

# Jeffrey Chang

jeffrey\_chang@g.harvard.edu

Google Scholar

Personal Website

## Education

Ph.D. candidate in Physics, Harvard University 2020–  
B.S. in Physics, Stanford University (GPA: 4.03) 2016–'20

## Career

Graduate Researcher in Nicholas Polizzi's lab 2022–  
*Dana Farber Cancer Institute and Harvard Medical School*

- De novo protein design of ligand-binding proteins for single-molecule proteomics

Graduate Researcher in Wesley Wong's Lab 2021–'22  
*Wyss Institute, Boston Children's Hospital, and Harvard Medical School*

- Single-molecule force spectroscopy and Bayesian inference for polyclonal antibodies

Graduate Researcher in Michael Desai's lab 2020–'22  
*Harvard Dept. of Organismic and Evolutionary Biology*

- High-throughput measurements of antibody binding affinities with yeast display

Biophysics / Statistical Modeling Consultant 2020–  
*Manifold Biotechnologies, Inc.*

- Algorithmic development of a platform for multiplexed quantification of barcoded proteins

Undergraduate Researcher in Steven Boxer's lab 2017–'19  
*Stanford Dept. of Chemistry*

- X-ray crystallography to study photochemical pathways in fluorescent proteins

Software Engineering Intern 2017  
*Schrödinger, Inc.*

- Helped develop python GUI for protein structure visualization

## Teaching Assistant

Harvard Life Sciences 50: Integrated Science Winter 22-23

Harvard Applied Math 104: Complex and Fourier Analysis Autumn 21-22

Stanford Physics 216: Back of the Envelope Physics Autumn 19-20

Stanford Physics 63: Electricity, Magnetism, and Waves Winter 19-20

## Honors

Harvard NSF-Simons Center Quantitative Biology Student Award 2022

Harvard Dept. of Physics James Mills Peirce Fellowship 2020

National Science Foundation Graduate Research Fellowship 2020

Stanford Deans' Award for Academic Achievement 2020

Stanford Undergraduate Research and Advising Small Grant 2019

Stanford Bio-X Undergraduate Fellow 2018

## Skills

*Next-generation DNA sequencing.* Library preparation, data analysis

*Yeast display.* Library design, cloning, transformation, flow cytometry

*Biochemistry.* Protein expression and purification, UV-vis spectroscopy, X-ray crystallography

*Statistics.* Bayesian inference, machine learning

*Programming.* Python, C++, R

## Publications

★ = proudest works

### Serial femtosecond crystallography reveals that photoactivation in a fluorescent protein proceeds via the hula twist mechanism

A. Fadini, C.D.M. Hutchison, D. Morozov, [J. Chang](#), K. Maghlaoui, S. Perrett, F. Luo, J.C.X. Kho, M.G. Romei, R.M.L. Morgan, C.M. Orr, V. Cordon-Preciado, T. Fujiwara, N. Nuemket, T. Tosha, R. Tanaka, S. Owada, K. Tono, S. Iwata, S.G. Boxer, G. Groenhof, E. Nango, J. van Thor

*Journal of the American Chemical Society*, **145**, 29, 15796-15808 (2023). [[link](#)]

### ★ Resolving Molecular Heterogeneity with Single-Molecule Centrifugation

Y. Luo<sup>‡</sup>, [J. Chang](#)<sup>‡</sup>, D. Yang<sup>‡</sup>, J. S. Bryan IV, M. MacIsaac, S. Pressé, W. P. Wong

*Journal of the American Chemical Society*, **145**, 6, 3276-3282 (2023). [[link](#)]

### The landscape of antibody binding affinity in SARS-CoV-2 Omicron BA.1 evolution

A. Moulana<sup>‡</sup>, T. Dupic<sup>‡</sup>, A.M. Phillips<sup>‡</sup>, [J. Chang](#)<sup>‡</sup>, A.A. Roffler, A.J. Greaney, T.N. Starr, J.D. Bloom, M.M. Desai

*eLife*, **12**, e83442 (2023). [[link](#)]

### Torsional Diffusion for Molecular Conformer Generation

B. Jing<sup>‡</sup>, G. Corso<sup>‡</sup>, [J. Chang](#), R. Barzilay, T. Jaakkola

*Advances in Neural Information Processing Systems*, **35**, 24240-24258 (2022). [[link](#)]

### Compensatory epistasis maintains ACE2 affinity in SARS-CoV-2 Omicron BA.1

A. Moulana<sup>‡</sup>, T. Dupic<sup>‡</sup>, A.M. Phillips<sup>‡</sup>, [J. Chang](#)<sup>‡</sup>, S. Nieves, A.A. Roffler, A.J. Greaney, T.N. Starr, J.D. Bloom, M.M. Desai

*Nature Communications*, **13**, 7011 (2022). [[link](#)]

### Binding affinity landscapes constrain the evolution of broadly neutralizing anti-influenza antibodies

A.M. Phillips, K.R. Lawrence, A. Moulana, T. Dupic, [J. Chang](#), M.S. Johnson, I. Cvijovic, T. Mora, A.M. Walczak, M.M. Desai

*eLife*, **10**, e71393 (2021). [[link](#)]

### ★ Structural Evidence of Photoisomerization Pathways in Fluorescent Proteins

[J. Chang](#), M.G. Romei, S.G. Boxer

*Journal of the American Chemical Society*, **141**, 39, 15504-15508 (2019). [[link](#)]

## Books

### ★ Statistical Mechanics of Phases and Phase Transitions

Steven A. Kivelson, Jack M. Jiang, [Jeffrey Chang](#)

(Princeton University Press, 2024) [[website](#)]