Zeqian Li

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Education

- **University of Chicago** — United States
  Research assistant, Center for Physics of Evolving Systems — *Aug 2020 – current*
- **University of Illinois at Urbana-Champaign** — United States
  Ph.D in Physics candidate — *Aug 2018 – current*
- **Hong Kong Baptist University** — Hong Kong
  B.S in Physics (minor in Applied Mathematics) — *Sep 2014 – July 2018*

Publications

- **Closed microbial communities self-organize to persistently cycle carbon**
  Luis Miguel de Jesús Astacio*, Kaumudi H. Prabhakara*, **Zeqian Li**, Harry Mickalide, Seppe Kuehn
  Accepted, PNAS, 2021.

Research Experience

- **University of Chicago** — United States
  Supervisor: Seppe Kuehn — *Aug 2019 - current*
  - **Yellowstone hot spring microbial mats:** I am studying the model system Yellowstone hot spring microbial mats using a multi-omics dataset (metagenome, metatranscriptome and single-cell sequencing). Using pangenomics and custom omics tools, I am studying how environments shape microbial community structure and functions.
  - **Evolution of microbial metabolism:** In collaboratioin with Ahmed Selim, we are studying what are essential evolutionary determinants of microbial carbon metabolism using both experiments and computational tools (flux-balance analysis).
  - **Pathway splitting in denitrification:** I studied statistical structure of the denitrification pathway in microbial communites and how it was shaped by environments. We hypothesized that environmental pH is an essential determinant. With Kyle Krocker and Karna Gowda, we are performing experiments to test the hypothesis.
  - **Closed microbial communities:** I formulated how pressure change reflects microbial respiration and photosythesis, a crucial part in our closed microbial communities project (de Jesus Astacio et al., *PNAS* 2021). I also helped setting up experimental instruments.
- **Hong Kong Baptist University** — Hong Kong
  Supervisor: Changsong Zhou — *Jul 2016 - Jul 2018*

  I studied various biological systems (C. elegans development, C. elegans neural systems, biological neural networks) using theoretical and computational tools stem from statistical physics.

Honors and Rewards

- **Center for Physics of Living Cells (CPLC) Fellow** — UIUC, 2018-2020
- **HKSAR Government Scholarship** — Hong Kong, 2015-2018
- **Scholastic Award** — Hong Kong Baptist University, 2018

Others

- **ICTP Spring College on the Physics of Complex Systems (2018)** — ICTP, Triest, Italy
  Took five graduate courses with grade E (excellent).
- **Teaching experience**
  Teaching assistant for introductory physics courses in college and graduate school.

Skills

- **Experiments:** common microbiology lab operation and assays.
- **Bioinformatics:** common omics tools, 16s data analysis, metagenome data analysis.
- **Programming:** Python, Java, Javascript, C/C++, Matlab, Bash, LaTeX.