

Department of Physics,
17 Oxford St,
Harvard University,
Cambridge, MA 02138.

(617) 496-9123
mreece@physics.harvard.edu

Matthew Reece

Curriculum Vitae

Updated July 28, 2021

- Appointments** Professor of Physics, Department of Physics, Harvard University, July 2019 – present.
John L. Loeb Associate Professor of the Natural Sciences, Department of Physics, Harvard University, July 2016 – June 2019.
Junior Visiting Faculty, Institute for Advanced Study, Fall 2016.
Assistant Professor, Department of Physics, Harvard University, July 2012 – June 2016.
Postdoctoral Fellow, Harvard Center for the Fundamental Laws of Nature, Harvard University, September 2011 – June 2012.
Postdoctoral Fellow, Princeton Center for Theoretical Science, Princeton University, September 2008 – August 2011.
Graduate Fellow, Kavli Institute for Theoretical Physics, University of California in Santa Barbara, January – June, 2008.
- Education** Ph.D., Physics, Cornell University, 2008.
BA, Physics and Mathematics, University of Chicago, 2004.
Paul R. Cohen Memorial Prize in Mathematics; John Haeseler Lewis Prize in Physics; Phi Beta Kappa (elected 2003); David W. Grainger Senior Scholarship in Physics; College Honor Scholarship; Dean’s Grant.
- Publications** *Journal Articles and Preprints*
Notes: JHEP = Journal of High Energy Physics; JCAP = Journal of Cosmology and Astroparticle Physics. An updated list of my publications can be found at the [Inspire-HEP database](#).
Yuichiro Nakai, Matthew Reece, and Motoo Suzuki, “Supersymmetric Alignment Models for $(g - 2)_\mu$,” [arXiv:2107.10268 \[hep-ph\]](#).
Jiji Fan, Katherine Fraser, Matthew Reece, and John Stout, “Axion Mass from Magnetic Monopole Loops,” [arXiv:2105.09950 \[hep-ph\]](#).
Manuel A. Buen-Abad, Jiji Fan, Matthew Reece, and Chen Sun, “Challenges for an axion explanation of the muon $g - 2$ measurement,” [arXiv:2104.03267 \[hep-ph\]](#).
Daniel Aloni, Pouya Asadi, Yuichiro Nakai, Matthew Reece, and Motoo Suzuki, “Spontaneous CP Violation and Horizontal Symmetry in the MSSM: Toward Lepton Flavor Naturalness,” [arXiv:2104.02679 \[hep-ph\]](#).
Hind Al Ali, Nima Arkani-Hamed, Ian Banta, Sean Benevides, Dario Buttazzo, Tianji Cai, Junyi Cheng, Timothy Cohen, Nathaniel Craig, Majid Ekhterachian, Jiji Fan, Matthew Forsslund, Isabel Garcia Garcia, Samuel Homiller, Seth Koren, Giacomo Koszegi, Zhen Liu, Qianshu Lu, Kun-Feng Lyu, Alberto Mariotti, Amara McCune, Patrick Meade,

- Isobel Ojalvo, Umut Oktem, Diego Redigolo, Matthew Reece, Filippo Sala, Raman Sundrum, Dave Sutherland, Andrea Tesi, Timothy Trott, Chris Tully, Lian-Tao Wang, and Menghang Wang, “The Muon Smasher’s Guide,” [arXiv:2103.14043 \[hep-ph\]](#).
- Ben Heidenreich, Jacob McNamara, Miguel Montero, Matthew Reece, Tom Rudelius, and Irene Valenzuela, “Chern-Weil Global Symmetries and How Quantum Gravity Avoids Them,” [arXiv:2012.00009 \[hep-ph\]](#).
- Cari Cesarotti, Matthew Reece, and Matthew J. Strassler, “The Efficacy of Event Isotropy as an Event Shape Observable,” [arXiv:2011.06599 \[hep-ph\]](#).
- Cari Cesarotti, Matthew Reece, and Matthew J. Strassler, “Spheres to Jets: Tuning Event Shapes with 5d Simplified Models,” *JHEP* 05 (2021) 096, [arXiv:2009.08981 \[hep-ph\]](#).
- Prateek Agrawal, Aditya Parikh, and Matthew Reece, “Systematizing the Effective Theory of Self-Interacting Dark Matter,” *JHEP* 10 (2020) 191, [arXiv:2003.00021 \[hep-ph\]](#).
- Dan Stefan Eniceicu and Matthew Reece, “Quasinormal Modes of Charged Fields in Reissner–Nordström Backgrounds by Borel–Padé Summation of Bender–Wu Series,” *Phys.Rev. D* 102 (2020) no.4, 044015, [arXiv:1912.05553 \[gr-qc\]](#).
- Katherine Fraser and Matthew Reece, “Axion Periodicity and Coupling Quantization in the Presence of Mixing,” *JHEP* 05 (2020) 066, [arXiv:1910.11349 \[hep-ph\]](#).
- Jiji Fan, Matthew Reece, and Yi Wang, “An Inflationary Probe of Cosmic Higgs Switching,” *JHEP* 2005 (2020) 042, [arXiv:1905.05764 \[hep-th\]](#).
- Prateek Agrawal, Naoya Kitajima, Matthew Reece, Toyokazu Sekiguchi, and Fuminobu Takahashi, “Relic Abundance of Dark Photon Dark Matter,” *Phys. Lett. B* 801 (2020) 135136 [arXiv:1810.07188 \[hep-ph\]](#).
- Ben Heidenreich, Matthew Reece, and Tom Rudelius, “Repulsive Forces and the Weak Gravity Conjecture,” *JHEP* 1910 (2019) 055, [arXiv:1906.02206 \[hep-th\]](#).
- Matthew Reece, “Photon Masses in the Landscape and the Swampland,” *JHEP* 1907 (2019) 181, [arXiv:1808.09966 \[hep-th\]](#).
- Cari Cesarotti, Qianshu Lu, Yuichiro Nakai, Aditya Parikh, and Matthew Reece, “Interpreting the Electron EDM Constraint,” *JHEP* 1905 (2019) 059, [arXiv:1810.07736 \[hep-ph\]](#).
- Thomas Roxlo and Matthew Reece, “Opening the black box of neural nets: case studies in stop/top discrimination,” [arXiv:1804.09278 \[hep-ph\]](#).
- Mustafa A. Amin, Jiji Fan, Kaloian D. Lozanov, and Matthew Reece, “Cosmological dynamics of Higgs potential fine tuning,” *Phys.Rev. D* 99 (2019) no.3, 035008. On arXiv as: “Higgs-citment: Cosmological Dynamics of Fine Tuning,” [arXiv:1802.00444 \[hep-ph\]](#).
- Prateek Agrawal, Jiji Fan, and Matthew Reece, “Clockwork Axions in Cosmology: Is Chrononatural Inflation Chrononatural?,” *JHEP* 1810 (2018) 193, [arXiv:1806.09621 \[hep-th\]](#).
- Ben Heidenreich, Matthew Reece, and Tom Rudelius, “Emergence of Weak Coupling at Large Distance in Quantum Gravity,” *Phys. Rev. Lett.* **121**, 051601 (2018), [arXiv:1802.08698 \[hep-th\]](#). (Original arXiv title: “Emergence and the Swampland Conjectures.”)
- Ben Heidenreich, Matthew Reece, and Tom Rudelius, “The Weak Gravity Conjecture and Emergence from an Ultraviolet Cutoff,” *Eur. Phys. J. C* (2018) 78: 337, [arXiv:1712.01868 \[hep-th\]](#).

- Prateek Agrawal, JiJi Fan, Matthew Reece, and Lian-Tao Wang, “Experimental Targets for Photon Couplings of the QCD Axion,” *JHEP* 1802 (2018) 006, arXiv:1709.06085 [hep-ph].
- Rebecca Krall and Matthew Reece, “Last Electroweak WIMP Standing: Pseudo-Dirac Higgsino Status and Compact Stars as Future Probes,” *Chin. Phys. C* 42 (2018) no. 4, 043105, arXiv:1705.04843 [hep-ph].
- Prateek Agrawal, JiJi Fan, Matthew Reece, and Wei Xue, “Deciphering the MSSM Higgs Mass at Future Hadron Colliders,” *JHEP* 1706 (2017) 027, arXiv:1702.05484 [hep-ph].
- Yuichiro Nakai and Matthew Reece, “Electric Dipole Moments in Natural Supersymmetry,” *JHEP* 1708 (2017) 031, arXiv:1612.08090 [hep-ph].
- Ben Heidenreich, Matthew Reece, and Tom Rudelius, “Evidence for a Sublattice Weak Gravity Conjecture,” *JHEP* 1708 (2017) 025, arXiv:1606.08437 [hep-th].
- Ben Heidenreich, Matthew Reece, and Tom Rudelius, “Axion Experiments to Algebraic Geometry: Testing Quantum Gravity via the Weak Gravity Conjecture,” *Int. J. Mod. Phys. D* 25, 1643005 (2016), arXiv:1605.05311 [hep-th].
Awarded fifth prize in the 2016 Gravity Research Foundation Essay Contest.
- JiJi Fan, Rebecca Krall, David Pinner, Matthew Reece, and Joshua T. Ruderman, “Stealth Supersymmetry Simplified,” *JHEP* 1607 (2016) 016, arXiv:1512.05781 [hep-ph].
- Prateek Agrawal, JiJi Fan, Ben Heidenreich, Matthew Reece, and Matthew Strassler, “Experimental Considerations Motivated by the Diphoton Excess at the LHC,” *JHEP* 1606 (2016) 082, arXiv:1512.05775 [hep-ph].
- Matthew Reece and Wei Xue, “SUSY’s Ladder: Reframing Large-Volume Sequestering,” *JHEP* 1604 (2016) 045, arXiv:1512.04941 [hep-ph].
- Matthew Reece and Thomas Roxlo, “Nonthermal Production of Dark Matter and Dark Radiation,” *JHEP* 1609 (2016) 096, arXiv:1511.06768 [hep-ph].
- Yuichiro Nakai, Matthew Reece, and Ryosuke Sato, “SUSY Higgs Mass and Collider Signals with a Hidden Valley,” *JHEP* 1603 (2016) 143, arXiv:1511.00691 [hep-ph].
- Ben Heidenreich, Matthew Reece, and Tom Rudelius, “Sharpening the Weak Gravity Conjecture with Dimensional Reduction,” *JHEP* 1602 (2016) 140, arXiv:1509.06374 [hep-th].
- Andrey Katz, Matthew Reece, and Aqil Sajjad. “Continuum-Mediated Dark Matter-Baryon Scattering,” *Phys. Dark Univ.* 12, 24-36 (2016), arXiv:1509.03628 [hep-ph].
- Ben Heidenreich, Matthew Reece, and Tom Rudelius, “Weak Gravity Strongly Constrains Large-Field Axion Inflation,” *JHEP* 1512 (2015) 108, arXiv:1506.03447 [hep-th].
- JiJi Fan, Matthew Reece, and Lian-Tao Wang, “Precision Natural SUSY at CEPC, FCC-ee, and ILC,” *JHEP* 1508 (2015) 152, arXiv:1412.3107 [hep-ph].
- JiJi Fan, Matthew Reece, and Lian-Tao Wang, “Possible Futures of Electroweak Precision: ILC, FCC-ee, and CEPC,” *JHEP* 1509 (2015) 196, arXiv:1411.1054 [hep-ph].
- Andrey Katz, Matthew Reece, and Aqil Sajjad. “Naturalness, $b \rightarrow sy$, and SUSY Heavy Higgses,” *JHEP* 1410 (2014) 102, arXiv:1406.1172 [hep-ph].
- Rebecca Krall, Matthew Reece, and Thomas Roxlo, “Effective field theory and keV lines from dark matter,” *JCAP* 1409 (2014) 007, arXiv:1403.1240 [hep-ph].

- Lisa Randall and Matthew Reece, "Dark Matter as a Trigger for Periodic Comet Impacts," *Phys. Rev. Lett.* **112**, 161301 (2014), arXiv:1403.0576 [astro-ph].
Featured in an *APS Physics Viewpoint*; selected as a PRL Editors' Suggestion.
- JiJi Fan and Matthew Reece, "A New Look at Higgs Constraints on Stops," *JHEP* **1406** (2014) 031, arXiv:1401.7671 [hep-ph].
- JiJi Fan and Matthew Reece, "In Wino Veritas: Indirect Searches Shed Light on Neutralino Dark Matter," *JHEP* **1310** (2013) 124, arXiv:1307.4400.
- JiJi Fan, Andrey Katz, Lisa Randall, and Matthew Reece, "Dark-Disk Universe," *Phys. Rev. Lett.* **110**, 211302 (2013), arXiv:1303.3271 [hep-ph].
Featured in an *APS Physics Synopsis*.
- JiJi Fan, Andrey Katz, Lisa Randall, and Matthew Reece, "Double-Disk Dark Matter," *Phys. Dark Univ.* **2**, 139 (2013). arXiv:1303.1521 [astro-ph].
- JiJi Fan and Matthew Reece, "Probing Charged Matter Through $h \rightarrow \gamma\gamma$, Gamma Ray Lines, and EDMs," *JHEP* **1306** (2013) 004, arXiv:1301.2597 [hep-ph].
- JiJi Fan and Matthew Reece, "A Simple Recipe for the 111 and 128 GeV Lines," *Phys. Rev. D.* **88**, 035014 (2013), arXiv:1209.1097 [hep-ph].
- Matthew Reece, "Vacuum Instabilities with a Wrong-Sign Higgs-Gluon-Gluon Amplitude," *New J. Phys.* **15** (2013) 043003, arXiv:1208.1765 [hep-ph].
- Lisa Randall and Matthew Reece, "Single-Scale Natural SUSY," *JHEP* **08** (2013) 88, arXiv:1206.6540 [hep-ph].
- Zhenyu Han, Andrey Katz, David Krohn, and Matthew Reece, "(Light) Stop Signs," *JHEP* **08** (2012) 083, arXiv:1205.5808 [hep-ph].
- JiJi Fan, Matthew Reece, and Joshua T. Ruderman, "A Stealth Supersymmetry Sampler," *JHEP* **07** (2012) 196, arXiv:1201.4875 [hep-ph].
- Patrick Draper, Patrick Meade, Matthew Reece, and David Shih, "Implications of a 125 GeV Higgs Boson for the MSSM and Low-Scale SUSY Breaking," *Phys. Rev. D* **85**, 095007 (2012), arXiv:1112.3068 [hep-ph].
- Yevgeny Kats, Patrick Meade, Matthew Reece, and David Shih, "The Status of GMSB After 1/fb at the LHC," *JHEP* **1202** (2012) 115, arXiv:1110.6444 [hep-ph].
- JiJi Fan, Matthew Reece, and Lian-Tao Wang, "Mitigating Moduli Messes in Low-Scale SUSY Breaking," *JHEP* **09** (2011) 126, arXiv:1106.6044 [hep-ph].
- JiJi Fan, Matthew Reece, and Joshua T. Ruderman, "Stealth Supersymmetry," *JHEP* **11** (2011) 012, arXiv:1105.5135 [hep-ph].
- JiJi Fan, Matthew Reece, and Lian-Tao Wang, "Nonrelativistic effective theory of dark matter direct detection," *JCAP* **11** (2010) 042, arXiv:1008.1591 [hep-ph].
- Patrick Meade, Matthew Reece, and David Shih, "Long-Lived Neutralino NLSPs," *JHEP* **10** (2010) 067, arXiv:1006.4575 [hep-ph].
- Matthew Reece and Lian-Tao Wang, "Randall-Sundrum and Strings," *JHEP* **07** (2010) 040, arXiv:1003.5669 [hep-ph].
- Patrick Meade, Matthew Reece, and David Shih, "Prompt Decays of General Neutralino NLSPs at the Tevatron," *JHEP* **05** (2010) 105, arXiv:0911.4130 [hep-ph].

- Matthew Reece and Lian-Tao Wang, “Searching for the light dark gauge boson in GeV-scale experiments,” *JHEP* 07 (2009) 051, [arXiv:0904.1743 \[hep-ph\]](#).
- Csaba Csáki, Matthew Reece, and John Terning. “The AdS/QCD Correspondence: Still Undelivered,” *JHEP* 05 (2009) 067, [arXiv:0811.3001 \[hep-ph\]](#).
- Kaustubh Agashe, Csaba Csáki, Christophe Grojean, and Matthew Reece. “The S Parameter in Holographic Technicolor Models,” *JHEP* 12 (2007) 003, [arXiv:0704.1821 \[hep-ph\]](#).
- Csaba Csáki and Matthew Reece, “Toward a Systematic Holographic QCD: A Braneless Approach,” *JHEP* 05 (2007) 062, [arXiv:hep-ph/0608266](#).
- Patrick Meade and Matthew Reece, “Top Partners at the LHC: Spin and Mass Measurement,” *Phys.Rev. D* 74 (2006) 015010, [arXiv:hep-ph/0601124](#).
- Giacomo Cacciapaglia, Csaba Csáki, Christophe Grojean, Matthew Reece, and John Terning. “Top and Bottom: a Brane of Their Own,” *Phys.Rev. D* 72 (2005) 095018, [arXiv:hep-ph/0505001](#)
- Markus Duelli, Matthew Reece, and Robert W. Cohn, “A modified minimum-distance criterion for blended random and nonrandom encoding,” *J. Opt. Soc. Am. A* 16, 2425–2438 (1999).

White Papers, Working Group Reports

- C. Alpigian et al., “An Update to the Letter of Intent for MATHUSLA: Search for Long-Lived Particles at the HL-LHC,” [arXiv:2009.01693 \[physics.ins-det\]](#).
Contributed studies of MATHUSLA’s physics reach for long-lived particles in gauge mediated supersymmetry.
- B. Fleming and I. Shipsey, eds., *DOE Basic Research Needs Study on High Energy Physics Detector Research and Development*, August 2020.
Contributed to the “Explore the Unknown” working group.
- CEPC Conceptual Design Report, Volume II: Physics and Detector. Available at http://cepc.ihep.ac.cn/CEPC_CDR_Vol2_Physics-Detector.pdf and [arXiv:1811.10545](#).
Edited the section on exotic physics at the future CEPC collider in China; also contributed studies of electroweak precision tests.
- J. de Blas et al., “The CLIC Potential for New Physics,” *CERN Yellow Rep. Monogr. Vol. 3* (2018). [arXiv:1812.02093](#).
Contributed studies of precision supersymmetry measurement prospects.
- J. Alimena et al., “Searching for long-lived particles beyond the Standard Model at the Large Hadron Collider,” *J.Phys.G* 47 (2020) 9, 090501. [arXiv:1903.04497 \[hep-ex\]](#).
Contributed, with Cari Cesarotti, studies to the “Dark Showers” chapter on how to interpolate Hidden Valley event shapes between strong and weak coupling.
- D. Curtin et al., “Long-Lived Particles at the Energy Frontier: The MATHUSLA Physics Case,” *Rept.Prog.Phys.* 82 (2019) 11, 116201. [arXiv:1806.07396](#)
Contributed studies of MATHUSLA’s physics reach for long-lived particles in gauge mediated and stealth supersymmetry scenarios.

Physics at a 100 TeV pp Collider: beyond the Standard Model phenomena. CERN Yellow Report (2017) no. 3, 441-634. [arXiv:1606.00947](https://arxiv.org/abs/1606.00947)

Contributed studies of precision supersymmetry measurements at a future 100 TeV collider.

CEPC-SPPC Preliminary Conceptual Design Report, Volume 1: Physics & Detector (2015). Available at <http://cepc.ihep.ac.cn/preCDR/volume.html>.

Contributed physics studies and wrote much of chapter 4, "Electroweak Precision Physics at the CEPC" and portions of chapter 2, "Overview of the Physics Case for CEPC-SPPC."

K. Agashe *et al.*, "Snowmass 2013 Top quark working group report," [arXiv:1311.2028](https://arxiv.org/abs/1311.2028) [hep-ph].

Contributed studies of spin correlation for top/stop discrimination.

G. Amelino-Camelia *et al.* [KLOE collaboration], "Physics with the KLOE-2 experiment at the upgraded DAΦNE," *Eur. Phys. J. C* **68**, 619 (2010), [arXiv:1003.3868](https://arxiv.org/abs/1003.3868) [hep-ex].

Contributed to Monte Carlo simulations and discussion of dark photon searches at KLOE-2.

Peer-Reviewed, Invited Conference Proceedings

Matthew Reece, "Physics at a Higgs Factory," Hong Kong University of Science and Technology Jockey Club Institute for Advanced Study Program on High Energy Physics Conference, *Int. J. Mod. Phys. A* **31** (2016) 1644003, [arXiv:1609.03018](https://arxiv.org/abs/1609.03018) [hep-ph].

Matthew Reece, "The Status of AdS/QCD," The IX International Conference on Quark Confinement and the Hadron Spectrum, *AIP Conf. Proc.* **1343**, 117-122 (2011).

Other Publications

Yuichiro Nakai and Matthew Reece, "The implications of a precise electron measurement" *Physics Today Commentary & Reviews*, 14 November 2018.

Matthew Reece, "Viewpoint: Sizing Up the Top Quark's Interaction with the Higgs," *APS Physics* **11**, 56 (2018).

Matthew Reece, "Tracking Subatomic Physicists" (a review of the film *Particle Fever*). *Science* **343**, 1434 (2014).

Patrick Meade and Matthew Reece, "BRIDGE: Branching Ratio Inquiry / Decay Generated Events," [arXiv:hep-ph/0703031](https://arxiv.org/abs/hep-ph/0703031). (Software manual.)

Funding

Co-Investigator (with Principal Investigator Matthew Schwartz), DOE Grant DE-SC0013607 "Quantum Field Theory and Theoretical Particle Physics." Renewal grant. Expected total funding for April 1, 2021 to March 31, 2025: \$1,275,000.

Principal Investigator, Alfred P. Sloan Foundation Grant "Electric Dipole Moments: Providing a Theoretical Context," July 2020 to July 2023. Total funding: \$333,000.

Principal Investigator, NASA Astrophysics Theory Grant 80NSSC20K0506 "Accelerated Expansion of the Early and Late Universe: Bridging Observations and Consistent Theories," FY 2020-2022. Total funding: \$450,000.

Dean's Competitive Fund for Promising Scholarship, "Simulating a Finely Tuned Higgs Boson in the Early Universe." 2017 Funding: \$22,000.

Co-Investigator (with Principal Investigator Matthew Schwartz), DOE Grant DE-SC0013607 “Quantum Field Theory and Theoretical Particle Physics.” Expected total funding for April 1, 2017 to March 31, 2021: \$1,297,000 (my share: \$635,000).

Principal Investigator, NASA Astrophysics Theory Grant NNX16AI12G “Astrophysical Probes of Dark Matter Interactions.” Expected total funding for FY2016-2018: \$486,000.

Principal Investigator, National Science Foundation Grant PHY 1415548 “Hidden Particles in Weak Scale Physics and Beyond.” July 1, 2014 to June 30, 2017. Total funding: \$149,000.

Teaching

Quantum Mechanics 1 (Harvard University, Physics 143a): Fall 2014, 2015; Spring 2017, 2018.

Quantum Field Theory 1 (Harvard University, Physics 253a): Fall 2013, 2017.

Standard Model (Harvard University, Physics 254): Spring 2013, 2014, 2015, 2016, 2019; Fall 2020

A new course that I designed.

Quantum Field Theory 3 (Harvard University, Physics 253c): Fall 2019.

A course I designed, focused on instantons, solitons, monopoles, and other nonperturbative and semi-classical phenomena in QFT.

Wave Phenomena (Harvard University, Physics 15c): Spring 2020.

Advanced Quantum Mechanics 1 (Harvard University, Physics 251a): Fall 2021.

Advanced Quantum Mechanics 2 (Harvard University, Physics 251b): Spring 2021.

Advising

Past PhD students: Rebecca Krall (PhD 2017), Thomas Roxlo (PhD 2018)

Current PhD students (post-qualifying exam): Aditya Parikh (G5), Cari Cesarotti (G4), Qianshu Lu (G4), Katie Fraser (G3)

(Unofficial) co-advisor to Tom Rudelius (PhD 2017)

Thesis advisory committee member, undergraduate concentration advisor, or graduate academic advisor to over 30 other students

Advisor or co-advisor to postdoctoral fellows: Sam Homiller, Cody Long, John Stout, David Pinner, Francis-Yan Cyr-Racine, Prateek Agrawal, Andrew Larkoski, Jakub Scholtz, Yuichiro Nakai, Ben Heidenreich, Aqil Sajjad, Marat Freytsis, Andrey Katz

Supervised undergraduate research projects of: Patrick Komiske, Michael Landry, Wayne Zhao, Dan Eniceicu

Simulation, Software Development

2015: Developed Monte Carlo tools for simulating Stealth Supersymmetry signals at the LHC (with J. Fan, R. Krall, D. Pinner, J. Ruderman). Available at <http://physics.harvard.edu/~mreece/stealthsusy/>

2009: Developing Monte Carlo tools for simulation of a GeV-scale secluded sector (with L.-T. Wang). Formerly available at <http://phy-gzk.princeton.edu/LeptonJets/>; now available by request.

2006-07 (with ongoing maintenance): Coauthor (with P. Meade) of BRIDGE, Monte Carlo software for computing decay widths in arbitrary physics models and decaying unstable particles in events produced by other event generators. Available at <http://lepp.cornell.edu/public/theory/BRIDGE>.

2006-07: Produced a “black box” of sample LHC new physics data for the 4th LHC Olympics workshop, using MadGraph, BRIDGE, Pythia, and PGS (with P. Meade, P. Onyisi, and M. Perelstein).

**Awards,
Honors**

Most Valued Reviewer, *Physics Letters B*, 2017
 Clark Fund Award, Harvard University, 2016
 Fifth Award, Gravity Research Foundation Essay, 2016 (with Ben Heidenreich and Tom Rudelius)
 KITP Graduate Fellow, Spring 2008
 NSF Graduate Research Fellowship, 2004
 Cornell University Olin Graduate Fellowship, 2004
 Barry M. Goldwater Scholarship, 2002
 Intel Science Talent Search, 6th Place, 2000

Selected Media

“Debate Intensifies Over Dark Disk Theory,” Natalie Wolchover, *Quanta Magazine* (2016).
 “Did dark matter kill the dinosaurs?,” Elizabeth Gibney, *Nature News* (2014).
 “Do dark-matter discs envelop galaxies?,” Edwin Cartlidge, *Physics World* (2013).
 “Strange Dark Matter Interactions Could Create Galactic Disks and Dark Light,” Adam Mann, *Wired Science* (2013).

Talks

Invited Keynote Talks or Plenary Talks at Large International Conferences

Pheno 2020, Pittsburgh, May 6, 2020 (online)
 “New Physics at the TeV Scale”

Strings 2019, Brussels, Belgium, July 11, 2019
 “The Swampland Program”

Beyond the Standard Model: Where do we go from here?,
 42nd Johns Hopkins Workshop, GGI, Florence, Italy, October 5, 2018
 “From the Weak Gravity Conjecture to the Photon Mass”

COSMO 2018, Daejeon, Korea, August 27, 2018
 “Cosmology: the String Swampland, Dark Photons, and Moduli Dynamics”

SUSY 2018, Barcelona, Spain, July 24, 2018
 “Status of Low-Scale Supersymmetry”

KEK-PH 2018, Tsukuba, Japan, February 16, 2018
 “Higgscitement: Cosmological Dynamics of Fine Tuning”

StringPheno 2017, Blacksburg, Virginia, July 3, 2017
 “Big Hierarchies, Little Hierarchies, and Flat Directions in the SUSY Landscape”

29th Rencontres de Blois, May 29, 2017
 Collider Physics Keynote Talk: “Status and prospects for physics Beyond the Standard Model at the LHC”

SEARCH 2016, Oxford, UK, September 1, 2016
 “Dark Matter at the LHC and Beyond”

StringPheno 2016, Ioannina, Greece, June 24, 2016
 “Exploring the Weak Gravity Conjecture”

Fourth Annual Large Hadron Collider Physics Conference (LHCP) , Lund, June 16, 2016
 “The Status of Supersymmetry”
 HKUST Jockey Club IAS Conference on High Energy Physics, Hong Kong, January 18, 2016
 “Physics at a Higgs Factory”
 Naturalness 2014, Tel Aviv, November 16, 2014
 “Natural SUSY’s Last Hiding Places”
 SEARCH Conference at Stony Brook University, August 21, 2013
 “(Where) Are the Top Partners Hiding?”
 Large Hadron Collider Physics Conference (LHCP), Barcelona, May 16, 2013
 “Supersymmetry: Where Do We Stand?”
 9th International Conference on Identification of Dark Matter (IDM), July 26, 2012
 “Supersymmetry: Where Do We Stand?”
 Quark Confinement and the Hadron Spectrum IX, Madrid, September 3, 2010
 “The AdS/QCD Correspondence: Still Undelivered”

Seasonal School Lectures

Lectures on Formal Developments in High Energy Physics, Summer School on Particle Physics,
 ICTP (Trieste), June 10-21, 2019
 Lectures on the Weak Gravity Conjecture, Spring School on Superstring Theory and Related
 Topics, ICTP (Trieste), Mar. 28-Apr. 5, 2019
 Lectures on Physics Beyond the Standard Model, 11th Annual Hadron Collider Summer
 School, Fermilab, Aug. 11-20, 2016
 Lectures on Dark Matter, The 21st International Summer Institute on Phenomenology of
 Elementary Particles and Cosmology (SI2015), Aug. 1-7, 2015 Beijing, China

Colloquia

Harvard Physics Colloquium, November 26, 2018
 “Fundamental Physics from Underground to the Sky”
 Brown University Physics Colloquium, November 19, 2018
 “Fundamental Physics from Underground to the Sky”
 Rice University Physics and Astronomy Colloquium, October 17, 2018
 “Fundamental Physics from Underground to the Sky”
 Carleton University Physics Colloquium, November 1, 2016
 “Particle Physics After the Higgs: What’s Next?”
 Northeastern University Physics Colloquium, October 27, 2016
 “Particle Physics After the Higgs: What’s Next?”
 Harvard Physics Colloquium, September 28, 2015
 “Particle Physics After the Higgs: What’s Next?”
 Cornell University Physics Colloquium, November 24, 2014
 “Supersymmetry After the LHC’s First Run”
 Brandeis University Physics Colloquium, October 21, 2014
 “After the Higgs: What’s Next for Particle Physics?”

- Oskar Klein Center Colloquium, Stockholm, May 14, 2013
 “Modeling Bright Gamma Ray Lines”
 York University Physics Colloquium, March 7, 2012
 “Theory Confronts the LHC: Sizing Up Supersymmetry”
 Ohio State University Physics Colloquium, January 11, 2012
 “Theory Confronts the LHC: Sizing Up Supersymmetry”

Panel Discussions at Conferences

- Snowmass Community Planning Meeting 2020 (online), Beyond the Standard Model section. Panel on “Naturalness and EWSB” (with Cavaliere).
 QFT and Geometry Summer School 2020 (online), Panel on the Swampland Program (with García García, McNamara, and Valenzuela)
 5th MCTP Spring Symposium, Ann Arbor, MI April 22, 2017. Panel on “Weak Gravity Conjecture” (with Hebecker, Rudelius, Shiu)
 SEARCH 2016 Conference, Oxford, UK, September 1-2, 2016. Participated in three panels: “Without hints in the LHC data what’s the next benchmark for collider physics? What are the alternative promising probes of particle physics? How best can future colliders be motivated?” (with Hoecker, Peskin, Craig, Sundrum, Han, Camporesi); “Dark Matter and neutral long lived particles: what can it motivate further for LHC?” (with Terashi, McCullough, Worm, Cui); “Other theory motivations? Where would you put your money for the LHC and why?” (with Shih, Terning, Peskin, Rattazzi, Thomas, Chacko)
 SEARCH 2013 Conference, Stony Brook University, August 21-22, 2013. Participated in two panels: “Does Dark Matter have any relevance for the LHC or the TeV scale?” (with Thaler, Volansky, Weiner, Yavin); “SUSY Status” (with Padhi, Pierini, Pralavorio, Weiner)

Other Invited Workshop or Conference Talks Since 2010

- 2021: Pitt PACC LHC Physics for Run 3 workshop (online), CMS Week SUSY Meeting (online), LHCP (online, two talks), FCC Week (online), MIT “New Opportunities for Fundamental Physics Research with Radioactive Molecules” Conference (online)
 2020: Snowmass CFI Meeting on GeV+ Dark Matter (online), KITP Workshop “UV Meets the IR” (online), 4th FCC Physics and Experiment Workshop (online)
 2019: ACFI Swampland Workshop (co-led a discussion), CEPC Workshop in Chicago, KITP Workshop “Origin of the Vacuum Energy and Electroweak Scales,” Gordon Research Conference on New Tools for the Next Generation of Particle Physics and Cosmology (Hong Kong), Princeton Gravity Initiative Spring Conference on Weak Gravity and Cosmic Censorship
 2018: Hong Kong IAS Theory Mini-Workshop, 2nd FCC Physics Workshop at CERN, PIKIO Workshop Headline Talk, CLIC Beyond Standard Model Searches Meeting, Confronting Naturalness Workshop at DESY, Simons Summer Workshop, CERN-Korea TH Institute, Vistas over the Swampland

- 2017: Aspen Winter Conference, Lattice for BSM Physics, MCTP Spring Symposium, After Inflation workshop in Aspen, CEPC Workshop in Beijing
- 2016: PCTS@Ten Meeting, Radcliffe Rethinking Dark Matter Exploratory Seminar, CUNY Symposium on quantum fields, KITP New Accelerator Conference, Amsterdam String Workshop, Multi-Boson Interactions conference, ICTP Trieste Energy Frontier workshop, KICP cosmology workshop, PCTS dark matter workshop, Madrid IFT Xmas workshop
- 2015: Aspen Primordial Physics, CEPC physics workshop, String-Pheno-Cosmo Conference at the GGI (talk and discussion leader), Dark Matter at a Future Hadron Collider meeting at Fermilab
- 2014: CFHEP in Beijing, New Physics Workshop at ICTP in Trieste, Unsolved Problems in Astrophysics and Cosmology Workshop in Budapest, US ATLAS Workshop in Seattle, MCTP Hidden Dark Matter Conference
- 2013: Snowmass Energy Frontier Top Group Meeting, APS April Meeting, PCTS Higgs Physics workshop, Higgs Couplings conference in Freiburg, SUSY workshop at Fermilab, TRIUMF Cosmology at Colliders
- 2012: Pitt PACC Light Higgs workshop, Aspen Winter Conference, New Physics @ Korea Institute workshop, Perimeter Higgs physics workshop, PCTS collider workshop, LHC Workshop in Chicago, Frontiers of Beyond the Standard Model III in Minneapolis
- 2011: Aspen Center for Physics, LHC First Year workshop at KITP, Hidden SUSY workshop at UC Davis

Invited Seminars Since 2010

- 2021: Berkeley (online), ICTS (online), Mainz (online)
- 2020: Paris-wide seminar (online), Madrid IFT (online), Cambridge DAMTP (online), Fermilab (online), UC Santa Cruz (online), Maryland (online), UC Davis (online)
- 2019: Johns Hopkins, U. Minnesota
- 2018: UC Irvine, CERN BSM forum (remotely), Brandeis, Cornell, McGill, UCLA
- 2017: Columbia, MIT, SLAC, Yale, Northeastern, U. Michigan, Tufts, U. Penn
- 2016: Perimeter, Princeton, NYU, Carleton, IAS
- 2015: Chicago, Boston U, Michigan, Brown, UCLA, MIT, Rutgers
- 2014: LBNL, Berkeley Theory, Cornell, Stanford, Fermilab LPC, Fermilab Theory, U. Cincinnati, Chicago, Boston U
- 2013: UC Irvine, Stanford, MIT, Syracuse, Johns Hopkins
- 2012: U Wisconsin, Johns Hopkins, Perimeter, Brandeis, Case Western Reserve U, Boston U, CfA ITC, Chicago
- 2011: UC Davis, Rutgers, Maryland, MIT, Boston U, Stanford, Ohio State, U Michigan, Harvard, U Wisconsin
- 2010: Cornell, Johns Hopkins, SLAC, UC Berkeley, UC Davis, Los Alamos, Rutgers, Perimeter, IAS, Stony Brook

Professional Service

Reviewed grant proposals for Research Grants Council of Hong Kong; Netherlands Organization for Scientific Research (NWO); US DOE Graduate Student Research (SCGSR)

Program; National Science Centre, Poland; South Africa National Research Foundation (NRF); Swiss National Science Foundation; São Paulo Research Foundation, Brazil; Chilean Research Council; DOE Office of High Energy Physics Comparative Review; Gordon and Betty Moore Foundation

Refereed publications for Physical Review Letters, Physical Review D, Journal of High Energy Physics (JHEP), European Physics Journal C, Physics Letters B, European Physics Letters, Journal of Cosmology and Astroparticle Physics (JCAP), International Journal of Astrobiology, Journal of Physics G, Chinese Physics C, Universe, SciPost Physics, Cambridge University Press

Member of the Editorial College of SciPost Physics, 2019–present

Convener, Cosmo21 Conference (online, hosted by UTUC)

Scientific Program Committee, CEPC International Workshop 2020

Local organizing committee, String Pheno 2020 and 2021 (both online, hosted by Northeastern)

Member of the DOE's Office of High Energy Physics working group "Explore the Unknown" for the Basic Research Needs survey, 2019

Co-organizer, Amherst Center for Fundamental Interactions Workshop, "Theoretical Tests of the Swamp." October 21-23, 2019. (Organized with B. Heidenreich, M. Lotito, D. Harlow, and I. Valenzuela.)

Co-organizer, "String Theory and the Hidden Universe" Workshop, Aspen Center for Physics, May-June 2019. (Organized with J. Halverson, A. Hebecker, and L. McAllister)

Rutgers University external PhD thesis examiner, June 2018

Convener, ICHEP 2018 (Seoul) Beyond the Standard Model Session, July 2018

Convener, Section X: Theories Beyond the Standard Model, PASCOS 2018 Conference (Case Western Reserve University), June 2018

Scientific Committee, Theory Section, International Workshop on High Energy Circular Electron Positron Collider, IHEP, Beijing, November 2017

Co-organizer, Amherst Center for Fundamental Interactions Workshop, "Recent Developments in Semiclassical Probes of Quantum Field Theories." March 17-19, 2016. (Organized with P. Draper, N. Craig, J. Donoghue, G. Dunne, and M. Ünsal.)

Theory Convener (with S. Su), HKUST IAS Program on High Energy Physics, January 2016

Co-organizer, "Primordial Physics" Workshop, Aspen Center for Physics, Summer 2015. (Organized with D. Baumann, E. Komatsu, and L. McAllister)

Co-organizer, Harvard Self Interacting Dark Matter Workshop, August 7 to 9, 2013. (Organized with J. Fan, M. Freytsis, A. Katz, J. Shelton, M. Vogelsberger and M. Walker)

Co-organizer, "Understanding the TeV Scale Through LHC Data, Dark Matter, and Other Experiments," GGI Workshop, Florence, Italy, October & November, 2012 (with N. Arkani-Hamed, R. Barbieri, S. De Curtis, B. Heinemann, G. Rolandi, L.-T. Wang).

Co-organizer, "Dark Matter: Direct Detection and Theoretical Developments," PCTS Workshop, Princeton, NJ, November 15-16, 2010 (with J. Fan, M. Lisanti, and L.-T. Wang).

Co-organizer, Eötvös-Cornell workshop, “Beyond the Standard Model at the Dawn of the LHC Era,” Eötvös University (ELTE), Budapest, June 25-29, 2007. (Organized with C. Csáki, F. Csikor, G. Cynolter, J. Heinonen, and Z. Horváth)

Boston TheoryNet outreach to local high schools, 2013-2015.

Science Café outreach event participant, Aspen Center for Physics, 2012.

Departmental Service Graduate admissions committee, Harvard Physics Department, 2013, 2015, 2017, 2018, 2020
 Committee on Higher Degrees, Harvard Physics Department, Spring 2021
 Mentorship committee, Harvard Physics Department, 2020
 Harvard Physics Occupancy Oversight Committee, 2020
 Newsletter committee, Harvard Physics Department, 2020
 Harvard Physics High Energy Committee (assessing future hiring priorities), 2020
 Organizing committee for Harvard Physics PhD Reunion, 2020
 Colloquium committee chair, Harvard Physics Department, 2014–2016
 Faculty search committee, Harvard Physics Department, 2016
 “How to Give a Job Talk” panel for Harvard physics postdocs, 2017
 “On the Edge of the Unknown” article for the department newsletter (with J. Huth, C. Rogan, M. Schwartz), 2016.
 Golub Fellowship committee, Harvard Physics Department, 2014