

# Hélène Le Mével

GEOPHYSICIST · VOLCANOLOGIST

Carnegie Institution for Science, Earth and Planets Laboratory  
5241 Broad Branch Road NW, Washington DC, 20015, USA

☎ (+1) 202-478-8842 | ✉ hlemevel@carnegiescience.edu | 📧 Hélène Le Mével

## Education

### University of Wisconsin–Madison

PH.D. IN GEOPHYSICS

*Madison, WI, USA*

2012 – 2016

### Institut de Physique du Globe de Paris (IPGP)

M.S. IN GEOPHYSICS

*Paris, France*

2009 – 2011

### Université de Nantes

B.S. IN EARTH AND PLANETARY SCIENCES

*Nantes, France*

2006 – 2009

- 2008–2009: Study abroad at University of Iceland

## Peer-Reviewed Publications

Precursor-free eruption triggered by edifice rupture at Nyiragongo volcano

D. Smittarello, B. Smets, J. Barrière, C. Michellier, A. Oth, T. Shreve, R. Grandin, N. Theys, H. Brenot, V. Cayol, P. Allard, C. Caudron, O. Chevrel, F. Darchambeau, P. Buyl, L. Delhayé, D. Derauw, G. Ganci, H. Geirsson, E. Kamate Kaleghetso, J. Kambale Makundi, I. Kambale Nguomoja, C. Kasereka Mahinda, M. Kervyn, C. Kimanuka Ruriho, H. Le Mével, S. Molendijk, O. Namur, S. Poppe, M. Schmid, J. Subira, C. Wauthier, M. Yalire, N. d'Oreye, F. Kervyn, A. Syavulisembo Muhindo

*Nature* 609.7925 (2022) pp. 83–88. Nature Publishing Group, 2022

Modeling deformation, seismicity, and thermal anomalies driven by degassing during the 2005–2006 pre-eruptive unrest of Augustine Volcano, Alaska

Y. Zhan, H. Le Mével, D.C. Roman, T. Girona, P.M. Gregg

*Earth and Planetary Science Letters* 585 (2022) p. 117524. Elsevier, 2022

Earthquakes Indicated Stress Field Change during the 2006 unrest of Augustine Volcano, Alaska

Y. Zhan, D.C. Roman, H. Le Mével, J.A. Power

*Geophysical Research Letters* (2022) e2022GL097958. Wiley Online Library, 2022

Unrest at the Laguna del Maule volcanic field 2005–2020: renewed acceleration of deformation

H. Le Mével, L. Córdova, C. Cardona, K.L. Feigl

*Bulletin of Volcanology* 83.6 (2021) pp. 1–9. Springer, 2021

The mechanical response of a magma chamber with poroviscoelastic crystal mush

Y. Liao, S.A. Soule, M. Jones, H. Le Mével

*Journal of Geophysical Research: Solid Earth* 126.4 (2021) e2020JB019395. Wiley Online Library, 2021

Novel treatment of the deformation–induced topographic effect for interpretation of spatiotemporal gravity changes: Laguna del Maule (Chile)

P. Vajda, P. Zahorec, C.A. Miller, H. Le Mével, J. Papčo, A.G. Camacho

*Journal of Volcanology and Geothermal Research* 414 (2021) p. 107230. Elsevier, 2021

Integrating reservoir dynamics, crustal stress, and geophysical observations of the Laguna del Maule magmatic system by FEM models and data assimilation

Y. Zhan, P.M. Gregg, H. Le Mével, C.A. Miller, C. Cardona

*Journal of Geophysical Research: Solid Earth* 124.12 (2019) pp. 13547–13562. Wiley Online Library, 2019

Stress triggering of the 2005 eruption of Sierra Negra Volcano, Galápagos

P.M. Gregg, H. Le Mével, Y. Zhan, J. Dufek, D. Geist, W.W. Chadwick Jr

*Geophysical Research Letters* 45.24 (2018) pp. 13–288. Wiley Online Library, 2018

Geomorphic expression of rapid Holocene silicic magma reservoir growth beneath Laguna del Maule, Chile

B.S. Singer, H. Le Mével, J.M. Licciardi, L. Córdova, B. Tikoff, N. Garibaldi, N.L. Andersen, A.K. Diefenbach, K.L. Feigl

*Science advances* 4.6 (2018) eaat1513. American Association for the Advancement of Science, 2018

Microgravity changes at the Laguna del Maule volcanic field: Magma-induced stress changes facilitate mass addition

C.A. Miller, H. Le Mével, G. Currenti, G. Williams-Jones, B. Tikoff

*Journal of Geophysical Research: Solid Earth* 122.4 (2017) pp. 3179–3196. Wiley Online Library, 2017

Magma injection into a long-lived reservoir to explain geodetically measured uplift: Application to the 2007–2014 unrest episode at Laguna del Maule volcanic field, Chile

H. Le Mével, P.M. Gregg, K.L. Feigl

*Journal of Geophysical Research: Solid Earth* 121.8 (2016) pp. 6092–6108. Wiley Online Library, 2016

Evolution of unrest at Laguna del Maule volcanic field (Chile) from InSAR and GPS measurements, 2003 to 2014

H. Le Mével, K.L. Feigl, L. Córdova, C. DeMets, P. Lundgren

*Geophysical Research Letters* 42.16 (2015) pp. 6590–6598. Wiley Online Library, 2015

Rapid uplift in Laguna del Maule volcanic field of the Andean Southern Volcanic zone (Chile) 2007–2012

K.L. Feigl, H. Le Mével, S.T. Ali, L. Córdova, N.L. Andersen, C. DeMets, B.S. Singer

*Geophysical Journal International* 196.2 (2014) pp. 885–901. Oxford University Press, 2014

Dynamics of a large, restless, rhyolitic magma system at Laguna del Maule, southern Andes, Chile

B.S. Singer, N.L. Andersen, H. Le Mével, K.L. Feigl, C. DeMets, B. Tikoff, C.H. Thurber, B.R. Jicha

*GSA today* 24.12 (2014) pp. 4–10. 2014

## Professional Experience

---

**Carnegie Institution for Science**, Earth and Planets Laboratory

STAFF SCIENTIST

*Washington, DC, USA*

*Feb. 2017 – Now*

**Carnegie Institution for Science**, Department of Terrestrial Magnetism

POSTDOCTORAL FELLOW

*Washington, DC, USA*

*Aug. 2016 – Jan. 2017*

**University of Wisconsin–Madison**, Department of Geoscience

GRADUATE RESEARCH ASSISTANT

*Madison, WI, USA*

*Jan. 2012 – Jun. 2016*

- Fall 2013: Teaching Assistant for Applied Geophysics class

**Hawaiian Volcano Observatory (HVO), USGS**

USGS VOLUNTEER

*Hawaii, USA*

*Aug. 2011 – Dec. 2011*

**Institut de Physique du Globe de Paris (IPGP)**

M.S. RESEARCH INTERN

*Paris, France*

*2009 – 2011*

- 2010–2011: Space and Planetary Geophysics Lab

- Fall 2009: Seismology Lab

## Grants & Awards

---

### GRANTS

2020 **National Science Foundation (NSF-EAR) - Petrology and Geochemistry**, *Collaborative Research: Integrating Petrochronology, Magma Dynamics, and Volcanic Unrest at the Three Sisters Volcanic Complex*, \$19,223 (Carnegie, co-PI), \$357,626 (total), Feb. 2020 – Jan. 2023.

*Carnegie Inst. & U. Oregon*

2019 **The Brinson Foundation**, *Understanding dynamic volcanic processes and the magma plumbing system beneath an active volcano using gravity measurements*, \$185,360 (Sole PI), 2019 – 2021.

*Carnegie Inst.*

### AWARDS

2016 **Schiesser Outstanding Student Research Paper Award**, University of Wisconsin–Madison, Dpt. Geoscience

*Madison, WI*

2015 **Outstanding Student Paper Award (OSPA)**, American Geophysical Union, Geodesy section

*San Francisco, CA*

2014 **James J. & Dorothy T. Hanks Graduate Student Award in Geophysics**, University of Wisconsin–Madison

*Madison, WI*

## Invited Talks

---

2021 **AGU 2021 Fall Meeting**, Session: Submarine volcanism: Advances in Observations, Methods, and Models, New Orleans, LA and Virtual

2021 **Volcanic Systems Modeling Workshop**, Modeling Collaboratory for Subduction (MCS) RCN, Virtual

2019 **Stanford University**, Department of Geophysics, Stanford, CA

2019 **Southern Methodist University**, Department of Earth Sciences, Dallas, TX

2018 **Columbia University**, Lamont-Doherty Earth Observatory, Palisades, NY

2018 **Geological Society of Washington**, Washington, DC

2017 **University of Maryland**, Department of Geology, College Park, MD

## Professional Service

---

- 2022 **Guest Editor**, Journal of South American Earth Sciences Special Issue on Laguna del Maule volcanic complex
- 2021 **AGU Session Convener**, AGU Fall Meeting, New Orleans, LA and Virtual
- 2021 **PhD Viva External Examiner**, Matthew Head, “Viscoelastic controls on volcanic deformation and reservoir failure”, University of Exeter, UK
- 2020 **Guest Editor**, Remote Sensing Special Issue on SAR for Natural Hazard
- 2020 **PhD Committee member**, Kimberly Degrandpre, “Data-defined, geophysical models of Aleutian arc magma storage and dynamics at Akutan, Semisopchnoi, and Okmok volcanoes”, Southern Methodist University, TX
- 2019 **IUGG Session Convener**, IUGG General Assembly, Montreal, Canada
- 2018 **AGU Session Convener**, AGU Fall Meeting, Washington, DC
- Proposal Reviewer**, Future Investigators in NASA Earth and Space Science and Technology (FINESST).
- Journal Reviewer**, Journal of Geophysical Research, Journal of Volcanology and Geothermal Research, Remote Sensing, Bulletin of Volcanology, Geosphere, Earth, Planets and Space.

## Community Outreach

---

**IAVCEI Early-Career Researchers Network**, Panelist

*Discussion Panel on Careers in Academia*

*Virtual*

*Oct. 2020*

**Carnegie Institution for Science**, Department of Terrestrial Magnetism Neighborhood Lecture

*“The gravity of volcanoes: using gravity data to probe magma reservoirs”*

*Washington, DC*

*Apr. 2019*

**Rockville Science Center**, Science Cafe

*“Monitoring Volcanoes from Space”*

*Rockville, MD*

*Nov. 2017*

## Professional Memberships

---

**2013 – now** International Association of Volcanology and Chemistry of Earth’s Interior

**2010 – now** American Geophysical Union