

## CURRICULUM VITAE

Name Chiara Borrelli  
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### EDUCATION:

- 2010-2014 Ph.D. in Geology, Rensselaer Polytechnic Institute, Troy, NY, USA. Dissertation title: “Reconstructing past ocean circulation and chemistry using benthic Foraminifera: traditional and novel approaches”.
- 2007-2009 M.S. in Marine Biology, Polytechnic University of Marche, Ancona, Italy. Thesis title: “Experimental ecology of benthic Foraminifera”. Final grade: 110\110 cum laude.
- 2004-2007 B.S. in Biological Sciences (Marine Biology and Oceanography), Polytechnic University of Marche, Ancona, Italy. Thesis title: “Foraminifera from the abyssal sediments of the NE Atlantic Ocean: taxonomy, abundance, and biodiversity”. Final grade: 110\110 cum laude.

### APPOINTMENTS:

- Sept. 2016-present *Research Associate, Lecturer*  
University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY
- Sept. 2014-Aug. 2016 *Postdoctoral Research Associate*  
University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY

### ADDITIONAL RESEARCH EXPERIENCE:

- Jul. 2010-Aug. 2014 *Research Assistant*  
Rensselaer Polytechnic Institute, Department of Earth and Environmental Sciences, Troy, NY
- Apr. 2008-Nov. 2009 *Research Assistant*  
Polytechnic University of Marche, Department of Sciences of Life and of the Environment, Ancona, Italy

## LIST OF PUBLICATIONS (\* indicates graduate student authors)

### PAPERS:

#### In preparation

10. **C. Borrelli** and M. E. Katz, Global fluctuations of the carbonate compensation depth during the Eocene/Oligocene transition.
9. R. I. Gabbitov, **C. Borrelli**, J. Buettner, B. Garner\*, C. Hoff\*, S. Khasanov, B. Kirkland, G. Panieri, A. Skarke, M. Testa\*, R. V. K. G. Thirumalai, J. B. Thomas, D. Trail, M. Wahidi\*, J. Weremeichik, and I. I. Zverkova, Carbonate crust from modern methane seep of North Atlantic continental margin of the US: trace element characterization and experimental approach.

#### Published and submitted research

8. **C. Borrelli**, G. Panieri, T. M. Dahl, and K. Neufeld (2018) Novel biomineralization strategy in calcareous foraminifera, *Sci. Rep.-UK*, 8(10201), doi:10.1038/s41598-018-28400-2.
7. D. McVeigh, A. Skarke, A. Dekas, **C. Borrelli**, W. Hong, J. Marlow, A. Pasulka, S. Jungbluth, R. Barco, and A. Djurhuus (2018), Characterization of benthic biogeochemistry and ecology at three methane seep sites on the northern US Atlantic margin, *Deep-Sea Res. Pt. II*, 150, 41-56, doi:10.1016/j.dsr2.2018.03.001.
6. **C. Borrelli**, Y. Hou, J. W. Pawlowski, M. Holzmann, M. E. Katz, G. T. Chandler, and S. S. Bowser (2018), Assessing SSU rDNA barcodes in foraminifera: a case study using *Bolivina quadrata*, *J. Eukaryot. Microbiol.*, 65, 220-235, doi:10.1111/jeu.12471.
5. J. Marlow, **C. Borrelli**, S. Jungbluth, C. Hoffman\*, J. Marlow, P. Girguis, and the AT-36 Team (2017), Opinion: Telepresence is a potentially transformative tool for field science, *P. Natl. Acad. Sci. USA*, 114(19), 4841-4844, doi:10.1073/pnas.1703514114.
4. S. J. Langton, N. M. Rabideaux\*, **C. Borrelli**, and M. E. Katz (2016), Southeastern Atlantic deepwater evolution during the late middle Eocene to earliest Oligocene (ODP Site 1263 and DSDP Site 366), *Geosphere*, 12(3), 1032-1047, doi:10.1130/GES01268.1.
3. **C. Borrelli** and M. E. Katz (2015), Dynamic deep-water circulation in the northwestern Pacific during the Eocene: Evidence from Ocean Drilling Program Site 884 benthic foraminiferal stable isotopes ( $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$ ), *Geosphere*, 11(4), 1204-1255, doi:10.1130/GESO1152.1.
2. **C. Borrelli**, B. S. Cramer, and M. E. Katz (2014), Bipolar Atlantic deepwater circulation in the middle-late Eocene: effects of Southern Ocean gateway openings, *Paleoceanography*, 29(4), 308-327, doi:10.1002/2012PA002444.
1. **C. Borrelli**, A. Sabbatini, G. M. Luna, M. P. Nardelli, T. Sbaffi\*, C. Morigi, R. Danovaro, and A. Negri (2011), Technical Note: Determination of the metabolically active fraction of benthic foraminifera by means of Fluorescent In Situ Hybridization (FISH), *Biogeosciences*, 8, 2075-2088, doi:10.5194/bg-8-2075-2011.

## ABSTRACTS:

### Invited conference presentations and academic talks

29. **C. Borrelli**, Unlocking past ocean circulation and climate changes using benthic foraminifera, Montclair State University, Department of Earth and Environmental Studies, January 2018.
28. **C. Borrelli**, Climate changes in the geological past – a paleoceanographic perspective, Nazareth College, Department of Chemistry and Biochemistry, March 2017.
27. **C. Borrelli**, Ocean circulation changes from the middle Eocene to the early Oligocene: a benthic foraminiferal perspective, Time series analysis in environmental science and applications to climate change, Tromsø (Norway), 8-11 November 2016.
26. **C. Borrelli**, Investigating past ocean circulation and climate using benthic foraminifera: traditional and novel approaches, The Arctic University of Norway Department of Geology, and Centre for Arctic Gas Hydrate, Environment, and Climate, March 2016.
25. **C. Borrelli**, Investigating past ocean circulation and climate using benthic foraminifera: traditional and novel approaches, Binghamton University – The State University of New York, Department of Geological Sciences and Environmental Studies, March 2016.
24. **C. Borrelli**, R. I. Gabitov, S. R. Messenger, A. N. Nguyen, M. Torres, and J. D. Kessler, Investigation of benthic foraminiferal “non-traditional” stable isotopes to reconstruct methane fluxes in sedimentary environments, GSA, Baltimore, 1-4 November 2015.
23. **C. Borrelli**, Application of LA-ICP-MS technology on foraminifera: trace elements as tool for paleoceanographic reconstructions, Rensselaer Polytechnic Institute, Department of Earth and Environmental Sciences (two invited lectures and one invited laboratory session - Applied Micropaleontology course), October 2014.
22. **C. Borrelli**, E. B. Watson, R. Gabitov, J. B. Thomas, M. Ackerson\*, D. Trail, D. Ruscitto, and M. E. Katz, Development of a new technique to promote unseeded precipitation of inorganic calcium carbonate crystals from artificial seawater, Goldschmidt, Sacramento, 8-13 June 2014.
21. **C. Borrelli**, Foraminifera: a promising field for interdisciplinary studies, University of Rochester, Department of Earth and Environmental Sciences, May 2013.

### Submitted abstracts

20. R. Gabitov, **C. Borrelli**, A. Crechiere, B. Kirkland, G. Panieri, A. Skarke, M. Testa\*, N. Van Hartesveldt\*, and M. Wahidi\*, Carbonate crust from a recently discovered methane seep along the North Atlantic continental margin of the US: isotopic characterization, 14<sup>th</sup> International Conference on Gas in Marine Sediments (GIMS 14), Haifa (Israel), 14-20 October 2018. (*submitted*)
19. **C. Borrelli** and G. Panieri, *Melonis barleeanus* is a calcareous and (facultative) agglutinated foraminifera, International Symposium on Foraminifera (FORAMS 2018), Edinburgh (United Kingdom), 17-22 June 2018.

18. **C. Borrelli**, Y. Hou, J. W. Pawlowski, M. Holzmann, M. E. Katz, G. T. Chandler, and S. S. Bowser, Testing SSU rDNA barcodes in foraminifera: a case study using *Bolivina quadrata*, International Symposium on Foraminifera (FORAMS 2018), Edinburgh (United Kingdom), 17-22 June 2018.
17. **C. Borrelli** and G. Panieri. Calcareous foraminifera are able to agglutinate sedimentary particles within their test, EGU, Vienna (Austria), 8-13 April 2018.
16. R. I. Gabitov, **C. Borrelli**, J. Buettner, M. Testa\*, B. Garner\*, J. Weremeichik, J. B. Thomas, M. Wahidi\*, R. V. K. G. Thirumalai, B. Kirkland, and A. Skarke, Characterization of carbonate crust from deep-sea methane seeps on the Northern US Atlantic margin, AGU, New Orleans, 11-15 December 2017.
15. **C. Borrelli**, G. Panieri, and T. M. Dahl, The presence of silicate grains in foraminiferal calcite tests suggests a novel biomineralization strategy in foraminifera, Goldschmidt, Paris, 13-18 August 2017.
14. R. I. Gabitov, J. Weremeichik\*, **C. Borrelli**, J. L. Mitchell\*, B. Garner\*, J. B. Thomas, B. Hartenbower\*, C. Hoff\*, B. Watson, D. Trail, J. Singer, K. Rogers, T. French, and H. Toghiani, Geochemical response of aragonite on pressure and oxygen depletion in seawater: an experimental study, AGU Ocean Sciences Meeting, New Orleans, 21-26 February 2016.
13. J. M. Weremeichik\*, **C. Borrelli**, J. Mitchell\*, and R. I. Gabitov, Aragonite precipitation under simulated oceanic pressures, GSA, Baltimore, 1-4 November 2015.
12. **C. Borrelli**, B. S. Cramer, M. E. Katz, Ocean circulation in the northwestern Pacific (ODP Site 884) from the middle Eocene to the early Oligocene (45-33 Ma), GSA, Charlotte, 4-7 November 2012.
11. **C. Borrelli**, B. S. Cramer, M. E. Katz, Evidence for increased thermal differentiation in the deep Atlantic in the middle-late Eocene (40-33 Ma), AGU, San Francisco, 5-9 December 2011.
10. M. E. Katz, **C. Borrelli**, B. S. Cramer, N. M. Rabideaux\*, J. R. Toggweiler, Impact of Antarctic Circumpolar Current evolution on late middle Eocene to early Oligocene ocean structure, AGU, San Francisco, 5-9 December 2011.
9. J. Williams\*, **C. Borrelli**, X. Chen\*, B. M. Srain\*, K. Hanselmann, W. Berelson, G. Caporaso, M. Coleman, F. A. Corsetti, S. Dawson, H. Johnson, V. Petryshyn\*, A. L. Sessions, R. Shapiro, J. R. Spear, B. S. Stevenson, C. H. D. Williamson\*, International Geobiology Course, Microbial survival in strongly lithifying hot spring environments, Yellowstone National Park, AGU, San Francisco, 5-9 December 2011.
8. **C. Borrelli**, A. Sabbatini, G. M. Luna, M. P. Nardelli, T. Scaffi\*, C. Morigi, R. Danovaro, A. Negri, Determination of the metabolically active fraction of benthic foraminifera by means of Fluorescent in situ Hybridization (FISH), GSA, Minneapolis, 9-12 October 2011.
7. **C. Borrelli**, A. Sabbatini, G. M. Luna, C. Morigi, R. Danovaro, A. Negri, Determination of the metabolically active fraction of benthic foraminifera by means of Fluorescent in situ Hybridization (FISH), International Symposium on Foraminifera (FORAMS 2010), Bonn (Germany), 5-10 September 2010.
6. A. Sabbatini, **C. Borrelli**, M. P. Nardelli, C. Morigi, A. Negri, Benthic foraminifera as ecological and biological indicators: a practical approach using experimental cultures and their potential use in coastal monitoring management, FIST, Rimini (Italy), 9-11 September 2009.

5. **C. Borrelli**, A. Sabbatini, C. Morigi, A. Negri, Una nuova prospettiva nel monitoraggio costiero: l'utilizzo dei foraminiferi bentonici come bioindicatori, Ricerca e applicazione di metodologie ecotossicologiche in ambienti marini e salmastri, Viareggio (Italy), 25-26 November 2008.
4. A. Sabbatini, **C. Borrelli**, A. J. Gooday, J. Pawlowski, C. Morigi, A. Negri, Morphological and molecular studies of komokiacean and komokiacean-like foraminifera from the Porcupine Abyssal Plain (NE Atlantic) and Weddell Sea (Southern Ocean), Eighth International Workshop on Agglutinated Foraminifera (IWAF-8), Cluj-Napoca (Romania), 7-13 September 2008.
3. **C. Borrelli**, A. Sabbatini, C. Morigi, A. Negri, I foraminiferi come indicatori ecologici e biologici: un approccio mediante colture e loro potenziale uso in azioni di monitoraggio costiero, XVIII Congresso della Società Italiana di Ecologia, Parma (Italy), 1-3 September 2008.
2. **C. Borrelli**, A. Sabbatini, A. J. Gooday, C. Morigi, A. Negri, New observations on komokiaceans and other large, soft-bodied Foraminifera from the Porcupine Abyssal Plain (Northeast Atlantic): morphological and molecular implications, HERMES Workshop, Ancona (Italy), 7-10 April 2008.
1. **C. Borrelli**, A. Sabbatini, A. J. Gooday, C. Morigi, A. Negri, I Foraminiferi dei sedimenti abissali dell'Oceano Atlantico nord-orientale: tassonomia, abbondanza, biodiversità, Congresso Congiunto AIOL – SitE, Ancona (Italy), 17-20 September 2007.

**PROPOSAL SUBMISSION (BORRELLI AS PRINCIPAL INVESTIGATOR):**

National Science Foundation (OCE1838645): “A benthic foraminiferal multi-proxy approach to investigate paleo-methane emission and oxidation in sedimentary environments” (*pending*).

**PROPOSAL SUBMISSION (BORRELLI AS COLLABORATOR):**

Research Council of Norway (36650): “NORCRUST - Norwegian margin fluid systems and methane-derived carbonate crusts – Recent scientific advances in service of petroleum exploration (Kompetanseprosjekt for næringslivet - PETROMAKS2)” (ca. \$4,315,310) (04/2016-03/2020).

**TEACHING EXPERIENCE:**

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|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aug.-Dec. 2018 | <i>Instructor.</i> University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY. EES 310 Science and Sustainability.               |
| Jan.-May 2018  | <i>Instructor.</i> University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY. EES 274/474 Paleooceanography and Climate Change. |

- Jan.-May 2018 *Instructor.* University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY. EES 100 Introduction to Oceanography.
- Aug.-Dec. 2017 *Instructor.* University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY. EES 310 Science and Sustainability.
- Jan.-May 2017 *Instructor.* University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY. EES 310 Science and Sustainability.
- Jan.-May 2017 *Instructor.* University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY. EES 100 Introduction to Oceanography.
- Aug.-Dec. 2016 *Instructor.* University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY. EES 220/420 Introduction to Geobiology.
- Jan.-Apr. 2016 *Instructor.* University of Rochester, Department of Earth and Environmental Sciences, Rochester, NY. EES 274/474 Seminar in Paleoceanography.
- Jan.-May 2014 *Teaching Assistant.* Rensselaer Polytechnic Institute, Department of Earth and Environmental Sciences, Troy, NY. EARTH 4500 Earth's Climate.
- Sept.-Dec. 2013 *Teaching Assistant.* Rensselaer Polytechnic Institute, Department of Earth and Environmental Sciences, Troy, NY. EARTH 4070 Sedimentology/Stratigraphy; EARTH 4190 Environmental Measures.
- Jan.-May 2013 *Teaching Assistant.* Rensselaer Polytechnic Institute, Department of Earth and Environmental Sciences, Troy, NY. EARTH 4180 Environmental Geology; EARTH 4500 Earth's Climate.
- Sept.-Dec. 2012 *Teaching Assistant.* Rensselaer Polytechnic Institute, Department of Earth and Environmental Sciences, Troy, NY. EARTH 2610 Oceanography; EARTH 4200/6200 Applied Micropaleontology.

**EXPEDITIONS:**

- 14-17 Jul. 2016 R/V G.O. Sars, Svalbard, Norway  
Member of the Science Party
- Jul. 28-Aug. 7 2016 R/V Atlantis, US Atlantic margin  
Member of the Science Party, Alvin Diver, Gravity Core coordinator

**OTHER EXPERIENCES:**

UNOLS Deep-Submergence Science Leadership Cruise, July 26-August 8, 2016.

Workshop on Secondary Ion Mass Spectrometry – Arizona State University, 6-8 January 2016.

“Science Education Workshop” – Rochester Museum and Science Center, December 2015.

“Reconstructing Earth’s deep-time climate – the state of the art in 2012” - Short course sponsored by the *Paleontological Society* and Co-Sponsored by the *GSA*, *SEPM*, and *Cushman Foundation*, GSA 2012.

Geobiology International Summer Course, sponsored by *Agouron Institute*, *Gordon and Betty Moore Foundation*, *NSF*, *USC Wrigley Institute for Environmental Studies*, *NASA*, *Colorado School of Mines*, Jun. 12-Jul.13 2011. PROJECT: Microbial survival in lithifying environments (presented at AGU 2011).

“Taxonomy and ecology of recent Foraminifera” - HERMES (Hotspot Ecosystem Research on the Margins of European Seas) Workshop, co-proposed and co-convened by HERMES partner *CoNISMa*, Ancona (Italy), 7-10 April 2008.

**CO-CHAired MEETING SESSIONS:**

Insights from microfossils, from terrestrial to marine environments – GSA Northeastern Section Meeting 2016.

PP23C. Cenozoic Climate: From Proxy Reconstructions to Model Assessments III - AGU meeting 2011.

**AWARDS AND HONORS:**

2014	Goldschmidt 2014 Travel Grant
2013	Rensselaer Polytechnic Institute Founders Award of Excellence The Cushman Foundation Loeblich and Tappan Student Research Award SEPM Foundation Award IAGC-Elsevier Student Research Grant
2012	GSA Student Research Grant Garry Jones and Brian O'Neill Memorial Grant for NAMS Student Research
2011	Geobiology International Summer Course Scholarship
2010	Cushman Foundation Student Travel Award for Forams 2010

**REVIEWER FOR THE FOLLOWING JOURNALS:** *Biogeosciences, Climate of the Past, Deep-Sea Research Part II, Earth and Planetary Science Letters, Journal of Earth System Science, Journal of Foraminiferal Research, Journal of the Brazilian Chemical Society, Nature Geoscience, Micropaleontology, Palaeogeography Palaeoclimatology Palaeoecology, Paleoceanography.*

**PROPOSAL REVIEWER FOR THE FOLLOWING FUNDING AGENCIES:** *NSF - Ocean Science: Marine Geology and Geophysics*

**PROFESSIONAL AFFILIATIONS:**

2010-2018 Cushman Foundation for Foraminiferal Research  
2011-2018 Geological Society of America (GSA)  
2011-2018 American Geophysical Union (AGU)  
2014-2018 Geochemical Society (GS)

**STUDENTS ADVISED:**

Amy Eisenstadt (Undergraduate; University of Rochester)  
Gregory Shinaman (Undergraduate; University of Rochester)  
Brian O'Neil (Undergraduate; University of Rochester)

**SENIOR THESIS READER:**

Molly Weiner (University of Rochester; Class 2016)  
Amy Eisenstadt (University of Rochester; Class 2016)

**SEMINARS TO COMMUNITY GROUPS:**

Dec. 2015 Rochester Museum and Science Center – Richard C. Shultz Science on the Edge Lecture series

**MEDIA APPERANCE:**

How the Arctic Ocean became salty by Beth Geiger, Science News For Students  
<https://www.sciencenewsforstudents.org/article/how-arctic-ocean-became-salty>

Dive Deeper: you never forget your first dive (WHOI video) -  
<https://vimeo.com/album/4261384/video/191864896>



Life on the Shore-Based Team: the Other Half of a Telepresence Expedition by Jeffrey Marlow, Explorers Journal (National Geographic)  
<http://voices.nationalgeographic.org/2016/10/22/life-on-the-shore-based-team-the-other-half-of-a-telepresence-expedition/>

PhD Student Research Grants – Elements, 9(3), page 229, 2013.

### **OUTREACH AND VOLUNTEER ACTIVITIES:**

- Apr. 2018 Faculty tea –I was among the faculty members invited to this event, which was organized by Sigma Delta Tau as a networking opportunity for its members.
- Feb. 2018 Rochester Museum and Science Center – Science Saturdays (Featured presenter).
- Aug. 2017 Brighton Farmers Market – Ask a Scientist (volunteer scientist).
- Jul. 2017 Rochester Museum and Science Center – Ladies in the Lab (Featured presenter).
- Apr. 2016 Rochester Museum and Science Center – Science Saturdays (Featured presenter).
- Apr. 2015 Panelist at the University of Rochester Post-Doc Panel Discussion.
- 2013 Rensselaer Polytechnic Institute (RPI) Climby Ambassador (Climby is an online tool designed to improve RPI’s admissions process. Thanks to Climby, RPI can build personal relationship with all prospective students with the help of designed people (RPI ambassadors) who have the possibility to chat with prospective students on behalf of RPI).
- 2013 RPI Successful Female Graduate Student Representative (The RPI Office of Graduate Admissions created a webpage with the profiles of several successful graduate students, and I have been recommended by the Associate Deans of the RPI School of Science).
- 2012-2013 RPI School of Science Graduate Student Council Member (organization of social and professional events, preparation of the Council by-laws as reference for future generation of students, organization of the first RPI School of Science Graduate Symposium, collaboration with the search committee for the new RPI Associate Dean of Student Affairs).
- Jun. 2012 RPI Science Day - Invited scientific talk to GK-12 program teachers.