

Scott Kaniela Rowland

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EDUCATION

Ph.D. Geology & Geophysics, 1987, University of Hawai'i at Mānoa. Dissertation title: The flow character of Hawaiian basalt lavas. Dissertation advisor: George P.L. Walker.
BS in Geology, Oregon State University, 1982.

COURSES TAUGHT REGULARLY

[ERTH101L](#) (*Dynamic Earth Lab; 26 times, most recently Spring 2020*): Students learn, with hands-on and in-the-field exercises, about mineralogy, lithology, map-reading, earthquakes, structural geology, hydrology, landslides, and coastal processes. Lab sections are taught by TAs.

[ERTH103](#) (*Geology of the Hawaiian Islands; 9 times, most recently Fall 2018*): All key geologic processes are taught with Hawai'i examples during a geologic tour that starts at Lō'ihi and finishes in Papahānaumokuākea.

[ERTH104](#) (*Volcanoes in the Sea; 7 times, most recently Fall 2019*): This course looks at how the specific geological and geophysical aspects of Pacific islands and Pacific-rim regions affect the societies that lived there in the past and who live there (here) now.

[ERTH130](#) (*Geologic Hazards; 4 times, most recently Spring 2015*): This course looks in depth at those Earth processes (volcanic eruptions, earthquakes, tsunami, floods, etc.) that have direct and typically detrimental effects on people and societies.

[ERTH305](#) (*Geological Field Methods; 21 times, most recently Spring 2020*): In this class, Earth Sciences majors apply their classroom, lab, and book knowledge to real examples in the hot, muggy, dry, dusty, rainy, cold world, both in Hawai'i and in the Mojave desert.

[ERTH306](#) (*Work of Water; 6 times, most recently Fall 2019*): This is an introduction to water properties and processes, both on the surface and underground. E mālama i ka wai.

[ERTH460](#) (*Geological Remote Sensing; 17 times, most recently Spring 2020*): Students learn how energy interacts with terrestrial surfaces and how that energy can be collected from space or in the air, and how those data are processed, displayed, and interpreted. The course is co-taught with [Rob Wright](#).

[ERTH461](#) (*Geospatial Information; 9 times, most recently Fall 2019*): Students learn how to collect field data with a quantitative spatial component (i.e., with GPS), and then how to store and process these data (i.e., with GIS).

CURRENT RESEARCH PROJECTS

Understanding groundwater flow paths beneath the Red Hill Fuel Tanks, understanding lava flow morphology and emplacement, thick lava flows on Moloka'i, Co-Investigator with the Mars Science Laboratory "Curiosity" rover, improving Earth-science literacy among Hawai'i teachers.

ACTIVE EXTRAMURAL GRANTS

University of Hawai'i Participation in the Mars Science Laboratory Mission (Co-I; NASA)

The 13th NASA Volcanology Field Workshop (PI; NASA)

Geologic Controls on Groundwater Flow Paths Beneath the Red Hill Fuel Storage Tanks, O'ahu, Hawai'i (PI; State of Hawai'i Dept. of Health)

Project EPIK – Earth, Planets, 'Ike, and Kuleana – Preparing the Next Generation of Diverse Geoscientists in Hawai'i (Co-I, NSF)

STUDENTS ADVISED

Danielle Chittenden (Senior thesis, 2003), Warren McKinzie (Senior thesis, 2016), Brooke Winans (Senior thesis, 2014), Carrie Brooks (Senior thesis, current), Elaine Lompitoc (MS, 2009), Darwina Griffin (MS, 2012), Samantha Jacob (MS, 2015), Joy Cline (MS, current), Brian Shiro (PhD, current)

EMPLOYMENT

- 11/04 to present: Associate Specialist, then Specialist in the Dept. of Earth Sciences (formerly Geology & Geophysics), University of Hawai'i at Mānoa, teaching courses, conducting volcanological research, and working with the Curiosity rover (on Mars).
- 9/89 to 10/04: Assistant, then Associate Researcher in the Hawai'i Institute of Geophysics and Planetology, University of Hawai'i at Mānoa. Most work was remote-sensing volcanology in support of various Earth-observing satellite missions (EOS, SIR-C, TOPSAR, etc.).
- 1/89 to 9/89: Geologist for Dames & Moore, Honolulu. Work involved field analysis of drill cores, sub-surface contaminant detection and mapping, and construction monitoring.
- 1/89 to 5/89: Instructor at Windward Community College, Kāne'ohe Hawai'i.
- 3/88 to 12/88: Laboratory technician, US Geological Survey, Menlo Park, CA. Work involved processing sulfide and sulfate minerals (using wet chemistry and gas distillation) to prepare them for running on a mass-spectrometer.
- 3/88 to 12/88: Geologist for Smith-Evernden Associates, Santa Cruz, CA. Work entailed evaluation of existing and proposed home sites with regard to their soil conditions, drainage, flooding potential, and fault proximity.
- 7/87 to 12/87: Instructor, Dept. of Geology & Geophysics, University of Hawai'i at Mānoa.

PROFESSIONAL MEMBERSHIP

AGU (American Geophysical Union), GSA (Geological Society of America; Fellow), IAVCEI (International Association for Volcanology and Chemistry of the Earth's Interior)

PUBLICATIONS

- Malin MC (and 28 others; 2017) The Mars Science Laboratory (MSL) Mast cameras and Descent imager: I. Investigation and instrument descriptions. *Earth and Space Science*, doi: 10.1002/2016EA000252
- Harris AJL, Rowland SK, Villeneuve N, Thordarson T (2017) Pāhoehoe, 'a'ā, and block lava: an illustrated history of the nomenclature. *B Volcanol* **79.7**, doi: 10.1007/s00445-016-1075-7
- Harris AJL, Rowland SK (2015) Lava flows and rheology. *In* Sigurdsson H, Houghton B, McNutt SR, Rymer H, Styr J, eds. *Encyclopedia of Volcanoes*, 2nd Edition
- Mangold N, and 49 others (2015) Chemical variations in Yellowknife Bay formation sedimentary rocks analyzed by ChemCam on board the Curiosity rover on Mars. *J. Geophys. Res. Planets*, **120**:452–482, doi:10.1002/2014JE004681
- Harris AJL, Rowland SK (2015) FLOWGO 2012: An updated framework for thermorheological simulations of Channel-Contained lava. *In* Carey R, Cayol V, Poland M, and Weis D, eds., *Hawaiian Volcanoes: From Source to Surface*, Am Geophys Union Geophysical Monograph **208**
- Blaney DL and 31 others (2014) Chemistry and texture of the rocks at Rocknest, Gale Crater: Evidence for sedimentary origin and diagenetic alteration. *J Geophys Res Planets*, **119**:2109-2131, doi:10.1002/2013JE004590
- Kurz MD, Rowland SK, Curtice J, Saal AE, Naumann T (2014) Eruption rates for Fernandina Volcano: A new chronology at the Galápagos hotspot center. *In* Harpp KS, Mittlestaedt E, d'Ozouville N, Graham DW, eds. *The Galapagos: A Natural Laboratory for the Earth Sciences*, Am Geophys Union Geophysical Monograph **204**
- Grotzinger JP and 71 others (2013) A habitable fluvio-lacustrine environment at Yellowknife Bay, Gale Crater, Mars. *Science* **343**, 10.1126/science.1242777
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- Edgett KS, Yingst RA, Ravine MA, Caplinger MA, Maki JN, Ghaemi FT, Schaffner JA, Bell JF, Edwards LJ, Herkenhoff KE, Heydari E, Kah LC, Lemmon MT, Minitti ME, Olson TS, Parker TJ, Rowland SK, Schieber J, Sullivan RJ, Sumer DY, Thomas PC, Jensen EH, Simmonds JJ, Sengstaken AJ, Willson RG, Goetz W (2012) Curiosity's Mars Hand Lens Imager (MAHLI) Investigation. *Space Science Reviews* DOI 10.1007/s11214-012-9910-4.
- Rowland SK, Mougini-Mark PJ, Fagents SA, (2011) NASA volcanology field workshops on Hawai'i: Part 1. Description and history. *In* Garry WB, Bleacher JE, eds., *Analogs for*

- Planetary Exploration: Geological Society of America Special Paper **483**: 401–434, doi:10.1130/2011.2483
- Mouginis-Mark PJ, Fagents SA, Rowland SK, (2011) NASA volcanology field workshops on Hawai'i: Part 2. Understanding lava flow morphology and flow field emplacement. *In* Garry WB, Bleacher JE, eds., Analogues for Planetary Exploration: Geological Society of America Special Paper **483**: 435–448, doi:10.1130/2011.2483
- Rowland SK, Sparks RSJ (2009) A pictorial summary of the life and work of George Patrick Leonard Walker. *In*: Hoskuldsson A, Thordarson T, Larsen G, Self S, Rowland S, eds. The Legacy of George P.L. Walker, Special Publications of IAVCEI, **2**: 371–400, Geological Society, London.
- Rowland SK, Jurado-Chichay Z, Ernst GJ (2009) Pyroclastic deposits and lava flows from the 1759–1774 eruption of El Jorullo, México: Aspects of “violent strombolian” activity and comparison with Parícutin. *In*: Hoskuldsson A, Thordarson T, Larsen G, Self S, Rowland S, eds. The Legacy of George P.L. Walker, Special Publications of IAVCEI, **2**: 105-128, Geological Society, London.
- Harris AJL, Rowland SK (2009) Effusion Rate Controls on Lava Flow Length and the Role of Heat Loss: A Review. *In*: Hoskuldsson A, Thordarson T, Larsen G, Self S, Rowland S, eds. The Legacy of George P.L. Walker, Special Publications of IAVCEI, **2**: 33-51, Geological Society, London.
- Mouginis-Mark PJ, Rowland SK (2008) Lava flows at Arsia Mons, Mars: Insights from a graben imaged by HiRISE. *ICARUS* **198**:27-36.
- Kervyn M, Kervyn F, Goossens R, Rowland SK, Ernst GGJ (2007) Mapping volcanic terrain using high-resolution and 3D satellite remote sensing. *In*: Teeuw RM (ed) Mapping Hazardous Terrain using Remote Sensing. Geol. Soc. Lond. Spec Publ **283**:5-30
- Mouginis-Mark PJ, Harris AJL, Rowland SK (2007) Terrestrial analogs to the calderas of the Tharsis volcanoes on Mars, *in*: Chapman M (ed) The Geology of Mars: Evidence from Earth-Based Analogs. Cambridge Univ. Press: 71-94
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- Rowland SK, Garbeil H, Harris AJL (2005) Lava channel lengths and hazards on Mauna Loa determined from thermal and downslope modeling with FLOWGO. *Bull Volcanol* **67**:634-647.
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- Garcés M, Harris A, Hetzer C, Johnson J, Rowland S, Marchetti E, Okubo P (2003) Infrasonic tremor observed at Kīlauea Volcano, Hawai'i. *Geophys Res Lett* **30**:2023-2026, doi:10.1029/2003GL018038.
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- Harris AJL, Rowland SK (2001). FLOWGO: A kinematic thermo-rheological model for lava flowing in a channel. *Bull Volcanol* **63**:20-44.
- Rowland SK, Garbeil H (2000). The slopes of oceanic basalt volcanoes. *in* Remote Sensing of Active Volcanism, AGU Monograph **116**, PJ Mouginis-Mark, JA Crisp, JH Fink, eds. pp. 223-247.
- Zimbelman JR, Fagents SA, Gregg TKP, Manley CR, Rowland SK (2000). Subaerial Terrestrial Volcanism: Eruptions in our own Backyard, *in*: Environmental Effects on Volcanic Eruptions: From Deep Oceans to Deep Space JR Zimbelman & TKP Gregg, Eds. Kluwer Academic/Plenum Publishers, New York, pp. 9-37.

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- Jurado-Chichay Z, Urrutia Fucugauchi J, Rowland SK (1996). A paleomagnetic study of the Pohue Bay flow and its associated coastal cones, Mauna Loa Volcano, Hawaii: constraints on their origin and temporal relationships. *Physics of Earth and Planetary Interiors. Phys. Earth Planet. Int.* **97**:269-277.
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- Rowland SK, Munro DC (1993). The 1919-1920 eruption of Mauna Iki, Kilauea: chronology, geologic mapping, and magma transport mechanisms. *Bull. Volcanol.* **55**:190-203.
- Rowland SK, Munro DC (1992). The caldera of Volcan Fernandina: a remote sensing study of its structure and recent activity. *Bull. Volcanol.* **55**:97-109.
- Bruno BC, Taylor GJ, Rowland SK, Lucey PG, Self S (1992). Lava flows are fractals. *Geophys. Res. Lett.* **19**:305-308.
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