CURRICULUM VITAE
MATTHEW D. SCHWARTZ

Department of Physics
Harvard University
17 Oxford Street, Cambridge, MA 02138
schwartz@g.harvard.edu

PROFESSIONAL APPOINTMENTS

- 2015 – present: Professor of Physics, Harvard University
- 2012 – 2015 : Associate Professor of Physics, Harvard University.
- 2008 – 2012: Assistant Professor of Physics, Harvard University.
- 2006 – 2008: Research Associate, Johns Hopkins University.
- 2003 – 2006: Postdoctoral Scholar, UC Berkeley.

EDUCATION

- 2003: Ph.D., Physics, Princeton University.
  - Thesis: “Effective Theories for Gravity;” advisor: Lisa Randall. 2003.
- 1998: M.A., Mathematics, University of Pennsylvania.
- 1998: B.A., Mathematics and Biophysics, University of Pennsylvania.
  - *Summa cum Laude with Departmental Honors, Benjamin Franklin Scholar, University Scholar, Phi Beta Kappa, Dean's List 1995,1996,1997,1998.*

GRANTS

- Department of Energy, 2017-2021.
  Department of Energy, 2015-2017.
- Department of Energy Continuation Award 2014-2015.
- Early Career Award of the Department of Energy, 2010-2014.
- Outstanding Junior Investigator Award, 2009-2010.
- Clark Fund Award, Harvard University, 2009.

TEACHING EXPERIENCE

- Instructor: “Physics 181: Statistical Mechanics,” Harvard University, 2018, 2019.
- Instructor: “Physics 253b: Quantum Field Theory II,” Harvard University, 2017.
- Instructor: “Physics 15c: The Physics of Waves,” Harvard University, 2011,2013, 2015, 2016.
  - Highest course rating *ever* for any intro physics class: 4.8/5.0
- Instructor: “Physics 253a: Quantum Field Theory I,” Harvard University, 2008, 2009, 2010, 2011, 2012, 2014, 2015, 2016, 2018.
- Project leader, Harvard Initiative for Teaching and Learning.

ADVISING

- **Ph.D. Advisor:**
  - Current students
    - Hofie Hannesdottir (G3).
  - Former students
    - Anders Andreassen, Ph. D. May 2018
    - Christopher Frye, Ph. D. May 2018
    - Kai Yan, Ph. D. May 2018
    - William Frost, Ph. D. <ay 2017
    - David Farhi, Ph.D. January 2016
    - Ilya Feige, Ph. D. May 2015.
    - Yang-Ting Chien, Ph.D. May 2013.
    - Jason Gallicchio,Ph.D. May 2011.
- **Thesis Advisor:**
  - Qianshu Lu, Antonio Copete, Lashkar Kashif, Alex Genday, Michael Kagan, Tongyan Lin, Kevin Mercurio, Abishek Parthak, Brian Shuve, Julia Rasmussen, Thomas Rudelius, Yat Shan Au, John Paul Chou and Aqil Sajjad.
- **Graduate Student Advisor:**
  - Gareth Kafka, Sam Espahbodi, Wiliam Frost, Abhishek Pathak, Matthew Stanton.
- **Undergraduate Concentration Advisor:**
  - Andrew Milewski, Rolando La Placa, Yale Fan, Jeffrey Epstein, Matthew Alpert, Jeffrey Iuliano, Christopher Wood, Masha Baryakhtar, Adam Ehrenberg, Ben Sorcscher, Sebastian Wagner-Carena, Maxwell L'Etoile, Francesca Childs.

LOCAL CONFERENCES ORGANIZED

- "Boost 2019" Massachusetts Institute of Technology, July 21-26, 2019.
- "Boston Jet Physics Workshop II" Massachusetts Institute of Technology, January 21-23, 2014.
- "ATLAS Standard Model Workshop 2013", Harvard University September 19-21, 2013.
- "Harvard Self-Interacting Dark Matter Workshop," Harvard University, August 7-13, 2013.
- "Boston Jet Physics Workshop," Harvard University, January 12-14, 2011.

SUMMER/WINTER SCHOOL LECTURING

- ICTP Summer School, Trieste Italy (2019)
- Pre-Susy Summer School, Barcelona, Spain (2018)
- Chilean School on High Energy Physics, Valparaiso, Chile (2018)
- Nordic Winter School (2017)
- TASI, Boulder, CO (2016)
- GGI lectures on the theory of fundamental interactions Florence, Italy (2016)
- 7th Odense Winter School, Odense Denmark (2014).
- Institut d'Etudes Scientifiques de Cargese, lectures on "Jet Physics" (2012).
- CTEQ summer school (2012)

DEPARTMENTAL SERVICE

- Chair: Junior Faculty Advisory Committee.
- Undergraduate Curriculum Committee.
- Office Space Planning Committee.
- Faculty Search Committee
- Computing Resources Committee.
- Career advisory panelist.
- Graduate, Undergraduate and APS Minority Scholarship Advisor.

PROFESSIONAL SERVICE

- Institutional review panelist, Department of Energy.
- Grant Reviewer for Department of Energy.
- Referee for *Physical Review Letters.*
- Referee for *Physical Review D.*
- Referee for *Journal of High Energy Physics.*
- Referee for *Nuclear Physics B.*
- Referee for *Physics Letters B.*

RESEARCH ACCOMPLISHMENTS

Major accomplishments

- Initiated new era of jet substructure and boosted physics.
- Produced many of the world's most precise calculations for collider observables.
- Proved factorization and unified three different approaches to it.
- Developed a consistent method for computing tunneling rates in Quantum Field Theory.
- Developed and applied techniques for effective field theory in quantum gravity, quantum chromodynamics and Beyond-the-Standard-Model physics.
- Developed methods of machine learning for collider physics.

- **Structure of Quantum Field Theory**
  - Developed systematically improvable methods for quantum tunneling calculations
    - Resolved 40 year old gauge-dependent stability bound puzzle. [Andreassen:2014].
    - Produced new method for precision decay rate calculations [Andreassen:2016].
    - Computed the world's most accurate estimate of the universe's lifetime [Andreassen:2017]
  - Developed simplified picture of the infrared structure of gauge theories.
    - First complete proof of universality of splitting functions and soft factors to all orders in perturbation theory [Feige:2014].
  - Developed insights into structure of scattering amplitudes.
    - First calculation of non-global structure at 2-, 3-, 4- and 5-loop order [Schwartz:2014].
    - Exponentiation properties simplified through a mapping to AdS [Chien:2012].

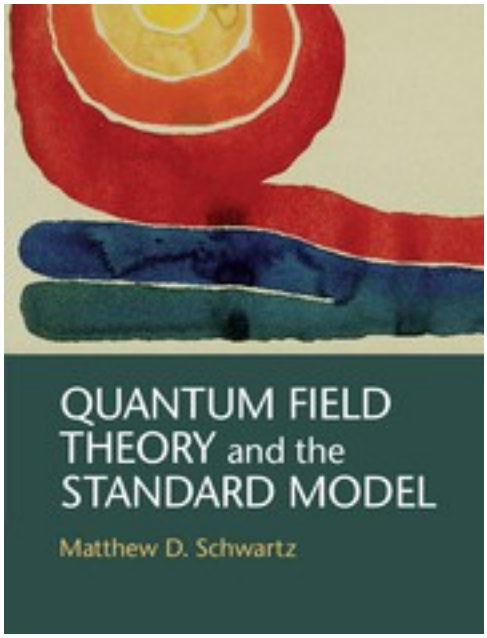
- **Effective field theory for collider physics.**
  - First event shape calculation using Soft-Collinear Effective Theory [Schwartz:2008].
  - First resummation of next-to-next-to leading and next-to-next-to-next-to-leading logarithms in event shape calculations, for thrust [Becher:2008] and heavy jet mass [Chien:2010].
  - Most precise calculation to date of electroweak gauge boson distributions at high energy at the LHC and Tevatron [Becher:2010, Becher:2012].
  - Most precise calculation of jet mass distributions at the LHC [Chien:2011, Frye:2016].
  - Connected Soft-Collinear Effective Theory to event generation [Bauer:2006].

- **Jet substructure**
  - Showed that boosted tops could be efficiently distinguished from QCD jets [Kaplan:2008].
  - Deigned a practical and effective measure of color flow [Gallicchio:2010].
  - Showed that quark and gluon jets can be distinguished [Gallicchio:2011].
  - Showed that jet charge could be measured and predicted scaling violation [Krohn:2012].
  - Introduced first non-deterministic jet algorithm and multiple event interpretations [Ellis:2012].

- **Effective field theory for gravity**
  - Simplified the study of massive spin-two particles [Arkani-Hamed:2003].
  - Demonstrated a consistent regulation scheme for 5D Anti-de Sitter space with application to unification in the Randall-Sundrum model [Randall:2001].

- **Beyond-the-standard-model physics**
  - Proposed topcolor as an explanation of the top forward-backward asymmetry excess [Cui:2011]. Featured in *Nature*, doi:10.1038/news.2011.436.
  - Used the AdS/CFT correspondence to calculate meson masses [Katz:2006,2007].
  - Proposed an extra-dimensional solution to the strong CP problem [Harnik:2004].
  - Deconstructed extra-dimensional supergravity models in superspace [Gregoire:2004].

TEXTBOOK



"**Once in a generation** particle physicists elevate a quantum field theory text to **the rank of classic.** Two such classics are the texts by Bjorken and Drell and Peskin and Schroeder; it wouldn't surprise me if this new book by Schwartz joins this illustrious group"
Mark Wise, *Caltech*

"A **wonderful tour** of quantum field theory from the modern perspective, filled with insights on both the conceptual underpinnings and the concrete, elegant calculational tools of the subject."
Nima Arkani-Hamed, *IAS, Princeton*

"In this book, Schwartz gives a thoughtful and modern treatment of many classical and contemporary topics. Students and experienced researchers will find much here of value."
Edward Witten, *IAS, Princeton*

(5 stars) on Amazon.com

- "I really **love this book,** it is the best quantum field theory (QFT) book I ever had." Y. Lay, Amazon reviewer.
- I was always interested in learning QFT but none of the available books (P&S, Srednicki, Zee's Nutshell) could offer me a clear understanding of the logic and reasoning behind QFT's esoteric formalism. That all changed after taking on Matthew Schwartz's book. **There is so much to tell about this marvelous book**..." P. Jannaty, Amazon reviewer.
- "The challenge to physics students though, is building the intuitive understanding of QFT. And, in this regard, **Schwartz's text is the best** … the level of detail in the calculations and the explanatory text around it are invaluable to the QFT beginner, and thus this text is highly recommended." S. Akula, Amazon reviewer.
- "Schwartz which starts you off slow and teaches you everything you need to know for QFT … **every section in Schwartz is impressing me**." Nate, Amazon reviewer.
- "This is a truly **great and wonderful book**." Stephan, Amazon reviewer.
- "This is the **best QFT textbook available** right now. It succeeds in covering a lot of ground without sacrificing accessibility." A Lupsasca, Amazon reviewer.

- Over 6000 copies sold.
- Adopted for courses at Stanford, U. Chicago, UC Berkeley, UC Santa Cruz, UC San Diego, UC Irvine, NYU, U. Colorado Bolder, U. New Mexico, Northwestern, McGill, UIUC, Indiana and more...

WORKSHOPS, CONFERENCES AND COLLOQUIA

- Aspen Center for Physics, August 2019.
- “Hammers and Nails: Machine Learning and HEP”, Weizmann Institute, July 2019.
- KEK Phenomenology Workshop, Tsukuba, Japan, Dec 2018.
- Colloquium Northwestern University, November 2018.
- Radcliffe Exploratory Seminar on “Learning in the Wider Universe” October 2018.
- HarvardData Science Institute Workshop, May 2018.
- "Jets and Machine Learning," Workshop on Machine Learning for Jets, LBNL, Dec 2017
- "Modern Machine Learning and the Large Hadron Collider," Colloquium, Dartmouth, Oct 6 2017
- "Modern Machine Learning and the Large Hadron Collider" Colloquium, University of Toronto, Oct 26 2017
- "Machine Learning and Particle Physics," Colloquium, Aspen CO, Aug 17 2017
- "Jet flavors at 100 fb^-1", Helsinki, Finland, May 2017
- "Scale setting in SCET", SCALES workshop, Cambridge, England, March 2017
- "Progress in Jet Physics," Cambridge, England March 2017
- “Jet Quantum Numbers,” CERN January 2017
- “Boost Workshop”, Zurich, Switzerland, August 2016.
- “LHC Run II and the Precision Frontier” KITP workshop, May 2016.
- “Semiclassics workshop,” Amherst, March 2016.
- “Factorization Violation workshop”, SUNY Buffalo, November 2015.
- “Boost Workshop,” Chicago, IL, August 2015.
- “SCET Workshop,” Santa Fe, NM, March 2015.
- Colloquium, Columbia University, New York, NY, February 2015.
- Colloquium, Harvard University, Cambridge, MA, October 2014.
- “Loopfest XIII”, City College of Technology, NY, June 2014.
- “Mitigation of Pileup Effects at the LHC”, CERN, Geneva, Switzerland, May 2014.
- “Workshop on Physics at a 100 TeV Collider,” SLAC, Menlo Park, CA, April 2014.
- “SCET Workshop,” TMU, Munich, Germany, March 2014.
- “Boost Workshop,” Flagstaff, AZ, August 2013.
- “Strongly-Interacting Dark Matter Workshop,” Harvard University, Cambridge, MA, August 2013.
- “Jets and Quantum Fields for the LHC and Future Colliders,” ESI, Vienna, Austria, July 2013.
- “QCD Evolution Workshop,” Jefferson Laboratory, VA, May 2013
- “Northwest Terascale Resarch Project”, Eugene, OR, April 2013
- “SCET Workshop,” Duke University, NC, March 2013.
- Colloquium, Ludwig Maximillian University, Munich, Germany, June 2012
- “Boost Workshop,” Valencia, Spain, July 2012.
- “LHC Now Workshop,” Sante Fe, NM, July 2012.
- “SCET Workshop,” Madrid, Spain, March 2012.
- “SEARCH Workshop,” University of Maryland, MD, March 2012.
- “LPCC Summer Institute,” CERN, Geneva, Switzerland, August 2011.

- “The First Year of the LHC” and “Harmony of Scattering Amplitudes,” KITP workshop, Santa Barbara, CA, June 2011.
- “Boost 2011,” Princeton, NJ, May 2011.
- PI-ATLAS LHC Day,” York University, Toronto, Canada, May 2011.
- “SCET Workshop,” Carnegie Mellon University, Pittsburgh, PA, March 2011.
- “LHC Physics Day,” CERN, Geneva, Switzerland, February 2011.
- “Workshop on Topologies for Early LHC Searches,” SLAC, Menlo Park, CA, September 2010.
- “Implications of First LHC Data,” MIT-Berkeley workshop, MIT, Cambridge, MA, August, 2010.
- “Forefront QCD and LHC Discoveries,” Aspen Center for Physics, Aspen CO, May-June, 2010.
- “SCET Workshop,” Max Planck Institute, Munich, Germany, April 2010.
- “Jet Substructure Workshop,” Seattle, WA, January 2010.
- “Jets and the LHC,” IMPU focus week, Tokyo, Japan, November 2009.
- “Giving new physics a boost,” SLAC, Menlo Park, CA, July 2009.
- “Physics at TeV Colliders,” QCD Working Group, Les Houches, France, June 2009.
- “Top quarks at the LHC,” CERN theory workshop, Geneva, Switzerland, May 2009.
- “Loopfest,” Madison, WI, May 2009.
- Colloquium, Brandeis University, Waltham, MA March 2009.
- “SCET Workshop,” MIT, Cambridge, MA, March 2009.
- “From Strings to LHC II,” Bangalore, India, December 2008.
- “SCET Workshop,” Mainz, Germany, April 2008.
- “Physics at TeV Colliders,” Monte Carlo Working Group, Les Houches, France, June 2007.
- “SCET Workshop,” Berkeley, CA, March 2007.
- “Physics at LHC: From Experiment to Theory,” Princeton, NJ, March 2007.
- “INT workshop on Electric Dipole Moments and CP Violation,” Seattle, WA, March 2007.
- “New Physics at the Electroweak Scale and New Signals at Hadron Collider,” Aspen, CO, January 2007.
- “West Coast LHC meeting,” San Diego, CA, May 2006.
- “Particle theory and the LHC,” Santa Fe Summer Workshop, Santa Fe, NM, 2006.
- “From the Planck Scale to the Electroweak Scale,” Planck Conference, Paris, France, 2006.
- “The Weak Scale, the Planck Scale and What's in between Them,” Technion, Israel, 2005.

MATTHEW D. SCHWARTZ

BOOKS

Quantum Field Theory and the Standard Model
By Matthew. D. Schwartz
Cambridge University Press 2014.
See http://www.schwartzqft.com/ or summary page on CV for more information.

JOURNAL ARTICLES

1. Infrared Finiteness and Forward Scattering.
By Christopher Frye, Holmfridur Hannesdottir, Nisarga Paul, Matthew D. Schwartz, Kai Yan.
[arXiv:1810.10022 [hep-ph]].
10.1103/PhysRevD.99.056015 .
Phys.Rev. D99 (2019) no.5, 056015.

2. JUNIPR: a Framework for Unsupervised Machine Learning in Particle Physics.
By Anders Andreassen, Ilya Feige, Christopher Frye, Matthew D. Schwartz.
[arXiv:1804.09720 [hep-ph]].
10.1140/epjc/s10052-019-6607-9
Eur.Phys.J. C79 (2019) no.2, 102.

3. Jet Charge and Machine Learning.
By Katherine Fraser, Matthew D. Schwartz.
[arXiv:1803.08066 [hep-ph]].
10.1007/JHEP10(2018)093 .
JHEP 1810 (2018) 093.

4. Learning to classify from impure samples with high-dimensional data.
By Patrick T. Komiske, Eric M. Metodiev, Benjamin Nachman, Matthew D. Schwartz.
[arXiv:1801.10158 [hep-ph]].
10.1103/PhysRevD.98.011502
Phys.Rev. D98 (2018) no.1, 011502.

5. Factorization Violation and Scale Invariance.
By Matthew D. Schwartz, Kai Yan, Hua Xing Zhu.
[arXiv:1801.01138 [hep-ph]].
10.1103/PhysRevD.97.096017
Phys.Rev. D97 (2018) no.9, 096017.

6. TASI Lectures on Collider Physics.
By Matthew D. Schwartz.
[arXiv:1709.04533 [hep-ph]].
10.1142/9789813233348_0002

7. Pileup Mitigation with Machine Learning (PUMML)
By Patrick T. Komiske, Eric M. Metodiev, Benjamin Nachman, Matthew D. Schwartz
[arXiv:1707.08600 [hep-ph]].
10.1007/JHEP12(2017)051 .
JHEP 1712 (2017) 051.

8. Scale Invariant Instantons and the Complete Lifetime of the Standard Model.
By Anders Andreassen, William Frost, Matthew D. Schwartz.
[arXiv:1707.08124 [hep-ph]]. 10.1103/PhysRevD.97.056006
Phys.Rev. D97 (2018) no.5, 056006.

9. Reducing the Top Quark Mass Uncertainty with Jet Grooming

By Anders Andreassen, Matthew D. Schwartz.
[arXiv:1705.07135 [hep-ph]]
10.1007/JHEP10(2017)151 .
JHEP 1710 (2017) 151.

10. Collinear factorization violation and effective field theory.
By Matthew D. Schwartz, Kai Yan, Hua Xing Zhu.
[arXiv:1703.08572 [hep-ph]].
10.1103/PhysRevD.96.056005.
Phys.Rev. D96 (2017) no.5, 056005.

11. Deep learning in color: towards automated quark/gluon jet discrimination
By Patrick T. Komiske, Eric M. Metodiev, Matthew D. Schwartz.
[arXiv:1612.01551 [hep-ph]].
10.1007/JHEP01(2017)110
JHEP 1701 (2017) 110.

12. Precision direct photon spectra at high energy and comparison to the 8 TeV ATLAS data.
By Matthew D. Schwartz.
[arXiv:1606.02313 [hep-ph]].
10.1007/JHEP09(2016)005
JHEP 1609 (2016) 005.

13. Precision direct photon spectra at high energy and comparison to the 8 TeV ATLAS data.
By Matthew D. Schwartz.
[arXiv:1606.02313 [hep-ph]].
JHEP09(2016)005.

14. Precision decay rate calculations in quantum field theory.
By Anders Andreassen, David Farhi, William Frost, Matthew D. Schwartz.
[arXiv:1604.06090 [hep-th]].

15. Factorization for groomed jet substructure beyond the next-to-leading logarithm.
By Christopher Frye, Andrew J. Larkoski, Matthew D. Schwartz, Kai Yan.
[arXiv:1603.09338 [hep-ph]]. JHEP07(2016)064.

16. Precision physics with pile-up insensitive observables.
By Christopher Frye, Andrew J. Larkoski, Matthew D. Schwartz, Kai Yan.
[arXiv:1603.06375 [hep-ph]].

17. A direct approach to quantum tunneling.
By Anders Andreassen, David Farhi, William Frost, Matthew D. Schwartz.
[arXiv:1602.01102 [hep-th]].

18. Streamlining resummed QCD calculations using Monte. Carlo integration
By David Farhi, Ilya Feige, Marat Freytsis, Matthew D. Schwartz.
[arXiv:1507.06315 [hep-ph]]. JHEP08(2016) 112.

19. Measurement of colour flow with the jet pull angle in $t\bar{t}$ events using the ATLAS detector at $\sqrt{s}=8$ TeV.
By ATLAS Collaboration (Georges Aad et al.).
[arXiv:1506.05629 [hep-ex]].

20. Removing phase-space restrictions in factorized cross sections.
By Ilya Feige, Matthew D. Schwartz, Kai Yan.
[arXiv:1502.05411 [hep-ph]].
10.1103/PhysRevD.91.094027.
Phys.Rev. D91 (2015) 094027.

21. Consistent Use of the Standard Model Effective Potential.
By Anders Andreassen, William Frost, Matthew D. Schwartz.
[arXiv:1408.0292 [hep-ph]].
10.1103/PhysRevLett.113.241801.
Phys.Rev.Lett. 113 (2014) 24, 241801.

22. Consistent Use of Effective Potentials
By Anders Andreassen, William Frost, Matthew D. Schwartz.
[arXiv:1408.0287 [hep-ph]].
10.1103/PhysRevD.91.016009.
Phys.Rev. D91 (2015) 1, 016009.

23. Quantifying the Power of Multiple Event interpretations
By Yang-Ting Chien, David Farhi, David Krohn, Andrew Marantan, David Lopez Mateos and Matthew D. Schwartz.
arXiv:1407.2892 [hep-ph].
JHEP 1412 (2014) 140.

24. Hard-Soft-Collinear Factorization to All Orders
By Ilya Feige, Matthew D. Schwartz.
[arXiv:1403.6472 [hep-ph]].
10.1103/PhysRevD.90.105020.
Phys.Rev. D90 (2014) 10, 105020.

25. Non-global Logarithms at 3 Loops, 4 Loops, 5 Loops and Beyond
By Matthew D. Schwartz and Hua Xing Zhu
arXiv:1403.4949 [hep-ph].
Phys.Rev.D90 (2014) 065004.

26. Jet Cleansing: Pileup Removal at High Luminosity.
By David Krohn, Matthew Low, Matthew D. Schwartz, Lian-Tao Wang.
arXiv:1309.4777 [hep-ph].
Phys.Rev.D90 (2014) 065020.

27. An on-shell approach to factorization.
By Ilya Feige, Matthew D. Schwartz.
arXiv:1306.6341 [hep-th].
10.1103/PhysRevD.88.065021.
Phys.Rev. D88 (2013) 065021.

28. Jet Sampling: Improving Event Reconstruction through Multiple Interpretations.
By Dilani Kahawala, David Krohn, Matthew D. Schwartz.
arXiv:1304.2394 [hep-ph].
10.1007/JHEP06(2013)006.
JHEP 1306 (2013) 006.

29. Quark and Gluon Jet Substructure.
By Jason Gallicchio, Matthew D. Schwartz.
arXiv:1211.7038 [hep-ph].
10.1007/JHEP04(2013)090.
JHEP 1304 (2013) 090.

30. Jet Charge at the LHC.
By David Krohn, Tongyan Lin, Matthew D. Schwartz, Wouter J. Waalewijn.
arXiv:1209.2421 [hep-ph].
10.1103/PhysRevLett.110.212001.
Phys.Rev.Lett. 110 (2013) 212001.

31. Resummation of Jet Mass at Hadron Colliders.
By Yang-Ting Chien, Randall Kelley, Matthew D. Schwartz, Hua Xing Zhu.
[arXiv:1208.0010 [hep-ph]].
10.1103/PhysRevD.87.014010.
Phys.Rev. D87 (2013) 014010.

32. Precision Direct Photon and W-Boson Spectra at High p_T and Comparison to LHC Data.
By Thomas Becher, Christian Lorentzen, Matthew D. Schwartz.
[arXiv:1206.6115 [hep-ph]].
10.1103/PhysRevD.86.054026.

Phys.Rev. D86 (2012) 054026.

33. Precision Jet Substructure from Boosted Event Shapes.
By Ilya Feige, Matthew D. Schwartz, Iain W. Stewart, Jesse Thaler.
[arXiv:1204.3898 [hep-ph]].
10.1103/PhysRevLett.109.092001.
Phys.Rev.Lett. 109 (2012) 092001.

34. Qjets: A Non-Deterministic Approach to Tree-Based Jet Substructure.
By Stephen D. Ellis, Andrew Hornig, Tuhin S. Roy, David Krohn, Matthew D. Schwartz.
[arXiv:1201.1914 [hep-ph]]. 10.1103/PhysRevLett.108.182003.
Phys.Rev.Lett. 108 (2012) 182003.

35. Jet Mass with a Jet Veto at Two Loops and the Universality of Non-Global Structure.
By Randall Kelley, Matthew D. Schwartz, Robert M. Schabinger, Hua Xing Zhu.
[arXiv:1112.3343 [hep-ph]].
10.1103/PhysRevD.86.054017.
Phys.Rev. D86 (2012) 054017.

36. Jet Physics from Static Charges in AdS.
By Yang-Ting Chien, Matthew D. Schwartz, David Simmons-Duffin, Iain W. Stewart.
[arXiv:1109.6010 [hep-th]].
10.1103/PhysRevD.85.045010.
Phys.Rev. D85 (2012) 045010.

37. Resummation for W and Z production at large pT.
By Thomas Becher, Christian Lorentzen, Matthew D. Schwartz.
[arXiv:1106.4310 [hep-ph]].
10.1103/PhysRevLett.108.012001.
Phys.Rev.Lett. 108 (2012) 012001.

38. Quark and Gluon Tagging at the LHC.
By Jason Gallicchio, Matthew D. Schwartz.
[arXiv:1106.3076 [hep-ph]].
10.1103/PhysRevLett.107.172001.
Phys.Rev.Lett. 107 (2011) 172001.

39. Top condensation as a motivated explanation of the top forward-backward asymmetry.
By Yanou Cui, Zhenyu Han, Matthew D. Schwartz.
[arXiv:1106.3086 [hep-ph]].
10.1007/JHEP07(2011)127.
JHEP 1107 (2011) 127.

40. The two-loop hemisphere soft function.
By Randall Kelley, Matthew D. Schwartz, Robert M. Schabinger, Hua Xing Zhu.
[arXiv:1105.3676 [hep-ph]].
10.1103/PhysRevD.84.045022.
Phys.Rev. D84 (2011) 045022.

41. Pure Samples of Quark and Gluon Jets at the LHC.
By Jason Gallicchio, Matthew D. Schwartz.
[arXiv:1104.1175 [hep-ph]].
10.1007/JHEP10(2011)103.
JHEP 1110 (2011) 103.

42. Resummation of jet mass with and without a jet veto.
By Randall Kelley, Matthew D. Schwartz, Hua Xing Zhu.
[arXiv:1102.0561 [hep-ph]].

43. W-jet Tagging: Optimizing the Identification of Boosted Hadronically-Decaying W Bosons.
By Yanou Cui, Zhenyu Han, Matthew D. Schwartz.
[arXiv:1012.2077 [hep-ph]].

10.1103/PhysRevD.83.074023.
Phys.Rev. D83 (2011) 074023.

44. Multivariate discrimination and the Higgs + W/Z search.
By Jason Gallicchio, John Huth, Michael Kagan, Matthew D. Schwartz, Kevin Black, Brock Tweedie.
[arXiv:1010.3698 [hep-ph]].
10.1007/JHEP04(2011)069.
JHEP 1104 (2011) 069.

45. Threshold hadronic event shapes with effective field theory.
By Randall Kelley, Matthew D. Schwartz.
[arXiv:1008.4355 [hep-ph]].
10.1103/PhysRevD.83.033001.
Phys.Rev. D83 (2011) 033001.

46. 1-loop matching and NNLL resummation for all partonic 2 to 2 processes in QCD.
By Randall Kelley, Matthew D. Schwartz.
[arXiv:1008.2759 [hep-ph]].
10.1103/PhysRevD.83.045022.
Phys.Rev. D83 (2011) 045022.

47. Resummation of heavy jet mass and comparison to LEP data.
By Yang-Ting Chien, Matthew D. Schwartz.
[arXiv:1005.1644 [hep-ph]].
10.1007/JHEP08(2010)058.
JHEP 1008 (2010) 058.

48. Seeing in Color: Jet Superstructure.
By Jason Gallicchio, Matthew D. Schwartz.
[arXiv:1001.5027 [hep-ph]].
10.1103/PhysRevLett.105.022001.
Phys.Rev.Lett. 105 (2010) 022001.

49. Annihilation decays of bound states at the LHC.
By Yevgeny Kats, Matthew D. Schwartz.
[arXiv:0912.0526 [hep-ph]].
10.1007/JHEP04(2010)016.
JHEP 1004 (2010) 016.

50. Direct photon production with effective field theory.
By Thomas Becher, Matthew D. Schwartz.
[arXiv:0911.0681 [hep-ph]].
10.1007/JHEP02(2010)040.
JHEP 1002 (2010) 040.

51. Top Tagging: A Method for Identifying Boosted Hadronically Decaying Top Quarks.
By David E. Kaplan, Keith Rehermann, Matthew D. Schwartz, Brock Tweedie.
[arXiv:0806.0848 [hep-ph]].
10.1103/PhysRevLett.101.142001.
Phys.Rev.Lett. 101 (2008) 142001.

52. Constraining Light Colored Particles with Event Shapes.
By David E. Kaplan, Matthew D. Schwartz.
[arXiv:0804.2477 [hep-ph]].
10.1103/PhysRevLett.101.022002.
Phys.Rev.Lett. 101 (2008) 022002.

53. A Precise determination of α_s from LEP thrust data using effective field theory.
By Thomas Becher, Matthew D. Schwartz.
[arXiv:0803.0342 [hep-ph]].
10.1088/1126-6708/2008/07/034.

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