Subhaneil Lahiri

James H Clark Center, Rm. S245
318 Campus Drive
Stanford CA 94305

sulahiri at stanford.edu

Professional appointments

Ganguli Lab: Research Scientist, Jan. 2016 – present; Postdoctoral Scholar, Mar. 2012 – Jan. 2016.
Ginzton Laboratory, Stanford University, Stanford CA. Theoretical and computational Neurobiology.

Samuel Lab: Postdoctoral Fellow, Cambridge MA, Jul. 2009 – Aug. 2011, Harvard University.
Behavioral Neuroscience: Performing quantitative analysis of brain and behavior in the *Drosophila* larva.

Education

Harvard University, Cambridge MA: Ph.D., Physics, 2009.
Ph.D. Thesis: Black holes from fluid mechanics. Advisor: Shiraz Minwalla.

Tata Institute, Mumbai, India: Visiting student, Spring 2006 – Spring 2007. Research in theoretical physics.

Oxford University, Oxford, UK: M.Phys., 1st class honors, Merton college, 2003.
M.Phys. Project: Monte Carlo simulations of galactic heating.

Publications

[1] **S. Lahiri**, P. Gao, and S. Ganguli, "Random projections of random manifolds," `arXiv:1607.04331 [stat.ML]`.

[2] B. Poole, **S. Lahiri**, M. Raghu, J. Sohl-Dickstein, and S. Ganguli, "Exponential expressivity in deep neural networks through transient chaos," in *Adv. Neural Inf. Process. Syst. 29*, pp. 3360–3368. 2016. `arXiv:1606.05340 [stat.ML]`.

[3] **S. Lahiri**, J. Sohl-Dickstein, and S. Ganguli, "A universal tradeoff between power, precision and speed in physical communication," `arXiv:1603.07758 [cond-mat.stat-mech]`.

[4] T. B. Nguyen-Vu*, G. Q. Zhao*, **S. Lahiri***, R. R. Kimpo, H. Lee, S. Ganguli, C. J. Shatz, and J. L. Raymond, "A saturation hypothesis to explain both enhanced and impaired learning with enhanced plasticity," *eLife* **6** (Feb., 2017) e20147.

[5] **S. Lahiri** and S. Ganguli, "A memory frontier for complex synapses," in *Adv. Neural Inf. Process. Syst. 26*, pp. 1034–1042. 2013.

[6] M. Advani, **S. Lahiri**, and S. Ganguli, "Statistical mechanics of complex neural systems and high dimensional data," *J. Stat. Mech.* **2013** (Jan., 2013) P03014, `arXiv:1301.7115 [q-bio.NC]`.

[7] **S. Lahiri***, K. Shen*, M. Klein, A. Tang, E. Kane, M. Gershow, P. Garrity, and A. D. T. Samuel, "Two alternating motor programs drive navigation in *Drosophila* larva," *PLoS ONE* **6** (2011) e23180.

[8] J. Bhattacharya* and **S. Lahiri***, "Lumps of plasma in arbitrary dimensions," *JHEP* **1008** (2010) 073, `arXiv:0903.4734 [hep-th]`.

[9] S. Bhattacharyya*, **S. Lahiri***, R. Loganayagam*, and S. Minwalla*, "Large rotating AdS black holes from fluid mechanics," *JHEP* **09** (2008) 054, `arXiv:0708.1770 [hep-th]`.

[10] **S. Lahiri*** and S. Minwalla*, "Plasmarings as dual black rings," *JHEP* **05** (2008) 001, `arXiv:0705.3404 [hep-th]`.

[11] I. Biswas*, D. Gaiotto*, **S. Lahiri***, and S. Minwalla*, "Supersymmetric states of $\mathcal{N} = 4$ Yang-Mills from giant gravitons," *JHEP* **12** (2007) 006, `arXiv:hep-th/0606087`.

* Equal contribution.

Awards and Fellowships

Highest rated abstract out of ∼500 submissions (Computational and Systems Neuroscience, Feb. 2014).

Winner of the Neural Information Processing Systems Outstanding Paper Award, given to 3 papers out of 1420 submissions (Neural Information Processing Systems, Dec. 2013).

Stanford Bio-X Genentech Fellowship (Stanford University, Stanford CA, 2013).

Certificate of distinction in teaching (Harvard University, Cambridge MA, Spring 2008).

Vineer Bhansali Graduate Travel Fellowship (Harvard University, Cambridge MA, 2006).

James Mills Pierce Fellowship (Harvard University, Cambridge MA, 2003).

Scott Prize for best performance in M.Phys. examination (Oxford University, Oxford, UK, 2003).

Conference presentations

Neural Information Processing Systems (NIPS): Barcelona, Spain. Dec 5-10, 2016 .
Poster: "Exponential expressivity in deep neural networks through transient chaos", with B. Poole, M. Raghu, J. Sohl-Dickstein, S. Ganguli.

Computational and Systems Neuroscience (Cosyne): Salt Lake City UT. February 25-28, 2016.
Talk: "Optimal synaptic strategies for different timescales of memory", with S. Ganguli.
Poster: "A universal tradeoff between energy, speed and precision in neural communication", with J. Sohl-Dickstein, S. Ganguli.

Computational and Systems Neuroscience (Cosyne): Salt Lake City UT. February 27 - March 2, 2014.
Talk: "Modeling enhanced and impaired learning with enhanced plasticity", with T.D.B. Nguyen-Vu, G.Q. Zhao, A. Suvrathan, H. Lee, S. Ganguli, C.J. Shatz, J.L. Raymond.

Neural Information Processing Systems (NIPS): Lake Tahoe NV. Dec 5-8, 2013 .
Poster: "A memory frontier for complex synapses", with S. Ganguli.

Sloan-Swartz Centers Annual Meeting: Brandeis University, Waltham MA. July 26-28, 2013.
Talk: "Understanding impaired learning with enhanced plasticity", with T.D.B. Nguyen-Vu, G.Q. Zhao, A. Suvrathan, H. Lee, S. Ganguli, C.J. Shatz, J.L. Raymond.

Computational and Systems Neuroscience (Cosyne): Salt Lake City UT. February 28 - March 3, 2013.
Poster: "A general theory of learning and memory with complex synapses", with S. Ganguli.

Sloan-Swartz Centers Annual Meeting: UC San Diego, La Jolla CA. June 27-29, 2012.
Poster: "Learning and memory with complex synapses", with S. Ganguli.

1st Asian Winter School on String Theory: KIAS, Seoul, S. Korea. January 8–19, 2007.
Talk: "Giant gravitons and the supersymmetric states of $\mathcal{N} = 4$ Yang-Mills", with I. Biswas, D. Gaiotto, S. Minwalla.

Teaching experience

SERC School Tutor: Taught at an intensive school in high energy theoretical physics for graduate students in India (Hyderabad University, Hyderabad, India, 2007).

Harvard University Teaching Fellow: Taught physics classes for undergraduates in physics and other departments (Harvard University, Cambridge MA, Fall 2004 – Fall 2005, Spring 2008 – Fall 2010).

Harvard Summer Teaching Fellow: Taught physics daily to high school students and undergraduates from various colleges (Harvard University, Cambridge MA, 2005).