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Subhaneil Lahiri

Professional appointments

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

Samuel Lab: Postdoctoral Fellow, Jul. 2009 – Aug. 2011, Harvard University, Cambridge MA, USA. Behavioural Neuroscience: Performing quantitative analysis of brain and behaviour in larval *Drosophila*.

Education

Harvard University, Cambridge MA, USA: 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 honours, Merton college, 2003.
M.Phys. Project: Monte Carlo simulations of galactic heating.

Publications

SE Harvey, **S Lahiri** and S Ganguli, 'A universal energy accuracy tradeoff in nonequilibrium cellular sensing', `arXiv:2002.10567 [physics.bio-ph]`, (Feb. 2020).

EM Trautmann, SD Stavisky, **S Lahiri**, KC Ames, MT Kaufman, DJ O'Shea, S Vyas, X Sun, SI Ryu, S Ganguli and KV Shenoy, 'Accurate Estimation of Neural Population Dynamics without Spike Sorting', *Neuron* **103**.2, 292–308.e4, (June 2019). `bioRxiv:229252`.

S Lahiri, P Gao and S Ganguli, 'Random projections of random manifolds', `arXiv:1607.04331 [stat.ML]`, (July 2016).

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]`, (2016).

TDB Nguyen-Vu*, GQ Zhao*, **S Lahiri***, RR Kimpo, H Lee, S Ganguli, CJ Shatz and JL Raymond, 'A saturation hypothesis to explain both enhanced and impaired learning with enhanced plasticity', *eLife* **6**, e20147, (Feb. 2017).

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. (Dec. 2016). `arXiv:1606.05340 [stat.ML]`.

S Lahiri and S Ganguli, 'A memory frontier for complex synapses', in: *Adv. Neural Inf. Process. Syst.* **26**, pp. 1034–1042. (2013).

M Advani, **S Lahiri** and S Ganguli, 'Statistical mechanics of complex neural systems and high dimensional data', *J. Stat. Mech.* **2013**.03, P03014, (Jan. 2013). `arXiv:1301.7115 [q-bio.NC]`.

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

J Bhattacharya* and **S Lahiri***, 'Lumps of plasma in arbitrary dimensions', *JHEP* **2010**.08, 073, (2010). `arXiv:0903.4734 [hep-th]`.

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

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

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

* Equal contribution.

Awards and Fellowships

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

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, USA, 2013).

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

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

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

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

Conference presentations

Computational and Systems Neuroscience (Cosyne, Lisbon, Portugal, 28th Feb.–3rd Mar. 2019).
Poster: 'Accurate estimation of neural population dynamics without spike sorting',
by **S Lahiri**, EM Trautmann, SD Stavisky, KC Ames, MT Kaufman, DJ O'Shea, S Vyas, X Sun, SI Ryu, S Ganguli and KV Shenoy.

Neural Information Processing Systems (NeurIPS, Barcelona, Spain, 5th–10th Dec. 2016).
Poster: 'Exponential expressivity in deep neural networks through transient chaos',
by B Poole, **S Lahiri**, M Raghu, J Sohl-Dickstein and S Ganguli.

Computational and Systems Neuroscience (Cosyne, Salt Lake City, UT, USA, 25th–28th Feb. 2016).
Talk: 'Optimal synaptic strategies for different timescales of memory',
by **S Lahiri** and S Ganguli.
Poster: 'A universal tradeoff between energy, speed and precision in neural communication',
by **S Lahiri**, J Sohl-Dickstein and S Ganguli.

Computational and Systems Neuroscience (Cosyne, Salt Lake City, UT, USA, 27th Feb.–2nd Mar. 2014).
Talk: 'Modeling enhanced and impaired learning with enhanced plasticity',
by **S Lahiri**, TDB Nguyen-Vu, GQ Zhao, A Suvrathan, H Lee, S Ganguli, CJ Shatz and JL Raymond.

Neural Information Processing Systems (NeurIPS, Lake Tahoe NV, USA, 5th–8th Dec. 2013).
Talk and poster: 'A memory frontier for complex synapses',
by **S Lahiri** and S Ganguli.

Sloan-Swartz Centers Annual Meeting (Brandeis University, Waltham MA, USA, 26th–28th July 2013).
Talk: 'Understanding impaired learning with enhanced plasticity',
by **S Lahiri**, TDB Nguyen-Vu, GQ Zhao, A Suvrathan, H Lee, S Ganguli, CJ Shatz and JL Raymond.

Computational and Systems Neuroscience (Cosyne, Salt Lake City, UT, USA, 28th Feb.–3rd Mar. 2013).
Poster: 'A general theory of learning and memory with complex synapses',
by **S Lahiri** and S Ganguli.

Sloan-Swartz Centers Annual Meeting (UC San Diego, La Jolla CA, USA, 27th–29th June 2012).
Poster: 'Learning and memory with complex synapses',
by **S Lahiri** and S Ganguli.

1st Asian Winter School on String Theory (KIAS, Seoul, S. Korea, 8th Jan. 2007).
Talk: 'Giant gravitons and the supersymmetric states of $\mathcal{N} = 4$ Yang-Mills',
by **S Lahiri**, I Biswas, D Gaiotto and S Minwalla.

Teaching experience

SERC School Tutor: Taught at an intensive school in high energy theoretical physics for postgraduate 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, USA, Autumn 2004 – Autumn 2005, Spring 2008 – Autumn 2010).

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