

**Jenan J. Kharbush, Ph.D.**  
Department of Earth and Planetary Sciences  
Harvard University  
20 Oxford St. Cambridge, MA 02138  
[jkharbush@fas.harvard.edu](mailto:jkharbush@fas.harvard.edu)  
(608) 843-8517

## SCHOLARLY PROFILE

---

I am an analytical organic geochemist and chemical oceanographer with special interest in the close associations between biogeochemical cycling and microbial ecology. My work uses molecular biomarkers, biosynthetic pathways, and stable isotope geochemistry, to investigate how particular microbial groups contribute to organic matter and nutrient cycling in modern and ancient environments. My primary research skills include expertise in analytical method development, mass spectrometry, isotope ratio mass spectrometry, and microbiology/molecular biology techniques, including the culturing of microorganisms.

## CURRENT APPOINTMENT

---

**2015 - Postdoctoral Fellow**, Department of Earth and Planetary Sciences, Harvard University  
Funded by NASA Exobiology (Grant awarded to A. Pearson and A.E. Allen, JCVI)  
Advisor: Ann Pearson, Professor of Environmental Sciences  
Topic: Isotopic analysis of nitrogen partitioning during chlorophyll biosynthesis in microalgae.

## EDUCATION

---

**2015 Ph.D. in Chemical Oceanography**, Scripps Institution of Oceanography, UCSD  
Funded by UCSD Cota-Robles fellowship, NSF GRFP fellowship  
Advisor: Lihini Aluwihare, Professor of Geosciences  
Thesis: Molecular signatures of microbial metabolism in the marine water column.

**2009 B.A.**, Ripon College, Ripon, WI  
Double major in Chemistry and Biology, *summa cum laude*

## PUBLICATIONS

---

- Kharbush, J.**, Smith, D., Powers, M., Vanderploeg, H.A., Fanslow, D., Robinson, R.L., Dick, G.J., and Pearson, A. "Chlorophyll nitrogen isotope values track taxonomic shifts in a natural phytoplankton community in Lake Erie." 2019. *Organic Geochemistry* 128: 71-77. doi: <https://doi.org/10.1016/j.orggeochem.2018.12.006>
- Kharbush, J.**, Thompson, L., Haroon, F., Knight, R. and Aluwihare, L. "Hopanoid-producing bacteria in the Red Sea include the major marine nitrite-oxidizers." 2018. *FEMS Microbiology Ecology* 94(6): fiy063.
- Kharbush, J.**, Allen, A.E., Moustafa, A., Dorrestein, P., and Aluwihare, L. 2016. "Intact polar diacylglycerol biomarker lipids isolated from suspended particulate organic matter accumulating in an ultraoligotrophic water column." *Organic Geochemistry* 100: 29-41.
- Wang, M., Carver, J.J., Phelan, V.V., Sanchez, L.M [and 123 others, including **Kharbush, J.**], 2016. "Sharing and community curation of mass spectrometry data with Global Natural Products Social Molecular Networking." *Nature Biotechnology* 34: 828-837.

## Publications, continued

5. **Kharbush, J.**, Kejriwal, K. and Aluwihare, L. 2016. "Distribution and abundance of hopanoid producers in low oxygen environments of the Eastern Pacific Ocean." *Microbial Ecology* 71(2): 401-8.
6. **Kharbush, J.**, Ugalde, J., Hogle, S., Allen, E., and Aluwihare, L. 2013. "Composite bacterial hopanoids and their microbial producers across oxygen gradients in the water column of the California Current." *Applied and Environmental Microbiology*. 79 (23): 7491-7501.

## PRESENTATIONS

---

### Talks

- Invited:* "Nitrogen isotope signatures of phytoplankton biomarkers: connecting intracellular metabolites to large-scale biogeochemical trends." William T. Smith Lecture, Dept. of Earth and Environmental Sciences at the University of Michigan, Ann Arbor, MI (2018)
- Invited:* "Nitrogen isotope fractionation patterns of chlorophyll track taxonomic shifts in a natural phytoplankton community." Goldschmidt, Boston, MA (2018)
- "Nitrogen isotope fractionation patterns of chlorophyll in a natural phytoplankton community." Ocean Sciences Meeting, Portland, OR (2018)
- "Investigating the biosynthetic basis of nitrogen isotopic fractionation during chlorophyll biosynthesis in microalgae." EPS Graduate Student/Post Doc Seminar, Harvard University, Cambridge, MA (2017)
- "Low-oxygen marine environments as "hot-spots" of microbial hopanoid production." Southern California Annual Geobiology Conference, Los Angeles, CA (2014)

### Posters

- "Isotopic analysis of nitrogen partitioning during chlorophyll biosynthesis in microalgae," Gordon Research Conference of Chemical Oceanography, New London, NH (2017)
- "Microbial contribution to suspended particulate organic matter accumulating in an ultra oligotrophic water column investigated using intact polar diacylglycerol biomarker lipids." Ocean Sciences Meeting, New Orleans, LA (2016)
- "Low-oxygen marine environments as potential "hot-spots" of microbial hopanoid production." Ocean Sciences Meeting, Honolulu, HI (2014).
- "Exploring the structural diversity of composite bacterial hopanoids across oxygen gradients in the water column of the Santa Barbara Basin." Gordon Research Conference of Organic Geochemistry. Holderness, NH (2012).

## TEACHING and MENTORING EXPERIENCE

---

### Instructor

Microbial Oceanography, UCSD Academic Connections Program, UCSD (2014)

Designed and taught 3-week pre-college course, including lectures, labs, and local field trips. 15 high school students.

### Teaching Assistant

Led weekly lab and discussion sections; developed activities to foster student participation; provided feedback on problem sets and writing assignments; organized review sessions; advised students during office hours.

Energy and the Environment (2019), **Harvard University, Cambridge, MA.** 90 undergraduate students.

The Fluid Earth (2016, 2018), **Harvard University, Cambridge, MA.** 15-20 undergraduate students.

Marine Microbiology, (2015) **University of California San Diego, San Diego, CA.** 35 undergraduate students.

### **Pedagogical Training**

#### **Graduate of UCSD Center for Teaching Development's "The College Classroom" (2014)**

Part of the "Preparing Future Practitioners" series that provides seminars and training in modern educational practice to future college instructors, with curricula developed by the NSF-funded Center for the Integration of Research, Teaching and Learning (CIRTL) Network program.

### **Mentoring**

Mentored 5 undergraduate students at UCSD, and three undergraduate students at Harvard. Also mentored one high school student at Harvard.

Mentor, Harvard Graduate Women in Science and Engineering (HGWISE), 3 Harvard graduate students.

## **FELLOWSHIPS and AWARDS**

---

### **Fellowships**

UCSD Cota-Robles graduate fellowship, NSF Graduate Research Fellowship (2009-15)

### **Awards**

Harvard University Bok Center Certificate of Distinction in Teaching Award (2016, 2018)

UCSD Chancellor's Dissertation Award (2016)

SIO Graduate Student Excellence Award (2014)

Edna Bailey Sussman Fund Internship Award (2014)

## **FIELD EXPERIENCE**

---

- 2012** *R/V Revelle* - "Microbial Oceanography of the Tonga Trench (MOTT)"  
Multi-station student-led cruise in South Pacific (6 days). Co-chief scientist, carried out all planning and sampling efforts. Sampled POM from several depths up to 5000m using *in situ* large volume pumps for analysis of microbial community diversity and intact polar lipid distribution. Deployment of free-falling landers to sample sediments at abyssal depths.
- 2010** *R/V Melville*- "Cal-ECHOES"  
Student-led cruise to Santa Barbara Basin, CA (9 days). Sampled POM throughout water column including anoxic layers using *in situ* large volume pumps, for analysis of microbial community composition and hopanoid lipid structural diversity.
- 2010** *SSV Corwith Cramer*- Sea Education Association North Atlantic Plastics Expedition Multi-station cruise from Bermuda to the center of the Sargasso Sea and back (35 days). Surface sampling to collect, categorize, and quantify plastic pollution in the Sargasso Sea.

## PROFESSIONAL SERVICE

---

### Outreach

- 2011-13**     **Graduate Advocate, UCSD STARs Program** (Summer Training Academy for Research in the Sciences). Mentor and liaison for underrepresented undergraduate students. Provided feedback on NSF-GRFP fellowship applications prepared by students.
- 2011-15**     **Member of Scripps Community Outreach Program for Education (SCOPE).** Led tours of lab and oceanographic facilities at Scripps, conducted workshops in local elementary and middle school classrooms.
- 2017-**         **Founding member of Inclusion and Diversity in Earth Science (IDEaS)**  
A new initiative in the Harvard Earth and Planetary Sciences Department that aims to improve the representation of women and minorities in the department and in the field as a whole. IDEaS will host educational events and discussions, and work to promote the science of visible minorities at department seminars.
- 2018-**         **Committee member, EPS-ESE Diversity, Inclusion, and Belonging Committee**  
A new standing committee consisting of an equal balance of faculty, grad students, staff, and post-docs, officially charged with collecting community-sourced concerns; leading community-wide events around issues of diversity, inclusion and belonging; and advising the department Chairs on possible actions.

### Affiliations

American Society of Microbiology (ASM), American Society of Limnology and Oceanography (ASLO), The Oceanography Society (TOS), Geochemical Society (GS)