

Short Curriculum Vitae
BRUCE FRANK HOUGHTON

(a) Education

University of Auckland	N.Z.	Geology BSc (Hons) 1972
University of Otago	N.Z.	Volcanology PhD 1977
Ruhr Universitat	Germany	Volcanology Postdoctoral Fellow 1983-1984

(b) Appointments

2009-present	Science Director	National Disaster Preparedness Training Center.
1999-present	Professor	University of Hawaii, Manoa
1994-1999	Program Leader	Institute of Geological & Nuclear Sciences
1992-1994	Group Manager	Institute of Geological & Nuclear Sciences
1991-1992	Program Leader	DSIR Geology & Geophysics
1976-1990	Volcanologist	N.Z. Geological Survey

(c) Awards, Honours

2021	Board of Regents Excellence in Research Award (University of Hawaii)
2021	NSF Research News Highlight
2018	Fellow of the American Geophysical Union
2018-	New Zealand National Science Challenges International Advisory Group
2017	Thorarinsson Medallist, International Association of Volcanology and Chemistry of the Earth's Interior
2014-	Editorial Board, <i>Frontiers in Earth Science</i> .
2014-15	Editor " <i>Encyclopaedia of Volcanoes Edition 2</i> " (Elsevier).
2013-15	Distinguished Academic Visitor, Queens' College, University of Cambridge.
2010-13	Editorial Board, <i>Geology</i> .
2010-16	Editorial Board, <i>Journal of Applied Volcanology</i> .
2009-13	Coordinating Scientist, Hawaiian Volcano Observatory.
2004	Fellow of the Geological Society of America.
2000	Fellow of the Royal Society of New Zealand.
2000-	Hawaiian State Volcanologist.
2000-	Gordon A. Macdonald Professor of Volcanology.
2000	Editor " <i>Encyclopaedia of Volcanoes</i> " (Academic Press).
1996-98	British Council High Education Links Award.
1996	Marsden Advisory Panel Earth Science-Astronomy.
1992	Hochstetter Lecturer, Geological Society of New Zealand.
1989	Department of Scientific & Industrial Research Prestige Award.
1989-94	Editor, <i>Bulletin of Volcanology</i> .
1987-07	Associate Editor, <i>Journal of Volcanology & Geothermal Research</i> .
1983-84	Alexander von Humboldt Fellowship.

(d) Professional service

- (i) International Association of Volcanology and Chemistry of the Earth's Interior.** *Deputy Secretary General 1991-95, Member of Executive 1999-2003, Leader: Commission on Explosive Volcanism 1986-90, National Correspondent 1986-92*
- (ii) Geological Society of New Zealand.** *President 1988-1989, Treasurer 1979-1983*
- (iii) American Geophysical Union.** *Chair Kuno Award 2018-2019, VGP fellows committee 2019-20*
- (iv) National Academies of Sciences.** *Committee on Improving Understanding of Volcanic Eruptions, 2016-2017, Committee on Catalysing Opportunities for Research in the Earth Sciences (CORES): A Decadal Survey for NSF's Division of Earth Sciences, 2018-2020*
- (v) National Science Foundation,** *Committee of Visitors, Division of Earth Science 2017, Discipline leader, Community Network for Volcanic Eruption Response Research Coordination Network 2019-2021*
- (vi) U.S. Department of the Interior. Strategic Science Group Panellist: 2018 Kilauea volcanic crisis**
- (vii) International Union of Geodesy and Geophysics.** *Convenor National Committee, 1990-1993*
- (viii) European Geophysical Union,** *Chair, Bunsen Award committee 2018*
- (ix) Hawaiian Volcano Observatory.** *Field team leader, Eruption Response 2018*
- (x) Hawaiian State Volcanologist.** *2000-*

(e) Current research

Real-time, in-flight characterization of the dynamics of explosive volcanic eruptions. This is an emergent field of volcanology, which has only emerged since the arrival of laboratory quality cameras on active volcanoes in 2010, quantifying eruption processes and rates for explosive eruptions, in real time, with high spatial and temporal resolution. The principal projects are based at: Kīlauea (Hawai‘i), Grímsvötn, Geldingadalir, Eyjafjallajökull, and Holuhraun (Iceland), and Etna and Stromboli (Italy).

Complex proximal deposition processes during explosive volcanism. Exposures of pyroclastic deposits within 500m of their parent vent are seldom preserved but offer insight into transient, impulsive, and sectorally confined processes of transport and deposition in the lower portions of much longer lived, sustained eruptive plumes. Current projects: the 17 June 1996 Ruapehu fall deposit, the Tarawera 1886 scoria fall, the 2011 Grímsvötn, and 2010 Eyjafjallajökull fall deposits.

Natural hazards & Society. It looks at quantitative evaluation of (i) hazards, (ii) impacts, (iii) perceptions and awareness, (iv) affective reactions and (v) societal and organisational behaviours during crises linked to hazard events. Current projects include: (1) public attitudes and behaviour during volcanic crises at Kīlauea and Mauna Loa in Hawai‘i, (2) the interface between land use planning, land subdivision, and infrequent, high-consequence hazard events, and (3) impacts of lava flows during 2014-2015 and 2018 volcanic crises in Puna, Hawai‘i.

(f) Research funding

NSF 2000-2021 (period at University of Hawaii).

Thirty awards from EAR, OCE and HSD totalling \$6,942,000.

Other awards 2000-2021.

Sixteen awards from USGS, ARRA, NZ FORST, Sea Grant. Total \$929,078.

New Zealand awards 1991-1999 (since formation of NZ Foundation of Research, Science and Technology).

Eleven awards totalling \$NZ8,881,000.

Publication List

Italics indicate lead author was a student or postdoctoral fellow at time of submission.

269. Swanson, D.A.; Orr, T.R.; Patrick, M.R.; Houghton, B.F. 2021. Tephra from Kīlauea volcano's 2008-2018 summit eruption: proximal deposits and dispersal characteristics. *U.S. Geological Survey Professional Paper 1867, on-line*, August 2021.
268. Soldati, A.; Houghton, B. F.; Dingwell D. B. 2021b. Subliquidus rheology of basalt from the 2018 Lower East Rift Zone (LERZ) Kilauea eruption: disequilibrium vs. equilibrium expression. online *Chemical Geology*. June 2021.
267. Soldati, A.; Houghton, B. F.; Dingwell D. B. 2021a. A lower bound on the rheological evolution of magmatic liquids during the 2018 Kilauea eruption. *Chemical Geology* 576: 120272. <https://doi.org/10.1016/j.chemgeo.2021.120272>
266. Roman, D.C.; Soldati, A.; Dingwell, D.B.; Houghton, B.F.; Shiro, B.R. 2021. Earthquakes indicated magma viscosity during Kīlauea's 2018 eruption. *Nature Geosciences*. <https://doi.org/10.1038/s41586-021-03400-x>
265. Namiki, A.; Patrick, M.R.; Manga, M.; Houghton, B.F. 2021. Brittle fragmentation by rapid gas separation in a Hawaiian fountain. *Nature Geosciences*, <https://doi.org/10.1038/s41561-021-00709>
264. *Mintz, B.G.*; Houghton, B.F., Llewellyn, E.W., Orr, T.R., Taddeucci, J., Carey, R.J., Kueppers, U.; Gaudin, D.; Patrick, M.R.; Burton, M.; Scalato, P.; La Spina, A. 2021. Patterns of bubble bursting and weak explosive activity in an active lava lake–Halema‘uma‘u, Kīlauea in 2015. Chapter E of Patrick, M., Orr, T., Swanson, D., and Houghton, B.F., eds., The 2008–2018 summit lava lake at Kīlauea Volcano, Hawai‘i: *U.S. Geological Survey Professional Paper 1867*, 16 p., <https://doi.org/10.3133/pp1867E>.
263. Houghton B.F.; Cockshell, W.A.; Gregg, C.E.; Walker, B.H.; Kim, K.; Tisdale, C.M.; Yamashita, E. 2021. Land, lava and disaster: Kīlauea's social problem in the 2018 eruption. *Nature Communications*, 12:1223 | <https://doi.org/10.1038/s41467-021-21455-2>
262. Patrick, M.R.; Orr, T.R.; Swanson, D.A.; Houghton, B.F. ; Wooten, K; Desmither, L.; Parcheta, C.E. 2021. Kīlauea Volcano's 2008-2018 summit lava lake: chronology and eruption insights. *U.S. Geological Survey Professional Paper 1867*, 50 p., <https://doi.org/10.3133/pp1867A>.
261. Houghton B.F.; Tisdale C.M.; Llewellyn E.W.; Taddeucci J.; Orr T.R.; Walker B.H.; Patrick M.R. 2020. The birth of a Hawaiian fissure eruption. *Journal of Geophysical Research: Solid Earth*, 126, e2020JB020903. <https://doi.org/10.1029/2020JB020903>
260. Patrick M.R.; Houghton B.F.; Poland M.P.; Anderson K.R.; Montgomery-Brown E.; Johanson I.; Thelen W.; Elias T. 2020. The cascading origin of the 2018 Kīlauea eruption and implications for future forecasting. *Nature Communications*, 11:5646 <https://doi.org/10.1038/s41467-020-19190-1>
259. Newcombe, M.E.; Plank, T.; Zhang, Y.; Holycross, M.; Barth A.; Lloyd, A.S.; Ferguson, D.; Houghton, B.F.; Hauri, E. 2020. Magma pressure-temperature-time paths during mafic explosive eruptions. *Frontiers in Earth Science* 8:531911. doi: 10.3389/feart.2020.531911.
258. *Mitchell, S.J.*; Houghton, B.F.; Carey, R.J.; Manga, M.; Fauria, K.E.; Jones, M.R.; Soule, S.A.; Conway, C.E.; Wei, Z.; Giachetti, T. 2019. Submarine giant pumice: a window into the shallow conduit dynamics of a recent silicic eruption. *Bulletin of Volcanology*, 81: 1–42

257. *Moreland WM*, Thordarson T, Houghton BF, Larsen G. 2019. Driving mechanism of subaerial and subglacial explosive episodes during the 10th century Eldgjá fissure eruption, southern Iceland. *Volcanica*, 2: 129–150.
256. *Mueller, S.B.*; Houghton, B.F.; Swanson, D.A.; Poret, M.; Fagents, S.A.; 2019. Total grain size distribution of an intense Hawaiian fountaining event: case study of the 1959 Kīlauea Iki eruption. *Bulletin of Volcanology*, 81: 43
255. Biass, S.; Orr, T.R., Houghton, B.F.; Patrick, M.R.; James, M.R.; Turner, N.R. 2019. Insights into pāhoehoe lava emplacement using visible and thermal structure-from-motion photogrammetry. *Journal of Geophysical Research*: 124.
<https://doi.org/10.1029/2019JB017444>
254. Neal CA, Brantley SR, Antolik L, Babb J, Burgess M, Calles K, Cappos M, Chang, J.C., Conway, S., Desmither, L., Dotray, P., Elias, T., Fukunaga, P., Fuke, S., Johanson, I.A., Kamibayashi, K., Kauahikaua, J., Lee, R.L., Pekalib, S., Miklius, A., Million, W., Moniz, C.J., Nadeau, P.A., Okubo, P., Parcheta, C., Patrick, M.R., Shiro, B., Swanson, D.A., Tollett, W., Trusdell, F., Younger, E.F., Zoeller, M.H., Montgomery-Brown, E.K., Anderson, K.R., Poland, M.P., Ball, J., Bard, J., Coombs, M., Dietterich, H.R., Kern, C., Thelen, W.A., Cervelli, P.F., Orr, T., Houghton, B.F., Gansecki, C., Hazlett, R., Lundgren, P., Diefenbach, A.K., Lerner, A.H., Waite, G., Kelly, P., Clor, L., Werner, C., Mulliken, K., Fisher, G. 2018. The 2018 rift eruption and summit collapse of Kilauea Volcano. *Science*: 363, 367-374.
10.1126/science.aav7046.
253. Biass, S.; Bonadonna, C.; Houghton, B.F. 2019. A step-by-step evaluation of empirical methods to quantify eruption source parameters from tephra-fall deposits. *Journal of Applied Volcanology*, 8: 1. 10.1186/s13617-018-0081-1
252. Houghton, B.F.; Carey, R.J. 2019. Forum Comment: Physical constraints for effective magma-water interaction along volcanic conduits during silicic explosive eruptions. *Geology* 47: 5.
<https://doi.org/10.1130/G46033C.1>
251. Cannata, C.B.; De Rosa, R.; Donato, P.; Donato, S.; Lanzafame, G.; Mancini, L.; Houghton, B. F. 2018. First 3D imaging characterization of Pele’s hair from Kilauea volcano (Hawaii). *Nature Scientific Reports*, December 2018. 10.1038/s41598-018-37983-9
250. *Holt, S.J.*; Carey, R.J.; Houghton, B.F.; Orr, T.R.; McPhie, M.; Feig, S. 2018. Eruption and fountaining dynamics of selected 1985–1986 high fountaining episodes at Kīlauea volcano, Hawai‘i. on-line in *Journal of Volcanology and Geothermal Research*, December 2018.
249. *Mueller, S.B.*; Houghton, B.F.; Swanson, D.A.; Fagents, S.A.; Klawonn, M. 2018. Intricate episodic growth of an Hawaiian tephra deposit: the case study of the 1959 Kīlauea Iki eruption, Hawai‘i. *Bulletin of Volcanology*, 80: 73. doi.org/10.1007/s00445-018-1249-6
248. Moitra, P.; Gonnermann, H.M.; Houghton, B.F. and Chandra S. Tiwary, C.A. 2018. Fragmentation and Plinian eruption of crystallizing basaltic magma. *Earth & Planetary Science Letters*, 500: 97-104.
247. *Jones, T. J.*; Houghton, B.F.; Llewellyn, E.W.; Parcheta, C.E.; Höltingen, L. 2018. Spatter matters—textural characteristics of spatter inform mechanisms of formation. *Nature Scientific Reports*, 9179.
246. *Mitchell, S.J.*; McIntosh, I.M.; Houghton, B.F.; R.J.; Shea, T. 2018. T. Dynamics of a powerful deep submarine eruption recorded in H₂O contents and speciation in rhyolitic glass: The 2012 Havre eruption. *Earth & Planetary Science Letters*, 494: 135-147.
245. *Mitchell, S.J.*; Biass, S; Houghton, B.F.; Anderson, A.; Bonny, E.; Walker, B.H.; Mintz, B.G.; Turner, N.R.; Frank, D.; Carey, R.J; Rosenberg, M.D. 2018. The interplay of clast size, vesicularity, post-fragmentation expansion, and clast breakage: an example from the 1.8 ka Taupo eruption. In Poland, M., Garcia, M., Camp, V., and Grunder, A., eds., *Field*

Volcanology: A Tribute to the Distinguished Career of Don Swanson. Geological Society of America Special Paper 53, [https://doi.org/10.1130/2018.2538\(17\)](https://doi.org/10.1130/2018.2538(17)).

244. *Isgett, S.J.*; Houghton, B.F.; Swanson, D.A. 2018. Eruption and emplacement dynamics of coarse-grained, wall rock-rich beds in the Keanakāko‘i Tephra, Kīlauea, Hawai‘i. In Poland, M., Garcia, M., Camp, V., and Grunder, A., eds., *Field Volcanology: A Tribute to the Distinguished Career of Don Swanson. Geological Society of America Special Paper 53*, [https://doi.org/10.1130/2018.2538\(08\)](https://doi.org/10.1130/2018.2538(08)).
243. *Biass, S.*; Swanson, D.A.; Houghton, B.F. 2018. A new perspective on the 19th century golden pumice deposit of Kīlauea volcano. In Poland, M., Garcia, M., Camp, V., and Grunder, A., eds., *Field Volcanology: A Tribute to the Distinguished Career of Don Swanson. Geological Society of America Special Paper 53*, [https://doi.org/10.1130/2018.2538\(10\)](https://doi.org/10.1130/2018.2538(10)).
242. Swanson, D.A.; Houghton, B.F. 2018. Products, processes, and implications of Keanakako‘i volcanism, Kīlauea Volcano, Hawai‘i. In Poland, M., Garcia, M., Camp, V., and Grunder, A., eds., *Field Volcanology: A Tribute to the Distinguished Career of Don Swanson. Geological Society of America Special Paper 53*, [https://doi.org/10.1130/2018.2538\(07\)](https://doi.org/10.1130/2018.2538(07)).
241. *Janebo, M.H.*; Houghton, B.F.; Thordarson, T.; Bonadonna, C.; Carey, R.J. 2018. Total grain-size distribution of four subplinian–Plinian tephtras from Hekla volcano, Iceland: Implications for sedimentation dynamics and eruption source parameters. *Journal of Volcanology and Geothermal Research*, 357: 25–38. doi.org/10.1016/j.jvolgeores.2018.04.001.
240. Manga, M.; Fauria, K.E.; Lin, C.; Mitchell, S.J.; Jones, M.; Conway, C.; Degruyter, W.; Hosseini, B.; Carey, R.; Cahalan, R.; Houghton, B.F.; White, J.D.L.; Jutzeler, M.; Soule, S.A.; Tani, K. 2018. The pumice raft-forming 2012 Havre submarine eruption was effusive. *Earth and Planetary Sciences Letters*, 489: 49–58. doi.org/10.1016/j.epsl.2018.02.025.
239. Carey, R.; Adam Soule, S.; Manga, M.; White, J.; McPhie, J.; Wysoczanski, R.; Jutzeler, M.; Tani, K.; Fornari, D.; Caratori-Tontini, F.; Houghton, B.; Mitchell, S.; Ikegami, F.; Conway, C.; Murch, A.; Fauria, K.; Jones, M.; Cahalan, R.; McKenzie, W. 2018. The largest deep-ocean silicic volcanic eruption of the past century. *Science Advances*, 4. e1701121. [doi:10.1126/sciadv.1701121](https://doi.org/10.1126/sciadv.1701121)
238. Gudnason, J.; Thordarson, T.; Houghton, B.F.; Larsen, G. 2017. The 1845 Hekla eruption: Grain-size characteristics of a tephra layer. *Journal of Volcanology and Geothermal Research*, 350: 33–46. [doi:10.1016/j.jvolgeores.2017.11.025](https://doi.org/10.1016/j.jvolgeores.2017.11.025)
237. Gonnermann, H.M.; Giachetti, T.; Fliedner, C.; Nguyen, C.T.; Houghton, B.F.; Crozier, J. A.; Carey, R.J. 2017. Permeability during magma expansion and compaction. *Journal of Geophysical Research*: 122: 1–24. [doi:10.1002/2017JB014783](https://doi.org/10.1002/2017JB014783)
236. Jones, T.J.; Llewellyn, E.W.; Houghton, B.F.; Brown, R.J.; Vye-Brown, C. 2017. Proximal lava drainage controls on basaltic fissure eruption dynamics. *Bulletin of Volcanology*, 79: 81. [doi:10.1007/s00445-017-1164-2](https://doi.org/10.1007/s00445-017-1164-2)
235. *Turner, N.*; Houghton, B.F.; Taddeucci, J.; von der Lieth, J.; Kueppers, U.; Gaudin, D.; Ricci, T.; Kim, K.; Scarlato, P. 2017. Drone peers into open volcanic vents, *Eos* 98. [doi:10.1029/2017EO082751](https://doi.org/10.1029/2017EO082751)
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225. Costanza Bonadonna, R Cioni, A Costa, T Druitt, J Phillips, Laura Pioli, D Andronico, A Harris, S Scollo, O Bachmann, Gholamhossein Bagheri, S Biass, Federico Brogi, K Cashman, L Dominguez, T Dürig, O Galland, G Giordano, M Gudmundsson, M Hort, A Höskuldsson, B Houghton, JC Komorowski, U Küppers, G Lacanna, Jean-Luc Le Pennec, G Macedonio, M Manga, Irene Manzella, M de'Michieli Vitturi, A Neri, M Pistolessi, M Polacci, M Ripepe, Eduardo Rossi, B Scheu, R Sulpizio, B Tripoli, S Valade, G Valentine, C Vidal, N Wallenstein. 2016. MeMoVolc report on classification and dynamics of volcanic explosive eruptions. *Bulletin of Volcanology*, 78:84
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216. Carey, R.J.; Swanson, D.A.; Houghton, B.F.; Orr, T.R.; Sutton, A.J. 2015. Onset of a basaltic explosive eruption from Kīlauea's summit in 2008. In: *Hawaiian volcanoes, from source to surface*. Eds: Carey, R.; Cayol, V.; Poland, M.; Weis, D. In: Hawaiian Volcanoes, From Source to Surface. *AGU Monograph Series* 421-438 pp.
215. May, M.D.; Carey, R.J.; Swanson, D.A.; Houghton, B.F. 2015. Reticulite-producing fountains from ring fractures in Kīlauea Caldera ca. 1500 CE. In: *Hawaiian volcanoes, from source to surface*. Eds: Carey, R.; Cayol, V.; Poland, M.; Weis, D. In: Hawaiian Volcanoes, From Source to Surface. *AGU Monograph Series* 351-368 pp.
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