

# ANINDITA MAITI

CURRICULUM VITAE

## Contact

Dana Research Center 237, 110 Forsyth St., Boston, MA 02115, USA  
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  
Incoming Postdoctoral fellow

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**, 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](https://arxiv.org/abs/2106.00694v1)], [Machine-Learning in Theoretical Physics & Pure Mathematics](#) (to be published by World Scientific).

J. Halverson, C. Long, **A. Maiti**, B. Nelson, G. Salinas, “*Gravitational waves from dark Yang-Mills sectors*”, [JHEP](#) **05** (2021), 154, [[arXiv:2012.04071](https://arxiv.org/abs/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](https://arxiv.org/abs/2008.08601)].

## In-Progress

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

## Seminars, Talks, Colloquia

**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).

**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](mailto: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](mailto: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](mailto: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

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

MEMBER: [Scientists for Palestine](#). (Jan 2023 - Present)

CONTRIBUTOR: [A World of Women in STEM](#). (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).