

Welcome to
MIT Physics!



Interdisciplinary Studies at MIT:

The NSF Institute for Artificial Intelligence and Fundamental Interactions (IAIFI)
Interdisciplinary PhD in Physics, Statistics, and Data Science (PhysSDS)

MIT Physics Open House — April 2, 2026

NSF Institute for Artificial Intelligence and Fundamental Interactions (IAIFI)





Deep Learning
(AI)

+

Deep Thinking
(Physics)

=

Deeper
Understanding

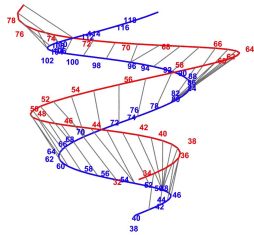
Generated using Adobe Firefly:
drawing of a brain on a chalkboard with physics equations written inside of it; chalkboard is surrounded by neural networks being injected into the brain; use purple and teal

A Strategic Approach to AI+Physics

AI for Physics: Developing novel AI to accelerate Physics discovery

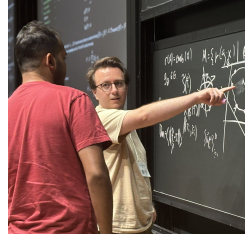
+

Physics for AI: Leveraging Physics principles to galvanize AI innovation



Pioneering
interdisciplinary

RESEARCH



Empowering the
next generation of

TALENT



Building a
dynamic

COMMUNITY

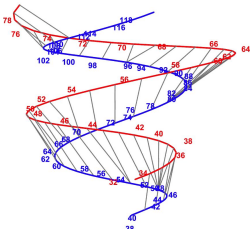
Tackling two of the greatest mysteries of science through **curiosity-driven research**:
how our **universe** works and how **intelligence** works

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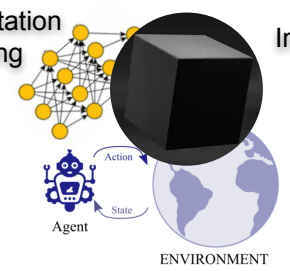
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Pioneering Interdisciplinary **Research**

Advancing **physics knowledge** and galvanizing **AI research innovation**

Representation Learning

Robust/
Interpretable AI



Foundational AI

Infusing physics principles into AI to create state-of-the-art AI innovations

Reinforcement Learning

ENVIRONMENT

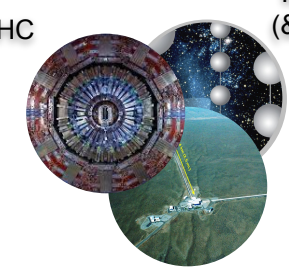
Agent

Action

State

LHC

IceCube (& DUNE)



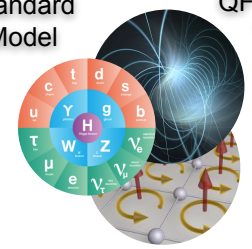
Experimental Physics

Enhancing the operations and analysis of flagship NSF experiments through AI

LIGO

Standard Model

QFT & String Theory

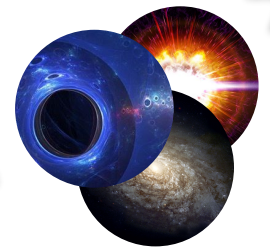


Theoretical Physics

Leveraging AI to understand the theoretical underpinning of fundamental physics

Many-Body Physics

Multi-Messenger Astrophysics



Astrophysics

Using AI techniques to understand the universe on cosmological scales

Dark Matter Searches

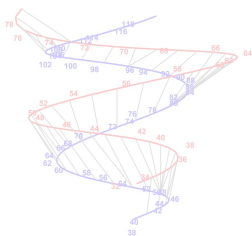
Structure Formation

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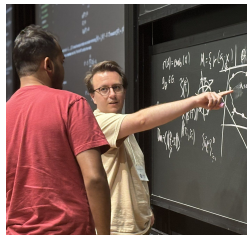
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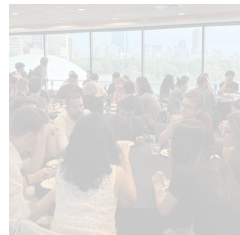
Pioneering
interdisciplinary

RESEARCH



Empowering the
next generation of

TALENT



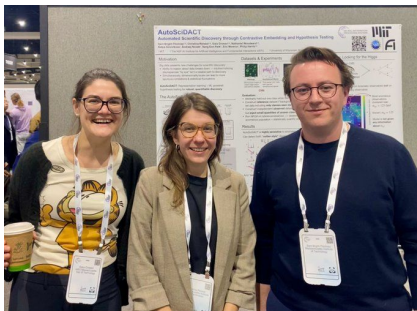
Building a
dynamic

COMMUNITY

Tackling two of the greatest mysteries of science through **curiosity-driven research**:
how our **universe** works and how **intelligence** works

Empowering the Next Generation of **Talent**

IAIFI Fellows



- **Interdisciplinary postdoc positions (3 years)**
- Each assigned both a **Physics and an AI mentor**
- Previous Fellows have gone on to **both academic and industry jobs**




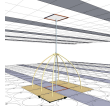
IAIFI Summer School

- Brings **100 AI+Physics PhD students** to Boston annually
- 4 days of **lectures and tutorials**, culminating in a **hackathon**
- Previous attendee: “[It gave] me **state-of-the-art vocabulary and tools**”



Education at MIT

- **Interdisciplinary PhD in Physics, Statistics and Data Science**
- Computational Data Science in Physics: **Project-based course** and **online modules** through MITx

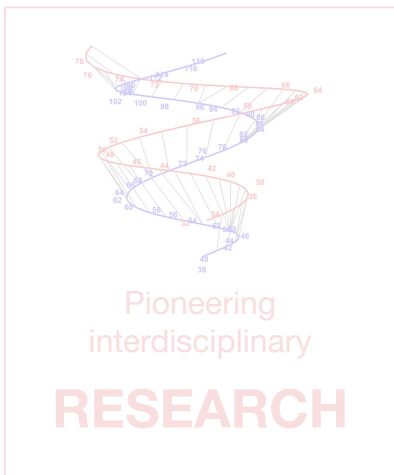
	Project 1 : Gravitational Wave Data From LIGO
	Project 2 : Collider Physics Data from the Compact Muon Solenoid on the Large Hadron Collider
	Project 3 : Cosmic Microwave Background (simulated) Data
	Project 4: ML modelling of Ising model /Lattice QCD with normalizing Flows

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Building a Dynamic **Community**

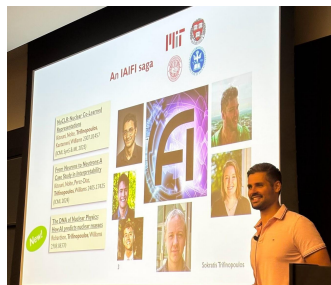
Networking



- **Industry lunches** with local industry professionals
- **Thematic discussions** and **informal lunch discussions** to share research
- Regular **social events**

IAIFI Summer Workshop

- Brings **almost 200 AI+Physics researchers** of all career stages to Boston annually
- Includes **plenary talks, contributed talks, poster session, and networking**
- Previous attendee: “One of the **very best interdisciplinary events** in my entire life.”



Local Engagement



- **Public Colloquia** featuring global leaders in AI+Physics, live on YouTube
- Presenting in **community events**, such as the Cambridge Science Festival
- **Hackathons** for specific domains

Get Involved with IAIFI

Follow IAIFI



Join our Mailing List

<http://mailman.mit.edu/mailman/listinfo/iaifi-news>



Follow on X (Twitter)

[@iaifi_news](https://twitter.com/iaifi_news)



Follow on LinkedIn

<https://www.linkedin.com/company/iaifi/>



Watch on YouTube

<https://www.youtube.com/IAIFInstituteforAIFundamentalInteractions>

<https://iaifi.org>

IAIFI Fellows Showcase

Friday, April 3, 2:00–3:30pm

MIT 26-414 and on Zoom



Berthy Feng

2025-2028 Fellow

Computational Imaging for Science



Mathis Gerdes

2026-2029 Fellow

ML Tools for Theoretical Physics



Akshunna Dogra

2026-2029 Fellow

Applied Mathematics and ML



IAIFI
Summer Workshop **2026**
August 10–August 14

<https://iaifi.org/summer-workshop.html>

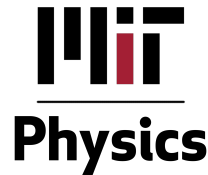
Registration now open!

Learn more about how to
become a “Friend of IAIFI” or
“Junior Investigator”:

<https://iaifi.org/junior-interest.html>

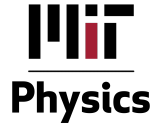


PhD in Physics, Statistics, and Data Science



[Physics, Statistics, and Data Science \(PhysSDS\)](#) PhD program open to **all MIT Physics PhD students**

PhD in Physics, Statistics, and Data Science



Interdisciplinary PhysSDS PhD is a collaboration between MIT Physics Department, MIT Statistics and Data Science Center (SDSC), and IAIFI

- Open to **current MIT Physics PhD students**
- Establishes a **verifiable credential** that helps Physics students pursue careers in the fields of data science and artificial intelligence
- Provides **essential training** for students working with these techniques
- **Facilitates mentoring** relationships with SDSC experts outside of Physics
- Utilizes existing structure of MIT's Interdisciplinary Doctoral Program in Statistics

PhysSDS Committee

- [Jesse Thaler](#) (co-chair)
- [Mike Williams](#) (co-chair)

Advisors:

- | | | |
|-----------------------------------|-------------------------------------|-------------------------------------|
| • Isaac Chuang | • Jacqueline Hewitt | • Phiala Shanahan |
| • Janet Conrad | • Kiyoshi Masui | • Marin Soljačić |
| • William Detmold | • Leonid Mirny | • Washington Taylor |
| • Philip Harris | • Christoph Paus | • Max Tegmark |

Twelve members of the Physics Department, three from each division, are serving as advisors on the PhysSDS Committee. Our preference is that at least one member of this committee is on a candidate's PhD Thesis Committee.

PhD in Physics, Statistics, and Data Science

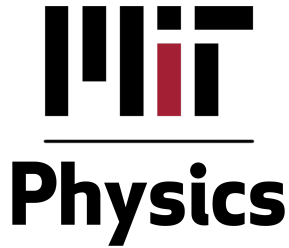
What kind of students should do this Interdisciplinary program? You!

- Students come from a **variety of fields**: nuclear physics, biophysics, neutrino physics, plasma physics, astrophysics, particle physics, quantum physics
- Students have been **hired for internships** at Microsoft Research, Meta AI, Amazon Alexa, NASA Frontier Development Lab, Jump Trading, TikTok, Visa, etc.
- **17 PhysSDS PhDs awarded** since 2021; jobs after graduation include:
 - Consultant Data Scientist, QuantumBlack
 - Quantitative Strategist, Virtu Financial
 - Associate Research Scholar, Princeton
 - Postdoctoral Researcher, MIT Plasma Science and Fusion Center
- **9 current students enrolled** (many more planning to join)



“Representations of Physics & Physics of Representations”

- Recent recipient: IAIFI Junior Investigator Ouail Kitouni
- Currently a Research Scientist at Anthropic



If you are interested in advancing Physics + AI through interdisciplinary research and exciting discovery opportunities, come to MIT Physics and collaborate with IAIFI!

Want to deepen your knowledge of the statistical foundations of AI and position yourself for exciting AI career opportunities? Join the Interdisciplinary PhD in Physics, Statistics, and Data Science!