

Gautam Reddy N.

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Employment and education

- 2024 - **Assistant Professor**, Department of Physics, Princeton University.
- 2021 - current **Research Scientist**, NTT Physics & Informatics Labs.
- 2021 - current **Associate**, Center for Brain Science, Harvard University.
- 2019 - 2021 **NSF-Simons Fellow**, NSF-Simons Center for the Mathematical & Statistical Analysis of Biology, Harvard University.
- June 2018 - **KITP Graduate Fellow**, Kavli Institute for Theoretical Physics, Santa Barbara.
Dec 2018
- 2013 - 2019 **Ph.D in Physics**, University of California San Diego.
- 2009 - 2013 **B.Tech in Engineering Physics with Honours**, Indian Institute of Technology, Bombay.

Selected publications and pre-prints

Full list available on Google Scholar.

* co-first author # corresponding author

1. W. Tong, A. Iyer, V. N. Murthy#, **G. Reddy#**, Adaptive algorithms for shaping behavior, bioRxiv: 2023.12.03.569774, 2023.
2. **G. Reddy#**, The mechanistic basis of data dependence and abrupt learning in an in-context classification task, arXiv: 2310.20141, 2023.
3. S. Petti*, **G. Reddy***, M. M. Desai, Inferring sparse structure in genotype-phenotype maps, *Genetics*, Vol. 225:1, 2023.
4. **G. Reddy#**, A reinforcement-based mechanism for discontinuous learning, **Proc. Nat. Acad. Sci.**, Vol. 119, No. 49, e2215352119, 2022.
5. N. Rigolli*, **G. Reddy***, A. Seminara, M. Vergassola, Alternation emerges as a multi-modal strategy for turbulent odor navigation, **eLife**, 11:e76989, 2022.
6. **G. Reddy**, V. N. Murthy, M. Vergassola, Olfactory sensing and navigation in turbulent environments, **Ann. Rev. of Cond. Matt. Phys.**, Vol. 13, 2022.
7. **G. Reddy**, B. I. Shraiman & M. Vergassola, Sector search strategies for odor trail tracking, **Proc. Nat. Acad. Sci.**, Vol. 119, No. 1 e2107431118, 2022.
8. **G. Reddy#**, L. Desban, H. Tanaka, J. Roussel & C. Wyart#, A lexical approach for identifying behavioral action sequences, **PLoS Computational Biology**, 18(1): e1009672, 2022.
9. **G. Reddy#** & M. M. Desai#, Global epistasis emerges from a generic model of a complex trait, **eLife**, 10:e64740, 2021.
10. **G. Reddy***, J. Wong Ng*, A. Celani, T. J. Sejnowski & M. Vergassola, Glider soaring via reinforcement learning in the field, **Nature**, Vol. 562, pp. 236-239, 2018.

11. **G. Reddy***, J. Zak*, M. Vergassola & V. Murthy, Antagonism in olfactory receptor neurons and its implications for the perception of odor mixtures, *eLife*, 7:e34958, 2018.
12. **G. Reddy**, A. Celani, T. J. Sejnowski & M. Vergassola, Learning to soar in turbulent environments, *Proc. Nat. Acad. Sci.*, 113-33:4877-4884, 2016.
13. **G. Reddy**, A. Celani & M. Vergassola, Infomax strategies for an optimal balance between exploration and exploitation, *J. Stat. Phys.*, 163:1454-1476, 2016.

Invited talks

- 2023 **KITP Deep Learning Program**, *Kavli Institute for Theoretical Physics*, Santa Barbara, CA.
- 2023 **MIT Physics of Living Systems Short Talk**, *Massachusetts Institute of Technology*, Cambridge, MA.
- 2023 **Neural Computation and Engineering Connection**, *University of Washington*, Seattle, WA.
- 2023 **Navigational Algorithms and Neural Circuit Computations Directing Olfactory Search Across Species**, *Janelia Research Campus*, Ashburn, VA.
- 2022 **Physics Colloquium**, *Bryn Mawr College*, Philadelphia, PA.
- 2022 **Reinforcement Learning @ Harvard Workshop**, *Harvard University*, Cambridge, MA.
- 2022 **MathBioSys Annual Meeting 2022**, *Simons Foundation*, New York, NY.
- 2022 **Physics Colloquium**, *Emory University*, Atlanta, GA.
- 2021 **UCLA Biophysics Seminar**, *University of California Los Angeles*, virtual.
- 2021 **eLife Computational and Systems Biology Symposium**, virtual.
- 2021 **Neurobiology Symposium**, *Duke University*, virtual.
- 2020 **Models, Inference and Algorithms**, *Broad Institute*, virtual.
- 2019 **QuantBio Workshop on Signal Processing & Integration in Complex Environments**, *Harvard University*, Cambridge, MA.
- 2018 **Center for Studies in Physics and Biology Seminar**, *Rockefeller University*, New York City, NY.
- 2018 **Harvard MathBio Symposium**, *Quantitative Biology Initiative*, Cambridge, MA.
- 2018 **Princeton CPBF Symposium**, *Center for Physics of Biological Function*, Princeton, NJ.
- 2018 **APS PhysicsNext: Machine Learning**, *American Physical Society*, Riverhead, Long Island, NY.
- 2016 **Inference Through the Lens of Physics Symposium**, *ITS, Graduate Center of CUNY*, New York City, New York, USA.

Service

Reviewer for *eLife*, *Current Biology*, *PLoS Computational Biology*, *Nature Communications*, *Physical Review E*, *Physical Review Research*, *Mathematical and Scientific Machine Learning*, *Physics Reports*, *Scientific Reports*, *Nature Machine Intelligence*, *Journal of Guidance Control and Dynamics*.