

# SHUZHE “Jerry” GUAN

*Ph.D. Candidate*

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## EDUCATION

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- 2022-present **Harvard University, Cambridge, MA**  
Doctor of Philosophy in Organismic & Evolutionary Biology  
Thesis Advisor(s): James Mallet (supervisor), Scott Edwards (committee chair),  
David Reich, Daniel Hartl
- 2019-2022 **Columbia University, New York, NY**  
Master of Arts in Ecology, Evolution and Environmental Biology  
Thesis Advisor(s): Dustin Rubenstein (supervisor), Molly Przeworski, Deren  
Eaton
- 2015-2019 **University of California San Diego, La Jolla, CA**  
Bachelor of Science with double major in Marine Biology (*cum Laude*) &  
Environmental System (Evolution, Behavior & Ecology Track) (*cum Laude*)  
Thesis Advisor(s): Lisa A. Levin

## HONORS, AWARDS & GRANTS

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- 2022 Distinguished Scholar (¥100,000 CNY ≈ \$15,000 USD), Yongxin  
Educational Foundation, China
- 2020-2021 E3B Travel Grant (\$1500 USD), Columbia University
- 2019 Outstanding Undergraduate Thesis Poster Award, UCSD
- 2015-2019 Provost’s Honor List, Revelle College, UCSD

## PUBLICATIONS

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### *Accepted*

Oliver S. Ashford, **Shuzhe Guan**, Dante Capone, Katherine Rigney, Katelynn Rowley, Erik Cordes, Jorge Cortés, Greg W. Rouse, Guillermo F. Mendoza, Andrew K. Sweetman, Lisa A. Levin. 2021. Relationships between biodiversity and ecosystem functioning proxies strengthen when approaching chemosynthetic deep-sea methane seeps. ***Proceedings of the Royal Society B— Biological Sciences***

Oliver S. Ashford, **Shuzhe Guan**, Dante C., Katherine R., Katelynn R., Victoria O., S.W. Mullin, K.S. Dawson, Jorge C., G.W. Rouse, G.F. Mendoza, Raymond W.L., L.A. Levin. 2021.

A chemosynthetic ecotone- ‘chemotone’ - in the sediments surrounding deep-sea methane seep.

**Limnology and Oceanography**

***Submitted***

Fernando Seixas, **Shuzhe Guan** et al. Ancient inversion polymorphisms are locally adaptive in a widespread butterfly species

***In prep***

**Shuzhe Guan** et al. Investigating the genomic architecture including a large chromosomal inversion region of the connecting population between two locally adapted burying beetle populations

**Shuzhe Guan** & G.W. Rouse. Resolve the phylogeny of squat lobster complex with a focus on *Pleuroncodes planipes* and *P. monodon*.

## TEACHING

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- Spring 2025    **Population Genetics** (OEB 242), with Dan Hartl & Michael Desai, Harvard University
- Fall 2024     **Coalescent Theory** (OEB 252), with John Wakeley, Harvard University
- Fall 2023     **Genome Analysis, Ecology and Evolution** (OEB 125), with Scott Edwards, Harvard University

## RESEARCH

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- 2024-present    **Research Project — Harvard University**  
Aim to understand the impact of bidirectional gene flow as compared to unidirectional gene flow in genomic inference with a focus on full likelihood models
- 2022-present    **Ph.D. Research — Mallet Lab, Harvard University**  
Aim to understand the population structure and dynamics of a pair of putatively coevolving *Heliconius* butterfly species
- 2019-2022     **MA Thesis — Rubenstein Lab, Columbia University**  
Investigating how a chromosomal inversion region, which is speculated to underpin the locally adapted photoperiodism, is developed, maintained and distributed in Asian burying beetle (*Nicrophorus nepalensis*) populations in Taiwan; understanding the population dynamics of a connecting population between two locally adapted populations, using a combination of phenotyp data and genomic data collected through spatial and temporal gradients
- Summer 2019    **Field Assistant — Shen Lab, Academia Sinica, Taiwan**  
Set up traps and iButton devices among mountains in Sichuan to record ambient temperatures and to collect burying beetle specimens as part of a project assessing their natural photoperiodism; set up experimental devices with cameras

to understand the intensity of interspecific competition over rat corpses between burying beetles and blowflies

- 2018-2019 **Independent Research — Levin Lab, UCSD**  
Identified macrofauna assemblage including Polychaeta, Crustacean and Mollusca collected from benthic sediments in East Pacific off Costa Rica; investigated the linkage between ecosystem functioning and a variety of biodiversity metrics, and how the linkage shifts with seep activity
- 2018-2019 **Independent Research — Rouse Lab, UCSD**  
Reconstructed the phylogeny of squat lobster complex using 16S and CO1 data; focused on the relationship between two tuna crab species, *P. planipes* and *P. monodon* using additional morphological data
- Summer 2018 **Intern — The First Institute of Oceanography in China, China**  
Extracted DNA from deep ocean sediment samples from Western Pacific, Yap Trench; analyzed biodiversity of the environment by applying metagenomic analysis
- 2017-2018 **Volunteer — Shurin Lab, UCSD**  
Maintained and censused the lab-strain copepods on a weekly basis; helped implement and investigate the influences of food variation, selective harvest, and nauplii removal on copepod population dynamics

## PRESENTATIONS & POSTERS

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O.S. Ashford, **Shuzhe Guan**, Dante C., Katherine R., Katelynn R., Victoria O., S.W. Mullin, K.S. Dawson, Jorge C., G.W. Rouse, G.F. Mendoza, Raymond W.L., L.A. Levin.  
A chemosynthetic ecotone- ‘chemotone’- surrounds deep-sea methane seep, eDeep-Sea Biology Society Conference, Online, Aug 20, 2020

Oliver S. Ashford, Guillermo F. Mendoza, Dante Capone, **Shuzhe Guan**, et. al. Do biodiversity–ecosystem functioning relationships shift across methane seepage gradients? 15th Deep-Sea Biology Symposium, Monterey CA, Sep 14, 2019

**Shuzhe Guan**, Oliver S. Ashford, L. A. Levin. Unravel the relationships between Costa Rican methane seep assemblages and their physical environments, Environmental System Symposium, UCSD, La Jolla CA, May 29, 2019

## RESEARCH SKILLS

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### *Analysis*

Programming — R, Python, Bash & Java

Bioinformatics — Curation and configuration of whole genome sequencing (WGS) datasets; classic population genetic statistics and phylogenetics; advanced demographic inference including

coalescent-based methods that leverage the power of WGS. e.g., Pairwise Sequential Markovian Coalescent (PSMC), Multi-Species Coalescent (MSC), and Ancestral Recombination Graph (ARG); demographic simulation of genomes; graphic representation of genome alignment, (Pangenome) *learning in progress*

Theoretical analysis — Probability theory, statistical inference, theoretical population genetics, and coalescent theory, stochastic models

Data Visualization — Tableau, Geographic Information System (GIS) & R

Graphic processing — ImageJ

### ***Field***

Wildlife trapping

Transect survey

Biological sampling

Behavioral observations & recordings

### ***Lab***

Maintenance of breeding of lab strain animals and plants

Common wet lab operation — Sample preparation, DNA extraction, electrophoresis, spectrophotometry

## **COMMUNITY ENGAGEMENT & PUBLIC OUTREACH**

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### ***Community Engagement***

2024-2025 **Departmental Representative — OEB, Harvard University**

Serving as the G3 representative to facilitate communication and engagement across the department. Duties include managing budget, organizing weekly happy hour for students and research associates, facilitating new student recruitment and student-faculty retreats

Fall 2024 **Panelist — Evolution Day at OEB, Harvard University**

Served as a panelist for aspiring high school students from Cambridge Rindge who wish to pursue a career in biological science

2024-present **Co-organizer — Evolution Discussion Club, OEB, Harvard University**

Co-founded and co-organizing a journal club that have a rotating theme under the umbrella of evolution each semester. The aim of this club is to facilitate scientific communication and collaboration across labs that are otherwise isolated and organismal-focused. The first two themes are tree thinking and phylogenetic inference

Fall 2023 **Co-organizer — Evolution Chalk Talk, Harvard University**

Co-organized a chalk talk series that features early-stage scholars who have research proposals or preliminary results that can benefit from peer discussion. This event is a miniature version of the Boston Evolutionary Genomics Supergroup, and is cross-departmental for all programs under life science

- Summer 2023 **Ph.D. Student Peer Mentor — NSF research experience for undergraduate (REU) program OEB, Harvard University**  
Served as a peer mentor for the cohort of REU students from historically underrepresented background whose home institutions do not have extensive research support. Duties include demystifying Ph.D. application, supervising research projects and advising on career development
- 2022-present **Ph.D. Student Peer Mentor — Qide Education, China**  
Serving as a peer mentor for those who completed their undergraduate education in China and wish to pursue graduate studies in the U.S. but are severely limited by information availability

### **Public Outreach**

- 2021-present **Guest Speaker — New Oriental Education, Online**  
Gave a series of information sessions about majoring in biology and the general life in the United States to Chinese high school and college students with a desire to study abroad in the U.S.
- 2018-present **Science Blogger — Zhihu (Chinese Equivalent of Quora)**  
Answering the questions related to evolution biology & ecology; dedicated to translating and interpreting scientific literature to the Chinese public in an entertaining yet scientifically authentic way
- 2020 **Independent Researcher — New Jersey Wild Safari**  
Started a project studying the frequency and nature of stereotypic behaviors in captive black bears and their potential consequences; made a sign introducing the findings to the public
- 2018 **Guest Speaker — Ocean University of China**  
Talked about the research culture and cutting-edge topics probed at the Scripps Institute of Oceanography
- 2017 **Guest Speaker — Shuangliu Middle School**  
Delivered a lecture on a common mistake made in taxonomy and its misleading nature for the public; addressed the importance of rigidity in scientific research and communication
- 2015 **Science Teacher — Winter Camp for Tibetan Pastoral Children in Elementary School, Lhasa**  
Educated children on basic biological, environmental & physiological knowledge, with a focus on human-induced climate change and human-wildlife conflict