

# Elaine Luo

Weston Howland Jr. Postdoctoral Scholar  
Woods Hole Oceanographic Institution  
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## EDUCATION

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- 2020      **PhD** in Marine Biology  
*University of Hawai'i*, Honolulu, USA  
“Viral diversity and dynamics in the open ocean”, mentor: Edward DeLong
- 2014      **Honors BSc** with High Distinction (eq. summa cum laude)  
*University of Toronto*, Toronto, Canada  
Ecology and Evolutionary Biology Specialist (eq. to double major)

## PEER-REVIEWED PUBLICATIONS

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\* co-first authors

### *in review*

12. Hackl T, Trigodet F, Eren M, Biller S, Eppley J, **Luo E**, Burger A, DeLong E, Fischer M.  
proofframe: frameshift-correction for long-read (meta)genomics.

### *in revision*

11. Linney M, Eppley J, Romano A, **Luo E**, DeLong E, Karl D. Microbial sources of exocellular DNA in the ocean.

10. Hackl T, Laurenceau R, Ankenbrand M, Bliem C, Cariani Z, Thomas E, Dooley K, Arellano A, Hogle S, Berube P, Leventhal G, **Luo E**, et al. Novel integrative elements and genomic plasticity in ocean ecosystems.

### *in press*

9. **Luo E**, Leu A, Eppley J, Karl D, DeLong E. Diversity and origins of bacterial and archaeal viruses on sinking particles reaching the abyssal open ocean. *ISME Journal*

### *published*

8. **Luo E**, Eppley J, Romano A, Mende D, DeLong E. 2020. Virioplankton population dynamics and reproductive strategies in the oligotrophic open ocean water column. *ISME Journal* 14: 1304–1315
7. Beaulaurier J,\* **Luo E\***, Eppley J\*, Den Uyl P, Dai X, Turner D, Pendelton M, Juul S, Harrington E, DeLong E. 2020. Assembly-free single-molecule sequencing recovers complete virus genomes from natural microbial communities. *Genome Research* 30(3): 437–446
6. Coenen A\*, Hu S\*, **Luo E\***, Muratore D\*, Weitz J. 2020. A primer for microbiome time-series analysis. *Frontiers in Genetics* 11: 310

5. McMullen A\*, **Luo E\***, Martinez-Hernandez F, Tominaga K, Ogata H, Yoshida T, DeLong E, Martinez-Garcia M. 2020. Diel cycling of the cosmopolitan abundant Pelagibacter virus 37-F6: one of the most abundant viruses on Earth. *Environmental Microbiology Reports* 12(2): 214-219
4. **Luo E**, Aylward F, Mende D, DeLong E. 2017. Bacteriophage distributions and temporal variability in the ocean's interior. *mBio* 8(6): 01903-17
3. Wheeler J, **Luo E**, Helfrich K, Anderson E, Starczak V, Mullineaux L. 2017. Light stimulates swimming behavior of larval eastern oysters (*Crassostrea virginica*) in turbulent flow. *Marine Ecology Progress Series* 571: 109-120
2. Dutton EM, **Luo E**, Cembrowski A, Shore J, Frederickson M. 2016. Three's a crowd: trade-offs between attracting pollinators and ant bodyguards with nectar rewards in *Turnera*. *The American Naturalist* 188(1): 38-51
1. **Luo E**, Ogilvie J, Thomson J. 2014. Stimulation of flower nectar replenishment by removal: A survey of eleven animal-pollinated plant species. *Journal of Pollination Ecology* 12(7): 52-62

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#### SELECTED RESEARCH APPOINTMENTS

\* acquired independent research funding

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|---------|---|
| 2021-   | <b>Weston Howland Jr. Postdoctoral Scholar*</b><br>Mentor: Julie Huber, <i>Woods Hole Oceanographic Institution</i> , Woods Hole, USA<br>Viral diversity and productivity near deep-sea hydrothermal vents          |
| 2020-21 | <b>Postdoctoral scholar</b><br>Mentor: Edward DeLong, <i>University of Hawai'i</i> , Honolulu, USA<br>Molecular inventory of viral particles; diversity and prevalence of viral parasites                           |
| 2015-20 | <b>Graduate research assistant*</b><br>Mentor: Edward DeLong, <i>University of Hawai'i</i> , Honolulu, USA<br>Viral diversity, dynamics, and export in the open ocean   |
| 2014    | <b>Guest student research fellow</b><br>Mentor: Matt Johnson, <i>Woods Hole Oceanographic Institution</i> , Woods Hole, USA<br>Effect of cell-cell interactions on heat-stressed dinoflagellate <i>Symbiodinium</i> |
| 2013-14 | <b>Honors BSc independent project</b><br>Mentor: Megan Frederickson, <i>University of Toronto</i> , Toronto, Canada<br>Trade-offs in multiple mutualistic interactions in ant-plant-pollinator systems              |
| 2013    | <b>Summer Student Fellow*</b><br>Mentor: Lauren Mullineaux, <i>Woods Hole Oceanographic Institution</i> , Woods Hole, USA<br>Quantifying larval swimming behavior using particle image velocimetry                  |
| 2012    | <b>NSERC-USRA scholar*</b><br><i>Toronto and Region Conservation Authority</i> , Toronto, Canada<br>Habitat connectivity in Toronto river systems   |

2011 **Independent student scholar\***  
 Mentor: James Thomson, *University of Toronto*, Toronto, Canada  
 & *Rocky Mountain Biological Laboratory*, Crested Butte, USA  
 Removal-enhanced nectar replenishment in Colorado wildflowers

**RESEARCH GRANTS AND SCHOLARSHIPS** open to **(I)** institutional **(N)** national **(Int)** international  
 total awarded ~\$398 285

2021-23	<b>(Int) Weston Howland Jr. Postdoctoral Scholarship</b> <i>Woods Hole Oceanographic Institution</i>	\$105 875
2016-19	<b>(N) Postgraduate Scholarship</b> <i>Natural Sciences and Engineering Research Council of Canada</i> Canadian equivalent of US NSF-GRFP	\$63 000
2018	<b>(Int) Travel Award for Young Scientists</b> <i>International Society for Microbial Ecology</i>	\$910
2016-18	<b>(I) Sea Grant</b> , graduate student co-author <i>University of Hawai'i</i>	\$168 000
2015	<b>(I) Exploration Fund Grant</b> <i>Explorer's Club</i>	\$1500
2015	<b>(I) Edmondson Research Grant</b> <i>University of Hawai'i</i>	\$2000
2014	<b>(N) Canadian Graduate Scholarship</b> \$17 500, declined, untenable internationally <i>Natural Sciences and Engineering Research Council of Canada</i> Canadian equivalent of one year of US NSF-GRFP	
2014	<b>(I) Margaret Addison Scholarship</b> <i>University of Toronto</i> Awarded biennially to one student to pursue graduate research internationally	\$5000
2013	<b>(Int) Travel Award</b> <i>Woods Hole Oceanographic Institution</i> 3/~30 Summer Student Fellows nominated to present work at conference of choice	~\$2500
2013	<b>(Int) Summer Student Fellowship</b> <i>Woods Hole Oceanographic Institution</i>	~\$9000
2012-13	2x <b>(N) Undergraduate Student Research Award</b> <i>Natural Sciences and Engineering Research Council of Canada</i> Canadian equivalent of US NSF-REU	\$9000

2012	<b>(I) Center for Global Change Sciences Research Award</b> \$8000, declined for above <i>University of Toronto</i>	
2012	<b>(I) Walter and Mary Tuohy Award for Field Research</b> <i>University of Toronto</i>	\$2000
2012	<b>(I) Milne Research Award</b> <i>University of Toronto</i>	\$2000
2011	<b>(I) International Research Experience Award</b> <i>University of Toronto</i>	\$2000

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#### SELECTED AWARDS AND SCHOLARSHIPS

**(M)** merit **(F)** financial need **(L)** leadership

2015-20	4x <b>(M)</b> Graduate Student Organization Award, <i>University of Hawai'i</i>
2019	<b>(M)</b> Maile Mentorship Bridge Program Award, <i>University of Hawai'i</i>
2019	<b>(M)</b> Best Poster Award, <i>FEMS Microbiology, Gordon Research Conference</i>
2010-14	4x <b>(M)</b> Dean's List Scholar, <i>University of Toronto</i>
2014	<b>(MF)</b> Hosinec Family Scholarship, <i>University of Toronto</i>
2013	<b>(MF)</b> James Bruce Falls Scholarship in Ecology and Evolutionary Biology
2013-14	2x <b>(ML)</b> Regents Scholarship, <i>University of Toronto</i>
2012-13	2x <b>(M)</b> McCuaig Muriel Memorial Scholarship in French, <i>University of Toronto</i>
2012	<b>(MF)</b> J.R. Dymond Memorial Award, <i>University of Toronto</i>
2011	<b>(MF)</b> Tsui Jenny and Frank Award, <i>University of Toronto</i>
2010	<b>(M)</b> Ontario Scholar Award

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#### TEACHING, MENTORING, AND OUTREACH

2021	<b>Science panelist</b> for high school students <i>BETA camp</i>
2015-19	<b>Mentor</b> for local Hawai'i students transferring from Kapi'olani Community College Maile mentoring bridge, Global and Environmental Sciences <i>University of Hawai'i</i>
2016	<b>Volunteer</b> for K-12 outreach on ocean microbes School of Oceanography, Earth Science, and Technology Open House <i>University of Hawai'i</i>
2015	<b>Mentor</b> in the Honolulu District Science Fair High school mentee won the agency's Junior Stockholm award and Best in Category
2014	<b>Instructor</b> for Genetics Laboratory BIOL 375 L Teaching laboratory techniques in genetics to upper-year undergraduates <i>University of Hawai'i</i>

- 2014      **Mentor** for undergraduate students in the Frederickson lab  
Training ~5 undergraduate students in experimental data collection  
*University of Toronto*
- 2013      **Science blog writer**, WHOI through the perspective of a Summer Student Fellow  
www.whoissf2013.wordpress.com  
*Woods Hole Oceanographic Institution*
- 2012-13    **Mentor** for undergraduate student researchers  
Research Opportunity Program, *University of Toronto*
- 2011-14    **Tutor** for undergraduate students in biology, mathematics, and statistics  
*University of Toronto*
- 2011-14    **Community outreach and reading mentor** for low-income communities  
Ideas for the World, *University of Toronto*

#### **LEADERSHIP AND SERVICE**

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- 2021-      **Marine Chemistry & Geochemistry representative**  
Postdoctoral Association, *Woods Hole Oceanographic Institution*
- 2019      **Early Career Scientist inaugural meeting organizer**  
Simons Collaborations on Ocean Processes and Ecology, *Simons Foundation*
- 2017-19    **Graduate program representative** for reviewing grant funding proposals  
Graduate Student Organization, *University of Hawai'i*
- 2012-14    **Co-President** for departmental student organization  
Ecology and Evolutionary Biology, *University of Toronto*
- 2011-12    **Secretary** for departmental student organization  
Ecology and Evolutionary Biology, *University of Toronto*

*Ad hoc* peer-reviewer for journals: PeerJ, mSystems, Microbiome

#### **SELECTED RESEARCH PRESENTATIONS**

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\* award

- Luo E\***, Eppley J, Romano A, Mende D, DeLong E. 2019. Viral population dynamics and reproductive strategy in the open oceans. *Applied and Environmental Microbiology Gordon Research Seminar and Conference*, South Hadley, USA
- Luo E**, Eppley J, Mende R, DeLong E. 2018. Spatiotemporal dynamics of bacteriophages and their hosts in the North Pacific Subtropical Gyre. *International Society for Microbial Ecology Symposium*, Leipzig, Germany

- Luo E**, Aylward F, Eppley J, DeLong E. 2018. Bacteriophage distributions in the ocean's interior. *Ocean Sciences Meeting*, Portland, USA
- Luo E**, Aylward F, Eppley J, Romano A, DeLong E. 2017. Depth structure and function of marine bacteriophage in the North Pacific Subtropical Gyre. *ASLO Meeting*, Honolulu, USA
- Luo E**, Dutton E, Cembrowski A, Frederickson M. 2014. Multiple mutualistic interactions: regulation of two mutualistic rewards. *Ecology and Evolutionary Biology Symposium*, Toronto, Canada
- Luo E**, Wheeler J, Helfrich K, Anderson E, Mullineaux L. 2014. Effects of light and turbulence on swimming behavior of larval eastern oysters (*Crassostrea virginica*). *Ocean Sciences Meeting*, Honolulu, USA
- Luo E**, Ogilvie J, Thomson J. 2013. Nectar replenishment in wildflowers of Colorado. *Ontario Ecology, Ethology, and Evolution Colloquium*, London, Canada

## ACADEMIC SOCIETIES

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- 2021- Society for Women in Marine Sciences (SWMS)  
 2018- International Society for Microbial Ecology (ISME)  
 2013- Association for the Sciences of Limnology and Oceanography (ASLO)

## PROFESSIONAL SKILLS

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- Computing Linux bash, Slurm, Python, R, Matlab, HTML, SAS, ArcGIS, ImageJ
- Laboratory DNA/RNA: collection, extraction, sequencing  
 PCR: standard, quantitative, digital drop  
 microscopy: epifluorescence, electron
- Sea 2016 Hawaii Ocean Time-series cruise 282  
 2016 Simons Collaboration in Ocean Processes and Ecology dipole cruise  
 2019 Hawaii Ocean Time-series cruise 312
- Culturing Plants, fish, marine invertebrates, microbes
- Certifications AAUS scientific diver, NAUI master diver, nitrox, rescue diver, CPR, first aid
- Languages fluent English  
 intermediate Chinese  
 elementary French