Designation
- **Ongoing Development**
  Advanced Field Geology, Global Intensive Experience through ASU Study Abroad
  *Volcanic eruptions, hydrothermal systems, and earthquakes in Indonesia*

### 7.2 Classroom Teaching at Arizona State University 2010-present

- **Spring 2021**
  GLG110/111 Dangerous World/Geologic Disasters, oCourse (4 credits)
- **Fall 2020**
  Advanced Field Geology (3 credits)
- **Spring 2020**
  Course development GLG110/111 Dangerous World/Geologic Disasters, oCourse with SQ & G designations (with EdPlus)
- **Fall 2019**
  GLG111 Laboratory (1 credit) & Advanced Field Geology (3 credits)
- **Summer 2019**
  GLG394/110 Geologic Disasters of the Mediterranean (3 credits, ASU Study Abroad Program, Siracusa, Italy)
- **Spring 2019**
  GLG110 & GLG111 (Geologic Disasters and Lab, 4 credits total); Geofluid Mechanics (1 credit)
- **Fall 2018**
  GLG111 (Geologic Disasters Lab, 1 credit); Flying Science: Data from UAVs (1 credit); Geofluid Mechanics (1 credit)
- **Summer 2018**
  GLG394/110 Geologic Disasters of the Mediterranean (3 credits, ASU Study Abroad Program, Siracusa, Italy)
- **Spring 2018**
  GLG 422/598 (Planetary Volcanology, 3 credits co-taught with D. Williams); GLG110 & GLG111 (Geologic Disasters and Lab, 4 credits total)

- **Fall 2017**
  GLG111 (Geologic Disasters Lab, 1 credit)
- **Sabbatical Fall 2016 & Spring 2017**
- **Summer 2016**
  GLG110 & GLG111 (Geologic Disasters and Lab, 4 credits)
- **Summer 2016**
  GLG110/GLG394 (3 credits), ASU Study Abroad Program in Florence, Italy
- **Spring 2016** Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit)
- **Summer 2015**
  Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit)
- **Spring 2015**
  Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit)
- **Fall 2015**
  Introduction to Volcanology (GLG420, 3 credits)
- **Fall 2014**
  Planetary Volcanology (3 credits, co-taught with David Williams)
- **Summer 2014**
  Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit)
- **Spring 2014**
  Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit)
- **Fall 2013**
  Introduction to Volcanology (3 credits)
- **Summer 2013**
  Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit)
- **Spring 2013**
  Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit)
- **Fall 2012**
  Introduction to Volcanology (3 credits)
- **Summer 2012**
  Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit)
- **Spring 2012**
  Geologic Disasters (GLG110, 3 credits) & Geologic Disasters Lab (GLG111, 1 credit); two sections taught simultaneously - face-to-face and online
- **Fall 2011**
  Introduction to Volcanology (3 credits) & Advanced Numerical Methods (co-taught with Mattia de'Michieli Vitturi)
- **Spring 2011**
  Geologic Disasters and Geologic Disasters Lab (4 credits); Planetary Volcanology (co-taught with Ron Greeley and David Williams, 3 credits)
- **Fall 2010**
  Geologic Disasters and Lab (4 credits)

- **Prior to 2010**
  Introduction to Geology (3x)
  Advanced Physical Volcanology (3x)
  Advanced Field Geology (2x)
  Introduction to Fluid Mechanics for Geologists (3x)

## 7.3 Mentoring

### 7.3.1 Current MS and PhD Student Advisees

Arizona State University; Sole advisor unless otherwise noted

1. **Saira Hamid** PhD Candidate
2. **Jisoo Kim** PhD Student
3. **Rachel Bruyere** PhD Candidate (co-advised with Kurt Roggensack)
4. **Vincenzo Cataldo** PhD Candidate (primary advisor is David Williams)
5. **Kyle Mohr** PhD Candidate
6. **Elisheva Sherman** PhD Student
7. **Rupa Ragavan** MS Student

### 7.3.2 Current undergraduate student advisees

Arizona State University; Sole advisor unless otherwise noted

1. **Yamini Patel** (SESE)
   Space Grant Student
2. **Jane Rector** (SESE)
   Space Grant Student

### 7.3.3 Graduated PhD Students

Sole advisor & dissertation chair at ASU unless noted; current position in italics

8. **Sean Peters, PhD 2020** PhD candidate (co-advised with Phil Christensen)
   Dissertation Title: Investigating lava flow emplacement: implications for volcanic hazards and planetary evolution
   *Japan Exchange and Teaching Program*
7. **Chelsea Allison, PhD 2018**
   (co-advised by Kurt Roggensack)
   Dissertation Title: The role of $H_20$ and $CO_2$ in causing unusually explosive basaltic eruptions
   *Post-doctoral Fellow; Cornell University, City College of New York, Baylor University*
6. **Brett Carr, PhD 2016**
   Dissertation Title: Thermal remote sensing of active volcanism: transitions from effusive to explosive eruptions
   *NSF Post-doctoral Fellow, Columbia University; Mendenhall Fellow, Hawaii Volcanoes Observatory*
5. **Shelby Cave, PhD 2015**
   (formerly a student of Professor R. Greeley)
   Dissertation Title: The Sentinel-Arlington Volcanic Field, Arizona
   *Senior Geologist, Freeport-McMoRan*
4. **Jean-Francois Smekens, PhD 2015**
   Dissertation Title: Degassing Processes at Persistently Active Explosive Volcanoes
   *Post-doctoral Research Associate, Cambridge University, United Kingdom*
3. **Kirsten Chojnicki, PhD 2012**
   Dissertation Title: Unsteady Jet Dynamics with Implications for Volcanic Plumes
   *Staff Scientist Sandia National Laboratories*

2. **Kimberly Genareau, PhD 2009**
(co-advisor R. Hervig)
Dissertation Title: SIMS depth profiling to determine volcanic conduit processes
*Associate Professor, University of Alabama*

1. **Brittany Brand, PhD 2008**
(co-advisor S. Semken)
Dissertation Title: Mafic Phreatomagmatic Volcanism and Density Current Dynamics
*Associate Professor, Boise State University*

#### 7.3.4 Graduated MS Students

Sole advisor & thesis chair at ASU unless noted; current position in italics

8. **Jisoo Kim, MS 2020**
Thesis Title: Transitions in Eruption Style at La Fossa Cone, Vulcano Island, Italy
*PhD Student; Arizona State University*

7. **Emily Zawacki, Masters in Passing 2018**
Thesis Title: Tecolote volcano, Pinacate volcanic field (Sonora, Mexico): A case of highly explosive basaltic volcanism and shifting eruptive styles.

6. **Leon Manfredi, MS 2012**
(formerly a student of Prof. R. Greeley)
Thesis Title: Volcanic History of the Tempe Volcanic Province, Mars
*Mars Student Imaging Project Staff, NASA Mars Exploration Program at ASU*

5. **Angela Magee, MS 2010**
(co-advisor M. Fouch)
Thesis Title: Triggered Seismicity
*Malin Space Science Systems*

4. **Kristina Diller, MS 2006**
Thesis Title: Numerical modeling of subsurface controls on short-lived volcanic explosions
*Senior Geologist at AMEC, Boulder, CO*

3. **Kirsten Chojnicki, MS 2006**
Thesis Title: A shock-tube investigation of the dynamics of gas-particle mixtures: implications for explosive volcanic eruptions
*Staff Scientist Sandia National Laboratories*

2. **Spencer Riley, MS 2006**
Thesis Title: Ground deformation analysis of Mount Cameroon, Cameroon Africa
*Schlumberger Limited, Houston, TX*

1. **Sally Stephens, MSci 2003**
from the University of Bristol, Bristol, UK Thesis Title: Petrological constraints on explosion dynamics at the Soufrieère Hills Volcano, Montserrat

#### 7.3.5 Former Post-docs

Sole advisor at ASU unless noted; current position in italics

5. **Erika Rader, 2016**
*Post-doctoral Researcher, NASA Ames*
*Assistant Professor, Department of Geography and Geological Science, University of Idaho*

4. **Alexa Van Eaton, NSF Post-doctoral Fellow, 2015-2016**
   *Research Geologist, US Geological Survey, Cascades Volcano Observatory, Volcano Hazards Program*

3. **Fabrizio Alfano, Swiss National Science Foundation Fellow, 2014-2017**
   *Instructor Chandler Community College*

2. **Sarah Cichy, SESE Exploration Fellow**
   (co-advised with C. Till, R. Hervig, K. Roggensack)

1. **Loÿc Vanderkluysen**, SESE Exploration Fellow
   (co-advised with H. Hartnett)
   *Assistant Professor, Department of Biodiversity, Earth & Environmental Science, Drexel University*

#### 7.3.6 Former Undergraduate Research Students

6. **Alex Gaon** (SESE)

5. **Jacob West** (SESE)
   Barrett Honors Thesis Title (2020) "Tecolote Cinder Cone Ballistics: Volcanic Bomb Formation and Dynamics"
   *Geologist, TITAN Mining Corporation, Esmeralda County, NV*

4. **Cara Courtney** (SEMTE; NASA Space Grant)
   Barrett Honors Thesis Title (2020) "Modeling the Effects of Flow Conditions and Rheology on Lava Flows with Polyethylene Glycol"
   *Engineer at Dell Computer Corporation, Austin TX*

3. **Amanda Voropaeff (nèe Meyer)**
   Undergraduate researcher, eruption plume simulations on Earth and Mars
   *MS Student at San Jose State (CA)*

2. **Cassie Collins**
   Undergraduate researcher, MODIS thermal IR imaging of Sinabung Volcano

1. **Rob Dekko (nèe Dekoschak)**
   Undergraduate researcher in experimental lab & sample analysis

#### 7.3.7 Student and Postdoctoral Collaborators, VolcanoLab ASU

Conducted experiments in my laboratory under my tutelage during year(s) indicated; current position in italics

- **Heather Zunino, PhD 2018, 2015 - 2019**
  ASU Fulton Schools, SEMTE
  (SEMTE advisor: Professor R. Adrian)
  particle-gas shock tube experiments, high-speed video, PIV
  *Engineer, Indian Health Services*

- **Blair Johnson, post-doc, 2017 - 2018**
  ASU Fulton Schools, SEMTE
  (SEMTE advisor: Professor R. Adrian)
  particle-gas shock tube, high-speed video, PIV
  *Assistant Professor, Civil, Architectural, & Environmental Engineering, University of Texas at Austin*

- **Paul Jarvis, post-doc, 2018**
  University of Geneva, Department of Geology
  particle-fluid convective instability experiments, PIV, PLIF
  *Post-doc, University of Geneva. Geneva advisor: Professor C. Bonadonna*

- **Jonathan Lemus, PhD candidate, 2018**
  University of Geneva, Department of Geology
  particle-fluid convective instability experiments, PIV, PLIF *PhD student, University of Geneva. Geneva advisor: Professor C. Bonadonna*

- **Allan Fries, PhD candidate, 2018**
  University of Geneva, Department of Geology
  particle-fluid convective instability experiments, PIV, PLIF *PhD student, University of Geneva. Geneva advisor: Professor C. Bonadonna*

#### 7.3.8 Second PhD Project Students

Student advisees: second projects to satisfy the requirements of SESE PhD qualifying exam

- **Jacqueline Giblin, current**
  Project: Constraining the Plumbing System Dynamics of the Most Recent Volcanic Eruption from Valles Caldera, NM
  (First project advisor K. Hodges)

- **Madison Borrelli, current**
  Project: The dynamics of pyroclastic surges on Mars
  (First project advisor J. O'Rourke)

- **Madeline Marquardt, current**
  Project: Eruption ascent rates during the last eruption of Mt. Hood
  (First project advisor M. Barboni)

- **Jessie Bersson, current**
  Project: Secondary explosion pits on the 50 ka Banco Bonito Rhyolite Lava Flow, Valles Caldera: mechanisms and hazards
  (First project advisor C. Till)

- **Daniel Chupik, current**
  Project: Reconstructing the dynamics of the 27ka explosive basaltic eruption of La Laja Cone, El Pinacate Volcanic Field
  (First project advisor: JR Arrowsmith)

- **Eamonn Needham, current**
  Project: Unraveling fragmentation and magma-mixing mechanisms in highly-explosive basaltic eruptions using microscale analysis
  (First project advisor: M. Barboni)

- **Emily Zawacki, 2016-2018**
  Project: Tecolote volcano, Pinacate volcanic field (Sonora, Mexico): A case of highly explosive basaltic volcanism and shifting eruptive styles.
  (First project advisor: JR Arrowsmith)

- **Heather Meyer, 2015-2017**
  Project: Erosion rates and ages of cinder cones on Mars: coupling numerical models and high-resolution DEMs
  (First project advisor: M. Robinson)

#### 7.3.9 Graduate student thesis committees (committee member), if not listed above. Partial List

Jacob Bleacher, PhD 2006, Erin Dimaggio, MS 2007, Melissa Bunte, MS 2008, Zack Bowles, MS 2008, Nick Warner, PhD 2008, Lynn Neakrase, PhD 2008, Sridhar Balasubramanian, PhD 2009 (Mechanical and Aerospace Engineering), Teresa Lassak, PhD 2009, Abigail Bull, PhD 2009, Thomas Doggett, PhD candidate, Christopher Edwards, Matthew Sanborn, Sarah Braden, Alicia Rutledge, Mingming Li, Lillian Ostrach, Heather Meyer, Heather Zunino, PhD 2019 (SEMTE); Meghan Guild, PhD 2020; Alexandra Huff, current; Linnea McCann, current.

#### 7.3.10 Research Experience for Undergraduates (REU) mentoring

- Emma Gleeman, Brown University, 2013. *Erosion of cinder cones in the San Francisco Volcanic Field*–San Francisco Volcanic Field REU
- Sarah Zibart, Western Kentucky University, 2013. *Using cinder cone morphology to constrain age*–San Francisco Volcanic Field REU
- Ryan Till, University of Buffalo, 2014. *Exploring variable original forms in the initial modifications of cinder cones*–San Francisco Volcanic Field REU
- Joanmarie Del Vecchio, Pomona College, 2014. *Spatially variable transport rates and the topographic development of cinder cones*–San Francisco Volcanic Field REU
- Kristin Pearthree, Oberlin College, 2014. *Insights on the topographic development of cinder cones and the transition to fluvial erosion using physical experiments and soil constraints*–San Francisco Volcanic Field REU

#### 7.3.11 Selected Informal Education, Outreach Activities, Press & Publicity

- Actor in volcanology pageant, elementary school on Vulcano Island, Sicily
- Instructor and presenter, to University of Gadjah Mada undergraduate students, Indonesia
- Adult Night Out presenter, Arizona Science Center
- Science Activities for Girls, Arizona Science Center
- Featured Scientist at Forces of Nature permanent exhibit, Arizona Science Center
- Featured volcanologist in Under Arizona, a television/DVD production of Eight/KAET (Arizona PBS affiliate)
- Earth and Space Exploration Day, Presenter, ASU
- Volcanology presentations for Arizona middle and high schools
- Sally Ride Festival, Presenter, ASU
- Earth Science Day, Speaker, ASU
- Summer Science Exhibition, Presenter - The Royal Society of London
- High School student research mentor (Jennifer Monninger)
- Desert Vista High School, Earth Science class, Presenter and Interviewee
- State College, PA, Primary Schools, Presenter (volcano hazards)
- Montserrat Volcano Observatory (MVO) representative (volcano hazards education)
- Albay Province, Philippines, Primary Schools, Presenter (volcano monitoring and hazards)

# 8 Research funding

Clarke is sole PI & amount to ASU is 100% RID to Clarke unless otherwise noted.

## 8.1 Pending Proposals

- Source: NASA Solar System Workings
  Title: Understanding Pyroclastic Cones Through Imaging Spectroscopy
  Amount to ASU: $167,000
  Collaborative with JPL & CalTech
  PI L. Kerber (JPL)
  *in submission via JPL*

- Source: NASA FINESST Program - DECLINED, RESUBMITTED
  Title: Triggering violent explosive eruptions: a petrologic and modeling study of caldera unrest (Vulcano Island, Aeolian Islands, Italy)
  Amount to ASU: $135,000
  Funds to support PhD student J Kim
  co-I K. Roggensack

- Source: NASA FINESST Program
  Title: The Effect of Volcanic Eruptions on the Martian Atmosphere, Climate, and Surface Geology
  Amount to ASU: $135,000
  Funds to support PhD student S Hamid
  co-I L. Kerber (JPL)

- Source: NASA FINESST Program
  Title: Investigating Explosive Basaltic Eruptions on Earth, Moon and Mars with Mixed-Volatile (H2O-CO2) Solubility Experiments
  Amount to ASU: $135,000
  Funds to support PhD student R Holsteen-Bruyere
  PI K. Roggensack; co-I Clarke

- Source: National Science Foundation, National Robotics Initiative (NRI)-DECLINED
  Title: NRI: INT: PLUMEonition: 4D mapping of volcanic emissions with a robot swarm
  Amount to ASU: $993,180
  PI is J. Das; 50% RID to Clarke

## 8.2 Active Grants

- Source: National Science Foundation - RECENTLY FUNDED
  Title: Collaborative Research: Linking pyroclastic surge dynamics and deposits through integration of field data, multiphase numerical modeling, and experiments
  Amount to ASU: ∼$300,000
  Collaborative with the University at Buffalo & Boise State University

- Source: Swiss National Science Foundation
  Title: Modeling settling-driven gravitational instabilities from volcanic clouds
  Amount to ASU: $0 (Senior Collaborator, Funds awarded to C. Bonadonna, Univ. of Geneva)
  Grant period: 9/01/2017-8/30/2020

- Source: National Science Foundation, NERC (UK Natural Environment Research Council)
  Title: NSFGEO-NERC(UK) Quantifying disequilibrium processes in basaltic volcanism (DisEqm)
  Amount to ASU: $325,000 (50% RID to Clarke, ASU co-I is K. Roggensack)
  Grant period: 8/01/2016 - 7/31/2021

## 8.3 Previous Funding

- Source: National Science Foundation
  Title: Risk Retirement for WAMS: The Water and Ash MM-wave Spectrometer
  Amount: $72,577 (33%, Co-I, with PI C. Groppi and co-I P. Mauskopf)
  Grant period: 2/15/2016 - 1/31/2017

- Source: National Science Foundation
  Title: Collaborative Research: Understanding The Causes Of Highly Explosive Basaltic Eruptions Using The Ad 1085 Sunset Crater Eruption And Its Deposits
  Amount to ASU: $292,522 (co-PI K. Roggensack)
  Grant period: 7/1/2013 - 6/31/2017

- Source: National Science Foundation
  Title: Building The Deccan Traps: What Can We Learn From Lava Flow Morphology In Large Igneous Provinces?
  Amount: $317,745 (co-PI L. Vanderkluysen*)
  Grant period: 8/1/2013 - 7/31/2016

- Source: National Science Foundation/Northern Arizona University
  Title: Collaborative Research: REU Site: Integrative Approach To Landscape Evolution In A Monogenetic Volcanic Field. San Francisco Volcanic Field, Northern
  Amount: $40,172 (co-PI JR Arrowsmith)
  Grant period: 5/26/2013 - 5/25/2015

- Source: ASU Foundation/Minarak Industries
  Title: The Bakrie Initiative in Geological Hazards at Arizona State University (Foundation Award)
  Amount: $200,000
  Grant period: 07/01/12 - 06/30/14
  Collaborators: JR Arrowsmith; HE Hartnett

- Source: NSF-EAR Instrumentation and Facilities
  Title: Acquisition of Imaging Equipment to Understand the Dynamics of Explosive Volcanic Flows through Laboratory Experiments and Field Observations
  Amount: $176,000
  Grant period: 08/15/09 - 08/14/12

- Source: NSF-EAR Petrology and Geochemistry
  Title: The Dynamics of Short-Duration, Unsteady Volcanic Eruptions
  Amount: $304,678
  Grant period: 08/16/08-06/16/12

- Source: European Community, Marie Curie International Outgoing Fellowship
  Title: Magma Ascent Mathematical Modeling and Analysis
  Role: Host of PI de'Michieli Vitturi
  Amount: € 190,000 (funds to INGV-Pisa; portion transferred to ASU)
  Grant period: 01/2010-12/2012

- Source: NSF-EAR Petrology and Geochemistry
  Title: Rapid decompression of pressurized magma and laterally-directed blasts: determining required initial conditions and predicting hazards using 3D multi-phase numerical simulations
  Amount: $255,859
  Grant period: 12/01/06 - 11/30/11

- Source: NSF-EAR Continental Dynamics
  Title: Collaborative Research: The CHECK Calipso Project-Imaging the Magma Chamber On Montserrat
  Amount to ASU: $165,068
  Grant period: 10/01/06 - 10/01/09

- Source: NASA-NESSF
  Title: Investigating characteristic bedforms of base surge deposits: implications for cross-stratified deposits at mars exploration rover (MER) landing sites and the dynamics of phreatomagmatic eruptions
  Amount: $24,000 per year
  Funds to support PhD student B.D. Brand
- Source: NSF-EAR Petrology and Geochemistry
  Title: Explosive Volcanism Workshop. Integrating Numerical and Laboratory Models of Explosive Eruptions with Field Observations: Understanding Pyroclastic Transport
  Amount: $29,957
  Grant period: 01/15/07-01/15/08
- Source: NSF-EAR Petrology and Geochemistry
  Title: Understanding Controls on the Scale and Style of Explosive Volcanic Eruptions with Observational and Multi-Phase Computational Techniques
  Amount: $275,772
  Grant period: 08/01/03 - 07/31/07
- Source: NSF-EAR Small Grants for Exploratory Research
  Title: Exploring Vulcanian explosions and sedimentation patterns leading to pyroclastic density currents using scaled laboratory experiments and Particle Image Velocimetry (PIV)
  Amount: $35,000
  Grant period: 08/15/05 - 07/31/06
- Source: The Royal Society of London
  Title: Experimental exploration of volcanic processes
  Amount: £16,000
  Grant period: 09/02 - 09/03
- Source: GSA Grants to Students (3 x $2500)

## 8.4 Recently Declined Proposals

- Source: Keck Concept Pitch
  Title: 3D Realtime Imaging of Internal Eruption Plume Processes with WAMS
  PI Sean Bryan; Co-Is Clarke, Groppi, Mauskopf, Paine, Aberle, Bliss
- Source: NASA Solar System Workings
  Title: Martian Fire and Ice - A diagnostic physical and numerical framework for understanding the dynamics or pyroclastic density currents and resulting deposits on the red planet
  Amount to ASU: $172,062
  PI was B. Brand at Boise State University
- Source: National Science Foundation
  Title: From Magma to Tephra
  Amount to ASU: $234,313
  Co-I was post-doc F. Alfano
- Source: National Science Foundation
  Title: MRI: Development of WAMS, The Water and Ash MM-Wave Spectrometer, a MM-Wave Radiometer and Radar System to Probe Volcanic Plumes
  Amount to ASU: $1,031,634
  PI was C. Groppi; 30% RID to Clarke
- Source: Arizona State University Foundation, Women in Philanthropy
  Title: Managing and Mitigating Geologic Risk: developing a new professional master?s degree at ASU
  Amount to ASU: $57,096
  co-PIs were HE Hartnett & JR Arrowsmith; 34% RID to Clarke

- Source: National Science Foundation
  Title: Collaborative Research: From Deposits to Dynamics: Constraining the hazard potential of dilute pyroclastic density currents
  Amount to ASU: $199,060
- Source: NASA Solar System Workings
  Title: Numerical Modeling of Explosive Volcanism on the Moon
  Amount to ASU: $77,000
  PI Edwards at Northern Arizona University

# 9 Service

## 9.1 Department/School Service

- **2019-present** SESE Awards Committee
- **2019-present** SESE Undergraduate Committee
- **2018-2019** SESE Promotion and Tenure Committee
- **2017** Annual Program Review Committee
- **2010 - 2016** Graduate Program Oversight Committee (Chair 2011-2012, 2015-2016)
- **2015** Awards Committee Member
- **2012** Chair of Earth Surface Processes Search Committee
- **2012** Member Isotope Geochemistry Search Committee
- **2011** IT Search Committee (Member)
- **2009** SESE ad hoc search committee
- **2009** SESE curriculum committee
- **2006 - 2008** Engineering Faculty search committee, SESE
- **2007** Faculty Search Committee, SESE
- **2006 - 2007** Faculty Computing Committee (ad hoc)
- **2005** SESE Director search committee
- **2005** Systems engineer search committee
- **2003 - present** Volcanoes for Lunch seminar coordinator
- **Fall 2004** Faculty Research Seminar coordinator
- **2004 - 2005** SESE steering committee, SESE governance committee

## 9.2 University Service and Synergistic Activities

- **2020** 1-YEAR Leadership Fellow ASU ADVANCE Program [PIs E. Wentz, M. Gaughan, E. Carr-Jordan, L. Dai, S. Pfirman]. Charged with helping the team establish professional development and mentoring protocols for members of underrepresented groups in STEM.
- **2012-present** Agreement for Scientific Cooperation, SESE & Geological Engineering, Universitas Gadjah Mada
- **2013** Member of Search Committee for the Dean of the Graduate College
- **2006 - 2008** Environmental Fluid Dynamics faculty search committee, Fulton Schools of Engineering

### 9.3 Service to Profession and Synergistic Activities

- **2021-2022** Early Career Award Committee Chair, Mineralogy Geochemistry Petrology & Volcanology Division, Geological Society of America
- **2020-2021** Ambassador Award Committee, American Geophysical Union
  https://www.agu.org/Honor-and-Recognize/Honors/Union-Awards/Ambassador-Award
- **2020-2021** 2nd Vice Chair, Mineralogy Geochemistry Petrology & Volcanology Division, Geological Society of America
- **2019** Workshop Organizing Committee, CONVERSE (Community Network for Volcanic Eruption Response)
- **2017 - present** Member US National Committee for Geodesy and Geophysics.
  National Academies of Science, Engineering, and Medicine.
- **2016 - 2017** Member of The Committee on Improving Understanding of Volcanic Eruptions.
  Responsible for writing The ERUPT Report of the National Academies of Science, Engineering, and Medicine.
- **2015 - 2017** Secretary, Volcanology, Petrology and Geochemistry Section, American Geophysical Union
- **2015-2017** Fall Meeting Program Committee, American Geophysical Union
- **2013 - present** NSF Panelist, Multiple Programs
- **2012** Volcanology Roundtable Participant
  National Research Council Committee on Seismology and Geodynamics
- **2009 - 2015** Chairperson, Commission on Explosive Volcanism, IAVCEI
- **2011 - 2017** Outstanding Student Presentation Award Committee Member and Judge (American Geophysical Union)
- **2008 - 2009** Editorial board, *Journal of Volcanology and Geothermal Research*
- **2003 - present** Vice-Manager VolcanoList Listserve
- **2007** NSF Explosive Volcanism Workshop, Chair and Organizer; Prescott, AZ
- **2003 - 2009** Active participant in Environmental Fluid Dynamics seminar series, Fulton School of Engineering
- **2003-present** Session Convener, AGU Fall Meeting, IAVCEI General Assembly, Cities on Volcanoes, GSA Meeting, etc.

## 10 Other Skills

### 10.1 Selected Experimental Experience

- **Shock Tube** Apparatus designed and built at ASU; funded by NSF; high speed video (10kfps); high-frequency pressure wave measurement (100kHz); development of Particle Image Velocimetry (PIV) analysis for very high velocities. One geology MS project, one engineering PhD project, one engineering post-doc project, two undergrad interns.
- **Short-lived volcanic jets and plumes** Designed and built at ASU; funded by NSF; simple high-speed video analysis; PIV measurements; ongoing Planar Laser Induced Fluorescence (PLIF) measurements of concentration and mixing; future simultaneous PIV and PLIF One PhD project; one undergrad intern.

- **Lava flow experiments - wax analogue** Designed and built at ASU; funded by NSF; programmable pulsatory source conditions; simple video analysis; quantitative and qualitative morphological analysis; planetary and terrestrial applications, including Large Igneous Provinces. One post-doc project; one PhD project ongoing; one Barrett Honors Thesis.
- **Erosion experiments** Designed and built at ASU; funded by NSF REU; eroding cinder cones; laboratory-scale Structure-from-Motion (SfM) topography analysis. Two undergraduate researchers.
- **Flumes: variable slope and re-circulating** Dilute density currents and instabilities at the base of spreading volcanic clouds; PIV and PLIF analysis; simple video analysis; funded via a collaboration with the University of Geneva.

## 10.2 Selected Field Experience

- **Field excursion leader for ASU students & Second PhD projects in the Valles Caldera, NM**
  2019 - present
- **Guest instructor on course led by the University of Geneva on Vulcano Island (Sicily) & pyroclastic stratigraphy, quantitative volcanology, sample collection for ASU MS project.**
  2016 - present
- **Pyroclastic stratigraphy, quantitative volcanology, and volcano geomorphology, El Pinacate Volcanic Field, Sonora, Mexico**
  2012 - present
- **Pyroclastic stratigraphy, quantitative volcanology, and volcano geomorphology, San Francisco Volcanic Field, Arizona, USA**
  2009 - present
- **Gas flux, ground-based remote thermal and geochemical measurements at LUSI mud volcano (Sidoarjo, Indonesia)**
  2008 - present
- **Gas flux, video, and pyroclastic deposit observations at volcanoes in East Java, Indonesia (Semeru, Bromo, Merapi, and Pennang Gunung volcanoes)**
  2008 - present
- **Field excursion leader for ASU students (Superstition Mountains (AZ,USA); Hopi Buttes Volcanic Field (Navajo Nation); San Francisco volcanic field (AZ,USA); El Pinacate Volcanic Field (Sonora, Mexico); Valles Caldera (NM, USA); Mt. Etna, Vulcano Island & Stromboli (Aeolian Islands, Sicily, Italy)**
  2003 - present
- **Sample collection in Montserrat, BWI**
  2005 - 2008
- **Tiltmeter deployment Mt. Cameroon, Cameroon**
  2004
- **Geophysics subsurface survey of potential borehole instrument sites, Montserrat, BWI**
  2002
- **Field trip leader, pyroclastic stratigraphy and fresh deposits, Montserrat, BWI**
  2002
- **Pyroclastic stratigraphy, field sieving, sample collection, quantitative volcanology, Montserrat, BWI**
  1999
- **Member of Monsterrat Volcano Observatory scientific team; Lead *Team Tilt***
  1997

- **Pyroclastic stratigraphy and tree-damage observations and sample collection, Mount St. Helens**
  1996, 2007
- **Socioeconomic field studies (interviews and surveys) and volcanological observations - Mayon Volcano, Legazpi City, Albay, Philippines**
  1994-95

# 11 Appendix: Selected Meeting Abstracts

* Clarke student/post-doctoral advisees at ASU.
** Student or post-doc at another institution.
+ Clarke secondary project advisee at ASU.
++ Research Experience for Undergraduates (REU) Summer Student.
+++ Other ASU graduate student.

## 11.1 Selected Abstracts from Meetings of the American Geophysical Union

- Jarvis**, J, Fries**, A, J Lemus**, **AB Clarke**, J Phillips, I Manzella, C Bonadonna (2019) Interplay Between Shear at the Base of Volcanic Clouds and Ash Sedimentation AGUFM 2019, V32A-04.
- Holsteen Bruyere*, R, K Roggensack, **AB Clarke** (2019) Mixed-fluid (H2O-CO2) Solubility of Basalts at Mid-crustal Pressures: Understanding the Role of Alkalis. AGUFM 2019, V13C-0169.
- Carr*, BB, E Lev, L Vanderkluysen, DK Moyer, GI Marliyani, **AB Clarke** (2019) The stability and collapse of lava domes: insight from UAS-derived 4D structure and slope stability models AGUFM 2019, V31H-0105.
- Kim*, J, **AB Clarke**, K Roggensack, M Pistolesi, C Bonadonna (2019) Eruptive Style Transition at La Fossa Cone, Vulcano Island, Italy AGUFM 2019, V13E-0218.
- Fries**, A, P Jarvis**, C Bonadonna, **AB Clarke**, J Phillips, I Manzella (2019) Experiments on the Effect of Particle Concentration and Size on Settling-Driven Gravitational Instabilities Associated with Volcanic Clouds. AGUFM 2019, V32A-05.
- Mohr*, KJ, **AB Clarke**, MDM Vitturi (2018) Updates to testing plume and ash dispersal models for highly explosive basaltic eruptions. AGU Fall Meeting 2018.
- Johnson, B. A., Zunino+++, H. A., Ding, L., Adrian, R. J., & **Clarke, A.B.** (2018). Gas and particle motions in a rapidly decompressed flow. American Geophysical Union Fall Meeting, 2018, Abstract V23K-0186.
- Roggensack, K., Allison*, C.M., & **Clarke, A.B.** (2017). Exploration of $H_2O$-$CO_2$ solubility in alkali basalt at low-$H_2O$. American Geophysical Union Fall Meeting, 2017, Abstract V33G-0594.
- Meyer*, A., **Clarke, A.B.**, Van Eaton*, A.R., & Mastin, L. G. (2017). Discovering parameters for ancient mars atmospheric profiles by modeling volcanic eruptions. American Geophysical Union Fall Meeting, 2017, Abstract P33C-2899.
- Peters*, S., & **Clarke, A.B.** (2017). Controls on lava flow morphology and propagation; using laboratory analogue experiments. American Geophysical Union Fall Meeting, 2017, Abstract V43F-0586.
- Allison*, C.M., Roggensack, K., & **Clarke, A.B.** (2017). Olivine-hosted melt inclusions; insights into highly explosive basaltic volcanism from alkali-rich magma at sunset crater, AZ. American Geophysical Union Fall Meeting, 2017, Abstract V51G-03.

- Allison*, C.M., Roggensack, K., & **Clarke, A.B.** (2017). A thermodynamic approach for modeling $H_2O$-$CO_2$ solubility in alkali-rich mafic magmas at mid-crustal pressures. American Geophysical Union Fall Meeting, 2017, Abstract U13B-07.
- Zawacki+, E.E., **Clarke, A.B.**, Arrowsmith, R., & Lynch, D. J. (2017). Reconstructing an explosive basaltic eruption in the pinacate volcanic field, NW sonora, mexico. American Geophysical Union Fall Meeting, 2017, Abstract T23B-0615.
- Rader*, E.L., **Clarke, A.B.**, & Vanderkluysen*, L. (2016). Wax modeling and image analysis for classroom-scale lava flow simulations. American Geophysical Union Fall Meeting, 2016, Abstract ED21A-0759.
- Vanderkluysen*, L., Rader*, E.L., Self, S., **Clarke, A.B.**, Sheth, H., & Moyer, D. K. (2016). Lateral variability of lava flow morphologies in the deccan traps large igneous province (india). American Geophysical Union Fall Meeting, 2016, Abstract V34B-05.
- Allison*, C.M., Roggensack, K., & **Clarke, A.B.** (2016). Improved understanding of $H_2O$-$CO_2$ solubility in alkali basalts at mid-crustal pressures. American Geophysical Union Fall Meeting, 2016, Abstract V33H-02.
- Carr*, B.B., **Clarke, A.B.**, Arrowsmith, R., & Vanderkluysen*, L. (2015). The ongoing lava flow eruption of sinabung volcano (sumatra, indonesia); observations from structure-from-motion and satellite remote sensing. American Geophysical Union Fall Meeting, 2015, Abstract V13D-04.
- Smekens*, J. F., **Clarke, A.B.**, & de'Michieli Vitturi, M. (2015). Eruption cycles in a basaltic andesite system; insights from numerical modeling. American Geophysical Union Fall Meeting, 2015, Abstract V31B-3023.
- Allison*, C.M., Roggensack, K., & **Clarke, A.B.** (2015). The plumbing system of a highly explosive basaltic volcano; sunset crater, AZ. American Geophysical Union Fall Meeting, 2015, Abstract V51D-3064.
- Meyer*, A., Van Eaton*, A.R., Mastin, L. G., & **Clarke, A.B.** (2015). Revisiting the atmospheric rise heights of volcanic eruption plumes on mars. American Geophysical Union Fall Meeting, 2015, Abstract P21C-06.
- Cichy, S. B., Till, C. B., Roggensack, K., Hervig, R. L., & **Clarke, A.B.** (2015). Experimental evidence for fast lithium diffusion and isotope fractionation in water-bearing rhyolitic melts at magmatic conditions. American Geophysical Union Fall Meeting, 2015, Abstract V43C-3167.
- Rader*, E.L., Vanderkluysen*, L., & **Clarke, A.B.** (2015). Experimental parameters for wax modeling of the deccan traps flood basalt province. American Geophysical Union Fall Meeting, 2015, Abstract V41C-3079.
- Vanderkluysen*, L., Self, S., Jay, A. E., Sheth, H. C., & **Clarke, A.B.** (2015). Transitions in lava emplacement recorded in the deccan traps sequence (india). American Geophysical Union Fall Meeting, 2015, Abstract V41C-3082.
- Vanderkluysen*, L., Self, S., Jay, A. E., Sheth, H. C., & **Clarke, A.B.** (2014). Distribution of "compound" and "simple" flows in the deccan traps (india). American Geophysical Union Fall Meeting, 2014, Abstract V13C-4796.
- Carr*, B.B., Vanderkluysen*, L., & **Clarke, A.B.** (2014). The 2013-2014 effusive eruption of sinabung volcano, sumatra, indonesia; satellite thermal observations and ground-based photogrammetry of a growing lava lobe. American Geophysical Union Fall Meeting, 2014, Abstract V13C-4788.
- Smekens*, J. F., **Clarke, A.B.**, Burton, M. R., Harijoko, A., & Wibowo, H. (2014). $SO_2$ emissions at semeru volcano, indonesia; characterization and quantification of persistent and periodic explosive activity. American Geophysical Union Fall Meeting, 2014, Abstract V23C-4811.
- Alfano*, F., Pioli, L., **Clarke, A.B.**, Ort, M. H., Roggensack, K., & Self, S. (2014). Evidence of a complex shallow reservoir network from micro-textural observations of the scoria products of the 1085 AD sunset crater eruption. American Geophysical Union Fall Meeting, 2014, Abstract V21B-4748.

- Allison*, C.M., Roggensack, K., & **Clarke, A.B.** (2014). Understanding magma storage conditions that produce highly explosive monogenetic basaltic eruptions using olivine-hosted melt inclusions from sunset crater, AZ. American Geophysical Union Fall Meeting, 2014, Abstract V23B-4795.
- Ruff, S. W., Farmer, J. D., Milliken, R., Niles, P. B., Alfano*, F., **Clarke, A.B.**, . . . Hardgrove, C. J. (2014). Investigating the habitability and preservation potential of two aqueous settings in gusev crater, mars. American Geophysical Union Fall Meeting, 2014, Abstract P32A-08.
- Van Eaton*, A.R.., Herzog, M., **Clarke, A.B.** & Brown, R. (2014). When do complex eruption dynamics matter? the roles of column instability and magma-water interaction on dispersal of volcanic ash. American Geophysical Union Fall Meeting, 2014, Abstract V53E-01.
- **Clarke, A.B.**, Brand*, B.D., & de'Michieli Vitturi, M. (2013). Modeling dilute pyroclastic density currents on earth and mars. American Geophysical Union Fall Meeting, 2013, Abstract V53C-2814.
- Arrowsmith, R., Zibart, S., Gleeman, E., Alfano*, F., **Clarke, A.B.**, de'Michieli Vitturi, M., & Dekko, R. (2013). Exploring the topographic evolution of cinder cones. American Geophysical Union Fall Meeting, 2013, Abstract EP31D-08.
- Spanu**, A., Barsotti, S., de'Michieli Vitturi, M., Moustaoui, M., Mahalov, A., & **Clarke, A.B.** (2013). Kelvin-helmholtz instabilities in volcanic clouds and their effects on ash dispersal. American Geophysical Union Fall Meeting, 2013, Abstract V23C-2862.
- Carr*, B.B., de'Michieli Vitturi, M., **Clarke, A.B.**, & Voight, B. (2013). Effects of magma and conduit conditions on transitions between effusive and explosive activity; a numerical modeling approach. American Geophysical Union Fall Meeting, 2013, Abstract V23C-2844.
- Alfano*, F., Pioli, L., **Clarke, A.B.**, Ort, M. H., Roggensack, K., & Self, S. (2013). Highly explosive mafic eruptions from the interplay between high viscosity and low viscosity magma; the sunset crater (AZ, USA) eruption. American Geophysical Union Fall Meeting, 2013, Abstract V23C-2838.
- Vanderkluysen*, L., Hartnett, H. E., **Clarke, A.B.**, & Burton, M. R. (2013). Origin of fluids and eruption dynamics at LUSI mud volcano (east java, indonesia). American Geophysical Union Fall Meeting, 2013, Abstract T51B-2470.
- de'Michieli Vitturi, M., Neri, A., La Spina, G., & **Clarke, A.B.** (2013). Investigating the effect of external water on magma ascent dynamics with a new multiphase flow numerical model. American Geophysical Union Fall Meeting, 2013, Abstract V34C-06.
- Smekens*, J. F., Burton, M. R., **Clarke, A.B.**, Harijoko, A., Wibowo, H., & Sawyer, G. (2013). High frequency $SO_2$ flux measurements at semeru volcano, indonesia, using the SO (sub 2) camera. American Geophysical Union Fall Meeting, 2013, Abstract V43B-2882.
- Allison*, C.M., Roggensack, K., **Clarke, A.B.**, & Alfano*, F. (2013). Understanding highly explosive basaltic eruptions; evidence from olivine-hosted melt inclusions from sunset crater, AZ. American Geophysical Union Fall Meeting, 2013, Abstract V31B-2698.
- Carr*, B.B., **Clarke, A.B.**, Vanderkluysen*, L., & de'Michieli Vitturi, M. (2012). Transitions in eruption style at merapi volcano (java, indonesia); insights from satellite thermal infrared images and numerical modeling. American Geophysical Union Fall Meeting, 2012, Abstract V33A-2835.
- Manfredi*, L., Platz, T., **Clarke, A.B.**, & Williams, D. A. (2012). Volcanic history of the tempe volcanic province. American Geophysical Union Fall Meeting, 2012, Abstract V33B-2873.
- Vanderkluysen*, L., Burton, M. R., **Clarke, A.B.**, Hartnett, H. E., & Smekens*, J. F. (2012). Periodic gas release from the LUSI mud volcano (East Java, Indonesia). American Geophysical Union Fall Meeting, 2012, Abstract NH41A-1590.

- de'Michieli Vitturi, M., **Clarke, A.B.**, La Spina, G., & Neri, A. (2012). Improving interpretation of real-time monitoring data using a novel combination of numerical models of magma ascent and statistical analysis tools. American Geophysical Union Fall Meeting, 2012, Abstract DI13C-2439.
- Smekens*, J. F., **Clarke, A.B.**, de'Michieli Vitturi, M., & Moore, G. M. (2012). Constraining the dynamics of periodic behavior at Mt. Semeru, indonesia, combining numerical modeling and field measurements of gas emission. American Geophysical Union Fall Meeting, 2012, Abstract V41A-2771.
- Brand*, B.D., Gravley, D., **Clarke, A.B.**, & Bloomberg, S. H. (2012). Pyroclastic density current hazards in the auckland volcanic field, new zealand. American Geophysical Union Fall Meeting, 2012, Abstract V52C-08.
- **Clarke, A.B.**, & Brand*, B.D. (2012). Modeling the dynamics and deposits characteristics of dilute pyroclastic density currents. American Geophysical Union Fall Meeting, 2012, Abstract V52C-01.
- **Clarke, A.B.**, Chojnicki*, K.N., de'Michieli Vitturi, M., & Phillips, J. C. (2011). Improving multi-phase models of explosive volcanic eruptions; comparison of models against scaled laboratory experiments and field observations. American Geophysical Union Fall Meeting, 2011, Abstract V43F-07.
- Chojnicki*, K.N., **Clarke, A.B.**, Phillips, J. C., & Adrian, R. J. (2011). Time-dependence in short-lived volcanic eruption plumes. American Geophysical Union Fall Meeting, 2011, Abstract V41E-05.
- de'Michieli Vitturi, M., **Clarke, A.B.**, Neri, A., & Voight, B. (2011). Assessing the influence of disequilibrium crystallization and degassing during magma ascent in effusive and explosive eruptions. American Geophysical Union Fall Meeting, 2011, Abstract V23H-05.
- **Clarke, A.B.**, de'Michieli Vitturi, M., Chojnicki*, K.N., & Phillips, J. C. (2011). The initial stages of explosive volcanic eruptions; insights gained from comparisons between laboratory experiments and numerical models. American Geophysical Union Fall Meeting, 2011, Abstract V33A-2610.
- Hartnett, H. E., Vanderkluysen*, L., & **Clarke, A.B.** (2011). Fluid geochemistry of the LUSI mud volcano (east java, indonesia) and implications for eruption dynamics. American Geophysical Union Fall Meeting, 2011, Abstract V53A-2594.
- Vanderkluysen*, L., **Clarke, A.B.**, & Hartnett, H. E. (2011). Cyclic activity of the LUSI mud volcano (east java, indonesia). American Geophysical Union Fall Meeting, 2011, Abstract V53A-2593.
- Allison*, C.M., **Clarke, A.B.**, Pioli, L., & Alfano*, F. (2011). Sunset crater, AZ; evolution of a highly explosive basaltic eruption as indicated by granulometry and clast componentry. American Geophysical Union Fall Meeting, 2011, Abstract V51F-2571.
- de'Michieli Vitturi, M., **Clarke, A.B.**, Neri, A., & Voight, B. (2009). The effects of time-varying chamber and surface pressure on dome-building eruptions. EOS, Transactions, American Geophysical Union, 90(52), Abstract V23D-2148.
- Genareau*, K.D., **Clarke, A.B.**, & Hervig, R. L. (2009). High-resolution examination of volcanic conduit processes using SIMS depth profiling. EOS, Transactions, American Geophysical Union, 90(52), Abstract V51E-1774.
- Voight, B., Chardot, L., Hidayat, D., Linde, A. T., Sacks, S. I., **Clarke, A.B.**, . . . de'Michieli Vitturi, M. (2009). Conduit evacuation dynamics for vulcanian explosions. EOS, Transactions, American Geophysical Union, 90(52), Abstract V32B-08.
- Esposti Ongaro, T., Widiwijayanti, C., Voight, B., **Clarke, A.B.**, & Neri, A. (2008). Simulating the initial dynamic of the 18 may 1980 mount saint helens blast. EOS, Transactions, American Geophysical Union, 89(53), Abstract V34A-07.
- **Clarke, A.B.**, Chojnicki*, K.N., & Phillips, J. C. (2008). Vulcanian eruptions; experimental insights into leading shock waves, initial acceleration, and flow evolution. EOS, Transactions, American Geophysical Union, 89(53), Abstract V34A-06.

- Bowles+++, Z.R., A. Clarke, R.,Greeley (2007). Constraining Eruptive Conditions From Lava Flow Morphometry: A Case Study With Field Evidence. Eos Trans. AGU, 88(52), Fall Meet. Suppl., Abstract P13A-1037.
- Genareau*, K.D., **Clarke, A.B.**, & Hervig, R. L. (2007). Constraining pre-eruptive pressure/temperature variations, transition from chamber to conduit, and crystal growth rates; a SIMS examination of plagioclase phenocrysts. EOS, Transactions, American Geophysical Union, 88(52), Abstract V22A-05.
- Brand*, B.D., & **Clarke, A.B.** (2007). Evidence for an unusually energetic basaltic phreatomagmatic eruption at the table rock complex in south-central oregon (USA); using field evidence to constrain surge flow dynamics. EOS, Transactions, American Geophysical Union, 88(52), Abstract V23E-04.
- **Clarke, A.B.**, Phillips, J. C., & Chojnicki*, K.N. (2006). Investigating the dynamics of vulcanian explosions; scaled laboratory experiments of particle-laden puffs. EOS, Transactions, American Geophysical Union, 87, Abstract V33E-03.
- Bowles+++, Z.R., A.B. Clarke, R. Greeley (2006). Lava Flow Lengths and Historic Eruptive Parameters: Implications for the Volcanic History of the Batamote Mountains, Ajo, Arizona, Eos Trans. AGU, 87(52), Fall Meet. Suppl., Abstract V53C-1758.
- Brand*, B.D., & **Clarke, A.B.**(2006). Mega-features at the table rock phreatomagmatic complex in christmas valley, oregon; law of original horizontality need not apply. EOS, Transactions, American Geophysical Union, 87, Abstract V43C-1826.
- Brand*, B.D., **Clarke, A.B.**, Semken, S. C., & Sandoval, C. (2005). Dynamics of a phreatomagmatic eruption at Narbona Pass Volcano, Navajo Volcanic Field, Navajo Nation, New Mexico. EOS, Transactions, American Geophysical Union, 86(52), Abstract V44B-02.
- Ongaro, T. E., **Clarke, A.B.**, Neri, A., Voight, B., & Widiwijayanti, C. (2005). A new high-performance 3D multiphase flow code to simulate volcanic blasts and pyroclastic density currents; example from the boxing day event, Montserrat. EOS, Transactions, American Geophysical Union, 86(52), Abstract V31D-0645.
- Diller*, K., K., **Clarke, A.B.** Voight, B., & Neri, A. (2005). Integrating fragmentation criteria with dynamic conduit models; the significance of syn-eruptive bubble expansion in vulcanian explosions. EOS, Transactions, American Geophysical Union, 86(52), Abstract V53A-1542.
- Mattioli, G. S., Voight, B., Linde, A. T., Sacks, I. S., Watts, P., Hidayat, D., . . . Bass, V. (2005). The CALIPSO borehole project at Soufrière Hills volcano, Montserrat, BWI; status and scientific overview of prodigious dome collapse of july 2003. EOS, Transactions, American Geophysical Union, 86(18), Abstract V34A-05.
- Voight, B., Mattioli, G. S., Linde, A. T., Sacks, I. S., Young, S. R., Malin, P. E., . . . **Clarke, A.B.** (2004). CALIPSO borehole monitoring project at Soufrière Hills volcano, Montserrat, BWI; overview, and response of magma reservoir to prodigious dome collapse. EOS, Transactions, American Geophysical Union, 85(47), Abstract G43C-03.
- **Clarke, A.B.**, Stephens**, S., Teasdale, R., & Sparks, R. S. J. (2003). Petrological constraints on the decompression history of magma prior to vulcanian explosions at the Soufrière Hills volcano, Montserrat. EOS, Transactions, American Geophysical Union, 84(46), Abstract V31G-06.
- **Clarke, A.B.**, Neri, A., Macedonio, G., Voight, B., & Druitt, T. H. (2000). Three-particle-size modelling of the 1997 vulcanian explosions at the Soufrière Hills volcano, Montserrat. EOS, Transactions, American Geophysical Union, 81(48), 1310-1311.
- **Clarke, A.B.**, Neri, A., Macedonio, G., Voight, B., & Druitt, T. (1999). Numerical simulations of vulcanian explosions at the Soufrière Hills volcano, Montserrat; effects of conduit parameters. EOS, Transactions, American Geophysical Union, 80(46), 1121.

- **Clarke, A.B.**, A. Neri, B. Voight, T.H. Druitt, G. Macedonio, C.H. Harford, R. Herd, R. Luckett (1998). Two-particle-size thermofluid axisymmetric transient dynamic modeling of the August 1997 vulcanian explosions at Soufrière Hills volcano, Montserrat: Determination of initial conditions and their influence on near-vent model results. Eos Trans. Am. Geophys. Union 79 (45): Abstract F1014.
- Voight, B., et al. (1998). Cyclic activity at Soufrière Hills volcano, Montserrat, B.W.I.: its use in understanding magma systems physics and its eruption forecasting. Eos Trans. Am. Geophys. Union 79 (45): V41C-03.
- Watson, M., et al. (1998). Relationship between degassing and ground deformation at the Soufrière Hills volcano, Montserrat. Eos Trans. Am. Geophys. Union 79 (45): V42A-09.

## 11.2 Selected Abstracts from Meetings of the: Geological Society of America (GSA), European Geophysical Union (EGU), International Union of Geodesy and Geophysics(IUGG), & International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

- Peters*, S. I., & **Clarke, A.B.** (2019). The effects of unsteady effusion rates on lava flow morphology and emplacement; results from laboratory analogue wax experiments. Abstracts with Programs - Geological Society of America, 51(5), Abstract no. 131-3.
- Kim*, J., **Clarke, A.B.**, Roggensack, K., Pistolesi, M., & Bonadonna, C. (2019). Eruptive style transitions at la fossa cone, vulcano island, italy. Abstracts with Programs - Geological Society of America, 51(5), Abstract no. 39-20.
- Cataldo+++, V., Williams, D. A., Schmeeckle, M. W., Lesher, C. M., & **Clarke, A.B.** (2017). Building a 3-D model of thermal erosion by turbulent lava at raglan, cape smith belt, new quebec, canada. Abstracts of Papers Submitted to the Lunar and Planetary Science Conference, 48, Abstract no. 1214.
- Ort, M. H., Wagner, K. D., Alfano*, F., Elson, M. D., **Clarke, A.B.**., & Self, S. (2016). Changing eruption styles during the approximately 1085 ce sunset crater eruption, northern arizona. Abstracts with Programs - Geological Society of America, 48(7), Abstract no. 176-4.
- Vanderkluysen*, L., Self, S., Jay, A. E., Sheth, H. C., & **Clarke, A.B.** (2015). Transitions in lava emplacement recorded in the deccan traps sequence (india). Abstracts with Programs - Geological Society of America, 47(7), 209.
- Pearthree++, K. S., **Clarke, A.B.**, Arrowsmith, J. R., Anderson, K. C., Alfano*, F., Del Vecchio++, J., . . . Till++, R. T. (2014). Investigating the relations among eolian dust accumulation, rill formation, and morphologic age for cinder cones, san francisco volcanic field REU. Abstracts with Programs - Geological Society of America, 46(6), 549.
- Ruff, S. W., Niles, P. B., Alfano*, F., & **Clarke, A.B.** (2014). Evidence for a noachian-aged ephemeral lake in gusev crater, mars. Abstracts of Papers Submitted to the Lunar and Planetary Science Conference, 45, Abstract 1739.
- Del Vecchio++, J., Arrowsmith, J. R., Alfano*, F., de'Michieli Vitturi, M., **Clarke, A.B.**, Pearthree++, K. S., & Till++, R. T. (2014). Aspect-related differences in sediment transport rates on cinder cones, san francisco volcanic field REU. Abstracts with Programs - Geological Society of America, 46(6), 549.
- Till++, R. T., Arrowsmith, J. R., Alfano*, F., **Clarke, A.B.**, de'Michieli Vitturi, M., Del Vecchio++, J., . . . Carr*, B. B. (2014). Cinder cones with complex original forms and implications for morphologic dating. Abstracts with Programs - Geological Society of America, 46(6), 576.
- Alfano*, F., Pioli, L., **Clarke, A.B.**, Ort, M. H., Self, S., & Lowenstern, J. B. (2013). Characterization of the 1000 AD sunset crater eruption and its pyroclastic products. Open-File Report - U.S.Geological Survey, , unpaginated.
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