

# Curriculum Vitae

**Andrew James Larkoski**

November 19, 2020

## Contact and Personal Information

- **Citizenship:** USA
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- **Address:**  
Reed College  
Department of Physics  
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## Employment

- Department of Physics at Reed College, Portland, OR  
Visiting Assistant Professor  
High Energy Particle Physics  
August 2016-
- Center for the Fundamental Laws of Nature at Harvard University, Cambridge, MA  
Post-Doctoral Researcher  
High Energy Particle Physics  
September 2015-August 2016
- Center for Theoretical Physics at Massachusetts Institute of Technology, Cambridge, MA  
Post-Doctoral Researcher  
High Energy Particle Physics  
September 2012-August 2015

## Academic History

- Stanford University, Stanford, CA, and SLAC National Accelerator Laboratory, Menlo Park, CA  
Ph.D., Physics, 2012  
High Energy Theory  
Advisor: Michael Peskin  
Dissertation Title: *The Structure of Jets at Hadron Colliders*
- University of Washington, Seattle, WA  
B.S., 2007  
Physics & Mathematics double major  
Magna Cum Laude, With Distinction in Physics

## Honors & Awards

- Wu-Ki Tung Award for Early Career Research on QCD 2017
- KITP Scholar 2017-2019
- LHC Theory Initiative Postdoctoral Fellow 2015-2016
- Paul Kirkpatrick Award for Outstanding Physics Teaching Assistant 2010-2011
- LHC Theory Initiative Travel Award 2011
- Mary Gates Endowment for Students Research Scholarship 2006-2007
- Robert E. Gross/Lockheed Aircraft Corporation Scholarship 2006-2007
- University of Washington Undergraduate Scholar Award 2003-2005

## Textbooks

1. A. J. Larkoski, *Elementary Particle Physics: An Intuitive Introduction*, Cambridge University Press (2019).

## Publications and Preprints

52. A. J. Larkoski and T. Melia, “Covariantizing Phase Space,” *Phys. Rev. D* **102**, no.9, 094014 (2020) [arXiv:2008.06508 [hep-ph]].
51. A. J. Larkoski, “Improving the Understanding of Jet Grooming in Perturbation Theory,” *JHEP* **09**, 072 (2020) [arXiv:2006.14680 [hep-ph]].
50. A. Buckley, G. Callea, A. J. Larkoski and S. Marzani, “An Optimal Observable for Color Singlet Identification,” *SciPost Phys.* **9**, 026 (2020) [arXiv:2006.10480 [hep-ph]].
49. A. Kardos, A. J. Larkoski and Z. Trócsányi, “Two- and Three-Loop Data for Groomed Jet Mass,” *Phys. Rev. D* **101**, no. 11, 114034 (2020) [arXiv:2002.05730 [hep-ph]]

48. A. Kardos, A. J. Larkoski and Z. Trócsányi, “Groomed jet mass at high precision,” *Phys. Lett. B* **809**, 135704 (2020) [arXiv:2002.00942 [hep-ph]].
47. A. Larkoski, S. Marzani and C. Wu, “Safe Use of Jet Pull,” *JHEP* **2001**, 104 (2020) [arXiv:1911.05090 [hep-ph]].
46. Y. Bao and A. J. Larkoski, “Calculating Pull for Non-Singlet Jets,” *JHEP* **1912**, 035 (2019) [arXiv:1910.02085 [hep-ph]].
45. T. Cohen, G. Elor, A. J. Larkoski and J. Thaler, “Circumnavigating Collinear Superspace,” *JHEP* **2002**, 156 (2020) [arXiv:1909.00009 [hep-th]].
44. A. J. Larkoski and E. M. Metodiev, “A Theory of Quark vs. Gluon Discrimination,” *JHEP* **1910**, 014 (2019) [arXiv:1906.01639 [hep-ph]].
43. A. J. Larkoski, S. Marzani and C. Wu, “Theory Predictions for the Pull Angle,” *Phys. Rev. D* **99**, no. 9, 091502 (2019) [arXiv:1903.02275 [hep-ph]].
42. K. Datta, A. Larkoski and B. Nachman, “Automating the Construction of Jet Observables with Machine Learning,” *Phys. Rev. D* **100**, no. 9, 095016 (2019) [arXiv:1902.07180 [hep-ph]].
41. T. Cohen, G. Elor, A. J. Larkoski and J. Thaler, “Navigating Collinear Superspace,” *JHEP* **2002**, 146 (2020) [arXiv:1810.11032 [hep-th]].
40. A. J. Larkoski and A. Procita, “New Insights on an Old Problem: Resummation of the D-parameter,” *JHEP* **1902**, 104 (2019) [arXiv:1810.06563 [hep-ph]].
39. K. Datta and A. J. Larkoski, “Novel Jet Observables from Machine Learning,” *JHEP* **1803**, 086 (2018) [arXiv:1710.01305 [hep-ph]].
38. A. J. Larkoski, I. Moult and D. Neill, “Factorization and Resummation for Groomed Multi-Prong Jet Shapes,” *JHEP* **1802**, 144 (2018) [arXiv:1710.00014 [hep-ph]].
37. A. J. Larkoski, I. Moult and D. Neill, “Analytic Boosted Boson Discrimination at the Large Hadron Collider,” arXiv:1708.06760 [hep-ph].
36. K. Datta and A. Larkoski, “How Much Information is in a Jet?,” *JHEP* **1706**, 073 (2017) [arXiv:1704.08249 [hep-ph]].
35. C. Frye, A. J. Larkoski, J. Thaler and K. Zhou, “Casimir Meets Poisson: Improved Quark/Gluon Discrimination with Counting Observables,” *JHEP* **1709**, 083 (2017) [arXiv:1704.06266 [hep-ph]].
34. A. Tripathy, W. Xue, A. Larkoski, S. Marzani and J. Thaler, “Jet Substructure Studies with CMS Open Data,” *Phys. Rev. D* **96**, no. 7, 074003 (2017) [arXiv:1704.05842 [hep-ph]].
33. A. Larkoski, S. Marzani, J. Thaler, A. Tripathy and W. Xue, “Exposing the QCD Splitting Function with CMS Open Data,” *Phys. Rev. Lett.* **119**, 132003 (2017) [arXiv:1704.05066 [hep-ph]].
32. T. Cohen, G. Elor and A. J. Larkoski, “Soft-Collinear Supersymmetry,” *JHEP* **1703**, 017 (2017) [arXiv:1609.04430 [hep-th]].

31. A. J. Larkoski, I. Moult and D. Neill, “The Analytic Structure of Non-Global Logarithms: Convergence of the Dressed Gluon Expansion,” *JHEP* **1611**, 089 (2016) [arXiv:1609.04011 [hep-ph]].
30. T. Cohen, G. Elor and A. J. Larkoski, “Collinear Superspace,” *Phys. Rev. D* **93**, no. 12, 125013 (2016) [arXiv:1603.09346 [hep-th]].
29. C. Frye, A. J. Larkoski, M. D. Schwartz and K. Yan, “Factorization for groomed jet substructure beyond the next-to-leading logarithm,” *JHEP* **1607**, 064 (2016) [arXiv:1603.09338 [hep-ph]].
28. C. Frye, A. J. Larkoski, M. D. Schwartz, K. Yan, “Precision physics with pile-up insensitive observables,” arXiv:1603.06375 [hep-ph].
27. A. J. Larkoski and I. Moult, “The Singular Behavior of Jet Substructure Observables,” *Phys. Rev. D* **93**, 014017 (2016) [arXiv:1510.08459 [hep-ph]].
26. A. J. Larkoski and I. Moult, “Non-Global Correlations in Collider Physics,” *Phys. Rev. D* **93**, no. 1, 014012 (2016) [arXiv:1510.05657 [hep-ph]].
25. A. J. Larkoski, I. Moult and D. Neill, “Analytic Boosted Boson Discrimination,” *JHEP* **1605**, 117 (2016) [arXiv:1507.03018 [hep-ph]].
24. A. J. Larkoski, F. Maltoni and M. Selvaggi, “Tracking down hyper-boosted top quarks,” *JHEP* **1506**, 032 (2015) [arXiv:1503.03347 [hep-ph]].
23. A. J. Larkoski, S. Marzani and J. Thaler, “Sudakov Safety in Perturbative QCD,” *Phys. Rev. D* **91**, 111501 (2015) [arXiv:1502.01719 [hep-ph]].
22. A. J. Larkoski, I. Moult and D. Neill, “Non-Global Logarithms, Factorization, and the Soft Substructure of Jets,” *JHEP* **1509**, 143 (2015) [arXiv:1501.04596 [hep-ph]].
21. A. J. Larkoski, D. Neill and I. W. Stewart, “Soft Theorems from Effective Field Theory,” *JHEP* **1506**, 077 (2015) [arXiv:1412.3108 [hep-th]].
20. A. J. Larkoski, I. Moult and D. Neill, “Building a Better Boosted Top Tagger,” *Phys. Rev. D* **91**, no. 3, 034035 (2015) [arXiv:1411.0665 [hep-ph]].
19. A. J. Larkoski, I. Moult and D. Neill, “Power Counting to Better Jet Observables,” *JHEP* **1412**, 009 (2014) [arXiv:1409.6298 [hep-ph]].
18. A. J. Larkoski, J. Thaler and W. J. Waalewijn, “Gaining (Mutual) Information about Quark/Gluon Discrimination,” *JHEP* **1411**, 129 (2014) [arXiv:1408.3122 [hep-ph]].
17. A. J. Larkoski and J. Thaler, “Aspects of Jets at 100 TeV,” *Phys. Rev. D* **90**, 034010 (2014) [arXiv:1406.7011 [hep-ph]].
16. A. J. Larkoski, “Conformal Invariance of the Subleading Soft Theorem in Gauge Theory”, *Phys. Rev. D* **90**, 087701 (2014) [arXiv:1405.2346 [hep-th]].
15. A. J. Larkoski, S. Marzani, G. Soyez and J. Thaler, “Soft Drop,” *JHEP* **1405**, 146 (2014) [arXiv:1402.2657 [hep-ph]].

14. A. J. Larkoski, I. Moult, D. Neill, “Toward Multi-Differential Cross Sections: Measuring Two Angularities on a Single Jet,” JHEP **1409**, 046 (2014) [arXiv:1401.4458 [hep-ph]].
13. A. J. Larkoski, D. Neill and J. Thaler, “Jet Shapes with the Broadening Axis,” JHEP **1404**, 017 (2014) [arXiv:1401.2158 [hep-ph]].
12. A. J. Larkoski and J. Thaler, “Unsafe but Calculable: Ratios of Angularities in Perturbative QCD,” JHEP **1309**, 137 (2013) [arXiv:1307.1699 [hep-ph]].
11. A. J. Larkoski, G. P. Salam and J. Thaler, “Energy Correlation Functions for Jet Substructure,” JHEP **1306**, 108 (2013) [arXiv:1305.0007 [hep-ph]].
10. A. J. Larkoski, J. J. Lopez-Villarejo and P. Skands, “Helicity-Dependent Showers and Matching with VINCIA,” Phys. Rev. D **87**, 054033 (2013) [arXiv:1301.0933 [hep-ph]].
9. A. J. Larkoski, “QCD Analysis of the Scale-Invariance of Jets,” Phys. Rev. D **86**, 054004 (2012) [arXiv:1207.1437 [hep-ph]].
8. M. Jankowiak and A. J. Larkoski, “Angular Scaling in Jets,” JHEP **1204**, 039 (2012) [arXiv:1201.2688 [hep-ph]].
7. C. Boucher-Veronneau, A. J. Larkoski, “Constructing Amplitudes from Their Soft Limits,” JHEP **1109**, 130 (2011) [arXiv:1108.5385 [hep-th]].
6. A. J. Larkoski, M. E. Peskin, “Antenna Splitting Functions for Massive Particles,” Phys. Rev. **D84**, 034034 (2011), [arXiv:1106.2182 [hep-ph]].
5. M. Jankowiak, A. J. Larkoski, “Jet Substructure Without Trees,” JHEP **1106**, 057 (2011). [arXiv:1104.1646 [hep-ph]].
4. A. J. Larkoski, M. E. Peskin, “Top Quark Amplitudes with an Anomalous Magnetic Moment,” Phys. Rev. **D83**, 034012 (2011). [arXiv:1012.0552 [hep-ph]].
3. A. J. Larkoski, M. E. Peskin, “Spin-Dependent Antenna Splitting Functions,” Phys. Rev. D **81**, 054010 (2010) [arXiv:0908.2450 [hep-ph]].
2. B. Batell, A. Larkoski, “Holography with Schroedinger potentials,” Annals Phys. **322**, 2776 (2007) [arXiv:hep-th/0610218]
1. A. J. Larkoski, D. G. Ellis, L. J. Curtis, “Numerical implementation of the Einstein-Brillouin-Keller quantization for arbitrary potentials”, Am. J. Phys. **74**, 572-577 (2006)

### Reports, Lecture Notes, and Conference Proceedings

14. A. J. Larkoski, “Another Unorthodox Introduction to QCD and now Machine Learning,” [arXiv:2008.09673 [hep-ph]].
13. S. Amoroso *et al.*, “Les Houches 2019: Physics at TeV Colliders: Standard Model Working Group Report,” arXiv:2003.01700 [hep-ph].
12. A. Kardos, A. Larkoski and Z. Trócsányi, “Soft-Dropped Observables with CoLoRFuLNNLO,” Acta Phys. Polon. B **50**, 1891 (2019).

11. J. Bendavid *et al.*, “Les Houches 2017: Physics at TeV Colliders Standard Model Working Group Report,” arXiv:1803.07977 [hep-ph].
10. A. J. Larkoski, “An Unorthodox Introduction to QCD,” arXiv:1709.06195 [hep-ph].
9. A. J. Larkoski, I. Moult and B. Nachman, “Jet Substructure at the Large Hadron Collider: A Review of Recent Advances in Theory and Machine Learning,” Phys. Rept. **841**, 1 (2020) [arXiv:1709.04464 [hep-ph]].
8. P. Gras *et al.*, “Systematics of quark/gluon tagging,” JHEP **1707**, 091 (2017) [arXiv:1704.03878 [hep-ph]].
7. M. L. Mangano *et al.*, “Physics at a 100 TeV pp collider: Standard Model processes,” CERN Yellow Report, no. 3, 1 (2017) [arXiv:1607.01831 [hep-ph]].
6. CEPC-SPPC Study Group Collaboration, “CEPC-SPPC Preliminary Conceptual Design Report. 1. Physics and Detector,” IHEP-CEPC-DR-2015-01, IHEP-TH-2015-01, HEP-EP-2015-01.
5. D. Adams *et al.*, “Towards an Understanding of the Correlations in Jet Substructure,” Eur. Phys. J. C **75**, no. 9, 409 (2015) [arXiv:1504.00679 [hep-ph]].
4. A. Larkoski, I. Moult and D. Neill, “Measuring Two Angularities on a Single Jet,” Int. J. Mod. Phys. Conf. Ser. **37**, 1560046 (2015).
3. A. Altheimer, A. Arce, L. Asquith, J. Backus Mayes, E. Bergeaas Kuutmann, J. Berger, D. Bjergaard and L. Bryngemark *et al.*, “Boosted objects and jet substructure at the LHC. Report of BOOST2012, held at IFIC Valencia, 23rd-27th of July 2012,” Eur. Phys. J. C **74**, 2792 (2014) [arXiv:1311.2708 [hep-ex]].
2. W. T. Giele, L. Hartgring, D. A. Kosower, E. Laenen, A. J. Larkoski, J. J. Lopez-Villarejo, M. Ritzmann and P. Skands, “The Vincia Parton Shower,” PoS DIS **2013**, 165 (2013) [arXiv:1307.1060].
1. A. Altheimer, S. Arora, L. Asquith, G. Brooijmans, J. Butterworth, M. Campanelli, B. Chapleau and A. E. Cholakian *et al.*, “Jet Substructure at the Tevatron and LHC: New results, new tools, new benchmarks,” J. Phys. G G **39**, 063001 (2012) [arXiv:1201.0008 [hep-ph]].

## Advised Senior Theses

- 2017:
  - Sabrina Appel, “Simulating the Gravitational Lensing of Massive Particles: An Exploration of Scattering Solutions to the Schwarzschild Metric”
  - Kaustuv Datta, “Extracting Information from Jets at Hadron Colliders Using Deep Learning”
  - Jonathan Croom, “Slacking Off: the Physics of Low Tension Highlining”
- 2018:
  - Kenji Arai, “Effect of Distinguishability on Multi-Parameter Estimation in Multiple Photon Interferometry”
  - Ali Cox, “Designing a New Type of Sail for Monohull Sailboats”
  - Aja Procita, “Resummation of the D-parameter”

- 2019:  
Colin Vangel, “Entanglement Entropy in Conformal Field Theory”  
Wills Harris, “Polarization Evolution from Gravitational Waves”  
Nate MacFadden, “Exact Solutions of Spin Chains”
- 2020:  
Jialun Zhao, “The AdS/CFT Correspondence”  
Asher Payton, “Supersymmetry and Hydrogen-Like Bound States”  
Yunjia Bao, “Understanding Scattering Amplitudes through Spinor Helicity Formalism”  
Trenor Hamilton, “A Beginner’s Guide to CMS Open Data Analysis”  
Dylan Russell, “Dark Photon Detection in Fixed Beam Experiments”

## Summer Students

- Summer 2017: Aja Procita, Kaustuv Datta
- Summer 2018: Aja Procita
- Summer 2019: Yunjia Bao, Nate MacFadden

## Seminars and Conferences

### Invited Seminars

- SLAC National Accelerator Lab, April 2020
- Willamette University, March 2020
- Institute for the Physics and Mathematics of the Universe, February 2020
- University of Oxford, January 2020
- CERN Library Book Talk, January 2020
- CERN QCD Lunch Talk, January 2020
- TRIUMF Colloquium, October 2019
- UCLA, April 2018
- LHC Results Forum, November 2017
- Fermi National Accelerator Laboratory “Topic of the Week”, July 2017
- UC Santa Barbara, May 2017
- Lewis & Clark College, April 2017
- University of Oregon, October 2016
- Peking University, July 2016

- Reed College, April 2016
- Fermi National Accelerator Laboratory, March 2016
- University of Wisconsin, February 2016
- Los Alamos National Laboratory, January 2016
- Pennsylvania State University, January 2016
- SUNY University at Buffalo, October 2015
- Brookhaven National Laboratory, September 2015
- NIKHEF, July 2015
- University of Maryland, April 2015
- Lawrence Berkeley Laboratory, UC Berkeley, April 2015
- California Institute of Technology, March 2015
- Boston University, February 2015
- Cornell University, November 2014
- SUNY Stony Brook, October 2014
- Brown University, May 2014
- SLAC National Laboratory, May 2014
- University of Durham IPPP, April 2014
- Université Catholique de Louvain, March 2014
- Rutgers University, February 2014
- Boston University, February 2013
- Argonne National Laboratory, November 2012
- Harvard University, September 2012
- IPhT CEA Saclay, February 2012
- CERN Collider Cross Talk, February 2012
- Lawrence Berkeley Laboratory, UC Berkeley, November 2011
- NIKHEF, October 2011
- UC Irvine, October 2011
- University of Manchester, September 2011



- SLAC National Laboratory, February 2011
- University of Durham IPPP, July 2010
- SLAC National Laboratory, October 2009

### **Invited Conference Talks**

- LHC-EW WG: Jets and EW bosons – Jet substructure mini workshop, November 2020
- Hadron Collider Physics Summer School 2020 Lecturer, August 2020
- Snowmass Computational Frontier: Machine Learning Workshop, August 2020
- KEK Theory Meeting on Particle Physics Phenomenology, February 2020
- BOOST 2019, July 2019
- In Pursuit of New Particles and Paradigms, March 2019
- SCET 2019, March 2019
- BOOST 2018, July 2018
- CTEQ Summer School 2018 Lecturer, June 2018
- LHCP Conference Plenary Talk, June 2018
- From Evidence to Scholarship: Transforming Undergraduate Student Research in the Digital Age, March 2018
- CMS SMP-Jets Group Theory Workshop, January 2018
- CTEQ Summer School 2017 Lecturer, July 2017
- BOOST 2017 Theory Introduction, July 2017
- SCET 2017, March 2017
- PITT PACC Workshop: Digging Deeper at LHC Run II, February 2017
- LHC Theory Initiative Fellows Meeting 2017, February 2017
- Jet Substructure “Planning for the future” Event at the Fermilab LPC, November 2016
- Hints of New Physics at the LHC Run 2, July 2016
- MC4BSM 2016, July 2016
- BOOST 2016, July 2016
- Stress Testing the Standard Model at the LHC, May 2016
- Threshold Logarithms Beyond Leading Power, January 2016

- QCD, EW and tools at 100 TeV Workshop at CERN, October 2015
- BOOST 2015 Theory Summary, August 2015
- BOOST 2015, August 2015
- American Physical Society April Meeting, April 2015
- SCET 2015, March 2015
- Exploring the Physics Frontier with Circular Colliders, January 2015
- Searches for New Phenomena at the Upgraded LHC Workshop, September 2014
- BOOST 2014, August 2014
- MC4BSM 2014, May 2014
- Workshop on Physics at a 100 TeV Collider, April 2014
- SCET 2014, March 2014
- LPC Workshop: JetMET at High Pile-up, Preparation for LHC Run II, January 2014
- QCD Tools for LHC Physics Workshop, November 2013
- Kinematic Variables for New Physics, October 2013
- BOOST 2013, August 2013
- Erwin Schrödinger Institute “Jets and Quantum Fields for LHC and Future Colliders” workshop, July 2013
- SCET 2013, March 2013
- BOOST 2012, July 2012
- SLAC DOE Review, June 2012
- US ATLAS Hadronic Final State Forum: Joint Theory/Experiment Open Session, November 2011
- VINCIA Collaboration Meeting, IPhT CEA Saclay, November 2011
- Galileo Galilei Institute “Interpreting Discoveries at the LHC” workshop, November 2011
- LHC Theory Initiative Fellows meeting, SLAC, October 2011
- BOOST 2011, Princeton University, May 2011
- West Coast ATLAS Forum, SLAC, May 2011
- West Coast LHC Conference, UC Irvine, December 2010
- TOOLS 2010, Winchester, England, June 2010

## Other Conferences Attended

- APS NW Particle Physics Session Chair, May 2019
- Pacific NW Theory Workshop, May 2019
- KITP Program: Scattering Amplitudes and Beyond, May 2017
- SCET 2016, March 2016
- MC4BSM 2013, April 2013
- Applications of Jet Substructure to New Physics Searches, February 2013
- US ATLAS Hadronic Final State Forum: Joint Theory/Experiment Open Session, August 2010
- Cargèse 2010: Physics at TeV colliders - From Tevatron to LHC, July 2010
- West Coast LHC Conference, May 2010
- Top @ Tevatron for LHC, November 2009
- Dark Forces Workshop, September 2009
- Confronting Challenges in Theoretical Physics, June 2009
- Northwest Terascale Workshop: *Parton Showers and Event Structure at the LHC*, February 2009
- West Coast LHC Conference, November 2008
- Anticipating Physics at the LHC, June 2008
- NSF Physics Research Experience for Undergraduates, Advisor Tony Gherghetta, Summer 2006, University of Minnesota
- APS NW Section Meeting, May 2006
- NSF Physics Research Experience for Undergraduates, Advisor David Ellis, Summer 2005, University of Toledo

## Teaching Experience

- Reed College
  - Lecturer:
    - \* Introductory Physics, Phys 101, Fall 2019, Fall 2020
    - \* Quantum Mechanics, Phys 342, Spring 2020
    - \* Computational Methods, Phys 367, Fall 2016, Fall 2017, Spring 2019
    - \* Elementary Particle Physics, Phys 366, Spring 2017, Spring 2019
    - \* General Relativity, Phys 411, Fall 2018

- Conference Leader:
  - \* Introductory Physics, Phys 101, Fall 2016, Fall 2017, Fall 2019, Fall 2020
  - \* Introductory Physics, Phys 102, Spring 2017, Spring 2019, Spring 2020
- Laboratory Leader:
  - \* Oscillations and Waves, Electronics Laboratory, Phys 201, Fall 2017, Fall 2018
  - \* Numerical Methods, Phys 202, Spring 2018
- Stanford University
  - Teaching Assistant
    - \* Advanced Freshman Physics, Physics 65, Prof. Roger Romani, Spring 2012
    - \* Quantum Mechanics, Physics 130, Prof. Pat Burchat, Autumn 2010
    - \* Introduction to Particle Physics, Physics 152/252, Prof. Pat Burchat, Winter 2010
    - \* Algebra-based Introductory Mechanics, Physics 21, Autumn 2007
    - \* Calculus-based Introductory Mechanics, Physics 41, Winter 2008
    - \* Calculus-based Introductory Electromagnetism, Physics 43, Spring 2008
  - Physics Department Teaching Mentor with Prof. Pat Burchat, September-December 2008
- University of Washington
  - Teaching Assistant
    - \* “Physics of Sports” Summer Challenge, July 2007
    - \* Calculus-based Introductory Physics, September 2004-June 2007

## Academic Service

- Member of BOOST Conference International Advisory Committee, 2018-
- Organizer, Physics Seminars at Reed College, Fall 2017
- Co-Organizer, Physics Seminars at Reed College, Spring 2017
- Organizer, Particle Physics Seminars at Harvard University, Fall 2015, Spring 2016
- Co-Organizer, Nuclear/Particle Seminars at MIT CTP, Fall 2012 - Spring 2014
- Organizer, Boston Jets Workshop 2014
- Editor, BOOST 2013 Report
- Referee: Journal of High Energy Physics, Physics Letters B, European Physical Journal C, Physical Review Letters, Physical Review D, SciPost, International Journal of Modern Physics A
- Member, Anacapa Society

## **Outreach**

- STEM talk on particle physics for Stanford Alumni Association of Oregon, June 16, 2018
- Visit to Lincoln High School, Tacoma, WA, for Q&A with students in physics, January 19, 2017
- Massachusetts Region IV Science and Engineering Fair Judge, March 14, 2015
- Massachusetts Region IV Science and Engineering Fair Judge, March 15, 2014
- Somerville High School Science Fair Judge, February 28, 2014
- Adopt-a-Physicist, Autumn 2009, Autumn 2010, Spring 2013, Autumn 2015
- Op-Ed regarding H.R. 1 Continuing Resolution proposed cuts to the Federal Science budget, published in the San Jose Mercury News, April 8, 2011
- Stanford ESP SPLASH Program, November 13, 2010