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Curriculum Vitae
Zack Edward Sullivan

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MS106, Theoretical Physics
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Birth date: August 11, 1971
Place of Birth: New York, NY

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

Work experience:

Research Associate, Fermi National Accelerator Laboratory, 2001 – present
Postdoctoral Appointee, Argonne National Laboratory, 1998 – 2001
Postdoctoral Research Associate, University of Illinois, Summer 1998
Research Assistant, University of Illinois, 1997 – 98, Summer 1994, 1995
GAANN Fellow, University of Illinois, 1995 – 97
Teaching Assistant, University of Illinois, Fall–Spring, 1993 – 95
Research Assistant, Johns Hopkins University, 1990 – 93

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
Elected to Sigma Pi Sigma, 1992
Elected to Golden Key National Honor Society, 1992

Publications in Refereed Journals

13. "Understanding single-top-quark production and jets at hadron colliders," Phys. Rev. D **70**, 114012 (2004).

12. "Fast Evaluation of CTEQ Parton Distributions in Monte Carlos," accepted for publication in Comp. Phys. Commun., hep-ph/0407033.

11. "Lower limits on R-parity-violating couplings in supersymmetric models with light squarks" (with Edmond L. Berger), Phys. Rev. Lett. **92**, 201801 (2004).

10. "Higgs-boson production via bottom-quark fusion" (with F. Maltoni and S. Willenbrock), Phys. Rev. D **67**, 093005 (2003).

9. "Fully differential W' production and decay at next-to-leading order in QCD," Phys. Rev. D **66**, 075011 (2002).

8. "Fully differential single-top-quark cross section in next-to-leading order QCD" (with B.W. Harris, E. Laenen, L. Phaf, and S. Weinzierl), Phys. Rev. D **66**, 054024 (2002).

7. "Direct probes of R-parity-violating supersymmetric couplings via single-top-squark production" (with Edmond L. Berger and B.W. Harris), Phys. Rev. D **63**, 115001 (2001).

6. "Low-energy supersymmetry and the Tevatron bottom-quark cross section" (with E.L. Berger, B.W. Harris, D.E. Kaplan, T.M.P. Tait, and C.E.M. Wagner), Phys. Rev. Lett. **86**, 4231 (2001).

5. "Single-Top-Squark Production via R-Parity-Violating Supersymmetric Couplings in Hadron Collisions" (with Edmond L. Berger and B.W. Harris), Phys. Rev. Lett. **83**, 4472 (1999).

4. "Higgs-boson production in association with bottom quarks at next-to-leading order" (with D. Dicus, T. Stelzer and S. Willenbrock), Phys. Rev. D **59**, 094016 (1999).

3. "Single-top-quark production at hadron colliders" (with T. Stelzer and S. Willenbrock), Phys. Rev. D **58**, 094021 (1998).

2. "Single-top-quark production via W-gluon fusion at next-to-leading order" (with T. Stelzer and S. Willenbrock), Phys. Rev. D **56**, 5919 (1997).

Publications in Refereed Journals continued

1. "Supersymmetric QCD correction to top-quark production at the Fermilab Tevatron," Phys. Rev. D **56**, 451 (1997).

Publications in Conference Proceedings

17. "Faster Parton Distribution Evaluation in Monte Carlos," FERMILAB-FN-755, hep-ph/0403055.

16. "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 Gióí Publishers, Hanoi, 2003), p. 379.

15. "Top physics," section 6.1 of the LHC / Linear Collider Working group report (with E. Boos, S. Sherstnev, S. Slabospitsky, and S. Weinzierl), hep-ph/0410364.

14. "How to rule out Little Higgs at the LHC," Bull. Am. Phys. Soc. **48**, No. 2, 216 (2003).

13. "Heavy-quark parton distribution functions and their uncertainties" (with P.M. Nadolsky), in *Proceedings of Snowmass 2001: the Future of Particle Physics*, edited by N. Graf (Stanford Linear Accelerator Center, Stanford, 2002), eConf C010630, P511.

12. "PDF uncertainties in WH production at Tevatron" (with P.M. Nadolsky), in *Proceedings of Snowmass 2001: the Future of Particle Physics*, edited by N. Graf (Stanford Linear Accelerator Center, Stanford, 2002), eConf C010630, P510.

11. "Balancing and Building the Field" section of "Young Physicists' Forum" (with R. Erbacher and C. Potter), in *Proceedings of Snowmass 2001: the Future of Particle Physics*, edited by N. Graf (Stanford Linear Accelerator Center, Stanford, 2002), eConf C010630, I003.

10. Sections III and IV of "Summary: Working Group on QCD and Strong Interactions" (with E.L. Berger, *et al.*), in *Proceedings of Snowmass 2001: the Future of Particle Physics*, edited by N. Graf (Stanford Linear Accelerator Center, Stanford, 2002), eConf C010630, P5001.

9. "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 Gióí Publishers, Hanoi, 2002), p. 93.

Publications in Conference Proceedings continued

8. "Fully differential QCD corrections to single top quark final states" (with B.W. Harris, E. Laenen, L. Phaf, and S. Weinzierl), Int. J. of Mod. Phys. **A 16**, Suppl. **1A**, 379 (2001).

7. "Single Top Production" section of "Top Quark Physics" (with S. Willenbrock, *et al.*), 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.

6. "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.

5. "Single-top-squark production via baryon-number-violating couplings at the Fermilab Tevatron Collider" section of "Searching for R-Parity Violation at Run-II of the Tevatron," in *Physics at Run II: the Supersymmetry/Higgs Workshop*, Fermilab, 1998, edited by M. Carena and J. Lykken (Fermilab, Batavia, 2002), p. 315.

4. "Supersymmetric Corrections to Standard Model Processes" section of "Report of SUGRA Working Group for Run II of the Tevatron" (with C. Kao, D. Pierce, and D. Wackeroth), in *Physics at Run II: the Supersymmetry/Higgs Workshop*, Fermilab, 1998, edited by M. Carena and J. Lykken (Fermilab, Batavia, 2002), p. 70.

3. "Report of the Higgs Working Group of the Tevatron Run 2 SUSY/Higgs Workshop" (with M. Carena, *et al.*), in *Physics at Run II: the Supersymmetry/Higgs Workshop*, Fermilab, 1998, edited by M. Carena and J. Lykken (Fermilab, Batavia, 2002), p. 424.

2. "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 (Stanford Linear Accelerator Center, Stanford, 1997), p. 797.

1. "Top Quark Physics: Future Measurements" (with R. Frey, *et al.*), 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 (Stanford Linear Accelerator Center, Stanford, 1997), p. 760.

Seminars and Conference Talks

"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 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 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 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

Service to High Energy Physics Community

Convenor of the QCD session at Frontiers in Contemporary Physics-III at Vanderbilt University, May 23–28, 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, in which I explained the significance of several discoveries in particle physics.

Participated in the Fermilab "Physics Questions" program.

Organizer of the Argonne National Laboratory Theory Institute 2002: Supersymmetry, Higgs and Extra Dimensions, Argonne National Laboratory, September 9–13, 2002.

Chairman of the "Balancing and Building the Field" working group at Snowmass 2001, July 1–20, 2001.

Young Physicists' Forum Steering Committee for Snowmass 2001, July 1–20, 2001.

Organizer of the Argonne National Laboratory Theory Institute 2001: From Supersymmetry To Extra Dimensions, Argonne National Laboratory, June 17–29, 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 10–12, 2000.

Organizer of the Argonne National Laboratory Theoretical Institute on SUSY and Higgs, Argonne National Laboratory, April 15–May 12, 2000.

Hosted the theoretical high energy physics portion of the 1999 Argonne Open House, April 30, 1999.

Conferences Attended

Tev4LHC, Fermilab, September 16–18, December 1, 2004.

PHENO 2004 Symposium, Madison, Wisconsin, April 26–28, 2004.

Aspen 2004 Winter Conference on Particle Physics: Where We Are and Where We Are Going, Aspen Center for Physics, Colorado, February 1–7, 2004.

Workshop on Monte Carlo Generator Physics for Run II at the Tevatron, Fermilab, December 4, 2003.

PHENO 2003 Symposium, Madison, Wisconsin, May 5–7, 2003.

DPF 2003 at the APS April meeting, April 5–8, 2003.

XXXVIII Rencontres de Moriond: QCD and High Energy Hadronic Interactions, Les Arcs, France, March 22–29, 2003.

LHC/LC Study Group, Fermilab, December 12–13, 2002.

Argonne National Laboratory Theory Institute 2002: Supersymmetry, Higgs and Extra Dimensions, Argonne National Laboratory, September 9–13, 2002.

PHENO 2002 Symposium, Madison, Wisconsin, April 22–24, 2002.

Snowmass 2001, The Future of Particle Physics, Snowmass, Colorado, July 1–20, 2001.

Argonne National Laboratory Theory Institute 2001: From Supersymmetry To Extra Dimensions, Argonne National Laboratory, June 17–29, 2001.

PHENO 2001 Symposium, Madison, Wisconsin, May 7–9, 2001.

Workshop on Monte Carlo Generator Physics for Run II at the Tevatron, Fermilab, April 18–20, 2001.

XXXVI Rencontres de Moriond: QCD and High Energy Hadronic Interactions, Les Arcs, France, March 17–24, 2001.

CDF SUSY Workshop for Run II of the Tevatron, Fermilab, November 30–December 1, 2000.

Argonne National Laboratory Theoretical Institute on SUSY and Higgs, Argonne National Laboratory, April 15–May 12, 2000.

Conferences continued

“Thinkshop 2, top-quark physics for Run II & beyond,” Fermilab, November 10–12, 2000.

PHENO 2000 Symposium: Phenomenology for the Nu Century, Madison, Wisconsin, April 17–19, 2000.

Workshop on B Physics at the Tevatron, Run II and Beyond, Fermilab, September 23–25, 1999; February 24–26, 2000.

SUSY 99: 7th International Conference on Supersymmetries in Physics, Fermilab, June 14–19, 1999.

XXXIV Rencontres de Moriond: QCD and Hadronic Interactions at High Energy, Les Arcs, France, March 20–27, 1999.

PHENO 99 Symposium: Phenomenology for the Third Millennium, Madison, Wisconsin, April 12–14, 1999.

Higgs and Supersymmetry: Search and Discovery, Gainesville, Florida, March 8–11, 1999.

“Thinkshop,” Top-Quark Physics For Run II, Fermilab, October 16–18, 1998.

“Physics at Run II,” Workshop on Supersymmetry/Higgs, Fermilab, May 14–16, 1998; November 19–21, 1998.

PHENO-CTEQ Symposium 98: Frontiers in Phenomenology, Madison, Wisconsin, March 23–26, 1998.

Workshop on Physics at the First Muon Collider and at the Front End of a Muon Collider, Fermilab, November 6–9, 1997.

CTEQ Summer School on QCD Analysis and Phenomenology, Lake Como, Wisconsin, May 27–June 4, 1997.

Frontiers in Contemporary Physics, Nashville, Tennessee, May 11–16, 1997.

PHENO 97: Frontiers in Phenomenology, Madison, Wisconsin, March 17–19, 1997.

New Directions for High Energy Physics, Snowmass, Colorado, June 25–July 12, 1996.

Theoretical Advanced Studies Institute in Elementary Particle Physics (TASI) 1996, “Fields, Strings and Duality,” University of Colorado, Boulder, June 2–28, 1996.

Physics with High Energy e^+e^- Colliders, Fermilab, November 16–18, 1995.