

HAOJIA ABBY REN

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EDUCATION

2010 Ph.D. in Geosciences, Princeton University, NJ, U.S.
2007 M.A. in Geosciences, Princeton University, NJ, U.S.
2005 B.S. in Geology (major) and Mathematics (minor), Peking University, China

EXPERIENCE

Associate Professor

Department of Geosciences, National Taiwan University, since 2018

Assistant Professor

Department of Geosciences, National Taiwan University, 2014-2018

Distinguished Postdoctoral Fellow

Research Center for Environmental Changes, Academia Sinica, Taiwan, 2012-2014

NOAA Climate and Global Change Postdoctoral Fellow

Lamont-Doherty Earth Observatory, Columbia University, U.S., 2010-2012

Graduate Research Assistant

Department of Geosciences, Princeton University, U.S., 2005-2010

HONORS AND AWARDS

2018 Nanne Weber Early Career Award in Paleoceanography
American Geophysical Union

2017 Ta-You Wu Memorial Award
Ministry of Science and Technology, Taiwan

2017 AOGS Early Career Researcher Distinguished Lecture
Asia Oceania Geosciences Society

- 2012-2014 Academia Sinica Distinguished Postdoctoral Fellowship
Academia Sinica, Taiwan
- 2010-2012 National Oceanic and Atmospheric Administration (NOAA) Climate and
Global Change Postdoctoral Fellowship
University Corporation for Atmospheric Research (UCAR)'s Visiting
Scientist Programs, U.S.
- 2009-2010 Charlotte Elizabeth Procter Honorific Fellowship
Princeton University, New Jersey, U.S.
- 2008-2009 Schlanger Ocean Drilling Fellowship
Consortium for Ocean Leadership

GRANTS

- 2018-2022 MOST Grant for the Columbus Program
Sole PI "Past and Present Evolution of Global Ocean Nitrogen Cycle:
1,710,000 USD Implications from Studies in the Western Tropical North Pacific and
South China Sea"
- 2016-2019 MOST Project for Excellent Junior Research Investigators
Sole PI "Ocean fertilization natural and anthropogenic nitrogen inputs in the past
333,000 USD and present"
- 2017-2018 MOST General Research Project
Sole PI "Groundtruth the biogeochemistry of planktonic foraminifera shell-bound
53,500 USD nitrogen isotopes: From modern ocean and recent sediment"
- 2014-2016 MOST General Research Project
Sole PI "Reconstructing surface nutrient status in the Subarctic North Pacific
153,000 USD Ocean during the last deglaciation: Using the isotopes of multiple organic
nitrogen pools"
- 2016-2017 National Taiwan University Cutting-Edge Steering Research Project
Co-PI "Orbital climate variabilities in the Western Pacific: Its global link and
523,000 USD implications"
- 2015-2016 National Taiwan University and Academia Sinica Innovative Joint
Co-PI Program
33,000 USD "Comparative study between the biogeochemical records in Dongsha
coral reef and environmental factors: Reconstructing the anthropogenic
impact in the South China Sea"

PEER-REVIEWED PAPERS

Xingchen T. Wang*, Anne L. Cohen, Victoria Luu, Haojia Ren, Zhan Su, Gerald H. Haug, and Daniel M. Sigman (2018), Natural forcing of the North Atlantic nitrogen cycle in the Anthropocene, *PNAS*, 115(42), 10606-10611. doi/10.1073/pnas.1801049115.

Sandi M. Smart*, Haojia Ren, Sarah E. Fawcett, Ralf Schiebel, Maureen Conte, Patrick A. Rafter, Karen K. Ellis, Mira A. Weigand, Sergey Oleyunik, Gerald H. Haug, Daniel M. Sigman (2018), Ground-truthing the planktic foraminifer-bound nitrogen isotope paleo-proxy in the Sargasso Sea, *Geochimica et Cosmochimica Acta*, 235, 463-482. doi:10.1016/j.gca.2018.05.023.

Tingting Wang, Ana Christina Ravelo, Haojia Ren, Haowen Dang, Haiyan Jin, Jingjing Liu, Zhimin Jian* (2018), Nitrogen isotope variations in the northern South China Sea since marine isotopic stage 3: reconstructed from foraminifera-bound and bulk sedimentary nitrogen, *Paleoceanography and Paleoclimatology*, 33. doi:10.1029/2018PA003344.

Thomas DeCarlo*, Haojia Ren, Gabriela Farfan (2018), The Origin and Role of Organic Matrix in Coral Calcification: Insights From Comparing Coral Skeleton and Abiogenic Aragonite, *Frontiers in Marine Science*, 5:170. doi: 10.3389/fmars.2018.00170.

Haojia Ren*, Daniel M. Sigman, Alfredo Martinez-Garcia, Robert F. Anderson, Min-Te Chen, Ana Christina Ravelo, Marietta Straub, George T.F. Wong, Gerald Haug (2017), Impact of glacial/interglacial sea level change on the ocean nitrogen cycle, *PNAS*, 114(33), 6759-6766.

Haojia Ren*, Yi-Chi Chen, Xingchen T. Wang, George T.F. Wong, Anne L. Cohen, Thomas M. DeCarlo, Mira A. Weigand, Horng-Sheng Mii, Daniel M. Sigman (2017), 21st Century Rise in Anthropogenic Nitrogen Deposition on a Remote Coral Reef, *Science*, 356, 749-752.

Yige Zhang*, Mark Pagani, Jorijintje Henderiks, Haojia Ren (2017), A long history of equatorial deep-water upwelling in the Pacific Ocean, *Earth and Planetary Science Letters*, 467: 1-9.

Xingchen T. Wang*, Daniel M. Sigman, Anne L. Cohen, Daniel J. Sinclair, Robert M. Sherrell, Kim M. Cobb, Dirk V. Erlen, Jaroslaw Stolarski, Marcelo V. Kitahara, Haojia Ren (2016), Influence of open ocean nitrogen supply on the skeletal of modern shallow-water scleractinian corals, *Earth and Planetary Science Letters*, 441, 125-132.

Kassandra M. Costa*, Jerry F. McManus, Robert F. Anderson, Haojia Ren, Daniel M. Sigman, Gisela Winckler, M. Q. Fleisher, F. Marcantonio, A. C. Ravelo (2016), No iron fertilization in the Equatorial Pacific during the Last Ice Age, *Nature*, 529, 519-522.

Haojia Ren*, Anja S. Studer, Sascha Serno, Daniel M. Sigman, Gisela Winckler, Robert F. Anderson, Sergey Oleyunik, Rainer Gersonde, and Gerald H. Haug (2015), Glacial-to-interglacial changes in nitrate supply and consumption in the subarctic North Pacific from microfossil-bound N isotopes at two trophic levels, *Paleoceanography*, 30, 1217–1232.

Sascha Serno*, Gisela Winckler, Robert F. Anderson, E. Maier, Haojia Ren, Rainer Gersonde, and Gerald H. Haug (2015), Comparing dust flux records from the Subarctic North Pacific and Greenland: Implications for atmospheric transport to Greenland and for the application of dust as a chronostratigraphic tool, *Paleoceanography*, 30.

Xingchen T. Wang*, Daniel M. Sigman, Anne L. Cohen, Daniel J. Sinclair, Robert M. Sherrell, Mira A. Weigand, Dirk V. Eler, and Haojia Ren (2014), Isotopic composition of skeleton-bound organic nitrogen in reef-building symbiotic corals: A new method and proxy evaluation at Bermuda, *Geochimica et Cosmochimica Acta*, 148, 179-190.

Sascha Serno*, Gisela Winckler, Robert F. Anderson, Christopher T. Hayes, Haojia Ren, Rainer Gersonde, Gerald H. Haug (2014), Using the natural spatial pattern of marine productivity in the Subarctic North Pacific to evaluate paleoproductivity proxies, *Paleoceanography*, 29(5), 438-453.

Xingchen T. Wang*, Maria G. Prokopenko, Daniel M. Sigman, Jess F. Adkins, Laura F. Robinson, Haojia Ren, Sergey Oleynik, Branwen Williams, Gerald H. Haug (2014), Isotopic composition of carbonate-bound organic nitrogen in deep-sea scleractinian corals: A new window into past biogeochemical change, *Earth and Planetary Science Letters*, 400, 243-250.

Sascha Serno*, Gisela Winckler, Robert F. Anderson, Christopher T. Hayes, David McGee, Bjorn Machalett, Haojia Ren, Susanne M. Straub, Rainer Gersonde, Gerald H. Haug (2014), Eolian dust input to the Subarctic North Pacific, *Earth and Planetary Science Letters*, 387, 252-263.

Alfredo Martinez-Garcia*, Daniel M. Sigman, Haojia Ren, Robert F. Anderson, Marietta Straub, David A. Hodell, Samuel L. Jaccard, Timothy I. Eglinton, Gerald H. Haug (2014), Iron fertilization of the Subantarctic Ocean during the last ice age, *Science*, 343, 6177.

Marietta Straub*, Daniel M. Sigman, Haojia Ren, Alfredo Martinez-Garcia, A. Nele Meckler, and Gerald H. Haug (2013), Changes in North Atlantic nitrogen fixation controlled by ocean circulation, *Nature*, 501, 200-203.

Haojia Ren*, Brigitte G. Brunelle, Daniel M. Sigman, and Rebecca S. Robinson (2013), Diagenetic aluminum uptake into diatom frustules and the preservation of diatom-bound organic nitrogen, *Marine Chemistry*, 155, 92-101.

Marietta Straub*, Marissa Tremblay, Daniel M. Sigman, Anja S. Studer, Haojia Ren, Satish Myneni, J. Robert Toggweiler, and Gerald H. Haug (2013), Nutrient conditions in the subpolar North Atlantic during the last glacial period reconstructed from foraminifera-bound nitrogen isotopes, *Paleoceanography*, 28(1), 79-90.

Haojia Ren*, Daniel M. Sigman, Robert C. Thunell, and Maria G. Prokopenko (2012), Nitrogen isotopic composition of planktonic foraminifera from the modern ocean and recent sediments, *Limnology and Oceanography*, 57(4), 1011-1024.

Haojia Ren*, Daniel M. Sigman, Min-Te Chen, and Shuh-ji Kao (2012), Elevated Foraminifera-bound Nitrogen Isotopic Composition During the Last Ice Age in the South China Sea and Its Global and Regional Implications, *Global Biogeochemical Cycles*, 26, GB1031, doi:10.1029/2010GB004020.

Shuh-Ji Kao*, Jin-Yu Yang, Kon-Kei Liu, Minhan Dai, Wen-Chen Chou, Hui-Ling Lin, and Haojia Ren (2012), Isotope constraints on particulate nitrogen dynamics in the upper water column of the oligotrophic South China Sea, *Global Biogeochemical Cycles*, 26, GB2033, doi:10.1029/2011GB004091.

Anna Nele Meckler*, Haojia Ren, Daniel M. Sigman, Birgit Plessen, Schubert, and Gerald H. Haug (2011), Deglacial nitrogen isotope changes in the Gulf of Mexico:

Evidence from bulk sedimentary and foraminifera-bound nitrogen in Orca Basin sediments, *Paleoceanography*, 26, PA4216, doi:10.1029/2011PA002156.

Haojia Ren*, Daniel M. Sigman, Anna Nele Meckler, Birgit Plessen, and Rebecca S. Robinson, Yair Rosenthal, and Gerald H. Haug (2009), Foraminiferal isotope evidence of reduced nitrogen fixation in the Ice Age Atlantic Ocean, *Science*, 323, 244.

CONFERENCE PRESENTATIONS AND INVITED TALKS

Haojia Ren, Ocean fertilization by natural and anthropogenic nitrogen input in the past and present, AOGS Early Career Researcher Distinguished Lecture, Singapore, 2017 (invited talk).

Haojia Ren, Ocean nitrogen cycle across different time scales: From foraminifera and coral archives, Gordon Conference, New London, NH, U.S., 2017 (invited talk).

Haojia Ren, Yi-Chi Chen, Xingchen T. Wang, George T.F. Wong, Anne L. Cohen, Thomas M. DeCarlo, Mira A. Weigand, Horng-Sheng Mii, Daniel M. Sigman, 21st Century Rise in Anthropogenic Nitrogen Deposition on a Remote Coral Reef, AGU Fall Meeting, San Francisco, CA, U.S., 2016 (poster).

Haojia Ren, Daniel M. Sigman, Alfredo Martinez-Garcia, Robert F. Anderson, Min-Te Chen, Marietta Straub, George T.F. Wong, Gerald Haug, Response of South China Sea nitrogen fixation to shelf nitrogen loss over glacial cycles, Goldschmidt Conference, Yokohama, Japan, 2016 (invited talk).

Haojia Ren, Daniel M. Sigman, Sascha Serno, Anja S. Studer, Robert F. Anderson, Gisela Winckler, Sergey Oleynik, Rainer Gersonde, and Gerald H. Haug, Glacial-to-interglacial changes in nitrate supply and consumption in the subarctic North Pacific from microfossil-bound N isotopes at two trophic levels, AGU Fall Meeting, San Francisco, CA, U.S., 2014 (invited talk).

Haojia Ren, Daniel M. Sigman, Sascha Serno, Anja S. Studer, Robert F. Anderson, Gisela Winckler, Sergey Oleynik, Rainer Gersonde, and Gerald H. Haug, Glacial-to-interglacial changes in nitrate supply and consumption in the subarctic North Pacific from microfossil-bound N isotopes at two trophic levels, Goldschmidt Conference, Sacramento, U.S., 2014 (talk).

Haojia Ren, Daniel M. Sigman, Karen K. Ellis, Mira A. Weigand, Robert F. Anderson, Ana Christina Ravelo, Mark A. Altabet, Sarah E. Fawcett, and Patrick A. Rafter, Groundtruthing the nitrogen isotopic composition of planktonic foraminifera as a paleobiogeochemical proxy, Goldschmidt Conference, Florence, Italy, 2013 (talk).

Haojia Ren, Anja S. Studer, Sascha Serno, Robert F. Anderson, Daniel M. Sigman, Gisela Winckler, Rainer Gersonde, and Gerald H. Haug, New evidence for deglacial changes in surface nutrient utilization and stratification in the western subarctic North Pacific, The 11th International Conference on Paleocyanography Sitges, Spain, 2013 (poster).

Haojia Ren, Daniel M. Sigman, Robert F. Anderson, Min-Te Chen, Alfredo Martinez-Garcia, Marietta Straub, and Gerald H. Haug, Orbital variation in South China Sea nitrogen fixation over the past 860,000 yrs, AGU Fall Meeting, San Francisco, CA, U.S., 2012 (invited talk).

Haojia Ren, Sascha Serno, Anja S. Studer, Robert F. Anderson, Gisela Winckler, Rainer Gersonde, Daniel M. Sigman, and Gerald H. Haug, Reconstructing surface nutrient status in the Subarctic North Pacific Ocean using the isotopes of multiple organic nitrogen pools, Summer Institute for the NOAA Climate and Global Change & PACE Postdoctoral Fellowship Programs, Steamboat Springs, Colorado, U.S., 2012 (invited talk).

Haojia Ren, Robert F. Anderson, Anja S. Studer, Sascha Serno, Daniel M. Sigman, Gisela Winckler, Rainer Gersonde, and Gerald H. Haug, Studies of surface ocean nitrate utilization in the Subarctic North Pacific using multiple nitrogen isotope recorders in the surface sediment, Goldschmidt Conference, Montreal, Canada, 2012 (poster).

Haojia Ren, Daniel M. Sigman, Robert C. Thunell, and Maria G. Prokopenko, Nitrogen isotopic composition of planktonic foraminifera from the modern ocean and recent sediments, AGU Fall Meeting, San Francisco, CA, U.S., 2010 (talk).

Haojia Ren, Daniel M. Sigman, Min-Te Chen, and Shuh-Ji Kao, Elevated Foraminifera-bound $^{15}\text{N}/^{14}\text{N}$ during the last Ice Age in the South China Sea and its global and regional implications, The 10th International Conference on Paleoceanography, San Pedro, California, U.S., 2010 (poster).

Haojia Ren, Daniel M. Sigman, Min-Te Chen, and Shuh-Ji Kao, Elevated Foraminifera-bound $^{15}\text{N}/^{14}\text{N}$ during the last Ice Age in the South China Sea and its global and regional implications, Western Pacific Geophysics Meeting, Taipei, Taiwan, 2010 (talk).

Haojia Ren, Foraminiferal isotope evidence of reduced nitrogen fixation in the Ice Age Atlantic Ocean, U.S. Advisory Committee for Scientific Ocean Drilling Meeting, Washington D.C., U.S., July 2009 (invited talk).

Haojia Ren, Daniel M. Sigman, Anna Nele Meckler, Birgit Plessen, Rebecca S. Robinson, Yair Rosenthal, and Gerald H. Haug, Foraminiferal isotope evidence of reduced nitrogen fixation in the Ice Age Atlantic Ocean, AGU Fall Meeting, San Francisco, CA, U.S., 2008 (poster).

Haojia Ren, and Daniel M. Sigman, A new method for studying planktonic foraminifera shell-bound organic nitrogen and its potential applications in paleoceanography, The 9th International Conference on Paleoceanography, Shanghai, China, 2007 (poster).

REVIEWS

Nature Geoscience

Nature communication

Earth and Planetary Science Letters

Scientific Report

Paleoceanography

Geology

Global Biogeochemical Cycles

Biogeosciences

Journal of Geophysical Review

Palaeogeography, Palaeoclimatology, Palaeoecology

National Science Foundation: P2C2