

ANINDITA MAITI

CURRICULUM VITAE

Contact

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Citizenship: Indian

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Academic Positions

Perimeter Institute for Theoretical Physics – Waterloo, Canada
Incoming Postdoctoral Fellow
Sept 2023 -

Harvard John A. Paulson SEAS – Boston, USA
Postdoctoral Fellow (Applied Math)
Supervisor: Cengiz Pehlevan
May 2023 - Aug 2023

Education

Northeastern University – Boston, USA
Ph.D. (Physics)
Advisor: James Halverson
2017-2023
The NSF AI Institute for Artificial Intelligence and Fundamental Interactions – Boston
Junior Investigator
2020-2023
Indian Institute of Technology Bombay – Mumbai, India
Integrated Bachelor and Master of Technology (Engineering Physics) with Honors (Physics)
Advisor: Urjit Yajnik
2012-2017

Research Interests

Neural Networks & Machine Learning for Quantum Field Theory.
Theoretical Physics for Deep Learning & Artificial Intelligence.
Neural Networks & Deep Learning for Quantum.

Preprints & Publications

M. Demirtas, J. Halverson, **A. Maiti**, M. D. Schwartz, K. Stoner, “*Neural Network Field Theories: Non-Gaussianity, Actions, and Locality*”, [\[arXiv:2307.03223\]](#).
A. Maiti, K. Stoner, and J. Halverson, “*Symmetry-via-Duality: Invariant Neural Network Densities from Parameter-Space Correlators*”, [MACHINE LEARNING: IN PURE MATHEMATICS AND THEORETICAL PHYSICS, 2023, 293-330, \[arXiv:2106.00694v1\]](#).
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

ORIGINS Data Science Lab Seminar , TU Munich	Jul 2023
Machine Learning for Lattice Field Theory and Beyond , ECT*, Italy	Jun 2023
Center for Theoretical Physics Seminar , Seoul National University	Mar 2023
Poster: Theoretical Physics for Machine Learning , Aspen Center for Physics	Feb 2023
AIC Seminar , Université Paris-Saclay, CEA-LIST	Jan 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
UCI Physics Astro/Particle-ML Seminar Series , UC Irvine	Oct 2022
UCSB Joint HEX-HET Seminar Series , UC Santa Barbara	Oct 2022
HEP Seminar , UC Riverside	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: “Theoretical Physics for Machine Learning” Workshop by Aspen Center for Physics (Feb 2023); “New Frontiers in Machine Learning and Quantum” Workshop by Perimeter Institute (Nov 2022); The NSF IAIFI (Feb 2023); Northeastern University Dept. of Physics (Summer 2022); Northeastern University PhD Network (Summer 2022).

UC Riverside Chancellor’s Postdoctoral Fellowship: Jul 1, 2023 to Jul 1, 2024 (Declined).

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: L^AT_EX, Git.

Professional Service Activities

MEMBER, ORGANIZING COMMITTEE: At the Interface of Physics, Mathematics and Artificial Intelligence, Pollica Physics Center (May 2023).

MEMBER, AI / ML SUMMER SCHOOL ORGANIZING COMMITTEE: [Scientists for Palestine](#). (Jan 2023 - Present)

CONTRIBUTOR: To STEM outreach initiatives for high school students, by [A World of Women in STEM](#) organization. (Jan 2023 - Present)

ALUMNUS MENTOR: For undergraduate students in Engineering Physics major at IIT Bombay. (Sept 2022 - Present)

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 - May 2023)

REFeree: SynS & ML @ ICML2023; 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).