Jesse Diaz Thaler

Curriculum Vitae
(Updated June 16, 2023)

Contact Information

Jesse Thaler
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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*
- 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*
- Fayad Ammar '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 Tripathee, *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, *anticipated M.Eng. 2023*
  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

- Xinyue (Stella) Wu, MIT Summer Research Program, *Summer 2023*
  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*
  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*

- 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*

Internal Service

- MIT Faculty Committee on Curricula, *Fall 2017–Spring 2020*
- MIT Physics CTP Junior Faculty Search Committee, *Fall 2017, Fall 2019, Fall 2021*
  Chair: *Fall 2019*
- MIT Physics Promotion Committee, *Fall 2019, Fall 2020, Fall 2021, Fall 2022*
  Chair: *Fall 2020, Fall 2021, Fall 2022*
- MIT Physics, Statistics, and Data Science (PhysSDS) Committee, *Fall 2020–Present*
  Co-Chair: *Fall 2020–Present*
- MIT Physics Graduate Admissions Committee, *Spring 2021*
- MIT Physics Pappalardo Fellowships Executive Committee, *Fall 2016–Fall 2017*
- MIT Physics Colloquium Committee, *Spring 2010–Spring 2014*
  Chair: *Fall 2012–Spring 2014*
- MIT Physics Ph.D. Thesis Committees:
  Cristian Zanoci *(Mikhail Lukin & Aram W. Harrow, in progress)*
  Patrick Fitzpatrick *(Tracy Slatyer & David Kaiser, Jul. 2021)*
  Joseph Johnston *(Lindley Winslow & Joseph Formaggio, May 2021)*
  Chih-Liang Wu *(Tracy Slatyer, Apr. 2021)*
  Constantin Weisser *(Mike Williams, Mar. 2021)*
  J. Owen Andrews *(Ibrahim Cissé, Nov. 2020)*
  Gherardo Vita *(Iain Stewart, Aug. 2020)*
  Jasmine Brewer *(Krishna Rajagopal, Jul. 2020)*
  Hongwan Liu *(Tracy Slatyer, May 2019)*
  Charles Epstein *(Richard Milner, Aug. 2018)*

Nicholas Rodd *(Tracy Slatyer, Apr. 2018)*
David Hernandez *(Edmund Bertschinger, Apr. 2018)*
Aram Apyan *(Markus Klute, Nov. 2016)*
Daniel Roberts *(Allan Adams, Apr. 2016)*
Ian Moult *(Iain Stewart, Apr. 2016)*
Daniel Kolodrubetz *(Iain Stewart, Apr. 2016)*
Mingming Yang *(Christoph Paus, Jan. 2015)*
Shawn Henderson *(Peter Fisher, Jul. 2013)*
Teng Ma *(Boleslaw Wyslouch, May 2013)*
Kevin Sung *(Steven Nahn, Mar. 2013)*
Christopher Jones *(Janet Conrad, Jun. 2012)*
Riccardo Abbate *(Iain Stewart, May 2012)*
Abolhassan Vaezi *(Xiao-Gang Wen, Jan. 2011)*
Georgia Karagiorgi *(Janet Conrad, Jul. 2010)*

- MIT Physics Graduate Academic Advisor, *Fall 2017–Present*
  Anticipated Ph.D. 2025: Ryan Abbott
  Anticipated Ph.D. 2024: Bruno Scheihing Hitschfeld, Stella Schindler
  Anticipated Ph.D. 2022: Eric Anschuetz, Samuel Leutheusser, Gregory Ridgway, Annie Wei, Ryan Weller
  Ph.D. 2020: Jasmine Brewer
- MIT Physics Academic Advisor, *Fall 2011–Present*
  Class of 2024: Omar Abdelghani, Chirag Falor, Lily Moseni, Dylan Raphael, David Suarez, Chris Viets
  Class of 2018–20: Robert Arnott, Zachary Bogorad, Hannah Field, Rodmy Paredes Alfaro, Saranesh Prembabu, Joshua Rhodes, Kevin Tang, Michael Winer
  Class of 2014–15: Allison Christian, Jay Lawhorn, Joseph Perricone, Jeffrey Prouty, Melih Ucer, Pranjal Vachaspati, Prashanth Venkataram
- MIT First-Year Advisor, *Fall 2019–Spring 2020*
  Class of 2023: Richter Brzeski, Megha Maran, Catalina Monsalve Rodriguez, Dylan Weber
- MIT Physics Qualifying Exam, Written Exam Grading Committee, *Jan. 2020*
- MIT Physics Qualifying Exam, Part III Committee, *Spring 2015–Spring 2017*
- MIT Physics Qualifying Exam, Part II Committee, *Spring 2012–Spring 2014*
  Chair: *Fall 2013–Spring 2014*
- MIT Physics Qualifying Exam, Part II Grading Committee, *Sept. 2010, Jan. 2020*
- MIT LNS Advisory Group Member, *Fall 2017, Spring 2020–Present*
- MIT LNS Colloquium Committee, *Fall 2015–Spring 2018*
  Chair: *Fall 2017–Spring 2018*
- MIT CTP Oral Qualifying Exam Committee, *Fall 2022, Spring 2023*
- MIT CTP Faculty Mentor, *Apr. 2021–Present*
- MIT CTP Deputy Group Leader in High-Energy Theory, *Spring 2020–Present*
- MIT CTP Visitor Coordinator, *Fall 2016–Present*
- MIT CTP Nuclear/Particle Seminar Committee, *Fall 2010–Fall 2016*
- MIT CTP Postdoc Selection Committee, *Fall 2009–Present*
- MISTI Global Seed Funds Evaluation Committee, *Fall 2012–Fall 2014*

External Service

- Member, Particle Physics Project Prioritization Panel (P5), *Dec. 2022–Present*
- External Ph.D. Examiner:
  Pedro Cal *(Wouter Waalewijn, U. Amsterdam, Sep. 2021)*
  Thea Aarrestad *(Ben Kilminster,U. Zurich, Mar. 2017)*
  Ignacio Garcia Garcia *(Eduardo Ros & Marcel Vos, U. Valencia, Dec. 2016)*
  Brian Walsh *(Tobias Golling, Yale, Feb. 2013)*
  Travis Martin *(Thomas Gregoire & Stephen Godfrey, Carleton U., Aug. 2012)*
- External Mentoring:
  Ilias Cholis, PI Academy for Research and Engagement, *Oakland U., Fall 2018–Fall 2019*
- Member, High Energy Physics Advisory Panel (HEPAP), *Aug. 2021–Mar. 2024*
- Topical Convener in Collider Phenomenology, Snowmass Theory Frontier, *Jul. 2022*
- General Member, Aspen Center for Physics, *Summer 2020–Summer 2025*
  Nominations Committee, *Summer 2021, Summer 2022; Chair: Summer 2022*
  Summer Program Committee, *Summer 2020*
- Advisory Committee, Mainz Machine Learning Workshop, *Jun. 2021*
- International Advisory Committee, Boost Workshops, *Jun. 2010, Jul. 2012, Aug. 2013, Aug. 2014, Aug. 2015, Jul. 2016, Jul. 2017, Jul. 2018, Jul. 2019, Jul. 2020, Aug. 2021*
  Ombuds Team: *since Jul. 2020*
  Local Organizing Committee: Boost 2019, *MIT, Jul. 2019*
- Organizer, Fermilab Remote CMS Open Data Workshop, *Sep. 2020*
- Advisory Committee, ML4Jets Workshop, *Jan. 2020*
- Local Organizing Committee, Rising Stars in Physics, *Apr. 2018*
- Jet Convenor, Les Houches Workshops, *Jun. 2015, Jun. 2017*
- Advisory Committee, BLV Workshop, *May 2017*
- Organizing Committee, Lattice for BSM Workshop, *Apr. 2017*
- Organizer, Aspen Center for Physics Workshops, *Feb. 2011, Jul. 2011, Aug. 2016*
- Organizer, Galileo Galilei Institute Workshop, *Sep. 2015*
- Organizer, Boston Jet Physics Workshop, *Jan. 2011, Jan. 2014*
- Program Committee, PANIC 2011, *Jul. 2011*
- Organizer, MIT/Berkeley Workshop, *Aug. 2010*
- Science Advisory Board, *USQCD Collaboration, Spring 2013–Fall 2016*
- Sakurai Dissertation Award Selection Committee, *American Physical Society, 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*
- Fellow of the Editorial College, *SciPost, Fall 2019–Present*
- Peer Review: *Physical Review Letters*, *Journal of High Energy Physics*, *Physical Review D*, *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*, *National Science Foundation*, *Heising-Simons Foundation*, *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*, *Hungarian National Research Office*
- 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
† = Paper arising from a supervised B.S. thesis

[125] Fabrizio Caola, Radosław Grabarczyk, Maxwell L. Hutt, Gavin P. Salam, Ludovic Scyboz, and Jesse Thaler, *Flavoured jets with exact anti-kt kinematics and tests of infrared and collinear safety* [arXiv:2306.07314].

[124] Andrew J. Larkoski and Jesse Thaler, *A Spectral Metric for Collider Geometry* [arXiv:2305.03751].

[123] * Samuel Alipour-fard, Patrick T. Komiske, Eric M. Metodiev, and Jesse Thaler, *Pileup and Infrared Radiation Annihilation (PIRANHA): A Paradigm for Continuous Jet Grooming* [arXiv:2305.00989].

[122] * Demba Ba, Akshunna S. Dogra, Rikab Gambhir, Abiy Tasissa, and Jesse Thaler, *SHAPER: Can You Hear the Shape of a Jet?* [arXiv:2302.12266].

[121] Erik Buhmann, Gregor Kasieczka, and Jesse Thaler, *EPiC-GAN: Equivariant Point Cloud Generation for Particle Jets* [arXiv:2301.08128].

[120] Peter Onyisi, Delon Shen, and Jesse Thaler, *Comparing Point Cloud Strategies for Collider Event Classification* [arXiv:2212.10659].

[119] † Eric R. Anschuetz, Lena Funcke, Patrick T. Komiske, Serhii Kryhin, and Jesse Thaler, *Degeneracy Engineering for Classical and Quantum Annealing: A Case Study of Sparse Linear Regression in Collider Physics*, Phys. Rev. D106:056008 (2022) [arXiv:2205.10375].

[118] Pedro Cal, Jesse Thaler, and Wouter J. Waalewijn, *Power Counting Energy Flow Polynomials*, JHEP 2209:021 (2022) [arXiv:2205.06818].

[117] * Rikab Gambhir, Benjamin Nachman, and Jesse Thaler, *Bias and Priors in Machine Learning Calibrations for High Energy Physics*, Phys. Rev. D106:036011 (2022) [arXiv:2205.05084].

[116] † Patrick T. Komiske, Serhii Kryhin, and Jesse Thaler, *Disentangling Quarks and Gluons with CMS Open Data*, Phys. Rev. D106:094021 (2022) [arXiv:2205.04459].

[115] * Rikab Gambhir, Benjamin Nachman, and Jesse Thaler, *Learning Uncertainties the Frequentist Way: Calibration and Correlation in High Energy Physics*, Phys. Rev. Lett. 129:082001 (2022) [arXiv:2205.03413].

[114] Hao Chen, Ian Moult, Jesse Thaler, and Hua Xing Zhu, *Non-Gaussianities in Collider Energy Flux*, JHEP 2207:146 (2022) [arXiv:2205.02857].

[113] Andrea Delgado and Jesse Thaler, *Quantum Annealing for Jet Clustering with Thrust*, Phys. Rev. D106:094016 (2022) [arXiv:2205.02814].

[112] Patrick T. Komiske, Ian Moult, Jesse Thaler, and Hua Xing Zhu, *Analyzing N-point Energy Correlators Inside Jets with CMS Open Data*, Phys. Rev. Lett. 130:051901 [arXiv:2201.07800].

[111] Krish Desai, Benjamin Nachman, and Jesse Thaler, *SymmetryGAN: Symmetry Discovery with Deep Learning*, Phys. Rev. D105:096031 (2022) [arXiv:2112.05722].

[110] Benjamin Nachman and Jesse Thaler, *Neural Conditional Reweighting*, Phys. Rev. D105:076015 (2022) [arXiv:2107.08979].

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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

- "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 Hidden Geometry of Particle Collisions"
  Particle Physics Colloquium, *KIT Karlsruhe, November 2020* (virtual)
  Theory Colloquium, *CERN, May 2020* (virtual)
- "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: 15 students (see above)
- First-Year Advising: 4 students (see above)
- Teaching General Institute Requirements (GIR): 8.02 (*Spring 2014, Spring 2015, Spring 2016*)
- Physics@MIT Journal, "Listening for Dark Matter from the Basement of Building 24" (with Lindley Winslow), *Fall 2019*
- MIT Postdoctoral Association, "Making the Cut - Job Searching During a COVID-19 Economy: A Panel Discussion", *Jun. 2020*
- MIT Graduate Student Council, "The Nuts and Bolts of Academic Job Search", *Jul. 2018*
- MIT Lecture Series Committee, Q&A for "Particle Fever", *Sep. 2014*
- MIT PhysPOP Orientation Lecture, "Implications of the Higgs Boson", *Aug. 2013*
- MIT MISTI Presentation, "The Higgs Boson: Keystone of the Standard Model", *Apr. 2013*
- MIT Physics Astronomical Event, "Dark Matter Beyond the Standard Model", *Oct. 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", *Aug. 2011*
- MIT Physics IAP Lecture, "The LHC Won't Destroy the Planet (But Will Spark a Revolution)", *Jan. 2010*