

August 1, 2008

Zack Edward Sullivan

25W016 Malibu Ct.
Naperville, IL 60540
zack@hep.anl.gov

(630) 416-3584 (home)
(630) 252-7405 (work)
(630) 252-5047 (fax)

Career Summary

Theoretical high-energy physicist, with a primary focus on phenomenological calculations of top-quark production and other particle processes at current and near-future colliders. This research has generated 40 publications, and more than 2200 citations.

Assistant Professor, Illinois Institute of Technology	2008 –
Southern Methodist University:	
Research Assistant Professor	2007 – 2008
Adjunct Assistant Professor	Spring 2007
Visiting Physicist, University of Chicago, Enrico Fermi Institute	2006
Joint Appointment with Argonne National Laboratory	
Assistant Physicist, Argonne National Laboratory	2005
Research Associate, Fermi National Accelerator Laboratory	2001 – 2005
Postdoctoral Appointee, Argonne National Laboratory	1998 – 2001
University of Illinois at Urbana-Champaign:	
Postdoctoral Research Associate	Summer 1998
Research Assistant	1997 – 1998
GAANN Fellow	1995 – 1997
Teaching Assistant and Research Assistant	1993 – 1995

Solid state physics experimental research manufacturing metastable alloys and thin films, measuring structural, electrical and magnetic properties.

Research Assistant, Johns Hopkins University	1990 – 1993
--	-------------

Education

Ph. D. Physics, University of Illinois at Urbana-Champaign, May 1998
M. S. Physics, University of Illinois at Urbana-Champaign, October 1994
B. A. Physics and Mathematics, Johns Hopkins University, May 1993

Teaching

Graduate classical mechanics, Southern Methodist University, Spring 2007.

Perturbative QCD, 2007 CTEQ Summer School, Madison, Wisconsin, June 2007.

Organizational and Public Service Experience

Convenor of the Electroweak Gauge Bosons at the Tevatron session at the PHENO 2008 Symposium, April 2008.

Organizer of the Argonne & University of Chicago Workshop on Collider Physics, Argonne National Laboratory, May 2006.

Convenor of the QCD session at Frontiers in Contemporary Physics III at Vanderbilt University, May 2005.

Technical advisor for the “NOVA Fall 2003 Teacher’s Guide.”

Wrote “Smashing Particles” for the PBS NOVA show “The Elegant Universe” in May 2003, which explained the significance of several discoveries in particle physics.

Organizer of the Argonne National Laboratory Theory Institutes 2000–2002, 2005:

- Supersymmetry, Extra Dimensions, and Higgs Bosons, May 2005.
- Supersymmetry, Higgs and Extra Dimensions, September 2002.
- From Supersymmetry To Extra Dimensions, June 2001.
- SUSY and Higgs, April–May 2000.

Participated in the Fermilab “Physics Questions” program.

Chairman of the “Balancing and Building the Field” working group at Snowmass 2001, July 2001.

Young Physicists’ Forum Steering Committee for Snowmass 2001, July 2001.

Organizer of the Argonne National Laboratory High Energy Physics Division Lunch Seminar Series, 1998–2001.

Convenor of the “Weak Interactions of the Top Quark” discussion group at Thinkshop 2, Fermilab, November 2000.

Hosted the theoretical high energy physics portion of the 1999 Argonne Open House.

Referee for the *Physical Review D*, the *Journal of High Energy Physics*, the *European Physical Journal C*, *Europhysics Letters*, and the Particle Data Group.

Awards

Division of Particles and Fields (DPF) Fellow for Snowmass 2001

Excellence in Teaching Award, University of Illinois, Fall 1996

Graduate Assistance in Areas of National Need (GAANN) Fellowship,
U. S. Department of Education, 1995 – 97

Donald E. Kerr Medal for the Most Outstanding Undergraduate in Physics, 1993

Arthur R. and Rena A. Knipp Scholarship for Excellence in the Fields
of Physics and Mathematics, 1992 – 93

Elected Phi Beta Kappa, 1993; Sigma Pi Sigma, 1992; Golden Key National
Honor Society, 1992

Publications

1. Zack Sullivan, “Supersymmetric QCD correction to top-quark production at the Fermilab Tevatron,” *Phys. Rev. D* **56**, 451 (1997).
2. R. Frey, Z. Sullivan, *et al.*, “Top Quark Physics: Future Measurements,” in *Proceedings of the 1996 DPF/DPB Summer Study on High Energy Physics*, Snowmass, June 25–July 12, 1996, edited by D. Cassel, L.T. Gennari, and R.H. Siemann (SLAC, Stanford, 1997), p. 760.
3. Zack Sullivan, “Supersymmetric QCD correction to top-quark production at the Tevatron,” in *Proceedings of the 1996 DPF/DPB Summer Study on High Energy Physics*, Snowmass, June 25–July 12, 1996, edited by D. Cassel, L.T. Gennari, and R.H. Siemann (SLAC, Stanford, 1997), p. 797.
4. T. Stelzer, Z. Sullivan, and S. Willenbrock, “Single-top-quark production via W -gluon fusion at next-to-leading order,” *Phys. Rev. D* **56**, 5919 (1997).
5. T. Stelzer, Z. Sullivan, and S. Willenbrock, “Single-top-quark production at hadron colliders,” *Phys. Rev. D* **58**, 094021 (1998).
6. Zack Edward Sullivan, “Testing the standard model with top quark production,” Ph. D. thesis, University of Illinois, Urbana-Champaign, Illinois, 1998.
7. D. Dicus, T. Stelzer, Z. Sullivan, and S. Willenbrock, “Higgs-boson production in association with bottom quarks at next-to-leading order,” *Phys. Rev. D* **59**, 094016 (1999).
8. Edmond L. Berger, B.W. Harris, and Z. Sullivan, “Single-top-squark production via R -parity-violating supersymmetric couplings in hadron collisions,” *Phys. Rev. Lett.* **83**, 4472 (1999).
9. Zack Sullivan, “Single-top-squark production via baryon-number-violating couplings at the Fermilab Tevatron Collider,” in *Physics at Run II: the Supersymmetry/Higgs Workshop*, Fermilab, 1998, edited by M. Carena and J. Lykken (Fermilab, Batavia, 2002), p. 315.
10. C. Kao, D. Pierce, Z. Sullivan, and D. Wackerroth, “Supersymmetric Corrections to Standard Model Processes,” in *Physics at Run II: the Supersymmetry/Higgs Workshop*, Fermilab, 1998, edited by M. Carena and J. Lykken (Fermilab, Batavia, 2002), p. 70.
11. S. Willenbrock, Z. Sullivan, *et al.*, “Top Quark Physics,” in *Proceedings of the Workshop on Standard Model Physics (and More) at the LHC*, CERN, 1999, edited by G. Altarelli and M.L. Mangano (CERN, Geneva, 2000), p. 456.

12. Zack Sullivan, “R-parity-violating production of single top squarks with R-parity-conserving decays,” in *Proceedings of the XXXIVth Rencontres de Moriond: ’99 QCD and High Energy Hadronic Interactions*, Les Arcs, Savoie, France, March 20–27, 1999, edited by J. Trân Thanh Vân (Thê Giói Publishers, Hanoi, 2001), p. 399.
13. M. Carena, Z. Sullivan, *et al.*, “Report of the Higgs Working Group of the Tevatron Run 2 SUSY/Higgs Workshop,” in *Physics at Run II: the Supersymmetry/Higgs Workshop*, Fermilab, 1998, edited by M. Carena and J. Lykken (Fermilab, Batavia, 2002), p. 424.
14. E.L. Berger, B.W. Harris, D.E. Kaplan, Z. Sullivan, T.M.P. Tait, and C.E.M. Wagner, “Low-energy supersymmetry and the Tevatron bottom-quark cross section,” *Phys. Rev. Lett.* **86**, 4231 (2001).
15. Edmond L. Berger, B.W. Harris, and Z. Sullivan, “Direct probes of R -parity-violating supersymmetric couplings via single-top-squark production,” *Phys. Rev. D* **63**, 115001 (2001).
16. B.W. Harris, E. Laenen, L. Phaf, Z. Sullivan, and S. Weinzierl, “Fully differential QCD corrections to single top quark final states,” *Int. J. of Mod. Phys. A* **16**, Suppl. **1A**, 379 (2001).
17. Zack Sullivan, “A supersymmetric solution to the bottom-quark cross section anomaly,” in *Proceedings of the XXXVIth Rencontres de Moriond: QCD and High Energy Hadronic Interactions*, Les Arcs, Savoie, France, March 17–24, 2001, edited by Jean Trân Thanh Vân (Thê Giói Publishers, Hanoi, 2002), p. 93.
18. E.L. Berger, Z. Sullivan, *et al.*, “Summary: Working Group on QCD and Strong Interactions,” in *Proceedings of Snowmass 2001: the Future of Particle Physics*, Snowmass, July 1–20, 2001, edited by N. Graf (SLAC, Stanford, 2002), eConf C010630, P5001.
19. Z. Sullivan, R. Erbacher, and C. Potter, “Balancing and Building the Field,” in *Proceedings of Snowmass 2001: the Future of Particle Physics*, Snowmass, July 1–20, 2001, edited by N. Graf (SLAC, Stanford, 2002), eConf C010630, I003.
20. P.M. Nadolsky and Z. Sullivan, “PDF uncertainties in WH production at Tevatron,” in *Proceedings of Snowmass 2001: the Future of Particle Physics*, Snowmass, July 1–20, 2001, edited by N. Graf (SLAC, Stanford, 2002), eConf C010630, P510.
21. Z. Sullivan and P.M. Nadolsky, “Heavy-quark parton distribution functions and their uncertainties” in *Proceedings of Snowmass 2001: the Future of Particle Physics*, Snowmass, July 1–20, 2001, edited by N. Graf (SLAC, Stanford, 2002), eConf C010630, P511.
22. B.W. Harris, E. Laenen, L. Phaf, Z. Sullivan, and S. Weinzierl, “Fully differential single-top-quark cross section in next-to-leading order QCD,” *Phys. Rev. D* **66**, 054024 (2002).
23. Zack Sullivan, “Fully differential W' production and decay at next-to-leading order in QCD,” *Phys. Rev. D* **66**, 075011 (2002).

24. F. Maltoni, Z. Sullivan, and S. Willenbrock, “Higgs-boson production via bottom-quark fusion,” *Phys. Rev. D* **67**, 093005 (2003).
25. Zack Sullivan, “How to rule out Little Higgs (and constrain many other models) at the LHC,” in *Proceedings of the XXXVIIIth Rencontres de Moriond: QCD and High Energy Hadronic Interactions*, Les Arcs, Savoie, France, March 22–29, 2003, edited by Étienne Augé and Jean Trân Thanh Vân (Thê Giói Publishers, Hanoi, 2003), p. 379.
26. Zack Sullivan, “How to rule out Little Higgs at the LHC,” *Bull. Am. Phys. Soc.* **48**, No. 2, 216 (2003).
27. Edmond L. Berger and Zack Sullivan, “Lower limits on R -parity-violating couplings in supersymmetric models with light squarks,” *Phys. Rev. Lett.* **92**, 201801 (2004).
28. Zack Sullivan, “Faster Parton Distribution Evaluation in Monte Carlos,” FERMILAB-FN-755, hep-ph/0403055.
29. Zack Sullivan, “Fast Evaluation of CTEQ Parton Distributions in Monte Carlos,” *Comput. Phys. Commun.* **168**, 25 (2005).
30. Zack Sullivan, “Understanding single-top-quark production and jets at hadron colliders,” *Phys. Rev. D* **70**, 114012 (2004).
31. E. Boos, S. Sherstnev, S. Slabospitsky, Z. Sullivan, and S. Weinzierl, “Top Physics,” in “Physics interplay of the LHC and the ILC,” edited by G. Weiglein, *et al.*, *Phys. Rept.* 426, 47 (2006).
32. A. Juste, Z. Sullivan, *et al.*, “Report of the 2005 Snowmass Top/QCD Working Group,” in *Proceedings of the 2005 International Linear Collider Physics and Detector Workshop and 2nd ILC Accelerator Workshop*, Snowmass, August 14–27, 2005, edited by N. Graf (SLAC, Stanford, 2006), eConf C0508141, PLEN0043.
33. Higgs Working Group, Z. Sullivan, *et al.*, “Toward High Precision Higgs-Boson Measurements at the International Linear e^+e^- Collider,” in *Proceedings of the 2005 International Linear Collider Physics and Detector Workshop and 2nd ILC Accelerator Workshop*, Snowmass, August 14–27, 2005, edited by N. Graf (SLAC, Stanford, 2006), eConf C0508141, PLEN0044.
34. Zack Sullivan, “Understanding Light: Why we need a terascale photon collider,” in *Proceedings of the 2005 International Linear Collider Physics and Detector Workshop and 2nd ILC Accelerator Workshop*, Snowmass, August 14–27, 2005, edited by N. Graf (SLAC, Stanford, 2006), eConf C0508141, ALCPG0402.
35. Zack Sullivan, “Angular correlations in single-top-quark and Wjj ,” to appear in *Final Report of the Tev4LHC Workshop*, Fermilab, 2004–2005, edited by M. Carena and S. Mrenna (Fermilab, Batavia, 2006), Sec. 3.2.3.

36. Zack Sullivan, “Model independent searches for W' bosons,” to appear in *Final Report of the Tev4LHC Workshop*, Fermilab, 2004–2005, edited by M. Carena and S. Mrenna (Fermilab, Batavia, 2006), Sec. 4.4.
37. Zack Sullivan, “Angular correlations in single-top-quark and Wjj production at next-to-leading order,” *Phys. Rev. D* **72**, 094034 (2005).
38. Zack Sullivan and Edmond L. Berger, “Missing heavy flavor backgrounds to Higgs production,” *Phys. Rev. D* **74**, 033008 (2006).
39. Edmond L. Berger and Zack Sullivan, “Higgs boson decay into a pair of leptons,” in *Proceedings of the 9th Conference on the Intersections of Particle and Nuclear Physics*, Rio Grande, Puerto Rico, May 30–June 3, 2006, AIP Conf. Proc. **870**, 258 (2006).
40. Zack Sullivan and Edmond L. Berger, “Trilepton Production at the LHC — Standard Model Sources and Beyond,” arXiv:0805.3720 [hep-ph], to appear in *Phys. Rev. D*.

Seminars, Public Lectures, and Conference Talks

- “Dilepton and Trilepton Production: Standard model sources and beyond”*
7/28/08 University of Chicago
- “Trilepton Production at LHC: Standard model sources and beyond”*
4/28/08 PHENO 2008 Symposium, University of Wisconsin, Madison
- “Understanding QCD through single-top-quark production”*
2/7/08 Illinois Institute of Technology, Colloquium
- “What does single-top-quark production teach us about LHC physics?”*
5/15/07 CTEQ Workshop, Physics at the LHC: Early Challenges,
Michigan State University
- “Understanding perturbative QCD through single-top-quark production”*
4/18/07 Southern Methodist University
1/22/07 Northwestern University
1/17/07 Argonne National Laboratory
10/24/06 Notre Dame University
- “Perspectives on single-top-quark production”*
1/10/07 Aspen 2007 Winter Conference, Aspen Center for Physics, Colorado
- “Understanding Light”*
10/10/06 Argonne National Laboratory
- “The missing heavy flavor backgrounds to Higgs production”*
6/12/06 University of Chicago
5/8/06 Argonne & University of Chicago Workshop on Collider Physics, Argonne
- “Complete angular correlations in single-top-quark and Wjj at NLO”*
10/20/05 Tev4LHC workshop, Fermilab
- “Understanding Light: Why we need a terascale photon collider”*
8/22/05 2005 International Linear Collider Physics and Detector Workshop,
Snowmass, Colorado
- “The Age of Precision QCD”*
5/28/05 Frontiers in Contemporary Physics III, Vanderbilt University
- “Understanding perturbative QCD through single-top-quark production”*
5/26/05 Frontiers in Contemporary Physics III, Vanderbilt University

Seminars, Public Lectures, and Conference Talks continued

“New ideas in single-top-quark theory and phenomenology”

12/2/04 CDF Electroweak top quark production workshop

12/1/04 Tev4LHC workshop, Fermilab

“Understanding single-top-quark production”

12/8/04 Brookhaven National Laboratory

11/8/04 Virginia Tech

9/24/04 University of Wisconsin, Madison

9/13/04 University of Illinois, Urbana-Champaign

“Searching for W' bosons at hadron colliders”

11/16/04 Northwestern University

9/17/04 Tev4LHC workshop, Fermilab

“Single-top-quark production: Flagship measurement of Run II”

8/9/04 The Tevatron Connection, Fermilab

“Faster Parton Distribution Evaluation in Monte Carlos”

6/11/04 Monte-Carlo Workshop, Fermilab

“Lower limits on R -parity-violating couplings in supersymmetry”

4/26/04 PHENO 2004 Symposium, University of Wisconsin, Madison

“The truth about top-quark production”

2/2/04 Aspen 2004 Winter Conference, Aspen Center for Physics, Colorado

“Is a b -squark hiding in $B^0-\overline{B}^0$ mixing or in the b cross section at the Tevatron?”

12/5/03 Chicago Flavor Seminar, Fermilab

“Looking for the Big Vectors of Little Higgs (and other non-SUSY models)”

11/6/03 Boston University

“Seeking the Truth and Beauty of Single-Top-Quark Production”

1/13/04 Michigan State University

11/2/03 Massachusetts Institute of Technology

10/30/03 Yale University

10/27/03 Columbia University

10/24/03 Pennsylvania State University

10/20/03 University of Maryland

10/17/03 Johns Hopkins University

Seminars, Public Lectures, and Conference Talks continued

“How to Rule Out Little Higgs (and constrain many other models) at the LHC”

5/6/03 PHENO 2003 Symposium, University of Wisconsin, Madison

4/8/03 DPF 2003, Philadelphia, Pennsylvania

3/28/03 XXXVIII Rencontres de Moriond: QCD and Hadronic Interactions,
Les Arcs, France

“Reaching from bottom to (single) top this year”

4/10/03 D0 Top Group Meeting

2/20/03 CDF Single-Top Group Meeting

“The Dangerous Beauty of Single-Top-Quark Production”

5/15/03 University of Washington in Seattle

4/14/03 Northwestern University

3/31/03 University of Chicago

“The Dangerous Beauty of Single-Top-Quark Production”

2/27/03 Fermilab Theory Seminar

11/25/02 University of Illinois at Chicago

“Complete differential NLO QCD corrections to single-top-quark production”

4/23/02 PHENO 2002 Symposium, University of Wisconsin, Madison

“A Supersymmetric Solution to the Bottom-Quark Cross Section Anomaly”

1/22/02 Michigan State University

“Shedding Light on Heavy-Quark PDFs”

11/16/01 Fermilab

“Heavy-quark parton distribution functions and their uncertainties”

10/26/01 CTEQ Meeting, Fermilab

“Young Physicists at Snowmass”

8/21/01 Argonne National Laboratory

“Balancing and Building the Field”

7/11/01 Snowmass 2001, The Future of Particle Physics, Snowmass, Colorado

“What We Need in QCD (a pragmatic point of view)”

7/9/01 Snowmass 2001, The Future of Particle Physics, Snowmass, Colorado

“A Supersymmetric Solution to the Bottom-Quark Cross Section Anomaly”

6/28/01 ANL Theory Institute 2001, Argonne National Laboratory

Seminars, Public Lectures, and Conference Talks continued

“Fully differential NLO QCD corrections to single-top-quark production”

5/8/01 PHENO 2001 Symposium, University of Wisconsin, Madison

4/20/01 Workshop on Monte Carlo Generator Physics for Run II, Fermilab

“A Supersymmetric Solution to the Bottom-Quark Cross Section Anomaly”

3/21/01 XXXVI Rencontres de Moriond: QCD and Hadronic Interactions, Les Arcs, France

“Direct Probes of R-Parity Violation at the Tevatron”

2/19/01 Southern Methodist University, Department of Physics Seminar

12/1/00 CDF SUSY Workshop, Fermilab

“An Introduction to Top Quarks and the Weak Interaction”

11/12/00 Summary of the Weak Interactions discussion group for Thinkshop 2, Fermilab

“A Theoretical Overview of Top Quarks and the Weak Interaction”

11/11/00 Thinkshop 2, Fermilab *“Developing Direct Probes of R-parity Violation”*

5/4/00 ANL Theoretical Institute on SUSY and Higgs, Argonne National Laboratory

“New Probes for Top Squarks and R-parity Violation at Hadron Colliders”

4/17/00 PHENO 2000 Symposium, University of Wisconsin, Madison

“R-parity violation and single top squarks at the Tevatron”

9/20/99 Indiana University, Bloomington

5/6/99 Fermilab, Theory Seminar

“A Half-Summary of Rencontres de Moriond: QCD and High Energy Interactions”

4/6/99 Argonne National Laboratory

“R-parity-violating production of single top squarks with R-parity-conserving decays”

4/13/99 PHENO 99, University of Wisconsin, Madison

3/26/99 XXXIV Rencontres de Moriond: QCD and Hadronic Interactions, Les Arcs, France

3/8/99 Higgs and Supersymmetry, University of Florida, Gainesville

“The Dangerous Beauty of Single-Top-Quark Production”

12/8/98 Argonne National Laboratory

12/7/98 University of Chicago

“Higgs-boson production in association with bottom quarks at next-to-leading order”

11/18/98 Workshop on Supersymmetry/Higgs, Higgs Working Group, Fermilab

“Single-Top-Quark Production at the Tevatron”

3/24/98 PHENO-CTEQ 98, University of Wisconsin, Madison

Seminars, Public Lectures, and Conference Talks continued*“Single-Top-Quark Production at Hadron Colliders”*

- 4/17/98 TRIUMF, Vancouver, B.C.
- 1/9/98 University of Wisconsin, Madison
- 12/9/97 University of Illinois, Urbana-Champaign
- 11/20/97 Brookhaven National Laboratory
- 11/10/97 Argonne National Laboratory

“Single-Top-Quark Production via W-Gluon Fusion at Next-to-Leading Order”

- 5/14/97 Frontiers in Contemporary Physics, Vanderbilt University

“Supersymmetric QCD Correction to Top-Quark Production at the Tevatron”

- 3/18/97 PHENO 97, University of Wisconsin, Wisconsin, Madison
- 7/2/96 New Directions For High-Energy Physics, Snowmass, Colorado