

# Jesse Diaz Thaler

## *Curriculum Vitae*

(Updated November 25, 2023)

### Contact Information

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### Research in Theoretical Particle Physics

- Data Science and AI/ML
- Collider Physics and QCD
- Beyond the Standard Model

### Degrees

*Fall 2002–Spring 2006* **Harvard University**  
Ph.D., Physics, *June 2006*  
A.M., Physics, *June 2004*  
Thesis: “Symmetry Breaking at the Energy Frontier”  
Advisor: Nima Arkani-Hamed

*Fall 1998–Spring 2002* **Brown University**  
Sc.B., Math/Physics, *May 2002*  
Advisor: Antal Jevicki

### Employment

*January 2010–Present* **Massachusetts Institute of Technology**  
*MIT Center for Theoretical Physics*  
Professor of Physics, *2021–Present*  
Associate Professor of Physics with Tenure, *2017–2021*  
Associate Professor of Physics, *2015–2017*  
Assistant Professor of Physics, *2010–2015*

*July 2009–December 2009* **Lawrence Berkeley National Laboratory**  
*Theoretical Physics Group*  
Physicist Postdoctoral Fellow

*July 2006–June 2009* **University of California, Berkeley**  
*Miller Institute for Basic Research in Science*  
Miller Research Fellow

## Leadership

- Director, *NSF Institute for Artificial Intelligence and Fundamental Interactions*, 2020–Present

## Affiliations

- MIT Center for Theoretical Physics; Laboratory for Nuclear Science, *Jan. 2010–Present*
- MIT Statistics & Data Science Center; Institute for Data, Systems & Society, *Jan. 2020–Present*
- Harvard Center for the Fundamental Laws of Nature, *Sep. 2018–Aug. 2019 sabbatical*

## Honors

- APS Fellow, *American Physical Society*, 2022
- Simons Investigator in Physics, *Simons Foundation*, 2022–2027
- Fermilab Distinguished Scholar, *Fermi National Accelerator Laboratory*, 2018–2020
- Simons Fellowship in Theoretical Physics, *Simons Foundation*, 2018
- Frank E. Perkins Award for Excellence in Graduate Advising, *MIT*, 2017
- Harold E. Edgerton Faculty Achievement Award, *MIT*, 2016
- Buechner Faculty Award for Teaching, *MIT Physics Department*, 2014
- Buechner Faculty Award for Undergraduate Advising, *MIT Physics Department*, 2013
- Sloan Research Fellowship, *Alfred P. Sloan Foundation*, 2013
- Kavli Frontiers Fellow, *Kavli Foundation*, 2012
- Presidential Early Career Award for Scientists and Engineers, *White House*, 2012
- Class of 1943 Career Development Professorship, *MIT*, 2012–2015
- Early Career Research Award, *U.S. Department of Energy, Office of Science*, 2011–2016
- Miller Research Fellowship, *University of California, Berkeley*, 2006–2009
- Giorgio Gamberini Dissertation Prize, *Scuola Normale Superiore di Pisa*, 2007
- Merit Fellowship, *Harvard Faculty of Arts and Sciences*, 2006
- Goldhaber Prize, *Harvard Physics Department*, 2005
- Graduate Research Fellowship, *National Science Foundation*, 2002–2005

## UROP Students Supervised

*Undergraduate Research Opportunities Program, MIT*

- Max Tan '25: *Spring 2023, Summer 2023*
- Ammar Fayad '24: *Summer 2023*
- Mohit Dighamber '23: *Fall 2022, Spring 2023*
- Octavio Vega '22: *Spring 2021, Summer 2021, Fall 2021*  
After MIT: Research Assistant, *University of Hamburg*
- Nishat Protyasha '23: *Summer 2020, Fall 2020, Spring 2021, Summer 2021*  
FUTURE of Physics Participant, *Caltech*, 2020

- Serhii Kryhin '22: *Spring 2020, Summer 2020, Spring 2021, Summer 2021* (see below)
- Christopher Miller '21: *Fall 2020*  
After MIT: Technical Instructor, *MIT*
- Debaditya Pramanik '21: *Spring 2020, Summer 2020, Fall 2020* (see below)
- Ziqi Zhou '20: *Fall 2018*
- Talya Klinger '20: *Spring 2017*  
After MIT: Marshall Scholar, *University of Cambridge and Cardiff University*  
Currently: Physics Ph.D. Candidate, *Caltech*
- Radha Mastandrea '19: *Spring 2017, Fall 2017, Spring 2018, Summer 2018* (see below)
- Eleanor Hall '18: *Spring 2017, Summer 2017, Fall 2017* (see below)
- Matthew Burns '18: *Fall 2014, Spring 2015*
- Kevin Zhou '17: *IAP 2016, Spring 2016, Summer 2016, Fall 2016, Spring 2017*  
After MIT: Marshall Scholarship, *U. Cambridge and U. Oxford*  
Currently: Physics Ph.D Candidate, *Stanford*  
Joel Matthew Orloff Award for Outstanding Research, *MIT Physics Department, 2017*
- Aashish Tripathee '17: *Spring 2015, Summer 2015, Fall 2015, IAP 2016, Spring 2016, Summer 2016, Fall 2016* (see below)
- Trung Phan '15: *Spring 2014, Summer 2014* (see below)
- T.J. Wilkason '15: *Fall 2013, Spring 2014, Summer 2014* (see below)
- Mobolaji Williams '13: *Fall 2010, Spring 2011, Summer 2012* (see below)
- Dustin Katzin '12: *Fall 2011, IAP 2012* (see below)
- Tucker Chan '12: *Summer 2011, Fall 2011, Spring 2012* (deceased)  
After MIT: Physics Ph.D. Candidate, *Stanford*
- Ken Van Tilburg '11: *Summer 2010, Fall 2010* (see below)

## B.S. Student Theses Supervised

- Serhii Kryhin, *B.S. 2022*  
Thesis: “Application of Unsupervised Machine Learning for Event Classification”  
After MIT: Physics Ph.D. Candidate, *Harvard*  
Morse/Orloff Research Award, *MIT Physics Department, 2022*
- Debaditya Pramanik, *B.S. 2021*  
Thesis: “Collinear Supergravity at Linear Order”  
After MIT: Physics Ph.D. Candidate, *Princeton*
- Radha Mastandrea, *B.S. 2019*  
Thesis: “Analyzing CMS Open Collider Data through Topic Modeling”  
After MIT: Marshall Scholarship, *U. Cambridge*  
Currently: Physics Ph.D Candidate, *U.C. Berkeley*  
Joel Matthew Orloff Award for Outstanding Service, *MIT Physics Department, 2019*  
Physics Research Fellowship, *Heising-Simons Foundation, 2018*  
FUTURE of Physics Participant, *Caltech, 2018*

- Eleanor Hall, *B.S. 2018*  
Thesis: “Photon Isolation and Jet Substructure”  
After MIT: Physics Ph.D. Candidate, *U.C. Berkeley*  
Joel Matthew Orloff Award for Outstanding Service, *MIT Physics Department, 2017*
- Aashish Tripathy, *B.S. 2017*  
Thesis: “Jet Substructure at the Large Hadron Collider”  
After MIT: Physics Ph.D., *U. Michigan*  
Currently: Postdoctoral Researcher, *U. Michigan*  
Philip Morse Memorial Award, *MIT Physics Department, 2017*
- Trung Phan, *B.S. 2015*  
Thesis: “Relativistic Quantum Fields in Theoretical Physics”  
After MIT: Physics Ph.D. Candidate, *Princeton*
- T.J. Wilkason, *B.S. 2015*  
Thesis: “Exclusive Cone Jet Algorithms for High Energy Particle Colliders”  
After MIT: Physics Ph.D. Candidate, *Stanford*  
Joel Matthew Orloff Award for Outstanding Service, *MIT Physics Department, 2015*
- Mobolaji Williams, *B.S. 2013*  
Thesis: “Pseudo-Goldstino to Gravitino Decay: An Implication of Multiple Supersymmetry Breaking”  
After MIT: Physics Ph.D., *Harvard*  
Currently: Data Scientist, *Jellyfish*
- Dustin Katzin, *B.S. 2012*  
Thesis: “The DarkLight Experiment: Searching for the Dark Photon”  
After MIT: Part III, *University of Cambridge*  
Currently: Analyst, *American International Group*
- Lin Fei, *B.S. 2011*  
Thesis: “Dark Matter Dynamics in the Early Universe”  
After MIT: Physics Ph.D. Candidate, *Princeton*
- Ken Van Tilburg, *B.S. 2011*  
Thesis: “Identifying Boosted Objects with N-subjettiness and Linear k-means Clustering”  
After MIT: Physics Ph.D., *Stanford*  
Currently: Assistant Professor, *NYU*  
Apker Award Finalist, *American Physical Society, 2011*  
Joel Matthew Orloff Award for Outstanding Research in Physics, *MIT Physics Department, 2011*

## M.Eng. Student Theses Supervised

- Raymond Wynne, *M.Eng. 2023*  
Thesis: “Anomaly Detection in Collider Physics via Factorized Observables”  
After MIT: Physics Ph.D. Candidate, *Caltech*
- Nilai Sarda, *M.Eng. 2020*  
Thesis: “On Anomaly Detection in Particle Accelerators” (*jointly advised with Justin Solomon*)  
After MIT: Researcher, *D.E. Shaw Group*  
Johnson Artificial Intelligence and Decision Making Thesis Award, *MIT EECS Department, 2020*
- Preksha Naik, *M.Eng. 2019*  
Thesis: “Exploring the Space of Jets with CMS Open Data”  
After MIT: Physics Ph.D. Candidate, *Caltech*

## Ph.D. Students Supervised

- Pamela Pajarillo, *anticipated Ph.D. 2027*
- Sean Benevedes, *anticipated Ph.D. 2026*
- Rikab Gambhir, *anticipated Ph.D. 2025*  
MIT Prize for Open Data (Honorable Mention), *MIT Libraries and School of Science, 2022*
- Samuel Alipour-fard, *anticipated Ph.D. 2025*
- Patrick Komiske, *Ph.D. 2021*  
Thesis: “Machine Learning for High-Energy Collider Physics”  
After MIT: Researcher, *PDT Partners*  
Currently: Researcher, *River Run Trading*
- Eric Metodiev, *Ph.D. 2020*  
Thesis: “Energy Flow in Particle Collisions”  
After MIT: Research Scientist, *Renaissance Technologies*
- Benjamin Elder, *Ph.D. 2018*  
Thesis: “Jet Fragmentation at the LHC”  
After MIT: Cognitive Software Developer, *IBM*  
Currently: Research Scientist, *IBM*
- Lina Necib, *Ph.D. 2017*  
Thesis: “Boosting (In)direct Detection of Dark Matter”  
After MIT: Fairchild Postdoctoral Scholar, *Caltech*  
Currently: Assistant Professor, *MIT*  
Vazquez Award for Outstanding Research, *MIT Physics Department, 2016*
- Yonatan Kahn, *Ph.D. 2015*  
Thesis: “Forces and Gauge Groups Beyond the Standard Model”  
After MIT: Postdoctoral Researcher, *Princeton*  
Currently: Assistant Professor, *U. Illinois, Urbana-Champaign*  
Andrew M. Lockett III Memorial Fund Award, *MIT Physics Department, 2014*  
J.J. and Noriko Sakurai Dissertation Award, *American Physical Society, 2016*
- Daniele Bertolini, *Ph.D. 2014*  
Thesis: “Electroweak Symmetry Breaking in the Era of the Higgs Boson Discovery”  
After MIT: Postdoctoral Researcher, *U.C. Berkeley*  
Currently: Data Scientist, *Unlearn*  
LHC-TI Graduate Fellowship, *LHC Theory Initiative, 2013*
- Zoe Thomas, *Ph.D. 2014*  
Thesis: “Supersymmetry at the Dawn of the LHC Era”  
After MIT: Postdoctoral Researcher, *U. Minnesota*  
Currently: Applied Research Mathematician, *Department of Defense*
- Francesco D’Eramo, *Ph.D. 2012*  
Thesis: “Hot and Dark Matter” (*jointly advised with Krishna Rajagopal and Hong Liu*)  
After MIT: Miller Research Fellow, *U.C. Berkeley*  
Currently: Associate Professor, *U. Padova*  
Vazquez Award for Outstanding Research, *MIT Physics Department, 2011*

## Postdoctoral Researchers Supervised

- Cari Cesarotti, CTP Postdoctoral Researcher, *Fall 2022–Spring 2025*  
J.J. and Noriko Sakurai Dissertation Award, *American Physical Society, 2023*
- Sokratis Trifinopoulos, Postdoc.Mobility Fellow, *Fall 2022–Spring 2024*
- Siddharth Mishra-Sharma, IAIFI Fellow, *Fall 2021–Spring 2024*
- Lena Funcke, CTP Postdoctoral Researcher, *Fall 2021–Fall 2022*  
After MIT: Assistant Professor, *U. Bonn*
- Katelin Schutz, Pappalardo Fellow, *Fall 2019–Fall 2020*  
NASA Einstein Fellow, *Spring 2021*  
After MIT: Assistant Professor, *McGill*
- Pouya Asadi, CTP Postdoctoral Researcher, *Fall 2019–Spring 2022*  
After MIT: Postdoctoral Researcher, *U. Oregon*
- Bernhard Mistlberger, Pappalardo Fellow, *Fall 2018–Spring 2020*  
After MIT: Associate Staff Scientist, *SLAC*  
Currently: Staff Scientist, *SLAC*
- Frédéric Dreyer, Early Postdoc.Mobility Fellow, *Fall 2016–Spring 2018*  
After MIT: Postdoctoral Researcher, *Oxford*  
Currently: University Research Fellow, *Oxford*
- Yotam Soreq, Rothschild Fellow, *Fall 2015–Spring 2018*  
After MIT: Postdoctoral Researcher, *CERN*  
Currently: Assistant Professor, *Technion*
- Benjamin Safdi, Pappalardo Fellow, *Fall 2014–Spring 2017*  
After MIT: Assistant Professor, *U. Michigan*  
Currently: Assistant Professor, *U.C. Berkeley*
- Wei Xue, CTP Postdoctoral Researcher, *Fall 2014–Spring 2017*  
After MIT: Postdoctoral Fellow, *CERN*  
Currently: Assistant Professor, *U. Florida*
- Simone Marzani, LHC Theory Initiative Postdoctoral Fellow, *Fall 2014–Spring 2015*  
After MIT: Assistant Professor, *U. Buffalo*  
Currently: Associate Professor, *U. Genova*
- Gilly Elor, CTP Postdoctoral Researcher, *Fall 2013–Spring 2016*  
After MIT: Postdoctoral Researcher, *U. Oregon*  
Currently: Postdoctoral Researcher, *JGU Mainz*
- Duff Neill, Pappalardo Fellow, *Fall 2012–Spring 2015*  
CTP Postdoctoral Researcher, *Spring 2015–Spring 2016*  
After MIT: Director’s Fellow, *Los Alamos National Laboratory*  
Currently: Staff Scientist, *Los Alamos National Laboratory*
- Andrew Larkoski, CTP Postdoctoral Researcher, *Fall 2012–Spring 2015*  
After MIT: LHC Theoretical Initiative Postdoctoral Fellow, *Harvard*  
Currently: Assistant Project Scientist, *UCLA*  
Wu-Ki Tung Award for Early Career Research on QCD, *CTEQ Collaboration, 2017*
- Matthew McCullough, Simons Postdoctoral Fellow, *Fall 2011–Spring 2014*  
After MIT: COFUND Fellowship, *CERN*  
Currently: Staff Scientist, *CERN*

- Keith Rehermann, CTP Postdoctoral Researcher, *Fall 2010–Spring 2012*  
After MIT: Consultant, *Ab Initio Software Corporation*

## Visitors Hosted

- Yiding Song, Research Science Institute, *Summer 2023*  
Project: “Towards an Understanding of Scientific Data with Multimodal Language Models”  
Home Institution: *Harrow School*
- Edward Gu, Research Internship, *Summer 2023*  
Home Institution: *Cornell*
- Xinyue (Stella) Wu, MIT Summer Research Program, *Summer 2023*  
Project: “Measuring the Size of Quark and Gluon Jets in CMS Open Data”  
Home Institution: *U. Rochester*
- Brian Nord, MIT MLK Visiting Professor, *Fall 2022–Spring 2023*  
Home Institution: *Fermilab and U. Chicago*
- Kaća Bradonjić, Visiting Artist, *Fall 2022*  
Home Institution: *Hampshire College*
- Sergio Diaz, MIT Summer Research Program, *Summer 2022*  
Project: “Determination of the W Mass Parameter using Machine Learning”  
Home Institution: *U. Maryland, Baltimore County*
- Pedro Rivera-Cardona, MIT Summer Research Program, *Summer 2021*  
Project: “Implementation of U(1) Group Symmetry on Energy Flow Networks”  
Home Institution: *U. Puerto Rico, Mayaguez*
- Athis Osathapan, Research Internship, *Spring 2021, Summer 2021, Summer 2022*  
Home Institution: *Bowdoin College*
- Shira Jackson, MIT Summer Research Program, *Summer 2020*  
Project: “Estimating the Energy Mover’s Distance with Exclusive Jet Clustering”  
Home Institution: *U. Cincinnati*
- Andrew Turner, Tushar Shah and Sara Zion Physics Fellowship, *2018–2019*  
Home Institution: *MIT (Washington Taylor)*
- Maximilian Henderson, International Research Opportunities Programme, *Summer 2018*  
Home Institution: *Imperial College London*
- Edward Hirst, International Research Opportunities Programme, *Summer 2018*  
Home Institution: *Imperial College London*
- Rahim Leung, International Research Opportunities Programme, *Summer 2017*  
Home Institution: *Imperial College London*
- Markus Schulze, Visiting Postdoc, *Fall 2015*  
Home Institution: *CERN*
- Alexis Romero, MIT Summer Research Program, *Summer 2015*  
Project: “Jet Physics Measurements on CMS Open Data”  
Home Institution: *San Diego State University*
- Nayara Fonseca, FAPESP Fellowship, *Spring 2014–Fall 2014*  
Home Institution: *U. Sao Paulo, Brazil (Gustavo Burdman)*

## Teaching Experience

- 8.398 — Selected Topics in Graduate Physics  
Instructor: *Spring 2021, Fall 2021, Spring 2022, Fall 2022, Spring 2023, Fall 2023*
- 8.03 — Physics III, Waves and Vibrations  
Recitation: *Fall 2020*
- 8.044 — Statistical Physics I  
Recitation: *Spring 2020*
- 8.831 — Supersymmetric Quantum Field Theories  
Lecture: *Spring 2017, Fall 2019*
- 8.05 — Quantum Mechanics II  
Instructor (MITx-based 8.051): *Spring 2018*  
Recitation: *Fall 2010, Fall 2012*
- 8.033 — Relativity  
Lecture: *Fall 2017*  
Recitation: *Fall 2016*
- 8.02 — Physics II, Electricity and Magnetism  
TEAL (studio class): *Spring 2014, Spring 2015, Spring 2016*
- 8.012 — Physics I, Classical Mechanics  
Recitation: *Fall 2014*
- 8.06 — Quantum Mechanics III  
Lecture: *Spring 2011, Spring 2012, Spring 2013*  
Recitation: *Spring 2010*

## Advising

- MIT Physics Ph.D. Thesis Committees:
  - Evgenii Kniazev (*Vladan Vuletic, in progress*)
  - Ouail Kitouni (*Mike Williams, in progress*)
  - Cristian Zanoci (*Mikhail Lukin & Aram W. Harrow, May 2023*)
  - Eva Huang (*Salvatore Vitale, January 2023*)
  - Gregory Ridgway (*Tracy Slatyer, June 2022*)
  - Patrick Fitzpatrick (*Tracy Slatyer & David Kaiser, July 2021*)
  - Joseph Johnston (*Lindley Winslow & Joseph Formaggio, May 2021*)
  - Chih-Liang Wu (*Tracy Slatyer, April 2021*)
  - Constantin Weisser (*Mike Williams, March 2021*)
  - J. Owen Andrews (*Ibrahim Cisse, November 2020*)
  - Gherardo Vita (*Iain Stewart, August 2020*)
  - Jasmine Brewer (*Krishna Rajagopal, July 2020*)
  - Hongwan Liu (*Tracy Slatyer, May 2019*)
  - Charles Epstein (*Richard Milner, August 2018*)
  - Nicholas Rodd (*Tracy Slatyer, April 2018*)
  - David Hernandez (*Edmund Bertschinger, April 2018*)
  - Aram Apyan (*Markus Klute, November 2016*)
  - Daniel Roberts (*Allan Adams, April 2016*)
  - Ian Moulton (*Iain Stewart, April 2016*)



Daniel Kolodrubetz (*Iain Stewart, April 2016*)  
Mingming Yang (*Christoph Paus, January 2015*)  
Shawn Henderson (*Peter Fisher, July 2013*)  
Teng Ma (*Boleslaw Wyslouch, May 2013*)  
Kevin Sung (*Steven Nahn, March 2013*)  
Christopher Jones (*Janet Conrad, June 2012*)  
Riccardo Abbate (*Iain Stewart, May 2012*)  
Abolhassan Vaezi (*Xiao-Gang Wen, January 2011*)  
Georgia Karagiorgi (*Janet Conrad, July 2010*)

- MIT Physics Graduate Academic Advisor, *Fall 2017–Present*  
Anticipated Ph.D. 2027: Manu Srivastava, Rachel Steinhorst  
Anticipated Ph.D. 2025: Ryan Abbott  
Anticipated Ph.D. 2024: Bruno Scheihing Hitschfeld, Stella Schindler, Annie Wei  
Ph.D. 2023: Eric Anschuetz  
Ph.D. 2022: Gregory Ridgway, Samuel Leutheusser  
Ph.D. 2020: Jasmine Brewer
- MIT Physics Undergraduate Academic Advisor, *Fall 2011–Present*  
Class of 2024: Omar Abdelghani, Chirag Falor, M. Geogdzhayeva, Lily Moseni, Dylan Raphael, Chris Viets  
Class of 2018/2019/2020: Robert Arnott, Zachary Bogorad, Hannah Field, Rodmy Paredes Alfaro, Saranesh Prembabu, Joshua Rhodes, Kevin Tang, Michael Winer  
Class of 2014/2015: Allison Christian, Jay Lawhorn, Joseph Perricone, Jeffrey Prouty, Melih Ucer, Pranjali Vachaspati, Prashanth Venkataram
- MIT First-Year Advisor, *Fall 2019–Spring 2020*  
Class of 2023: Richter Brzeski, Megha Maran, Catalina Monsalve Rodriguez, Dylan Weber
- External Ph.D. Examiner:  
Pedro Cal (*Wouter Waalewijn, U. Amsterdam, September 2021*)  
Thea Aarrestad (*Ben Kilminster, U. Zurich, March 2019*)  
Ignacio Garcia Garcia (*Eduardo Ros & Marcel Vos, U. Valencia, December 2016*)  
Brian Walsh (*Tobias Golling, Yale, February 2013*)  
Travis Martin (*Thomas Gregoire & Stephen Godfrey, Carleton U., August 2012*)
- External Mentoring:  
Ilias Cholis, PI Academy for Research and Engagement, *Fall 2018–Fall 2019*

## **Internal Service**

- MIT Faculty Committee on Curricula, *Fall 2017–Spring 2020*
- MIT Physics, Statistics, and Data Science (PhysSDS) Committee, *Co-Chair: Fall 2020–Present*
- MIT Physics Ad Hoc Committee on Graduate Student Professional Development, *Spring 2023*
- MIT Physics Graduate Admissions Committee, *Spring 2021*
- MIT Physics Communic.8 Faculty Liaison, *Fall 2020–Fall 2023*
- MIT Physics Promotion Committee, *Fall 2019; Chair: Fall 2020, Fall 2021, Fall 2022*
- MIT Physics Pappalardo Fellowships Executive Committee, *Fall 2016–Fall 2017*
- MIT Physics Colloquium Committee, *Spring 2010–Spring 2012; Chair: Fall 2012–Spring 2014*

- MIT Physics Part II Qualifying Written Exam Committee, *Spring 2012–Spring 2013; Chair: Fall 2013–Spring 2014*
- MIT Physics Part II Qualifying Written Exam Grading Committee, *September 2010, January 2020*
- MIT LNS Advisory Group, *Fall 2017, Spring 2020–Present*
- MIT LNS Colloquium Committee, *Fall 2015–Spring 2017; Chair: Fall 2017–Spring 2018*
- MIT CTP Part III Oral Qualifying Exam Committee, *Spring 2015–Spring 2017, Fall 2022–Spring 2023*
- MIT CTP Faculty Mentor, *April 2021–Present*
- MIT CTP Faculty Search Committee, *Fall 2017, Fall 2021; Chair: Fall 2019*
- MIT CTP Deputy Group Leader in High-Energy Physics, *Spring 2020–Present*
- MIT CTP Visitor Coordinator, *Fall 2016–Present*
- MIT CTP Nuclear/Particle Seminar Committee, *Fall 2010–Fall 2016, Fall 2020–Spring 2021, Fall 2022–Present*
- MIT CTP Postdoc Selection Committee, *Fall 2009–Present*
- MISTI Global Seed Funds Evaluation Committee, *Fall 2012, Fall 2013, Fall 2014*

## External Service

- Aspen Center for Physics (ACP)
  - General Member, *Summer 2020–Summer 2025*
  - Nominations Committee, *Summer 2021; Chair: Summer 2022; Ex officio: Summer 2023*
  - Summer Program Committee, *Summer 2020*
  - Conference Liason, “Theoretical Physics for Machine Learning”, *Winter 2023*
  - Workshop Organizer, “Interplay of Fundamental Physics and Machine Learning”, *Summer 2022*
  - Workshop Organizer, “The LHC Awakens: A New Energy Frontier”, *Summer 2016*
  - Workshop Organizer, “Year One of the LHC”, *Summer 2011*
  - Conference Organizer, “New Data from the Energy Frontier”, *Winter 2011*
- American Physical Society (APS)
  - Fellow, *2022–Present*
  - Sakurai Dissertation Award Selection Committee, *Fall 2016; Vice Chair: Fall 2022; Chair: Fall 2023*
  - Member, *2002–Present*
- High Energy Physics Advisory Panel (HEPAP)
  - HEPAP Member, *August 2021–March 2024*
  - Particle Physics Project Prioritization Panel (P5), *December 2022–December 2023*
  - HEPAP Presentation, “The NSF AI Institute for Artificial Intelligence and Fundamental Interactions”, *December 2020*
  - HEPAP Presentation, “The High Energy Physics Landscape in 2019”, *May 2019*
- Advisory Committee, “ML4Jets”, *DESY, November 2023*
- Advisory Committee, “ML4Jets”, *Rutgers, November 2022*
- Topical Convener, “Collider Phenomenology”, *Snowmass Theory Frontier, July 2021, July 2022*
- Advisory Committee and Ombuds Team (with Ayana Arce), “Boost 2022”, *Hamburg, August 2022*
- Organizer, “Machine Learning at GGI”, *Galileo Galilei Institute, August/September 2022*
- Advisory Committee and Ombuds Team (with Ayana Arce), “Boost 2021”, *Online, August 2021*

- Advisory Committee, “ML4Jets”, *Heidelberg, July 2021*
- Organizer, “CMS Open Data for Theorists”, *Fermilab/Virtual, September 2020*
- Advisory Committee and Ombuds Team (with Ayana Arce), “Boost 2020”, *Hamburg, July 2020*
- Advisory Committee, “Machine Learning for Particle Physics”, *Mainz, May 2020 → June 2021*
- Advisory Committee, “ML4Jets”, *New York, January 2020*
- Local Organizing Committee, “Boost 2019”, *MIT, July 2019*
- Advisory Committee, “Boost 2018”, *Paris, July 2018*
- Local Organizing Committee, “Rising Stars in Physics”, *MIT, April 2018*
- Advisory Committee, “Boost 2017”, *Buffalo, July 2017*
- Jet Convener, “Physics at TeV Colliders”, *Les Houches, June 2017*
- Advisory Committee, “BLV 2017”, *Cleveland, May 2017*
- Scientific Organizing Committee, “Lattice for BSM Physics 2017”, *Boston, April 2017*
- Advisory Committee, “Boost 2016”, *Zurich, July 2016*
- Organizer, “Gearing up for LHC13”, *Galileo Galilei Institute, Fall 2015*
- Advisory Committee, “Boost 2015”, *Chicago, August 2015*
- Jet Convener, “Physics at TeV Colliders”, *Les Houches, June 2015*
- Advisory Committee, “Boost 2014”, *London, August 2014*
- Organizer, “Boston Jet Physics”, *Harvard/MIT, January 2014*
- Advisory Committee, “Boost 2013”, *Flagstaff, August 2013*
- Advisory Committee, “Boost 2012”, *Valencia, July 2012*
- Conference Program Committee, “PANIC 2011: Particle and Nuclei International Conference”, *Boston, July 2011*
- Organizer, “Boston Jet Physics”, *Harvard/MIT, January 2011*
- Organizer, “Implications of First LHC Data”, *MIT/Berkeley, August 2010*
- Advisory Committee, “Boost 2010”, *Oxford U., June 2010*
- International Scientific Advisory Board, AI for Science and Science for AI (AISSAI) Center, *French CNRS, 2022–Present*
- International Advisory Committee, Machine Learning Physics, *JSPS/MEXT Grant-in-Aid for Transformative Research Areas, 2022–2026*
- Science Advisory Board, USQCD Collaboration, *Spring 2013–Fall 2016*
- Fellowship Selection Committee, LHC Theory Initiative, *Fall 2013–Fall 2014; Chair: Fall 2014*
- Editorial Board, *Journal of High Energy Physics, Fall 2019–Present*
- Editorial College, *SciPost Physics, Fall 2019–Present*
- Co-Topic Editor, “Efficient AI in Particle Physics and Astrophysics”, *Frontiers in Artificial Intelligence, Spring 2022*
- Peer Review:  
*Physical Review Letters; Journal of High Energy Physics; Physical Review D; SciPost Physics; Journal of Cosmology and Astroparticle Physics; Physics of the Dark Universe; Nuclear Physics B; Physics Letters B; European Physical Journal C; Journal of Physics G; Physics Reports; Annals of Physics; Particle Data Group*

- Funding Agency Review:  
*U.S. Department of Energy (DOE); National Science Foundation (NSF);  
European Research Council (ERC); Heising-Simons Foundation;  
Research Corporation for Science Advancement (Cottrell); The Royal Society;  
Swiss National Science Foundation; Natural Sciences & Engineering Research Council of Canada;  
Israel Science Foundation; Netherlands Organisation for Scientific Research;  
German Academic Exchange Service (DAAD); French National Research Agency;  
Hungarian National Research, Development & Innovation Office*

## Public Engagement

- High School Outreach: TheoryNet, *Northeastern U.*  
Scott Goelzer, *Coe-Brown Northwood Academy, Spring 2021*  
Michael Wadness, *Medford H.S., Fall 2012–Spring 2015, Spring 2018*  
Elaine Picard, *Concord-Carlisle H.S., Fall 2015–Spring 2016, Spring 2017, Spring 2020*  
Michael Hirsh, *Needham H.S., Spring 2010–Spring 2012*
- Open Data Advocacy  
“Slow and Steady” (with Matthew Strassler), *Nature Physics 15:725 (2019)*  
“Particle Collisions”, in Felice Frankel, *Picturing Science and Engineering, MIT Press, 2018*  
“The Future of Particle Physics is ‘Open’”, Guest Blog Post, *CMS Experiment, Dec. 2017*
- Artificial Intelligence Advocacy  
“Designing an AI Physicist”, Opinion Viewpoint, *CERN Courier, Sept.-Oct. 2021*

## Publications and Preprints

See <http://www.jthaler.net/research> for these publications organized by topic. Following the convention in particle physics, all authors are listed alphabetically, except for [83], [93], and [100].

\* = Paper arising from a supervised Ph.D. thesis

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## Invited Presentations

See <http://www.jthaler.net/cv> for a complete list of talks, including invited seminars, plenary talks, and additional workshop and conference talks.

## Colloquia

- “The Hidden Geometry of Particle Collisions”
  - Computer Science Colloquium, *Tufts, November 2023*
  - Particle Physics Colloquium, *KIT Karlsruhe, November 2020* (virtual)
  - Theory Colloquium, *CERN, May 2020* (virtual)

- “Particle Physics through the Lens of Machine Learning”
  - Physics and Astronomy Colloquium, *Northwestern*, March 2023
  - Physics Colloquium, *Technion*, January 2023
  - Physics Colloquium, *Tel Aviv*, January 2023
  - Physics Colloquium, *Brown*, November 2022
- “The Geometry of Particle Collisions: Hidden in Plain Sight”, Physics Colloquium, *Brandeis*, February 2022
- “Collision Course: Particle Physics meets Machine Learning”
  - Physics Colloquium, *U.C. San Diego*, May 2021 (virtual)
  - Physics and Astronomy Colloquium, *U. New Mexico*, April 2021 (virtual)
  - Physics Colloquium, *U.C. Santa Barbara*, April 2021 (virtual)
  - Physics Colloquium, *Northern Illinois University*, February 2021 (virtual)
  - Nordita Colloquium, *Stockholm University*, February 2021 (virtual)
  - Physics Colloquium, *University of Chicago*, February 2021 (virtual)
  - Physics Colloquium, *All Israel*, November 2020 (virtual)
  - Physics Colloquium, *Harvard*, November 2020 (virtual)
  - Physics Colloquium, *University of Maryland*, October 2020 (virtual)
  - Physics Colloquium, *Case Western Reserve University*, November 2019
  - Physics and Astronomy Colloquium, *Rice University*, October 2019
  - Physics Colloquium, *Oakland University*, October 2019
  - Physics Colloquium, *Tufts University*, September 2019
- “The Future is Open: Adventures with Public Collider Data”, Colloquium, *Fermilab*, September 2020 (virtual)
- “Jet Substructure at the Frontiers of Particle Physics”
  - Physics Colloquium, *University of Milan*, March 2018
  - Physics Colloquium, *University of Illinois, Urbana-Champaign*, October 2017
- “New Physics Gets a Boost: Jet Substructure at the Large Hadron Collider”
  - Colloquium, *Perimeter Institute*, May 2017
  - Physics Colloquium, *U.C. Berkeley*, April 2017
  - Physics Colloquium, *University of Texas, Austin*, March 2017
  - Physics Colloquium, *MIT*, October 2016
  - Physics and Astronomy Colloquium, *University of California, Riverside*, October 2016
  - Physics Colloquium, *University at Buffalo*, September 2016
- “Jet Substructure: Boosting the Search for New Physics at the LHC”
  - Physics Colloquium, *University of Chicago*, May 2016
  - Physics Colloquium, *Michigan State University*, January 2016
- “The Rise of Jet Substructure: Boosting the Search for New Physics at the LHC”
  - Physics Colloquium, *U.C. Santa Cruz*, November 2015
  - Physics Colloquium, *Brandeis*, September 2015
- “The Case for Jet Substructure”
  - Physics Colloquium, *Caltech*, November 2014
  - Colloquium, *MIT Laboratory for Nuclear Science*, April 2014
- “(Non)perturbative QCD and Jet Substructure”
  - Triangle Nuclear Theory Colloquium, *Duke University*, March 2014
  - Theory Colloquium, *University of Maryland*, October 2013

- “The Shape of Jets to Come: Boosting the Search for New Physics at the LHC”  
Physics Colloquium, *University of Oregon, May 2013*  
Physics Colloquium, *Cornell University, February 2013*
- “Anticipating New Data from the Energy Frontier”, Physics Colloquium, *Brown University, February 2011*
- “The Large Hadron Collider”, Physics Colloquium, *Wellesley College, October 2010*
- “The Shape of Jets to Come”, Colloquium, *MIT Laboratory for Nuclear Science, February 2010*

## Public Lectures

- “Collision Course: Artificial Intelligence meets Fundamental Physics”  
Distinguished Lecture, *National Science Foundation, January 2023* (virtual)  
Keynote Presentation, *Tommy Flowers Network Conference, October 2020* (virtual)
- “Artificial Intelligence Meets Fundamental Physics”, MIT Inside Track Master Class, *EmTech Digital, March 2021* (virtual)
- “Listening to the Invisible Universe”, Program with A Far Cry: Open Rehearsal of Gravity, *Harvard Education Portal, April 2019*
- “Confronting the Invisible Universe”  
MIT Club of Great Britain Event, *London, May 2018*  
Public Talk, *Aspen Center for Physics, March 2017*
- “The Higgs Boson: Triumph of the Standard Model”  
24th Annual Kavli Frontiers of Science, *National Academy of Sciences, U.C. Irvine, November 2012*  
Lecture Series Committee, *MIT, October 2012*

## Lecture Series & Schools

- “The Standard Model”, School on Table-Top Experiments for Fundamental Physics, *Perimeter Institute, September 2022*
- “Confronting the Invisible Universe”, Intro to Modern Physics, *MIT Lincoln Labs, March 2022*
- “QCD and Collider Physics”, Lectures on the Theory of Fundamental Interactions, *GGI, Florence, January 2020*
- “Collider Physics”, Cargese 2018 International Summer School, *Corsica, July 2018*
- “Jet Substructure”  
Theoretical and Experimental Issues on Jet Structure at Hadron Colliders, *Kavli IMPU and KEK, January 2017*  
PiTP Summer School, *Princeton, July 2013*
- “Jet Physics”, MITP Summer School, *Mainz, July 2016*
- “The Case for Jet Substructure”, Theorist of the Month, *DESY, June 2014*
- “Super-tricks for Superspace”, TASI Summer School, *C.U. Boulder, June 2012*
- “Little Lessons for a Little Higgs”, ICTP Winter School, *Trieste, January 2012*
- “Anticipating New Data from the Energy Frontier”, Topic of the Week Lecture Series, *Fermilab, November 2010*
- “Entering the LHC Era”, Felix Villars Theoretical Physics Retreat, *MIT CTP, January 2010*

## Research Contracts and Grants

- Simons Investigator in Physics, *Simons Foundation*, 2023–2028 (\$960k)
- AI Research Institute, “Institute for Artificial Intelligence and Fundamental Interactions (IAIFI)”, *National Science Foundation*, 2020–2025 (\$20M)
- MIT-Israel Zuckerman STEM Fund Award (with Tracy Slatyer, Tomer Volansky, Yotam Soreq), “The Quest for Dark Matter Interactions”, *MIT International Science and Technology Initiative (MISTI)*, 2020–2023 (\$25.5k)
- PIER Hamburg-MIT Seed Project (with Gregor Kasieczka, Phil Harris, Andreas Hinzmann, Roman Kogler, Iain Stewart), “Probing the Standard Model with Jet Substructure”, *Partnership for Innovation, Education and Research (PIER)*, 2019–2020 (€17k)
- Quantum Information Science (QuantISED) Award (with Aram Harrow), “Quantum Algorithms for Collider Physics”, *U.S. Department of Energy, Office of High Energy Physics*, 2018–2020 (\$264k)
- Simons Fellowship, “Theoretical Investigations In and Beyond the Standard Model”, *Simons Foundation*, 2018–2019 (\$142.8k)
- Comparative Review Funding Award, “Boosting the Search for New Physics at the Frontiers”, *U.S. Department of Energy, Office of High Energy Physics*, 2016–2017 (\$120k)
- The Charles E. Reed Faculty Initiatives Fund, “Boosting Jet Physics with Archival Collider Data”, *MIT Research Support Committee*, 2015–2017 (\$75k)
- MIT-Belgium Seed Fund Award (with Fabio Maltoni), “Beyond the Standard Model at the LHC”, *MIT International Science and Technology Initiative*, 2013–2014 (\$23.1k)
- Sloan Research Fellowship, *Alfred P. Sloan Foundation*, 2013–2016 (\$50k)
- Global Seed Fund Award (with Iain Stewart, Andre Hoang, Gavin Salam), “Probing a New Energy Frontier with Jets at the Large Hadron Collider”, *MIT International Science and Technology Initiative*, 2012–2013 (\$15k)
- Early Career Research Award, “Interpreting New Data from the Energy Frontier”, *U.S. Department of Energy, Office of Science*, 2011–2016 (\$750k)
- Cooperative Research Agreement, “Laboratory for Nuclear Science, High Energy Physics Program: Task C, Center for Theoretical Physics”, *U.S. Department of Energy, Office of Science*, 2010–present

## MIT Educational Commons

- Originator of “Flexible P/NR” grading option (*Approved by MIT Faculty, May 2020*)
- Faculty Committees: Committee on Curricula (see above)
- UROP Supervision: 21 students (see above)
- First-Year Advising: 4 students (see above)
- Teaching General Institute Requirements (GIR): 8.02 (*Spring 2014, Spring 2015, Spring 2016*)
- MIT Physics Career Panel, “SPS/PGSC Career Panel”, *November 2021*
- MIT Postdoctoral Association Panel Discussion, “Making the Cut - Job Searching During a COVID-19 Economy”, *June 2020*
- MIT Graduate Student Council Panel Discussion, “The Nuts and Bolts of Academic Job Search”, *July 2018*
- MIT PhysPOP Orientation Lecture, “Implications of the Higgs Boson”, *August 2013*

- MIT MISTI Presentation, “The Higgs Boson: Keystone of the Standard Model”, *April 2013*
- MIT Astronomical Event Presentation, “Dark Matter Beyond the Standard Model”, *October 2012*
- MIT Physics Alumni Breakfast, “Hints of New Physics at the Energy Frontier”, *May 2012*
- MIT PhysPOP Orientation Lecture, “Beyond the Standard Model at the Frontiers”, *August 2011*
- MIT Physics IAP Lecture, “The LHC Won’t Destroy the Planet (But Will Spark a Revolution)”, *January 2010*
- Physics@MIT Journal, “Listening for Dark Matter from the Basement of Building 24” (with Lindley Winslow), *Fall 2019*
- MIT Lecture Series Committee, Q&A for “Particle Fever”, *Sep. 2014*