



*International Association of Geomorphologists
Working Group on Planetary Geomorphology*

Recommended Reading List for Planetary Volcanism

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(Note: This list excludes the immense literature for volcanism on Earth, except for examples with comparisons to planetary examples, plus selected references for general lava flow morphology and emplacement.)

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General:

- Francis, P. (1993). "Volcanoes: A planetary perspective." Clarendon Press, Oxford University Press, Oxford, 443 p.
- Zimbelman, J. R., and Gregg, T. K. P., Eds. (2000). "Environmental effects on volcanic eruptions: From deep oceans to deep space." Kluwer Academic/Plenum Publishers, New York, 260 p.
- Lopes, R. M. C., and Gregg, T. K. P. (2004). "Volcanic worlds: Exploring the solar system's volcanoes." Springer-Verlag, Berlin, 236 p.
- Wilson, L., and Head, J. W. (1983). A comparison of volcanic eruption processes on Earth, Moon, Mars, Io, and Venus. *Nature* **302**, 663-669.

Mercury Volcanism:

- Strom, R. G. (1984). Mercury. In "The geology of the terrestrial planets." (M. H. Carr, Ed.), pp. 12-55. NASA SP-469. U. S. Government Printing Office, Washington, D.C.
- Head, J. W., Wilson, L., Robinson, M., Heisinger, H., Weitz, C., and Yingst, A. (2000). Moon and Mercury: Volcanism in early planetary history. In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 143-178. Kluwer Academic/Plenum Publishers, New York.

Venus Volcanism:

- Crumpler, L. S., and Aubele, J. C. (2000) Volcanism on Venus. In "Encyclopedia of volcanoes." (H. Sigurdsson, Ed.), pp. 727-769. Academic Press, San Diego, California.
- Crumpler, L. S., Aubele, J. C., Senske, D. A., Keddie, S. T., Magee, K. P., and J.W. Head, (1997). Volcanoes and centers of volcanism on Venus. In "Venus II" (D. M. Bougher, D.,M., et al., Eds.), pp. 697-756. The University of Arizona Press, Tucson, Arizona.
- Grosfils, E. B., Aubele J., Crumpler, J., Gregg, T. K. P., and Sakimoto, S. (2000). Volcanism on Earth's seafloor and Venus. In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 113-142. Kluwer Academic/Plenum Publishers, New York.
- Head, J. W., and Wilson, L. (1986). Volcanic processes and landforms on Venus: Theory, predictions, and observations. *Journal of Geophysical Research* **91**, 9407-9446.
- Head, J. W., Crumpler, L., Aubele, J., Guest, J., and Saunders, R. S. (1992). Venus volcanism: Classification of volcanic features and structures, associations, and global distribution from Magellan data. *Journal of Geophysical Research* **97**, 13153-13198.



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- Roberts, K. M., Guest, J. E., Head, J. W., and Lancaster, M.G. (1992). Mylitta Fluctus, Venus: Rift-related, centralized volcanism and the emplacement of large-volume flow units. *Journal of Geophysical Research* **97**, 15991-16015.
- Stofan, E. R., Sharpton, V. L., Schubert, G., Baer, G., Bindschadler, D. L., Janes, D. M., and Squyres, S. W. (1992). Global distribution and characteristics of coronae and related features on Venus: Implications for origin and relation to mantle processes. *Journal of Geophysical Research* **97**, 13347-13378.
- Stofan, E. (2004). Earth's evil twin: The volcanic world of Venus. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 61-79. Springer-Verlag, Berlin.
- Stofan, E. R., Hamilton, V. E. Janes, D. M., and Smrekar, S. E. (1997). Coronae on Venus: Morphology and origin. In "Venus II" (D. M. Bougher, D. M., et al., Eds.), pp. 931-965. The University of Arizona Press, Tucson, Arizona.
- Watters, T. R., and Janes, D. M. (1995). Coronae on Venus and Mars: Implications for similar structures on Earth. *Geology* **23(3)**, 200-204.
- Zimbelman, J. R. (1998). Emplacement of long lava flows on planetary surfaces. *Journal of Geophysical Research* **103(B11)**, 27503-27516.
- Zimbelman, J. R. (2003). Flow field stratigraphy surrounding Sekmet Mons volcano, Kawelu Planitia, Venus. *Journal of Geophysical Research* **108(E5)**, 10.1029/2002JE001965.

Lunar Volcanism:

- Gaddis, L. (2004). The face of the Moon: Lunar volcanoes and volcanic deposits. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 81-96. Springer-Verlag, Berlin.
- Head, J. W., Wilson, L., Robinson, M., Heisinger, H., Weitz, C., and Yingst, A. (2000). Moon and Mercury: Volcanism in early planetary history. In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 143-178. Kluwer Academic/Plenum Publishers, New York.
- Schaber, G.G. (1973). Lava flows in Mare Imbrium: Geologic evaluation from Apollo orbital photography. *Proceedings of the 4th Lunar and Planetary Science Conference*, 73-92.
- Schaber, G. G., Boyce, J. M., and Moore, H. J. (1976). The scarcity of mappable lava flow lobes on the lunar maria: Unique morphology of the Imbrium flows. *Proceedings of the 7th Lunar and Planetary Science Conference*, 2783-2800.
- Wilson, L., and Head, J. W. (1981). Ascent and eruption of basaltic magma on the Earth and Moon. *Journal of Geophysical Research* **86**, 2971-3001.
- Zimbelman, J. R. (1998). Emplacement of long lava flows on planetary surfaces. *Journal of Geophysical Research* **103(B11)**, 27503-27516.



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Earth Volcanism (General):

- Cashman, K. V. (2004). Volcanoes on Earth: Our basis for understanding volcanism. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 5-42. Springer-Verlag, Berlin.
- Gregg, T. (2004). Submarine volcanoes: The hidden face of the Earth. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 43-60. Springer-Verlag, Berlin.
- Mahoney, J. J., and Coffin, M. F. (1997). "Large igneous provinces." Geophysical Monographs Series Volume 100, American Geophysical Union, Washington, D.C.
- Rossi, M., Papale, P., Lupi, L., and Stoppato, M. (2003). "Volcanoes." Firefly Books, Buffalo, New York, 335 p.
- Zimbelman, J. R., Fagents, S. A., Gregg, T. K. P., Manley, C. R., and Rowland, S. K. (2000). Subaerial terrestrial volcanism: Eruptions in our own backyard. In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 9-37. Kluwer Academic/Plenum Publishers, New York.

Mars Volcanism:

- Carr, M. (2006). "Volcanism." In "The surface of Mars," M. Carr, pp. 43-76. Cambridge University Press, Cambridge, UK.
- Carr, M. H., Greeley, R., Blasius, K. R., Guest, J. E., and Murray, J. B. (1977). Some Martian volcanic features as viewed from the Viking orbiters. *Journal of Geophysical Research* **82**, 3985-4015.
- Greeley, R. and Spudis, P. (1981) Volcanism on Mars. *Reviews of Geophysics and Space Physics* **19**, 13-41.
- Greeley, R., Bridges, N. T., Crown, D. A., Crumpler, L., Fagents, S., Mougins-Mark, P. J., and Zimbelman, J. R. (2000). Volcanism on the Red Planet: Mars." In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 75-112. Kluwer Academic/Plenum Publishers, New York.
- Mougins-Mark, P. J., Wilson, L., and Zuber, M. T. (1992). The physical volcanology of Mars. In "Mars." (H. H. Kieffer, B. M. Jakosky, C. W. Snyder, and M. S. Matthews, Eds.), pp. 424-452. The University of Arizona Press, Tucson, Arizona.
- Sakimoto, S. (2004). Volcanoes on Mars: The global view. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 97-109. Springer-Verlag, Berlin.
- Zimbelman, J. R. (2000). Volcanism on Mars. In "Encyclopedia of volcanoes." (H. Sigurdsson, Ed.), pp. 771-783. Academic Press, San Diego, California.



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Mars Lava Flows:

- Baloga, S. M., Mouginis-Mark, P.J., and Glaze, L. S. (2003). The rheology of a long lava flow at Pavonis Mons, Mars. *Journal of Geophysical Research* **108(E7)**, 10.1029/2002JE001981.
- Carr, M. H., Greeley, R., Blasius, K. R., Guest, J. E., and Murray, J. B. (1977). Some Martian volcanic features as viewed from the Viking orbiters. *Journal of Geophysical Research* **82**, 3985-4015.
- Cattermole, P. J. (1987). Sequence, rheological properties and effusion rates of volcanic flows at Alba Patera, Mars. *Proceedings of the 17th Lunar and Planetary Science Conference, Journal of Geophysical Research* **92(B4)**, E553-E560.
- Hulme, G. (1976). The determination of the rheological properties and effusion rate of an Olympus Mons lava. *Icarus* **27**, 207-213.
- Lopes-Gautier, R. M. C. (1993). Extraterrestrial lava flows. In "Active Lavas." (C. R. J. Kilburn and G. Luongo, Eds.), pp. 107-144. University College London Press, London.
- Malin, M. C. (1977). Comparison of volcanic features of Elysium (Mars) and Tibesti (Earth). *Geological Society of America Bulletin* **88**, 908-919.
- Moore, H. J., Arthur, D. W. G., and Schaber, G. G. (1978). Yield strengths of flows on the Earth, Mars, and Moon. *Proceedings of the 9th Lunar and Planetary Science Conference*, 3351-3378.
- Mouginis-Mark, P. J. (1998). The long lava flows of Elysium Planitia, Mars. *Journal of Geophysical Research* **103**, 19389-19400.
- Mouginis-Mark, P. J., and Christensen, P. R. (2005). New observations of volcanic features on Mars from the THEMIS instrument. *Journal of Geophysical Research* **110(E8)**, 10.1029/2005JE002421.
- Plescia, J. B. (2003). Cerberus Fossae, Elysium, Mars: A source for lava and water. *Icarus* **164**, 79-95.
- Plescia, J. B. (2004). Morphometric properties of Martian volcanoes. *Journal of Geophysical Research* **109**, E03003, 10.1029/JE002031.
- Plescia, J. B., and Saunders, R. S. (1979). The chronology of the Martian volcanoes. *Proceedings of the 10th Lunar and Planetary Science Conference*, 2841-2859.
- Schaber, G. G. (1982). Syrtis Major: A low-relief volcanic shield. *Journal of Geophysical Research* **87(B12)**, 9852-9866.
- Schaber, G. G., Horstman, K. C., and Dial, A. C. (1978). Lava flow materials in the Tharsis region of Mars. *Proceedings of the 9th Lunar and Planetary Science Conference*, 3433-3458.
- Wilson, L., and Head, J. W. (1983). A comparison of volcanic eruption processes on Earth, Moon, Mars, Io, and Venus. *Nature* **302**, 663-669.
- Zimbelman, J. R. (1985). Estimates of rheologic properties for flows on the Martian volcano Ascraeus Mons. *Proceedings of the 16th Lunar and Planetary Science Conference, Journal of Geophysical Research* **90**, D157-D162.



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Zimbelman, J. R. (1998). Emplacement of long lava flows on planetary surfaces. *Journal of Geophysical Research* **103(B11)**, 27503-27516.

Mars Explosive Volcanism:

- Chapman, M. G., and Larsen, G. (2004). Products of powerful volcanic explosions on Earth and Mars. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 179-205. Springer-Verlag, Berlin.
- Chapman, M. G., Allen, C. C., Gudmundsson, M. T., Gulick, V. C., Jakobsson, S. P., Lucchitta, B. K., Skilling, I. P., and Waitt, R. B. (2000). Volcanism and ice interactions on Earth and Mars. In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 39-73. Kluwer Academic/Plenum Publishers, New York.
- Crown, D. A., and Greeley, R. (1993). Volcanic geology of Hadriaca Patera and the eastern Hellas region of Mars. *Journal of Geophysical Research* **98**, 3441-3451.
- Frey, H., and Jarosevich, M. (1982). Sub-kilometer Martian landscapes: Properties and possible terrestrial analogs. *Journal of Geophysical Research* **87**, 9867-9879.
- Frey, H., Lowry, B. L., and Chase, S. A. (1979). Pseudocraters on Mars. *Journal of Geophysical Research* **84(B14)**, 8075-8086.
- Greeley, R., and Crown, D. A. (1990). Volcanic geology of Tyrrhena Patera, Mars. *Journal of Geophysical Research* **95**, 7133-7149.
- Kieffer, S. W. (2004). From Yellowstone to Titan, with sidetrips to Mars, Io, Mount St. Helens and Triton. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 207-231. Springer-Verlag, Berlin.
- Lanagan, P. D., McEwen, A. S., Keszthelyi, L. P., and Thordarson, Th. (2001) Rootless cones on Mars indicating the presence of shallow equatorial ground ice in recent times. *Geophysical Research Letters* **28**, 2365-2367.
- Mouginis-Mark, P. J. (2002). Prodigious ash deposits near the summit of Arsia Mons volcano, Mars. *Geophysical Research Letters* **29**, 10.1029/2002GL015296.
- Mouginis-Mark, P. J., Wilson, L., and Head, J. W. (1982). Explosive volcanism at Hecates Tholus, Mars: Investigation of eruption conditions. *Journal of Geophysical Research* **87**, 9890-9904.
- Mouginis-Mark, P. J., Wilson, L., and Zimbelman, J. R. (1988). Polygenic eruptions on Alba Patera, Mars. *Bulletin of Volcanology* **50**, 361-379.
- Reimers, C. E., and Komar, P. D. (1979). Evidence for explosive volcanic density currents on certain Martian volcanoes. *Icarus* **39**, 88-110.
- Wilson, L., and Mouginis-Mark, P. J. (2003). The phreatomagmatic explosive origin of Hrad Vallis, Mars. *Journal of Geophysical Research* **108**, 10.1029/JE001927.

Io Volcanism:

- Keszthelyi, L., et al. (2001). Imaging of volcanic activity on Jupiter's moon Io by Galileo during GEM and GMM. *Journal of Geophysical Research* **106**, 33025-33052.
- Lopes, R. (2004). Io, a world of great volcanoes. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 127-144. Springer-Verlag, Berlin.



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- Lopes-Gautier, R. S., et al. (2000). A close-up look at Io from Galileo's Near-Infrared Mapping Spectrometer. *Science* **288**, 1201-1204.
- McEwen, A. S., et al. (1998). High-temperature silicate volcanism on Jupiter's moon Io. *Science* **281**, 87-90.
- McEwen, A. S., et al. (1998). Active volcanism on Io as seen by Galileo SSI. *Icarus* **135**, 181-219.
- McEwen, A. S., et al. (2000). Galileo at Io: Results from high-resolution imaging. *Science* **288**, 1193-1198.
- McEwen, A. S., Lopes-Gautier, R., Keszthelyi, L., and Kieffer, S. W. (2000). Extreme volcanism on Jupiter's moon Io. In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 179-205. Kluwer Academic/Plenum Publishers, New York.
- Smith, B. A., and the Voyager Imaging Team (1979). The Jupiter system through the eyes of Voyager 1. *Science* **204**, 951-972.
- Smith, B. A., Shoemaker, E. M., Kieffer, S. W., and Cook, A. F. (1979). The role of SO₂ in volcanism on Io. *Nature* **280**, 738-743.

Icy Body Volcanism:

- Fagents, S. A. (2003). Considerations for effusive cryovolcanism on Europa: the post-Galileo perspective. *Journal of Geophysical Research* **108**, 10.1029/2003JE002128.
- Pinkerton, H., Fagents, S. A., Prockter, L., Schenk, P., and Williams, D. A. (2000). Exotic lava flows. In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 207-241. Kluwer Academic/Plenum Publishers, New York.
- Prockter, L. (2004). Ice volcanism on Jupiter's moons and beyond. In "Volcanic worlds: Exploring the solar system's volcanoes." (R. M. C. Lopes and T. K. P. Gregg, Eds.), pp. 145-177. Springer-Verlag, Berlin.

Lava Flows (General):

- Griffiths, R. W., and Fink, J. H. (1992). The morphology of lava flows in planetary environments: Predictions from analog experiments. *Journal of Geophysical Research* **97**, 19739-19748.
- Hon, K., Kauahikaua, J., Denlinger, R., and Mackay, K. (1994). Emplacement and inflation of pahoehoe sheet flows: Observations and measurements of active lava flows on Kilauea volcano, Hawaii. *Geological Society of America Bulletin* **106**, 351-370.
- Hulme, G. (1974). The interpretation of lava flow morphology. *Geophysical Journal of the Royal Astronomical Society* **39**, 361-383.
- Keszthelyi, L. (1995). A preliminary thermal budget for lava tubes on the Earth and planets. *Journal of Geophysical Research* **100**, 20411-20420.
- Keszthelyi, L., and Self, S. (1998). Some physical requirements for the emplacement of long basaltic lava flows. *Journal of Geophysical Research* **103**, 27447-27464.



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- Kilburn, C. R. J. (1993). Lava crusts, aa flow lengthening and the pahoehoe-aa transition. In "Active Lavas." (C. R. J. Kilburn and G. Luongo, Eds.), pp. 263-280. University College London Press, London.
- Kilburn, C. R. J., and Lopes, R. M. C. (1991). General patterns of flow field growth: Aa and blocky lavas. *Journal of Geophysical Research* **96**, 19721-19732.
- Lipman, P. W., and Banks, N. G. (1987). Aa flow dynamics, Mauna Loa 1984. *U. S. Geological Survey Professional Paper 1350*, 1527-1567.
- Pieri, D. C., and Baloga, S. M. (1986). Eruption rates, areas and length relationships for some Hawaiian lava flows. *Journal of Volcanology and Geothermal Research* **30**, 29-45.
- Pinkerton, H., and Wilson, L. (1994). Factors controlling the lengths of channel-fed lava flows. *Bulletin of Volcanology* **56**, 108-120.
- Pinkerton, H., Fagents, S. A., Prockter, L., Schenk, P., and Williams, D. A. (2000). Exotic lava flows. In "Environmental effects on volcanic eruptions: From deep oceans to deep space." (J. R. Zimbelman and T. K. P. Gregg, Eds.), pp. 207-241. Kluwer Academic/Plenum Publishers, New York.
- Reidel, S. P., and Tolan, T. L. (1992). Eruption and emplacement of flood basalt: An example from the large-volume Teepee Butte member, Columbia River basalt group. *Geological Society of America Bulletin* **104**, 1650-1671.
- Rowland, S. K., and Walker, G. P. L. (1990). Pahoehoe and aa in Hawaii: Volumetric flow rate controls the lava structure. *Bulletin of Volcanology* **52**, 615-628.
- Self, S., Thordarson, T., Keszthelyi, L., Walker, G. P. L., Hon, K., and Murphy, M. T. (1996). A new model for the emplacement of Columbia River basalts as large, inflated pahoehoe lava flow fields. *Geophysical Research Letters* **23(19)**, 2689-2692.
- Walker, G. P. L. (1971). Compound and simple lava flows and flood basalts. *Bulletin of Volcanology* **35**, 579-590.
- Walker, G. P. L. (1973). Lengths of lava flows. *Philosophical Transactions of the Royal Society, London, Series A* **274**, 107-118.
- Walker, G. P. L. (1991). Structure and origin by injection under surface crust, of tumuli, "lava rises", "lava rise pits", and "lava inflation clefts" in Hawaii. *Bulletin of Volcanology* **53**, 546-558.
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