

## Sarah Lambart

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## Employment

2017-present: MSCA-COFUND Fellow, Cardiff University / Associate Research scientist, UC Davis

2015-2016: Visiting assistant professor, UC Davis / Adjunct associate research scientist, LDEO

2013-2015: Lamont postdoctoral fellow, Lamont-Doherty Earth Observatory

2010-2013: Postdoctoral scholar, Caltech

## Education

2006-2010: Ph.D. in Earth Sciences, Blaise Pascal University, France

2004-2006: MS Earth Sciences, Blaise Pascal University, France

2001-2004: BS Earth Sciences, Blaise Pascal University and Rennes I University, France

## Research interests

- Mantle melting and magma transport
- Magma/Fluid - Rock interactions
- Mantle heterogeneities
- Mineral carbon sequestration

### Key skills:

- experimental: Piston-cylinder, 1 atm. gas-mixing furnaces, triaxial deformation apparatus; occasional user: multi-anvil press
- analytical: Electron microprobe (JEOL JXA-8200 and CAMECA SX100), Scanning Electron Microscopy (Jeol 5910-SV), Optical Microscopy; occasional user: LA-ICP-MS, FTIR spectroscopy, X-ray microtomography
- modeling: alphaMELTS (MELTS, pMELTS and pHMELTS); occasional user: MATLAB, LabView

## Awards, Grants and fellowships

- "Experimental investigation of the melt-plagioclase reaction in the lower oceanic crust." (**Lead PI**, CUROP project (undergrad internships): 06/17-08/17, £1600) – **2017**
- "MORB2Mantle: tracking mid-ocean ridge basalt from source to seafloor" (**MSCA-COFUND fellowship**: 01/17-12/19; ~£255k) – **2016**
- "Near-fractional melting of pyroxenite: Experimental investigations and applications to basalt petrogenesis" (**Lead PI**, NSF-EAR: 06/16-05/18; ~\$79k – *continuous grant*) – **2016**
- "A combined experimental and theoretical investigation to reactive flow in brittle media with applications to solid Earth geodynamics" (**Postdoc co-author**, NSF-EAR: 06/15-05/17~\$409k) – **2015**
- "Collaborative Research: Alteration of mantle peridotite: Geochemical fluxes and dynamics of far from equilibrium transport (**Postdoc co-author**, NSF-EAR: 09/15-08/18; ~\$2,972k, LDEO part: \$1,968k) – **2015**
- "Experimental & Theoretical Studies of Reaction-Driven Cracking in Natural & Engineered Geological Systems" (**co-PI**, RISE award: 06/14-05/16; ~\$160k) – **2013**
- **Postdoctoral fellowship** (one year of full-time funding at LDEO) – **2012**
- University **travel grant** for the Melt-glass-magmas short course, München, Germany – **2008**
- **PhD Scholarship** "MESR" (three years of full-time funding) – **2006**
- **National scholarship** for highly ranked students – **2005**

### Invited talks and seminars:

- 2017: Invited talk at the Goldschmidt conference, Paris- FR, Aug. 2017  
Departmental seminar at the University of Utah, UT-USA, Feb. 2017  
Seminar at CRPG, Nancy, FR, Feb. 2017
- 2016: Seminar at the University of Nevada, Reno, UT-USA, Sep. 2016  
Invited presentation at the EGU General assembly (declined)
- 2015: Invited talk at the Geological Society of America Annual Meeting, Nov. 2015  
Geoscience seminar & Journal club seminar at Aarhus University, DK, Mar. 2015  
Geochemistry seminar at Lamont-Doherty Earth Observatory, NY-USA, Mar. 2015  
DTM weekly seminar at the Carnegie Institution, DC-USA, Mar. 2015
- 2014: Earth and Planetary Sciences Seminar at AMNH, NY-USA, Oct. 2014
- 2013: Geodynamics seminar at Lamont-Doherty Earth Observatory, NY-USA, Oct. 2013  
Departmental seminar at Rice University, TX-USA, Jan. 2013
- 2012: Brown bag seminar at University of California Davis, CA-USA, Apr. 2015  
Division seminar at Geosciences Montpellier, FR, Apr. 2015
- 2011: Magmas seminar at ISTO, Orléans, FR, Dec. 2011  
General seminar at CRPG, Nancy, FR, Dec. 2011  
General seminar at Laboratoire Magmas et Volcans, Clermont-Ferrand, FR, Dec. 2011
- 2010: Invited talk at the AGU Fall Meeting, Dec. 2010
- 2009: Special seminar at California Institute of Technology, Dec. 2009

### Teaching and training: (IR= instructor of record; TA=teaching assistant)

Year	IR/TA	Course	Level/year	Institutions	# students
2017	co-IR	Earth materials	Undergrad. 1	Cardiff U.	60
2016	IR	Mineralogy	Undergrad. 1-2	UC Davis	38
	co-IR	The Earth	Undergrad. 0-1	UC Davis	21
	IR	Igneous Petrology	Undergrad. 3-4	UC Davis	25
2015	IR	Optical Mineralogy	Undergrad. 2-3	UC Davis	22
	IR	Mineralogy	Undergrad. 1-2	UC Davis	28
2013	co-IR	Advanced petrology	Graduate 1-3	Columbia U.	8
2009	TA	Cartography 101	Undergrad. 1	Blaise Pascal U.	15
2006-09	co-IR	Mathematics	Undergrad. 1	Blaise Pascal U.	30
	TA	Volcanic cartography	Graduate 1	Blaise Pascal U.	30

### Mentored Students:

- Valérie Payré (master student; co-supervised with Ed Stolper; Caltech 03/2013-08/2013)
- Ben Robinson (Research assistant; Lamont-Doherty Earth Observatory, summer 2016)
- Cecilia Ajoku and Bryan Mccarty (senior undergrads; UC Davis summer & fall 2016)
- Paul Edwards (master student; co-supervised with Chip Lesher; UC Davis 09/2016-)

### Professional development

- Geochemistry Group Research in Progress, Bristol, UK – Apr. 2017
- GeoPRISM mini-workshop: “From rifting to drifting: evidence from rifts and margins worldwide”, San Francisco (CA), USA – Dec. 2015
- DCO thematic institute: “Carbon from the Mantle to the Surface”, Berkeley (CA), USA – Jul. 2015
- CIDER Summer Program: “Mantle Interactions with the Hydrosphere & Carbosphere”, Berkeley (CA), USA – Jul. 2015

- RCN-CCUS annual meeting and workshop, New-York (NY), USA – Apr. 2014
- EarthCube DEFORM/COMPRES workshop, Alexandria (VA), USA – Nov. 2013
- Short course «MELTS Camp», Pasadena (CA), USA – Sep. 2011
- Short course «Melts, Glasses, Magmas», München, Germany – Jun. 2007
- Short course «Gros Volumes», Clermont-Ferrand, France – Apr. 2007

### Field experience

- 2016: Smartville complex, CA, fieldtrip supervision (1 day)
- 2014: Oman ophiolite, Oman, fieldwork (two weeks); Beni Bousera, Morocco, Orogenic Lherzolite Conf., Field Forum (3 days)
- 2006-09: Clermont-Ferrand area, France, field camp supervision (3 days); Massif Central, France, field camp supervision (1 week)
- 2004-06: Aeolian Islands, Italy, field seminar (1 week); Alps, France and Italy, field course (1week); Cap Creus, Spain, field course (1 week); Chaîne des Puys, France, reflection seismology short course (3 days); Ardèche, France, field course (1 week); Corbière, France, field course (1 week); Pic Saint Loup, France, field course (1 week)

### Service & Outreach

- Seminar organization: In charge of the Solid Earth brownbag seminars at Cardiff University (2017-)
- Reviewer for NSF EAR and NSF GeoPRISMS funding programs (2013-)
- Reviewer for several international journals: Nature Geoscience, Geology, Journal of Petrology, Chemical Geology, EPSL, Lithos, GCA (2009- )
- In charge of the experimental petrology lab at UC Davis (2015-16)
- Member of the Volcanology-Geochemistry-Petrology (VGP) student awards committee. Selection of the Outstanding Student Paper Awards for VGP at the AGU conferences. (2014-16)
- Primary advisor of a geoscience education project: "Building" 3D visualization skills in mineralogy (2016)
- Co-Convener of the session 04f «Mantle Melting in Earth and Planetary Interiors», Goldschmidt2016, Yokohama, JP. (2016)
- Organization and supervision of the “Petrology and Mineralogy” stand for the UC Davis Picnic Day (2016)
- Primary Convener and chair of session #7653 “The origin of basalt magmatism”, AGU Fall Meeting, San Francisco, CA (2015)
- Postdoc representative for the Campus Life Committee at LDEO (2014-15)
- Development of the activity “Chemistry can break rocks!” for the LDEO Open House (2014)
- Seminar organization. In charge of the “fluid-rock deformations” seminar at LDEO - weekly reading groups and discussions (2014)
- OSPA Judge (Outstanding Student Paper Awards) at the AGU Fall Meetings (2011-14)
- PhD student delegate at the OPGC (Observatoire de Physique du Globe de Clermont-Ferrand) scientific council (2007-2009)
- Seminar organization: In charge of internal seminars of the experimental petrology division (X-pots) of the Laboratoire Magmas and Volcans (2007-2009)

### Professional memberships

American Geophysical Union; IAVCEI

### International publications:

Summary: 7 papers published, 2 submitted, 4 in preparation, total citations 192, h=6, \*students

[9] **Lambart S.**, Savage H.M., \*Robinson B.G., Kelemen P.B., Experimental investigation of the pressure of crystallization for reactive-cracking. Submitted to *Nature Communications*.

[8] **Lambart S.**, No direct contribution of the recycled crust in Icelandic basalts. Under Review for *Geochemical Perspective Letters*.

[7] **Lambart S.**, Baker M.B., Stolper E.M (2016) Role of pyroxenite in basalt genesis: Melt-PX, a melting parameterization for mantle pyroxenites at 0.9-5 GPa. *Journal of Geophysical Research – Solid Earth*, 121. doi: 10.1002/2015JB012762. **Selected for AGU Research Spotlight and Editor's Highlights.**

[6] Laporte D., **Lambart S.**, Schiano P., Ottolini L. (2014) Experimental derivation of nepheline syenite and phonolite liquids by partial melting of upper mantle peridotites. *Earth and Planetary Science Letters*, 404:319-331. doi: 10.1016/j.epsl.2014.08.002.

[5] Shorttle O., MacLennan J., **Lambart S.** (2014), Quantifying lithological variability in the mantle. *Earth and Planetary Sciences Letter*, 395(1):24-40. doi: 10.1016/j.epsl.2014.03.040.

[4] **Lambart S.**, Laporte D., Schiano P. (2013), Markers of the pyroxenite contribution on the major-element compositions of oceanic basalts: review of the experimental constraints. *Lithos*, Invited Review, 160: 14-36, doi:10.1016/j.lithos.2012.11.018.

[3] **Lambart S.**, Laporte, D., Provost A., Schiano, P. (2012), Fate of pyroxenite-derived melts in the peridotitic mantle: Thermodynamic and experimental constraints. *Journal of Petrology*, 53(3): 451-476. doi: 10.1093/petrology/egr068.

[2] **Lambart S.**, Laporte, D., Schiano, P. (2009), An experimental study of pyroxenite partial melts at 1 and 1.5 GPa: Implications for the major-element composition of Mid-Ocean Ridge Basalts. *Earth and Planetary Science Letters*, 288: 335-347. doi: 10.1016/j.epsl.2009.09.038.

[1] **Lambart S.**, Laporte, D., Schiano, P. (2009), An experimental study of focused magma transport and basalt-peridotite interactions beneath mid-ocean ridges: implications for the generation of primitive MORB compositions. *Contributions to Mineralogy and Petrology*, 157: 429-451. doi 10.1007/s00410-008-0344-7.

*In preparation:*

[10] **Lambart S.**, The importance of the melting process for quantifying mantle heterogeneity.

[11] **Lambart S.**, Brown E., Leshner C., What lithologies in the mantle source of plumes? A coupled geochemical and geodynamical approach.

[12] \*Payré V., **Lambart S.**, Baker M.B., Stolper E.M, Composition of basaltic lavas sampled in the deepest part (3098-3506 mbsl) of phase-2 of the Hawaii Scientific Drilling Project: Implication for mantle source and magma degassing.

[13] Gaudio S. J., \*Ajoku C., Mccarty B., **Lambart S.** "Building" 3D visualization skills in mineralogy.

### Published abstract since 2010 (\* denote the speaker)

[15] \***Lambart S.**, Batch vs Continuous Melting: Importance of the Melting Regime in Quantifying the Mantle Heterogeneity. Goldschmidt, Paris, France, August 2017. **Invited talk**

- [14] \*Skarbek R. M., Savage H. M., Kelemen P. B., **Lambart S.**, Robinson B., Experiments on the effects of confining pressure during reaction-driven cracking. AGU FM, San Francisco, Calif., #MR41A-2680, Dec. **2016. Poster**
- [13] Gaudio S. J., \*Ajoku C., McCarthy B., **Lambart S.** "Building" 3D visualization skills in mineralogy. AGU FM, San Francisco, Calif., #ED21A-0760, Dec. **2016. Poster**
- [12] \***Lambart S.**, Quantifying Mantle Heterogeneity beneath Iceland: Melting Process and Buoyancy. Goldschmidt, Yokohama, Japan, June **2016. Talk**
- [11] \***Lambart S.**, The importance of the melting process for quantifying mantle heterogeneity. AGU, San Francisco, Calif., Dec. **2015. Poster**
- [10] \***Lambart S.**, Melt-rock interactions: infinite source of new mantle lithologies. GSA meeting, Baltimore, Maryland, Nov. **2015. Invited talk**
- [9] **Lambart S.**, Savage H.M., \*Kelemen P.B., Experimental investigation of the pressure of crystallization of Ca(OH)<sub>2</sub>: implication for the reactive-cracking process. 5th ACEME, New York, New York, June **2015. Keynote presentation**
- [8] \***Lambart S.**, Kelemen P.B. A coupled geochemical and geodynamical approach for mantle melting beneath Hawaii, AGU, San Francisco, Calif., #V33C-4885, Dec. **2014. Poster**
- [7] Savage H., \***Lambart S.**, Kelemen P.B., Koczynski T.A., Experimental investigation of the pressure of crystallization, AGU, San Francisco, Calif., #V23A-4768, Dec. **2014. Poster**
- [6] \***Lambart S.**, Baker M.B., Stolper E.M. PX-MELT: a predictive model for the melting of pyroxenites in the mantle, 6th International Orogenic Lherzolite Conference, Marrakech, Morocco, May **2014. Talk**
- [5] \*Shorttle O., **Lambart S.**, MacLennan J. Quantifying the lithological and thermal properties of the mantle using basalt chemistry, AGU, San Francisco, Calif., #DI21A-2246, Dec. **2013. Poster**
- [4] \*Shorttle O., **Lambart S.**, MacLennan J. Constraining the amount of recycled material in the mantle source from basalt chemistry. EGU, Vienne, Austria, #EGU2013-8312-2, Apr. **2013. Invited talk**
- [3] \***Lambart S.**, Baker M.B., Stolper E.M. Parameterizing *P-T-F* relationships for mantle pyroxenites at 0.9–5 GPa, Fall Meeting, AGU, San Francisco, Calif., #DI51A-2343, Dec. **2012. Poster**
- [2] \***Lambart S.**, Baker M.B., Stolper E.M. Parameterizing near-solidus temperatures of mantle pyroxenites and eclogites, Fall Meeting, AGU, San Francisco, Calif., #V32B-04, Dec. **2011. Talk**
- [1] \***Lambart S.**, Laporte D., Schiano P., Provost A. Mantle pyroxenites as source of the compositional variability in alkali basalts?, AGU, San Francisco, Calif., #V13F-01, Dec. **2010. Invited talk**

#### **Collaborators (alphabetical order):**

Mike Baker (Caltech), Eric Brown (Aarhus University), Uli Faul (M.I.T.), Gordana Garapic (SUNY, New Paltz), Sarah Gaudio (SUNY, Geneseo), Peter Kelemen (Columbia University), Didier Laporte (Blaise Pascal University), Chip Leshner (UC Davis & Aarhus University), Johan Lissenberg (Cardiff University), John MacLennan (Cambridge University), Ariel Provost (Blaise Pascal University), Heather Savage (LDEO), Pierre Schiano (Blaise Pascal University), Oliver Shorttle (Cambridge university & Caltech), Ed Stolper (Caltech).