

# Graham A. Hagen-Peter

## Senior Engineer

Geological Survey of Norway

Email: [graham.hagen-peter@ngu.no](mailto:graham.hagen-peter@ngu.no)

Website: [www.grahamhpgeo.com](http://www.grahamhpgeo.com)

## Education

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*September 2015: PhD in Geological Sciences, UC Santa Barbara*

*May 2010: BSc in Geology, University of Vermont; summa cum laude*

## Professional Experience

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*Current: Senior Engineer at the Geological Survey of Norway*

*2016–2018: Post-doctoral researcher at Aarhus University, Denmark*

*2015–2016: Visiting assistant professor at St. Olaf College and Carleton College, MN*

*2015: Instructor at UC Santa Barbara*

*2010–2015: Graduate student researcher and teaching assistant at UC Santa Barbara*

*2007–2010: Teaching and lab assistant at the University of Vermont*

*2005–2010: Operating Room Assistant at Fletcher Allen Health Care, Burlington, VT*

## Teaching Experience

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### Courses as instructor:

Geology and Geohazards of Taiwan (*UCONN; adjunct instructor*)

Introduction to Geology (*Carleton*)

Antarctic Earth Science (*Carleton*)

Introductory Geology (“Geophysics”; *St. Olaf*)

Antarctic Earth Science (*UCSB*)

Courses as teaching assistant: Dynamic Earth, Dinosaurs, Tectonics, Analytical Methods in Mineralogy, Spring Field Camp, Summer Field Camp

## Research Areas (On-going and Recent)

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*Present: Developing methods for trace element and isotopic analyses of archaeological metals*

*Present:* Tracking magmatic processes using Sr isotopes in plagioclase measured *in situ* by LA-MC-ICPMS

*Present:* Linking petrology of kimberlite-borne xenoliths to geophysical observations from western Greenland

*Present:* Developing analytical routines and community reference materials for LA-ICPMS measurements of Sr isotopes in plagioclase and Pb isotopes in K-feldspar

2010–2017: Re-evaluating radiogenic isotope records to estimate the relative roles of crustal growth and recycling through continental arc magmatism

2010–2016: Variations in the timing, composition, source, and differentiation history of continental arc magmatism in the Ross orogen, Antarctica

2012–2015: Coupling garnet Lu-Hf and monazite U-Pb geochronology with phase equilibria modelling to study convergent margin dynamics and inform interpretations of accessory mineral dates in metamorphic rocks

2009– 2010: Intracontinental deformation in the Tavan Har basement block, southeastern Mongolia (*Undergraduate senior thesis; Advisor: Dr. Laura Webb at University of Vermont*)

## **Technical Experience**

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Clean Laboratory: Isotope-dilution ion-exchange chromatography for Lu-Hf geochronology; Low-blank clean lab chemistry and ion exchange chromatography for whole-rock Sr and Nd isotopes

SEM/EPMA: Imaging with CL, BSE, WDS maps; Mineral composition measurements with EDS (semi-quantitative) and WDS (quantitative)

ICPMS: Experience with single-collector (quadrupole and magnetic sector) and multi-collector ICPMS; Laser-ablation MC-ICPMS of U-Th-Pb, Hf, Nd, Pb, and Sr isotopes in various minerals; Laser-ablation split-stream ("LASS") analysis of zircon, monazite, plagioclase, and metals; Trace element measurements of various minerals, glasses, and synthetic metals by laser ablation; High precision solution MC-ICPMS

Other: Micro-XRF; Mineral separations and other rock sample preparation

Software: Adobe Illustrator, Iolite, Iqpet, Mathematica, MATLAB, MELTS, Perple\_X, THERMOCALC

## **Publications**

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### ***Published and Accepted Articles***

**Hagen-Peter, G.**, Tegner, C., Leshner, C.E. (2019). Strontium isotope systematics for plagioclase of the Skaergaard intrusion (East Greenland): A window to crustal assimilation, differentiation, and magma dynamics. *Geology*.

Edwards, M.A., Jackson, M.G., Kylander-Clark, A.R.C., Harvey, J., **Hagen-Peter, G.A.**, Seward, G.G.E., Till, C.B., Adams, J.V., Cottle, J.M., Hacker, B.R. and Spera, F.J. (2019). Extreme enriched and

heterogeneous  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios recorded in magmatic plagioclase from the Samoan hotspot. *Earth and Planetary Science Letters*, 511, 190–201.

Tegner, C., Andersen, T.B., Kjöll, H.J., Brown, E.L., **Hagen-Peter, G.**, Corfu, F., Planke, S. and Torsvik, T.H. (2019). A mantle plume origin for the Scandinavian Dyke Complex: a “piercing point” for 615 Ma plate reconstruction of Baltica? *Geochemistry, Geophysics, Geosystems*, 20, 20 pp.

**Hagen-Peter, G.** and Cottle, J.M. (2018). Evaluating the relative roles of crustal growth versus reworking through continental arc magmatism: A case study from the Ross orogen, Antarctica. *Gondwana Research*, 55, 153–156. \* **Invited GR Focus Review Article**

Poletti, J.E., Cottle, J.M., and **Hagen-Peter, G.** (2016). Petrochronologic constraints on the origin of the Mountain Pass Intrusive Suite, California. *Journal of Petrology*, 57, 1555–1598.

**Hagen-Peter, G.** and Cottle, J.M. (2016). Synchronous alkaline and subalkaline magmatism in the Ross orogen, Antarctica: Insights into magmatic sources and processes within a continental arc. *Lithos*, 262, 677–698.

**Hagen-Peter, G.**, Cottle, J.M., Smit, M., and Cooper, A.F. (2016). Coupled garnet Lu-Hf and monazite U-Pb geochronology constrain early convergent margin dynamics in the Ross orogen, Antarctica. *Journal of Metamorphic Geology*, 34, 293–319.

**Hagen-Peter, G.**, Cottle, J.M., Tulloch, A.J., and Cox, S.C. (2015). Mixing between enriched lithospheric mantle and crustal components in a short-lived subduction-related magma system, Dry Valleys area, Antarctica: Insights from U-Pb geochronology, Hf isotopes, and whole-rock geochemistry. *Lithosphere*, 7, 174–188.

### Conference Abstracts

**Hagen-Peter, G.** (2019). Illuminating geologic processes with laser-ablation split-stream (“LASS”) ICP-MS. *Norwegian Geological Society Winter Conference Abstract*.

**Hagen-Peter, G.**, Kooijman, E., Andreasen, R., Barfod, G., Schmitt, M., Karlsson, A., Tegner, C., Leshner, C. (2018). Sr isotope determinations in plagioclase and silicate glasses by LA-MC-ICPMS: Refinements in methodology and development of community standards. *14th European Workshop on Laser Ablation Abstract*.

**Hagen-Peter, G.**, Tegner, C., Thy, P., Leshner, C. (2018). Strontium isotopes in plagioclase record magma chamber dynamics of the Skaergaard intrusion. *33<sup>rd</sup> Nordic Geological Winter Meeting Abstract*.

**Hagen-Peter, G.**, Vestergaard, C., Tegner, C., Ulrich, T., Andreasen, R., Leshner, C. (2017). Strontium isotopes in plagioclase constrain mantle sources and crustal differentiation processes of the Skaergaard Intrusion and Kialineq Complex of eastern Greenland. *Goldschmidt Abstract*.

Skursch, O., Tegner, C., Corfu, F., Cawthorn, G., **Hagen-Peter, G.**, Leshner, C. (2017). On the relationship of the Nebo Granite to the Rustenburg Layered Suite, Bushveld Complex. *Goldschmidt Abstract*.

**Hagen-Peter, G.**, Cottle, J.M. (2017). Evaluating the relative roles of crustal growth and recycling through continental arc magmatism in the Ross orogen, Antarctica. *EGU Abstract 2017-11659*.

- Briggs, S., Smit, M., Cottle, J., **Hagen-Peter, G.** (2015). The P-T-t History of the Alpine Schist, New Zealand: Constraining Tectonic Processes During the Late Stages of Gondwana Breakup. *AGU Fall Meeting Abstract V41A-3061*
- Hagen-Peter, G.A.**, Cottle, J.M. (2014). Coeval alkaline and subalkaline magmatism in a continental arc: Geochemical and isotopic insights on contrasting magma sources in the Ross orogen, Antarctica. *GSA Abstracts with Programs*.
- Briggs, S., Cottle, J.M., **Hagen-Peter, G.A.** (2014). Combined U-Th-Pb monazite and Lu-Hf garnet ages from the Alpine Schist: Implications for the timing and duration of barrovian metamorphism in the Southern Alps, New Zealand. *GSA Abstracts with Programs*.
- Hagen-Peter, G.A.**, Cottle, J.M. (2013). Syn- and post-orogenic alkaline magmatism in a continental arc: Along-strike variations in the composition, source, and timing of igneous activity in the Ross Orogen, Antarctica. *AGU Fall Meeting Abstract T13A-2520*.
- Hagen-Peter, G.A.**, Smit, M.A., Cottle, J.M., Schmidt, J (2013). First garnet Lu-Hf ages for the Ross orogen, Antarctica: Garnet growth preceding arc magmatism. *GSA Abstracts with Programs*.
- Hagen-Peter, G.A.**, Cottle, J.M., Tulloch, A. (2011). Exploring the petrochronology of subduction-related magmatism in the Ross Orogen: a case study from Dry Valleys, southern Victoria land, Antarctica. *GSA Abstracts with Programs*, 43(5), 46.
- Webb, L.E., Taylor, J.P., Heumann, M.J., Johnson, C.L., Stypula, M., **Hagen-Peter, G.A.** (2010). Thermochronologic records of intraplate deformation in the northern East Gobi Fault Zone, Mongolia. *AGU Fall Meeting Abstract T51A-2004*.
- Hagen-Peter, G.A.**, Webb, L.E., Stypula, M. (2009). Large-scale folding in the Tavan Har basement block, southeastern Mongolia and its relevance to Phanerozoic intracontinental deformation. *AGU Fall Meeting Abstract T33C-1921*.
- Stypula, M., Webb, L.E., **Hagen-Peter, G.A.** (2009). Evidence for partial melting at northern Tavan Har and relationship to Late Triassic sinistral shear in the East Gobi Fault Zone, southeastern Mongolia. *AGU Fall Meeting Abstract T33C-1920*.
- Taylor, J.P., Webb, L.E., Johnson, C.L., Heumann, M.J., **Hagen-Peter, G.A.**, Gehrels, G.E. (2009). Testing the existence of the South Gobi Microcontinent: U-Pb zircon dating of tectonites within the East Gobi Fault Zone, southeastern Mongolia. *AGU Fall Meeting Abstract T33C-1919*.

## **Grants, Fellowships, and Awards**

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- 2015: ScienceLine certificate for constant support in promoting K–12 science education, *UCSB*
- 2014: NSF East Asia and Pacific Summer Institute Fellowship, *U.S. National Science Foundation*
- 2014: GSA Student Research Grant
- 2012 & 2014: ScienceLine Outstanding Contributor, *UC Santa Barbara*
- 2013: Graduate Opportunity Fellowship, *UC Santa Barbara*
- 2013: Richard V. Fisher Scholarship for Volcanology, *UC Santa Barbara*
- 2012: Harry Glicken Memorial Graduate Fellowship, *UC Santa Barbara*
- 2011: Richard and Eleanor Miguez Field Research Prize, *UC Santa Barbara*
- 2010: Charles G. Doll Award, *University of Vermont*

2009: Arthur J. and Claire Heiser Joseph B. Tinker Memorial Grant, *University of Vermont*  
2009: Hawley Award Research Grant, *University of Vermont*  
2008 & 2009: Vermont Space Grant Consortium Undergraduate Scholarship, *Vermont-NASA EPSCoR*

## **Outreach Activities**

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2016: Coordinator of “Science Night” at Greenvale Elementary School in Northfield, MN  
2014–2015: UCSB Department of Earth Science outreach committee representative  
2011– 2015: UCSB ScienceLine scientist  
2010– 2015: Numerous outreach visits to grade schools in Santa Barbara, Isla Vista, and Vermont, including guest lectures and participation in “science nights”  
2011– 2015: “Geologists On Ice” blog ([www.antarctica360.net](http://www.antarctica360.net))  
2012: UCSB Summer Institute in Mathematics and Science mentor  
2011: UCSB Summer Research Mentorship Program Participant

## **Other Professional Activities**

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Reviewer for  $G^3$ , *Geoscience Frontiers*, *Gondwana Research*, *Journal of Petrology*, *Minerals*, *Nature Geoscience*, and *Macmillan Learning* (textbook)

### **Invited Talks**

Carleton College (USA)  
Academia Sinica (Taiwan)  
National Taiwan University (Taiwan)

## **Languages**

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*English*: Primary language  
*Danish*: Intermediate level  
*Chinese*: Elementary level