

Thomas Giachetti, PhD

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ASSISTANT PROFESSOR IN VOLCANOLOGY

RESEARCH INTERESTS

Magma degassing and dynamics of volcanic eruptions

Low-temperature and low-pressure interactions between water and volcanic glass

Formation and propagation of debris avalanches and associated tsunamis

EXPERTISE

Volcanic fieldwork

Helium pycnometry (porosity), Capillary flow porometry (permeability), Rheometry (rheology), 2D and 3D quantitative textural analyses (Scanning Electron Microscopy, X-ray microtomography), Numerical modeling of volcanic eruptions, Matlab programming, Thermogravimetry, Electronic microprobe, FT infrared spectroscopy, Raman spectrometry

RESEARCH POSITIONS HELD

Since 2015 **Assistant Professor in Volcanology at the University of Oregon**

2011-2015 **Post-Doctoral Position, rice University, Houston TX:** Textural and chemical analyses of natural pyroclasts and numerical modeling of magma degassing during volcanic eruptions of highly silicic magmas. Advisor: Prof. Helge M. Gonnermann

2010-2011 **Post-Doctoral Position, GEOLAB, Clermont-Ferrand, France:** Numerical modeling of volcanic debris avalanches and associated tsunamis. Advisor: Dr. Raphaël Paris

EDUCATION

2006-2010 **Ph.D. Thesis in Volcanology**, University of Clermont-Ferrand, Laboratoire Magmas et Volcans, France. Advisors: Pr. Timothy H. Druitt & Dr. Karim Kelfoun. 2D and 3D textural analysis of products from the 1997 Vulcanian explosions of the Soufrière Hills Volcano, Montserrat. *Defense held on the 01-22-10.*

2004-2006 **Master in Earth Sciences**, University of Clermont-Ferrand, Laboratoire Magmas et Volcans, France. Analogical and numerical modeling of pumice flows and landslide-generated tsunamis

2003-2004 **Licence in Earth Sciences**, University of Clermont-Ferrand, France

2001-2003 **DEUG in Universe and Earth Sciences**, University of Lille I, France

AWARDS

2011 **Award of the Young Researcher** of Clermont-Ferrand, France (1500€)

2011 **Young Scientist's Travel Award for Europeans** of the European Geosciences Union

2011 **AXA postdoctoral grant** with Hugh Tuffen at Lancaster University, UK (120,000€)

2009 **Best VGP Student Presentations**, AGU Fall meeting 2009 (100US\$)

TEACHING

- 2018 'Volcanology' (CRN 36007) – Spring,
2018 'Advanced Volcanology' (CRN 26975) – Winter
2017 'Volcanology reading group: Magma Degassing' (CRN 22713) - Winter
2016 'Volcanoes and Earthquakes' (GEOL306) – Spring & Fall
2016 'Summer Geology Field camp' (GEOL406), Newberry Volcano, Four Craters (OR)
2015 **Field trip** Crater Lake (OR), Medicine Lake, Lassen Peak (CA)
03/2012 **Field trip** 'Sedimentary mapping', Jemez Springs (NM)
2011 **Field trips** '500 Ma in Auvergne', Earth Sciences, Blaise Pascal University, France
2010 **Field trips** 'College work methodology', Blaise Pascal University, France
10-12/2010 '**Hazards, crisis and impacts**' (**Junior Year**), Geography, Blaise Pascal University, France

GRANTS

- 08/15/2017 **NSF CMMI Start - RAPID #1748631: Reconnaissance of Twin Landslides and Tsunami of 17 June 2017 in Greenland.** PI: Hermann Fritz; Co-PI: Thomas Giachetti; Organization: Georgia Tech; Award Amount: \$39,692.00
07/01/2017 **NSF EAR Collaborative Research - #1725207: What Do Obsidian Pyroclasts Tell Us? Constraints from Textures, Volatiles, and Experiments.** PI: Thomas Giachetti; Co-PI: James Watkins; Organization: University of Oregon; Award Amount: \$247,971.00

SUPERVISION

- Since 2016 **Students (UO):** Erin Hoxsie (M.S), Kathy Trafton (PhD), Joshua Wiejaczka (PhD), Monserrat Cascante Matamoros (PhD)
2016-2017 **Undergraduate students (UO):** Kieran A McCann, Tobias C Earley, Mickey Swartz, Sarah A Menard, Taylor H Barnhart (Senior thesis), Gabriel L Mager, Ricky Ede (Honors thesis), Hannah Kruse (Honors thesis)
06-08/2014 **Student (Rice):** Céline Fliedner (undergraduate)
2010-2011 **Undergraduate students (Blaise Pascal, France):** analogical modeling of tsunamis

INVOLVEMENT IN THE SCIENTIFIC COMMUNITY AND SERVICES

- 2017-2019 Member of **curriculum committee**
2016-2018 Member of **search committee** for new faculty in volcanology (2 years)
2017-2018 Participating in "Take our children to Work Day" at UO (giving lab tours)
2017 **Public talk** at Eugene Public Library (OR): 'Volcanism in the Cascades'
2016 Improving Understanding of Volcanic Eruptions Workshop, Washington (DC)
2013-2017 **Convener:** American Geophysical Union Fall Meeting, San Francisco (CA), International Association of Volcanology and Chemistry of the Earth's Interior, Portland (OR)
2010-2013 **Reviewer:** *Bull. Volcanol., J. Volcanol. Geotherm. Res., Geology, Geochim. Cosmochim. Acta, Earth Planetary Sci. Lett., Geophysical Research Letters, Contribution to Mineralogy and Petrology, GSA Books, National Science Foundation, Sigma Delta Epsilon/Graduate Women in Science, Earth Observatory of Singapore, National Fellowships Committee for Graduate Women In Science*

FIELDWORK

- 2018 **Sampling of volcanic deposits**, Newberry Volcano (OR), Crater Lake (OR)
- 2015-2016 **Sampling of volcanic deposits**, Newberry Volcano (OR), Medicine Lake, Lassen Peak (CA)
- 2011-2013 **Sampling of volcanic deposits**, Valles Caldera (NM), Long Valley Caldera, Medicine Lake, Lassen Peak, Mount Shasta (CA)
- 2010 **Sampling of tsunami deposits**, Mauritius
- 2005-2008 **Mapping and sampling of volcanic deposits**, Soufrière Hills (Montserrat), Tungurahua (Ecuador), Santorini (Greece), Aeolian Islands, Vesuvius (Italy)
- 2002-2004 **Metamorphism field mapping**, Alps, Ardèche (France and Italy), Cap Creus (Spain)
Volcanological field mapping, Mont Dore, Chaîne des Puys (France), Stromboli (Italy)
Sedimentary field mapping, Corbières, Pic Saint Loup, Ardennes (France)

PEER-REVIEWED INTERNATIONAL PUBLICATIONS

PUBLISHED PAPERS

- Gauthier, D, Anderson, SA, Fritz, HM, **Giachetti, T** (2018). Karrat Fjord (Greenland) tsunamigenic landslide of 17 June 2017: initial 3D observations. *Landslides*. 15(2), 327-332. [doi:10.1007/s10346-017-0926-4](https://doi.org/10.1007/s10346-017-0926-4).
- Paris R, Ramalho RS, Ávila S, Madeira J, May SM, Rixhon G, Engel M, Bruckner H, Herzog M, Schukraft G, Torrado FJP, González AR, Carracedo JC, **Giachetti T** (2018) Megatsunami conglomerates on the flanks of oceanic shield volcanoes. *Marine Geology*, 395, 168-187. [doi:10.1016/j.margeo.2017.10.004](https://doi.org/10.1016/j.margeo.2017.10.004).
- Gonnermann, HM, **Giachetti, T**, Fliedner, C, Nguyen, CT, Houghton, BF, Crozier, JA, Carey, RJ (2017). Permeability during magma expansion and compaction. *Journal of Geophysical Research: Solid Earth*. [doi:10.1002/2017JB014783](https://doi.org/10.1002/2017JB014783)
- Falvard S, Paris R, Belousova M, Belousov A, **Giachetti T**, Cuven S (2017) Scenario of the 1996 volcanic tsunamis in Karymskoye Lake, Kamchatka, inferred from X-ray tomography of heavy minerals in tsunami deposits. *Marine Geol.* doi.org/10.1016/j.margeo.2017.04.011
- Shea T, Leonhardi T, **Giachetti T**, Lindoo A, Larsen J, Sinton J, Parsons E. (2017) Dynamics of an unusual cone-building trachyte eruption at Pu‘u Wa‘awa‘a, Hualālai, Hawaii. *Bull. Volc.* 79: 26. [doi:10.1007/s00445-017-1106-z](https://doi.org/10.1007/s00445-017-1106-z)
- Giachetti T**, Gonnermann HM, Gardner JE, Shea T, Gouldstone A. (2015) Discriminating secondary from magmatic water in rhyolitic matrix-glass of volcanic pyroclasts using thermogravimetric analysis. *Geochim. Cosmochim. Acta*. 148, 457-476. [doi:10.1016/j.gca.2014.10.017](https://doi.org/10.1016/j.gca.2014.10.017)
- Paris R, Kelfoun K, **Giachetti T**. (2013) Marine conglomerate and reef megaclasts at Mauritius Island: Evidences of a tsunami generated by a flank collapse of the Piton de la Fournaise volcano, Reunion Island? *Sci. of tsunami hazards*, 32, 4, [ISSN 8755-6839](https://doi.org/10.1016/j.sctsh.2013.03.001)
- Giachetti T**, Gonnermann HM. (2013) Water in pumices: rehydration or incomplete degassing? *Earth Planet. Sci. Lett.* 369-370, 317-332. [doi:10.1016/j.epsl.2013.03.041](https://doi.org/10.1016/j.epsl.2013.03.041)
- Moitra P, Gonnermann HM, Houghton B, **Giachetti T**. (2013) Relating vesicle shapes in pyroclasts to eruption styles. *Bull. Volc.* 75, 691. [doi:10.1007/s00445-013-0691-8](https://doi.org/10.1007/s00445-013-0691-8)
- Giachetti T**, Paris R, Kelfoun K, Ontowirjo B. (2012) Tsunami hazard related to a flank collapse of Anak Krakatau volcano, Sunda Strait, Indonesia. *Special Publications of the Geological Society of London: ‘Natural Hazards in the Asia–Pacific Region: Recent Advances and Emerging Concepts’*, 361, 79-90. [doi: 10.1144/SP361.7](https://doi.org/10.1144/SP361.7)
- Paris R, **Giachetti T**, Chevalier J, Guillou H, Frank N. (2011). Tsunami deposits in Santiago Island (Cape Verde archipelago) as a possible evidence of massive flank failure of Fogo volcano. *Sed. Geol.*, 239, 3-4, 129-145. [doi:10.1016/j.sedgeo.2011.06.006](https://doi.org/10.1016/j.sedgeo.2011.06.006)
- Giachetti T**, Burgisser A, Arbaret L, Druitt TH, Kelfoun K. (2011) Quantitative textural analysis of Vulcanian pyroclasts (Montserrat) using multi-scale X-ray computed microtomography: comparison with results from 2D image analysis. *Bull. Volc.* 73, 9, 1295-1309. [doi :10.1007/s00445-011-0472-1](https://doi.org/10.1007/s00445-011-0472-1)
- Giachetti T**, Paris R, Kelfoun K, Pérez-Torrado FJ. (2011) Numerical modelling of the tsunami triggered by the Güimar debris avalanche, Tenerife (Canary Islands): comparison with field-based data. *Marine Geol.*, 284, 189-202. [doi: 10.1016/j.margeo.2011.03.018](https://doi.org/10.1016/j.margeo.2011.03.018)
- Burgisser A, Arbaret L, Druitt TH, **Giachetti T**. (2011) Pre-explosive conduit conditions of the 1997 Vulcanian explosions at Soufrière Hills Volcano, Montserrat: II. Overpressure and depth distributions. *J. Volcanol. Geotherm. Res.* 199, 193-205. [doi:10.1016/j.jvolgeores.2010.11.014](https://doi.org/10.1016/j.jvolgeores.2010.11.014)

Burgisser A, Poussineau S, Arbaret L, Druitt TH, **Giachetti T**, Bourdier J-L. (2010) Pre-explosive conduit conditions of the 1997 Vulcanian explosions at Soufrière Hills Volcano (Montserrat): I. pressure and vesicularity distributions. *J. Volcanol. Geotherm. Res.* 194, 1-3, 27-41. [doi:10.1016/j.jvolgeores.2010.04.008](https://doi.org/10.1016/j.jvolgeores.2010.04.008)

Giachetti T, Druitt TH, Burgisser A, Arbaret L, Galven C. (2010) Bubble nucleation and growth during the 1997 Vulcanian explosions of Soufrière Hills Volcano, Montserrat. *J. Volcanol. Geotherm. Res.* Vol. 193, 3-4, 215-231. [doi:10.1016/j.jvolgeores.2010.04.001](https://doi.org/10.1016/j.jvolgeores.2010.04.001)

Kelfoun K, **Giachetti T**, Labazuy P. (2010) Landslide-generated tsunamis at Reunion Island. *J. Geophys. Res.* Vol. 115, F04012. [doi:10.1029/2009JF001381](https://doi.org/10.1029/2009JF001381)

REVISED MANUSCRIPTS UNDER REVIEW

Giachetti T, Gonnermann HM, Gardner JE, Burgisser A, Hajimirza S, Earley TC, Truong N, Toledo, P. Bubble coalescence and percolation threshold in expanding rhyolitic magma. *Submitted to G-cubed*

Hajimirza S, Gonnermann HM, Gardner JE, **Giachetti T**. Predicting homogeneous bubble nucleation in rhyolite: An empirical surface tension. *Submitted to J. Geophys. Res.: Solid Earth*

SUBMITTED MANUSCRIPTS

Mitchell S, Houghton BF, Carey RJ, Manga M, Fauria KE, Jones MR, Soule AS, Conway CE, Wei Z, **Giachetti T**. Submarine giant pumice: A window into the shallow conduit dynamics of a recent silicic eruption. *Submitted to Bull. Volc.*

MANUSCRIPTS IN PREPARATION

Giachetti T, Hudak MR, Bindeman I, Shea T. Magma degassing and pyroclasts rehydration during the 1060 CE Glass Mountain eruption of Medicine Lake Volcano, California.

Hoxsie EH, Watkins JM, **Giachetti T**, Gardner JE, Befus KS. Ash sintering in the presence of a CO₂-H₂O vapor: Experiments and comparison to natural samples

COMMUNICATIONS

- Fritz HM, **Giachetti T**, Anderson, SA, Gauthier D. (2018) 'Field Survey of the 17 June 2017 Landslide generated Tsunami in Karrat Fjord, Greenland'. EGU, Vienna (Oral, Fritz).
- Hoxsie E, Watkins J, **Giachetti T**, Gardner JE. (2017) 'Evidence for CO₂ fluxing from CO₂-H₂O anticorrelations in obsidian pyroclasts'. IAVCEI, Portland. (Poster, Hoxsie).
- Gonnermann HM, Flidner C, **Giachetti T**. (2017) 'The effect of hysteretic permeability during open-system degassing of erupting magma'. IAVCEI, Portland. (Talk, Gonnermann).
- Hajimirza S, Gonnermann HM, Gardner JE, **Giachetti T**. (2017) 'Predicting homogeneous bubble nucleation rate'. IAVCEI, Portland. (Poster, Hajimirza).
- Giachetti T**, Gardner JE, Gonnermann HM, Hajimirza S. (2017) 'Coalescence of gas bubbles and percolation threshold in rhyolitic melt: insights from decompression experiments'. IAVCEI, Portland. Poster.
- Hajimirza S, Gonnermann HM, Gardner JE, **Giachetti T** (2016). 'Predicting homogeneous bubble nucleation rates'. AGU, San Francisco. (Talk, Hajimirza).
- Giachetti T**, Shea T, Gonnermann HM, McCann KA, Hoxsie EC (2016). 'Juvenile pumice and pyroclastic obsidian reveal the eruptive conditions necessary for the stability of Plinian eruption of rhyolitic magma'. AGU, San Francisco. Poster.
- Giachetti, T.** (2016) 'The eruptive conditions necessary for the stability of Plinian eruption of rhyolitic magma'. Invited talk at the American Museum of Natural History, New York.
- Giachetti, T.** (2016) 'Open-system degassing of magma during volcanic eruptions of silicic magma and its control on the eruptive style'. Invited talk at Oregon State University.
- Giachetti, T**, Gonnermann HM, Crozier JA. (2015) 'Reconstructing magma degassing and fragmentation: The 1060 CE Plinian eruption of Medicine Lake Volcano, California'. AGU, San Francisco. Talk.
- Gonnermann HM, **Giachetti T**, Gardner JE, Truong N, Toledo P, Hajimirza S. (2015) 'Empirical relationships of homogeneous bubble nucleation, growth and coalescence in rhyolitic melt'. AGU, San Francisco. Poster (presenter).
- Giachetti, T.** (2015) 'Volcanology'. Freshmen Science Honors Colloquium at University of Oregon.
- Giachetti, T.** (2015) 'Integrating pyroclast analysis and numerical modeling to reconstruct magma degassing and fragmentation during explosive volcanic eruptions'. Invited talk at University of Oregon.
- Giachetti T**, Gonnermann HM. (2014) 'The location and timing of magma degassing during Plinian eruptions'. AGU, San Francisco. Talk.
- Leonhardi T, Shea T, **Giachetti T**, Larsen J, Lindoo A. (2014) 'From pumice to obsidian: eruptive behaviors that produce tephra-flow dyads. II- The 114ka trachyte eruption at Pu'u Wa'awa'a (Hawai'i)'. AGU, San Francisco. Poster (T Leonhardi).
- Shea T, **Giachetti T**, Gonnermann HM, Donnelly-Nolan J, Ramsey D. (2014) 'From pumice to obsidian: eruptive behaviors that produce tephra-flow dyads. I- The AD1100 Big Glass Mountain eruption at Medicine Lake Volcano (California)'. AGU, San Francisco. Talk.
- Giachetti T**, Gonnermann HM, Gardner JE, Shea T. (2014) 'Discriminating magmatic water in rhyolitic glass using thermogravimetric analysis'. Goldschmidt Conference, Sacramento. Talk.
- Giachetti T**, Gonnermann HM, Gardner JE, Shea T. (2013) 'Discriminating magmatic water in rhyolitic glass using thermogravimetric analysis'. AGU, San Francisco. Poster.
- Nguyen CT, Gonnermann HM, Houghton B, **Giachetti T**. (2013) 'The effect of open-system degassing on magma permeability Case study: 1912 Novarupta Eruption, Alaska'. AGU, San Francisco. Poster.

- Giachetti T**, Gonnermann HM. (2012) ‘Water in pyroclasts: rehydration or incomplete degassing?’ AGU. Invited talk.
- Moitra P, Gonnermann HM, Houghton B, **Giachetti T**. (2011) ‘Eruption dynamics from vesicle shapes in pumice’. AGU, San Francisco. Poster.
- Giachetti T**, Paris R, Kelfoun K., Pérez-Torrado FJ. (2011) ‘Numerical modeling of the tsunami triggered by the Güimar debris avalanche, Tenerife (Canary Islands): comparison with field-based data. EGU, Vienna. Invited talk.
- Giachetti T**, Paris R, Kelfoun K., Ontowirjo B. (2011) ‘Tsunami hazard related to a flank collapse of Anak Krakatau volcano, Sunda Strait, Indonesia.’ European Geosciences Union, Vienna. Poster.
- Kelfoun K, **Giachetti T**, Labazuy P, Paris R. (2011) ‘Landslide-generated tsunamis at Réunion Island and their possible sedimentary record in Mauritius Island.’ European Geosciences Union, Vienna. Poster.
- Giachetti T**, Druitt TH, Burgisser A, Arbaret L. (2010) ‘Vesiculation processes during the 1997 Vulcanian explosions of Soufrière Hills, Montserrat’. European Geosciences Union (EGU), Vienna. Talk.
- Giachetti T**, Burgisser A, Arbaret L., Druitt TH, Kelfoun K. (2010) ‘Three-dimensional textural analysis of products from the Vulcanian explosions of Soufrière Hills Volcano (SHV), Montserrat, 1997’. EGU, Vienna. Poster.
- Giachetti T**, Druitt TH, Burgisser A, Arbaret L. (2009) ‘Bubble nucleation, growth and coalescence during the 1997 Vulcanian explosions of Soufrière Hills Volcano, Montserrat’. AGU, San Francisco. Poster.
- Giachetti T**, Burgisser A, Arbaret L., Druitt TH. (2009) ‘Three-dimensional textural analysis of products from the Vulcanian explosions of Soufrière Hills Volcano (SHV), Montserrat, 1997’. AGU, San Francisco. Poster.
- Shea T, Houghton BF, Gurioli L, Cashman KV, Hammer JE, **Giachetti T**, Druitt TH. (2009) An integrated methodology to investigate vesicle textures in volcanic rocks: I-Presentation. AGU, San Francisco. Poster.
- Hammer JE, Shea T, Houghton BF, Gurioli L, Cashman KV, **Giachetti T**, Druitt TH. (2009) An integrated methodology to investigate vesicle textures in volcanic rocks: II-Applications. AGU, San Francisco. Poster.
- Giachetti T**, Druitt TH, Burgisser A, Arbaret L, Kelfoun K. (2009) ‘Dynamics of the 1997 Vulcanian explosions of Soufrière Hills, Montserrat’. Workshop ‘IAVCEI Commission on Explosive Volcanism Workshop’, Clermont-Ferrand. Talk.
- Kelfoun K, **Giachetti T**, Labazuy P. (2008) ‘Tsunamis hazard related to major catastrophic collapse at Reunion Island.’ IAVCEI General Assembly, Reykjavik. Talk given by K. Kelfoun.
- Giachetti T**, Druitt TH, Kelfoun K, Arbaret L. (2008) ‘Vesicle growth during Vulcanian explosions of Soufrière Hills Volcano, Montserrat, 1997.’ European Geosciences Union, Vienna. Poster.
- Giachetti T**, Druitt TH, Kelfoun K, Arbaret L. (2007) ‘Vesicle growth during Vulcanian explosions of Soufrière Hills Volcano, Montserrat, 1997.’ International Union of Geodesy and Geophysics, Perugia. Poster.