

## **Thibaut BARREYRE**

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### **RESEARCH INTERESTS**

Oceanography, Marine Geophysics and Fluid Dynamics  
Signal Analysis: Statistic, Stochastic and Spectral Methods  
Porous Media Flow, Poroelastic Modeling  
Data Mining, Deep-sea Instrumentation and Exploration

### **OTHER INTERESTS**

Surfing, Travelling, Diving, Theater, Hiking, and Underwater Robotics (OpenROV)

### **LANGUAGES**

French (Native language) – English (Fluent) – Spanish (Average level)

### **EDUCATION**

- 2013 **Ph.D., in Marine Geophysics**  
*Institut de Physique du Globe de Paris – Université Paris Diderot – Ecole Normale Supérieure, Paris, France*
- 2010 **M.S., Geophysics**  
*Institut de Physique du Globe de Paris – Ecole Normale Supérieure, Paris, France*
- 2010 **ENS diploma**  
*Ecole Normale Supérieure, Paris, France*
- 2008 **B.S., Physics – Earth and Planetary Science**  
*Ecole Normale Supérieure, Paris, France*

### **RESEARCH EXPERIENCE**

- 01/14 – Now **Postdoctoral Scholar** at the Woods Hole Oceanographic Institution, Woods Hole, MA., USA  
Dir.: Robert Sohn, Dan Fornari, Adam Soule, Margaret K. Tivey and Claudia Cenedese
- 9/10 – 10/13 **PhD program** at the Institut de Physique du Globe – Université Paris Diderot – Ecole Normale Supérieure, Paris, France  
Supervised by Javier Escartín  
*Dynamics and heat fluxes of hydrothermal fields.*
- Fluid dynamics experiments** at the FAST Laboratory, Orsay, France  
Supervised by Anne Davaille and Eric Mittelstaedt  
*Free convection above a linear heat source.*
- 2/10 – 6/10 **Master's Internship** at the Institut de Physique du Globe, Paris, France  
Supervised by Javier Escartín  
*Hydrothermal activity at slow-spreading ridges: Spatial structure and temporal variability at the Lucky Strike field (MAR).*
- 2/09 - 8/09 **Master's Internship** at the Woods Hole Oceanographic Institution, Woods Hole, USA  
Supervised by Robert Sohn and Adam Soule  
*Explosive volcanism in the deep ocean: Investigating the dispersal of volcanoclastic material through laboratory measurements and numerical models.*
- 5/08 - 7/08 **Bachelor's Internship** at the Laboratoire d'Océanographie et du Climat: Expérimentation et Approches Numériques (LOCEAN), Paris, France  
Supervised by Christine Provost and Alice Renault  
*Study of the Antarctic Circumpolar Current (ACC) in the Drake Passage.*

## **SKILLS**

- Programming and software: Matlab, Fortran 90, Shell, the Generic Mapping Tools (GMT), Particle Image Velocimetry (LaVision), Illustrator, Photoshop
- Instrumentation: Temperature sensors, tilt meters, current meters and tide gauges. Maintenance and management of IPGP and WHOI temperature sensor facility
- Laboratory: Analogical modeling in fluid dynamics
- WHOI certified diver – NAUI certification (Cert#: barr100687thisd) – Open Water certification, Nitrox certification, Emergency Oxygen for Scuba Diving Injuries certification

## **HONORS AND AWARDS**

- 2015 NSF Grant OCE-1536705: *Collaborative Research: Modeling hydrothermal recharge and outflow in oceanic crust analogs with sharp permeability gradients* – (\$73,211.00)
- 2015 WHOI Ocean Exploration Institute Award – *Sub-surface flow dynamics and poroelastic behavior in hydrothermal systems* – (\$17,147.00)
- 2014 WHOI Innovative Technology Award – *Developing a New Generation of Deep-Sea Hydrothermal Vent Fluid High-Temperature Logger* – (\$40,000.00)
- 2013 – 2015 WHOI postdoctoral scholarship (2 years)
- 2010 – 2013 French Ministry of Research and Higher Education Fellowship (3 years)

## **SYNERGETIC ACTIVITIES**

**Manuscript reviewer** for *Earth and Planetary Science Letters* and *Journal of Geophysical Research*

**Proposal Reviewer** for the National Science Foundation (Marine Geology and Geophysics)

- 2015 **Primary convener and co-chair** of Fall 2015 AGU session: *Follow the fluids: Integrating multi-disciplinary observations of deep-sea hydrothermal systems.*
- 2014 **Primary convener and co-chair** of Fall 2014 AGU session: *Dynamics of continental and submarine hydrothermal systems.*
- 2010 – 2013 **Teaching Assistant**  
Applied Mathematics (Algebra and Analysis) and Matlab for bachelor's degree classes  
*Université Paris Diderot* and *Institut de Physique du Globe de Paris*

## **FIELD EXPERIENCE AND RESEARCH CRUISE**

- 07/14 “AT26-17”, Instrument deployment and recovery for short-term observations at the ASHES site, on R/V *Atlantis – Alvin*, 11 Jul - 8 Aug 2014, Astoria
- 01/14 “64PE382”, Instrument recovery for long-term observations at the Rainbow site, on R/V *Pelagia*, 04 Jan - 22 Jan 2014, Ponta Delgada
- 08/13 “MoMARSAT13”, Instrument recovery and deployment for long-term observations at the Lucky Strike MoMAR site, on R/V *Atalante, Victor*, 21 Aug - 15 Sep 2013, Horta
- 07/12 “MoMARSAT12”, Instrument recovery and deployment for long-term observations at the Lucky Strike MoMAR site, on R/V *Atalante, Victor*, 12 Jul - 31 Jul 2012, Ponta Delgada
- 07/11 “MoMARSAT11”, Instrument recovery and deployment for long-term observations at the Lucky Strike MoMAR site, on R/V *PourQuoi Pas?, Victor*, 28 Jun - 21 Jul 2011, Horta
- 10/10 “MoMARSAT10”, Instrument recovery and deployment for long-term observations at the Lucky Strike MoMAR site, on R/V *PourQuoi Pas?, Victor*, 1 Oct - 16 Oct 2010, Horta
- 9/09 “Bathyluck'09”, Instrument recovery and deployment for long-term observations at the Lucky Strike MoMAR site, on R/V *PourQuoi Pas?, Nautille & Victor*, 31 Aug - 29 Sep 2009, Horta
- 9/07 – 5/10 Various field courses including cartography, tectonics and petrology in the French and Italian Alps (ENS); active tectonics in Greece (IPGP); and geodynamics in Barbados (WHOI)

## **ARTICLES**

### **Submitted or in press**

- [7] Barreyre, T. & R. Sohn, Poroelastic response of mid-ocean ridge hydrothermal systems to ocean tidal loading: Analysis of long-term temperature records from three observatory sites, *submitted to Geophysical Research Letters*.

- [6] Escartín, J., T. Barreyre, M. Cannat, R. Garcia, N. Gracias, A. Deschamps, A. Salocchi, P.-M. Sarradin, and V. Ballu, Hydrothermal activity along the slow-spreading Lucky Strike ridge segment (Mid-Atlantic Ridge): Distribution, heatflux, and geological controls, *submitted to Earth and Planetary Science Letters*.

### **Published**

- [5] Barreyre, T., J. Escartín, R. Sohn, and M. Cannat, Permeability of the Lucky Strike deep-sea hydrothermal system: Constraints from the poroelastic response to ocean tidal loading, *Earth and Planetary Science Letters*, 408, 146-154, 2014.
- [4] Barreyre, T., J. Escartín, R. Sohn, M. Cannat, V. Ballu and W. Crawford, Temporal variability and tidal modulation of hydrothermal exit-fluid temperatures at the Lucky Strike deep-sea vent field, Mid-Atlantic Ridge, *Journal of Geophysical Research*, 119, doi: 10.1002/2013JB010478, 2014.
- [3] Barreyre, T., J. Escartín, R. Garcia, M. Cannat, E. Mittelstaedt and R. Prados, Structure, temporal evolution, and heat flux estimates from the Lucky Strike deep-sea hydrothermal field derived from seafloor image mosaics, *G-cubed* 13, 4Q04007, doi:10.1029/2011GC003990, 2012.
- [2] Mittelstaedt, E., J. Escartín, N. Gracias, J.-A. Olive, T. Barreyre, A. Davaille, M. Cannat, and R. Garcia, Quantifying diffuse and discrete venting at the Tour Eiffel vent site, Lucky Strike hydrothermal field, *G-cubed* 13, doi:10.1029/2011GC003991, 2012.
- [1] Barreyre, T., S. Adam Soule, Robert A Reves-Sohn, Dispersal of volcanoclastic material by buoyant water plumes in deep-ocean explosive basaltic eruptions, *Journal of Volcanology and Geothermal Research* 205, doi:10.1016/j.jvolgeores.2011.05.006, 2011.

### **COMMUNICATIONS**

#### **Invited Talks**

- 2014 Dynamics and poroelastic behavior of the Lucky Strike hydrothermal field  
Columbia University – Lamont Doherty Earth Observatory, New York, NY, USA

Dynamics and Heat fluxes of the Lucky Strike hydrothermal field  
University of Idaho, Moscow, ID, USA

- 2013 Temporal monitoring and heat, mass and chemical fluxes estimates from photomosaics  
GEOMAR, Kiel, Germany

- 2011 Temporal monitoring and quantification of hydrothermal activity from photomosaics  
AGU, San Francisco, CA, USA

#### **Other selected presentations**

- Barreyre, T., R. Sohn and T.J. Crone, Global synthesis and analysis of deep-sea hydrothermal time-series data: Toward a characterization of the outflow dynamics, *Talk*, AGU, San Francisco, CA, December 2014.
- Barreyre, T., J. Escartín, R. Sohn, M. Cannat and V. Ballu, Temperature variation records at diffuse and focused outflow in Lucky Strike hydrothermal field: Toward a characterization of the outflow dynamic, *Talk*, AGU, San Francisco, CA, December 2012.
- Barreyre, T., J. Escartín, R. García, M. Cannat and E. Mittelstaedt, Structure and temporal variation in fluid outflow at the deep-sea Lucky Strike hydrothermal field (Mid-Atlantic Ridge) from seafloor imagery, DS3F, Sitges, Spain, March 2012.
- Barreyre, T., J. Escartín, M. Cannat, R. García, Distribution, structure and temporal variability of hydrothermal outflow at a slow-spreading hydrothermal field from seafloor image mosaics, Goldschmidt Conference, Knoxville, TN, June 2010.
- Barreyre, T., J. Escartín, M. Cannat, R. García, MoMAR'08 & Bathyluck'09 Science Party, Distribution, structure and temporal variability of hydrothermal outflow at a slow-spreading hydrothermal field from seafloor image mosaics, Geophysical Research Abstracts, Vol. 12, EGU2010-A-8487, Vienna, May 2010.