Anindita Maiti

Curriculum Vitae

Contact

Dana Research Center 237, 110 Forsyth St., Boston, MA 02115, USA
Citizenship: Indian
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maiti.a@northeastern.edu

Education

Northeastern University – Boston, USA 2017-2023
PhD Candidate (Physics)
Advisor: James Halverson

The NSF AI Institute for Artificial Intelligence and Fundamental Interactions – Boston
PhD Student 2020-2023

Indian Institute of Technology Bombay – Mumbai, India 2012-2017
Integrated Bachelor and Master of Technology (Engineering Physics) with Honors (Physics)
Advisor: Urjit Yajnik

Research Interests

Foundational Machine Learning ↔ Theoretical High Energy Physics.
Theoretical Physics, Applied Maths for Machine Learning Theory.
Machine Learning for String Phenomenology, Effective Field Theories.
Machine Learning for Quantum Many-body Physics, Quantum Computations.

Preprints & Publications

M. Demirtas, James Halverson, **A. Maiti**, K. Stoner, M. D. Schwartz, "*Locality and Non-Gaussianity in Neural Network Field Theories*", (to appear).

A. Maiti, K. Stoner, and J. Halverson, "*Symmetry-via-Duality: Invariant Neural Network Densities from Parameter-Space Correlators*", [arXiv:2106.00694v1], (in press).

J. Halverson, C. Long, **A. Maiti**, B. Nelson, G. Salinas, "*Gravitational waves from dark Yang-Mills sectors*", JHEP **05** (2021), 154, [arXiv:2012.04071].

J. Halverson, **A. Maiti**, and K. Stoner, *Neural Networks and Quantum Field Theory*, Mach. Learn. Sci. Tech. **2** (2021) no. 3, 035002, [arXiv:2008.08601].

In-Progress

"*Reinforcement Learning Exploration of Chiral Gauge Theories*" - with James Halverson.

Seminars, Talks, Colloquia

Theoretical Physics for Machine Learning, Aspen Center for Physics Feb 2023
New Frontiers in Machine Learning and Quantum, Perimeter Institute Nov 2022
IPPP Seminar, Institute for Particle Physics Phenomenology, Durham University Nov 2022
Oxford Dalitz Seminar in Fundamental Physics, U. Oxford Nov 2022
Machine Learning @ Computer Laboratory Seminar Series, U. Cambridge Oct 2022
UCI Physics Astro/Particle-ML Seminar Series, UC Irvine Oct 2022
UCSB Joint HEX-HET Seminar Series, UC Santa Barbara Oct 2022
Theoretical Particle Physics & Cosmology Seminar, King's College London Oct 2022
Mathematics Seminar, City, University of London Oct 2022
Theoretical Physics Seminar, Uppsala University Oct 2022
Majorana-Raychaudhuri Seminar Series, INFN & University Salerno, Italy & PAMU, Indian Statistical Institute, Kolkata, India Sept 2022
Journal Club, The NSF AI Institute for A. I. and Fundamental Interactions Sept 2022
Computational Algebra Seminar Series, University of Nottingham, UK Sept 2022
Pehlevan Research Group Journal Club, Harvard University [slides] Aug 2022
Poster Session: Summer Workshop 2022, The NSF AI Institute for Artificial Intelligence and Fundamental Interactions Aug 2022
Parallel Session: String Phenomenology 2022, University of Liverpool [slides] Jul 2022

Short Talks: A Deep-Learning Era of Particle Theory, Mainz Institute for Theoretical Physics, Johannes Gutenberg University [slides] June 2022

Lightning Talks on Discovering Latent Structure in Artificial and Physical Systems, The NSF AI Institute for Artificial Intelligence and Fundamental Interactions [slides] May 2022

Lightning Session: IAIFI-AIMLAC Workshop, The NSF AI Institute for Artificial Intelligence and Fundamental Interactions [slides] Mar 2022

String Data 2021, University of Witwatersrand & University of Cape Town [slides] Dec 2021

QFT Research Seminar, Institute for Theoretical Physics - Münster (WWU) [slides] May 2021

Joint High Energy Theory and Machine Learning Seminar, Heidelberg University, LMU Munich and Northeastern University [slides] May 2021

Journal Club, The NSF AI Institute for A. I. and Fundamental Interactions [slides] Feb 2021

Seminar Series on String Phenomenology [slides] Oct 2020

Gong Show: String Data 2020, CERN [slides] Dec 2020

Gong Show: Strings, Geometry, and Data Science, Simons Center for Geometry and Physics, Stony Brook University [slides] Jan 2020

Awards & Honors

Travel Grants: "New Frontiers in Machine Learning and Quantum" Workshop by Perimeter Institute (Nov 2022); Northeastern University Dept. of Physics (Summer 2022); Northeastern University PhD Network (Summer 2022).

Dean's Graduate Student Excellence Award in Research: Northeastern University College of Science (Spring 2021).

Lawrence Award for Graduate Academic Excellence: Northeastern University Dept. of Physics (Spring 2018).

Indian Academy of Sciences Summer Research Fellowship: Indian Academy of Sciences, (Summer 2014).

Summer Schools

- IAIFI Summer School, Aug 2022, The NSF AI Institute for Artificial Intelligence and Fundamental Interactions.
- Theoretical Advanced Study Institute in Particle Theory (TASI), June 2021, CU Boulder.
- Deep Learning Theory Summer School at Princeton, Jul 2021, Princeton University.

Teaching Experience

Teaching Assistant – Northeastern University, Boston, Massachusetts

PHYS 7325: Quantum Field theory 1 (Fall 2020, Fall 2019)
PHYS 5115: Quantum Mechanics (Spring 2020, Spring 2019)
PHYS 3601: Classical Dynamics (Fall 2018)
PHYS 2305: Thermo and Statistical Mechanics (Spring 2018)
PHYS 1155: Physics Lab for Engineering 2 (Fall 2017)
PHYS 3600: Advanced Physics Lab (multiple semesters)
Undergraduate Physics lab (multiple semesters)

Teaching Assistant – IIT Bombay, Mumbai, India

PH 117: Undergraduate Physics lab (Spring 2017)
EP 215: Undergraduate Electronics lab (Fall 2016)

References

(1) Dr. James Halverson, (*Email: j.halverson@northeastern.edu*),
Associate Professor, Dept. of Physics, Northeastern University,
The NSF AI Institute for Artificial Intelligence and Fundamental Interactions.

(2) Dr. Fabian Ruehle, (*Email: f.ruehle@northeastern.edu*),
Assistant Professor, Dept. of Physics, Northeastern University,
The NSF AI Institute for Artificial Intelligence and Fundamental Interactions.

(3) Dr. Brent Nelson, (*Email: B.Nelson@northeastern.edu*),
Associate Dean and Associate Professor, Dept. of Physics, Northeastern University,
The NSF AI Institute for Artificial Intelligence and Fundamental Interactions.

Technical skills

Programming languages: Python, C, C++, Mathematica, Matlab, Pytorch.
Software: LaTeX, Git.

Professional Service Activities

Outreach to High School Students: Presented HEP-th research at Northeastern. (Jul 2022)

Member, Early Career and Equity Committee: The NSF AI Institute for Artificial Intelligence and Fundamental Interactions. (Jan 2021 - Dec 2022)

Member, Graduate Student Council: Northeastern University College of Science. (Sept 2020 - Aug 2022)

Coordinator & Initiator, Graduate Women in Physics Society: Northeastern University Dept. of Physics. (Sept 2021 - Present)

Referee: NeurIPS 2022 workshop on Machine Learning and the Physical Sciences; NeurIPS 2021 workshop on Machine Learning and the Physical Sciences; 'Foundations of Physics' Journal; NeurIPS 2020 workshop on Machine Learning and the Physical Sciences.

Volunteer & Co-organizer: The 1st International Electronic Conference on Mathematics and Applications (May, 2023); String Phenomenology 2020 (Northeastern University).