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Dr. James Hickey

Curriculum Vitae

Current Employment

- 10/2015– Present **Postdoctoral Research Associate**, *University of Bristol*, UK.
Using satellite InSAR measurements to monitor and analyse volcano deformation worldwide. This role combines both research and operational/national capability responsibilities to provide timely information to the British Government and Latin American volcano observatories.

Higher Education

- 2011 – 2015 **PhD Volcanology and Geophysics**, *University of Bristol*, UK.
Title: *"Constraining volcanic unrest with integrated geodetic modelling"*.
2007 – 2011 **MSci Environmental Geoscience**, *University of Bristol*, UK, *First Class Honours*.

Previous Employment

- 04/2015 – 10/2015 **Postdoctoral Research Assistant**, *University of Bristol*, UK.
Geomechanical numerical modelling of volcanic deformation, with integrated geophysical and geodetic data.
2012 – 2014 **Educational Support Worker**, *University of Bristol*, UK.
Assisted with lecture and practical session note-taking for students with learning and physical disabilities.
2011 – 2014 **Teaching Assistant**, *University of Bristol*, UK.
Assisted with the teaching of undergraduate courses and provided additional one-on-one and group support.
Courses:
 - Physics for Earth Scientists
 - Environmental Hazards
 - Independent Development of Geoscience Skills
 - Computing for Earth Scientists
 - Environmental Geochemistry
 - Imaging and Mapping the Earth

06/2010 **Assistant Teacher**, *Student Associate Scheme*, Bristol, UK.
Helped with secondary school teaching of mathematics and geography.

Academic Awards & Funding

- 2015 NERC Impact Accelerator Award – Principal Investigator (6500 GBP).
2015 ClerVolc Postdoctoral research project at the University of Blaise Pascal – Principal Investigator, declined (15,000 Euros + salary & overheads).
2014 UNAVCO funding to attend InSAR processing course (1500 GBP).
2013 UNAVCO funding to attend GPS processing course (2000 GBP).
2013 Volcanic and Magmatic Studies Group funding for postgraduate travel (300 GBP).
2013 University of Bristol Alumni Fund for postgraduate travel (500 GBP).
2011 Hancock Memorial prize for best MSci results.

Invited Talks

- 2016 European Geosciences Union General Assembly, Austria - Session: Volcanic processes: tectonics, deformation, geodesy - *"Thermal and mechanical controls on magma supply and volcanic deformation"*
2015 Laboratoire de Magmas et Volcans, University of Blaise Pascal, France - *"Exploring the unstable ground of restless volcanoes"*

- 2014 University of British Columbia, Canada - "*Exploring the unstable ground of restless volcanoes*"
- 2014 Sakurajima Volcano Research Centre, University of Kyoto, Japan - "*Constraining volcanic unrest with integrated geodetic modelling*"

Teaching, Supervision & Tutoring

- 2011 – 2015 Co-supervision of 5 MSci research projects.
- 2012 – 2014 Guest lecturer - environmental hazards.
- 2011 – 2014 Small-group tutorials (pastoral and teaching).
- 2011 – 2014 Teaching assistant for 6 courses (including applied geophysics and associated fieldwork).

Collaborations & Research Links

- o Sakurajima volcano research centre, Japan
- o GNS Volcanology, New Zealand
- o Montserrat Volcano Observatory, Montserrat
- o BGS Volcanology, UK
- o COMET, STREVA & VUELCO projects
- o University of Miami, USA
- o University of Leeds, UK
- o Philippine Institute of Volcanology and Seismology, Philippines
- o Instituto Geofísico, Ecuador
- o Seismic Research Centre, Trinidad
- o Servicio Geológico Colombiano, Colombia
- o COMSOL Multiphysics, UK
- o Ludwigs Maximilian University, Germany
- o University of Illinois, USA
- o University of Newcastle, UK

Fieldwork Experience

- 2016 Colombia & Ecuador – Field geology and community workshops.
- 2014 Ecuador – Field geology.
- 2014 Japan – Field geology and GPS data collection.
- 2012 Bolivia – Campaign GPS and gravimetry survey.
- 2012 Montserrat & Dominica – Campaign GPS and EDM surveys.
- 2010 Lake District – Environmental geochemistry (undergraduate).
- 2009 South Wales – Shallow surface geophysics (undergraduate).
- 2008 Tenerife – Soil science and ecology (undergraduate).
- 2007 Italy – Natural Hazards (undergraduate).

Science Communication & Outreach

- 2014–Present Personal website and blog.
- 2013–Present STEM Ambassador: conducting school, museum and festival visits.
- 2013 – 2015 "Between a rock and a hard place" blog, part of the EGU blog network.
- 2014 – 2015 "A year in the life of a PhD student" blog, part of the Bristol Doctoral College.
- 2014 "Bristol Bright Night", part of the EU Commission "Researcher's Night" programme.
- 2014 "Access to Bristol" volcanology team.
- 2014 Bristol Earth Sciences "Pint of Science" team leader.
- 2013 "I'm A Scientist, Get Me Out Of Here!" winner.

Professional Service, Teamwork & Leadership

- 2014–Present Peer reviewer for Journal of Geophysical Research, Geophysical Journal International, and Earth, Planets and Space.
- 2014–Present University of Bristol School of Earth Sciences Web and Marketing Committee.
- 2013–Present Organiser – COMSOL Multiphysics for Earth Sciences workshops.

- 2013–Present American Geophysical Union (Volcanology, Geochemistry and Petrology) Twitter account holder.
- 2013–Present VUELCO project Twitter account holder.
- 2013 Co-organiser – Volcanic and Magmatic Studies Group annual meeting (University of Bristol).
- 2012 – 2014 University of Bristol School of Earth Sciences postgraduate representative.
- 2009 – 2010 President of the Bristol University Geology and Geoscience Society.

Additional Skills

- Geophysical field equipment
- Programming: Matlab, UNIX, GMT, Python
- L^AT_EX and Microsoft Office products
- Certified first aider
- Finite Element Modelling
- Geodetic processing
- Adobe Illustrator
- Full, clean driving license

Publications

Journal Articles (Published or In Review)

- 2016 **Hickey, J.**, Gottsmann, J., Nakamichi, H., & Iguchi, M. Thermomechanical controls on magma supply and volcanic deformation, *Scientific Reports*, *In Review*.
- 2015 **Hickey, J.**, Gottsmann, J., & Mothes, P. Estimating volcanic deformation source parameters with a Finite Element inversion: the 2001-2002 unrest at Cotopaxi volcano, Ecuador. *Journal of Geophysical Research: Solid Earth*, *120*(3), 1473-1486.
- 2014 **Hickey, J.**, & Gottsmann, J. Benchmarking and developing numerical Finite Element models of volcanic deformation. *Journal of Volcanology and Geothermal Research*, *280*, 126–130.
- 2014 Muir, D., Blundy, J., Rust, A., & **Hickey, J.** Experimental constraints on dacite pre-eruptive magma storage conditions beneath Uturuncu volcano. *Journal of Petrology*, *55*(4), 749–767.
- 2013 **Hickey, J.**, Gottsmann, J., & del Potro, R. The large-scale surface uplift in the Altiplano-Puna region of Bolivia: A parametric study of source characteristics and crustal rheology using finite element analysis. *Geochemistry, Geophysics, Geosystems*, *14*(3), 540–555.

Journal Articles (In Preparation)

- 2016 Pascal, K., **Hickey, J.**, & Odbert, H. Time-dependent deposit loading during co-eruptive deformation at Soufrière Hills volcano, Montserrat, *Journal of Volcanology and Geothermal Research*, *in prep*.
- 2016 **Hickey, J.**, Biggs, J., & Ebmeier, S. Rapid localised flank inflation at Tungurahua volcano: Potential for sector collapse, *Nature Geoscience*, *in prep*.
- 2016 **Hickey, J.**, Gottsmann, J., & Odbert, H. 3D numerical inversions of long-term ground deformation at Soufrière Hills volcano, Montserrat, *Geophysical Research Letters*, *in prep*.

Book Contributions (Published or In Review)

- 2016 **Hickey, J.**, Mothes, P., Odbert, H., Prutkin, I., Vajda, P., & Gottsmann, J. Volcano geodesy: the ups and downs of volcanic unrest, in *Volcanic Unrest: From science to society*, *in review*.

Selected Conference Abstracts

- 2015 **Hickey, J.**, Gottsmann, J., & Mothes, P. Aseismic magma supply inferred from geodetic Finite Element inversions: the case of the 2001-2002 non-eruptive unrest at Cotopaxi volcano. *Abstract EGU2015-12978 EGU general assembly*, Vienna, Austria.

- 2015 **Hickey, J.**, Gottsmann, J., Iguchi, M., & Nakamichi, H. Persistent inflation at Aira caldera accompanying explosive activity at Sakurajima volcano: Constraining deformation source parameters from Finite Element inversions. *Abstract EGU2015-13167 EGU general assembly*, Vienna, Austria.
- 2014 **Hickey, J.**, Gottsmann, J., & Mothes, P. What caused the 2001-2002 unrest at Cotopaxi volcano, Ecuador? Insights from a Finite Element based geodetic inversion. *Abstract V51B-4741 AGU Fall Meeting*, San Francisco, USA.
- 2014 Gottsmann, J., **Hickey, J.**, Iguchi, M., & Nakamichi, H. Characterizing magma storage at Aira caldera and Sakurajima volcano (Japan) from geodetic inversions. *Abstract V51B-4747 AGU Fall Meeting*, San Francisco, USA.
- 2014 **Hickey, J.**, Gottsmann, J., & Mothes, P. Estimation of volcanic deformation source parameters through optimization of geodetic data at Cotopaxi Volcano, Ecuador. *COMSOL Conference*, Cambridge, UK.
- 2014 **Hickey, J.**, & Gottsmann, J. Benchmarking and developing numerical Finite Element models of volcanic deformation. *VMSG annual meeting*, Edinburgh, UK.
- 2013 **Hickey, J.**, & Gottsmann, J. Benchmarking and developing numerical Finite Element models of volcanic deformation. *Abstract V51E-2732, AGU Fall Meeting*, San Francisco, USA.
- 2013 **Hickey, J.**, Gottsmann, J., & del Potro, R. Deep magmatic unrest: ground uplift and magma rise at Uturuncu volcano. *IAVCEI scientific assembly*, Kagoshima, Japan.
- 2013 **Hickey, J.**, Gottsmann, J., & del Potro, R. Large-scale ground deformation at Uturuncu volcano: evidence for magma rise from the Altiplano-Puna Magma Body. *VMSG annual meeting*, Bristol, UK.
- 2012 **Hickey, J.**, Gottsmann, J., & del Potro, R. What's causing the world's largest deformation anomaly in southern Bolivia? Insights from Finite Element Analysis. *Abstract EGU2012-2888, EGU general assembly*, Vienna, Austria.
- 2011 **Hickey, J.**, Gottsmann, J., & del Potro, R. Ground deformation at Uturuncu Volcano, Bolivia: Insights from Finite Element Analysis. *Abstract V53C-2641, AGU Fall Meeting*, San Francisco, USA.

References

Current Adviser – Dr. Juliet Biggs
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PhD Supervisor – Dr. Joachim Gottsmann
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