Michael SCHMITT – curriculum vitae

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Major Professional Interests:
My primary research interests lie in the field of *Experimental Particle Physics*. I have done most of my research on collider experiments in the United States and in Europe. On the technical side, I am an expert in muon detectors and muon reconstruction, while on the analysis side, I am an expert in Electroweak Physics and Searches for Supersymmetric Particles. I have a strong interest in statistical methods as applied within particles physics.

I am joining the Mu2e Collaboration to search for $\mu \to e$ conversion at Fermilab. My group will be responsible for the detailed maps of the complicated magnetic fields used in the experiment.

I have decided to join the LSST Collaboration. The LSST is a large-scale telescope that will revolutionize astrophysics. My main interest lies with studies and dark energy. I expect to devote a significant fraction of my research time to LSST later in this decade.

Education:

PhD - Nov., 1991:	Harvard University	Physics (High Energy Experimental)
B.A.- June, 1983:	Harvard College	Physics *cum laude*

Employment and Research Activities:

Jan. 2015 – present:	Chair, Physics & Astronomy	
Sep. 2013 – present:	Prof., Northwestern	CMS, Mu2e
Sep. 2004 – Sep. 2013:	Assoc. Prof., Northwestern	CMS
Sep. 2000 – Aug. 2004:	Assist. Prof., Northwestern	CDF
Jan. 1998 – Sep. 2000:	Assist. Prof., Harvard	CDF
May, 1996 – Jan. 1998:	Staff, CERN	ALEPH
Nov. 1991 – May, 1996:	Res. Assoc., U Wisconsin	ALEPH

Research Positions (since 2000):

since Jan. 2014:	CMS	Standard Model Physics - editorial board *chair*
Jan. 2012 - Dec. 2014:	CMS	Statistics Committee
Jan. 2012 - Dec. 2013:	CMS	Standard Model Physics - editorial board, member
Jan. 2010 - Dec. 2011:	CMS	Convener for Electroweak Physics
Jan. 2008 - Dec. 2009:	CMS	Convener for CSC Detector Performance Group
Jan. 2002 - Dec. 2003:	CDF	Convener for the Supersymmetry Subgroup
Jan. 2000 - Dec. 2002:	CDF	Convener for the Muon Reconstruction Group

Graduate Students:

Thoth Gunter	current	CMS
Nicolas Mucia	current	CMS
Andy Kubik	Ph.D. 2014	CMS, *Physics studies with muons at CMS*
Dale Stentz	Ph.D. 2011	CDF, *W +Jets Production at CDF*
Muge Karagoz Unel	Ph.D. 2006	CDF, *Search for* $Z' \to \mu^+\mu^-$

Research Associates:

Andy Kubik	2014–2015	CMS
Stoyan Stoynev	2006–2014	CMS (now at Fermilab)
Dale Stentz	2012	CDF & CMS
Victoria Martin	2001–2006	CDF (now at Edinburgh)
Abraham Gallas	2000-2004	CDF (now at Santiago de Campostella)
Tommaso Dorigo	1998-2000	CDF (now at Padova)

Outreach Activities:

Apr. 2013:	invited	*Kellogg Seminar*: High Energy Physics – A Highly Cooperative Enterprise
Jan. 2013:	speaker	*Science Salon* at Northwestern: The Higgs Boson – Why Is It Exciting?
Nov. 2012:	panel speaker	*SPS Event: the Higgs boson*
Mar. 2012:	volunteer judge	*Chicago Area Undergraduate Research Symposium*
Sep. 2008:	Fermilab / Mainz	*Ask a Scientist*
since 2008:	science writer	*Collider Blog* http://muon.wordpress.com/

Recent Professional Talks:

Oct. 2014:	seminar, CIERA–NU	*Using Random Forests to Classify Events*
June 2014:	plenary, LoopFest-Brooklynn	*Vector Boson Production at CMS*
Jan. 2014:	plenary, TIFR-Mumbai	*Electroweak Physics at the LHC*
Sep. 2012:	colloquium, Northwestern	*The Higgs Boson After Discovery*
Apr 2012:	colloquium, U. Kentucky	*W and Z Bosons at the High Energy Frontier*
Aug 2011:	plenary, DPF2011	*Electroweak Physics*
May 2011:	plenary, LoopFest	*Electroweak Results from Hadron Colliders*
Apr 2011:	colloquium, U. Nebraska	*Electroweak Physics at the LHC*
Jun 2009:	plenary, PAVI09	*Electroweak Physics at the LHC*
May 2009:	seminar, U. Chicago	*CMS is Ready for Physics*

Selected Publications:
The list below includes live links that lead the reader to an official online version of the publication.

1. CMS Collab., "Measurement of the differential and double-differential Drell-Yan cross sections in proton-proton collisions at $\sqrt{s} = 7$ TeV," JHEP **1312**, 030 (2013) arXiv:1310.7291, (inspire link)

2. CMS Collab., "Study of the dijet mass spectrum in $pp \to W+$ jets events at $\sqrt{s} = 7$ TeV," Phys. Rev. Lett. **109**, 251801 (2012) arXiv:1207.3973, (inspire link) (*2 citations)*

3. CMS Collab., "Forward-backward asymmetry of Drell-Yan lepton pairs in pp collisions at $\sqrt{s} = 7$ TeV," Phys. Lett. B **718**, 752 (2013) arXiv:1207.3973, (inspire link)

4. CMS Collab., "Measurement of the electron charge asymmetry in inclusive W production in pp collisions at $\sqrt{s} = 7$ TeV," Phys. Rev. Lett. **109**, 111806 (2012) (inspire link) (*4 citations)*

5. CMS Collab., "Measurement of the $Z/\gamma^* + b$-jet cross section in pp collisions at 7 TeV," JHEP **1206** 126 (2012) (inspire link) (*4 citations)*

6. CMS Collab., "Measurement of the weak mixing angle with the Drell-Yan process in proton-proton collisions at the LHC," Phys. Rev. D **84**, 112002 (2011) (inspire link) (*5 citations)*

7. CMS Collab., "Measurement of the Drell-Yan Cross Section in pp Collisions at $\sqrt{s} = 7$ TeV," JHEP **1110** 007 (2011) (inspire link) (*8 citations)*

8. CMS Collab., "Measurement of the Inclusive W and Z Production Cross Sections in pp Collisions at $\sqrt{s} = 7$ TeV," JHEP **1110**, 132 (2011) (inspire link) (*46 citations)*

9. CMS Collab., "Measurement of the Rapidity and Transverse Momentum Distributions of Z Bosons in pp Collisions at $\sqrt{s} = 7$ TeV," Phys.Rev. **D85** (2012) 032002 (inspire link) (*25 citations)*

10. CMS Collab., "Jet Production Rates in Association with W and Z Bosons in pp Collisions at $\sqrt{s} = 7$ TeV," JHEP **1201** (2012) 010 (inspire link) (*17 citations)*

11. CMS Collab., "Measurement of $W\gamma$ and $Z\gamma$ production in pp collisions at $\sqrt{s} = 7$ TeV," Phys. Lett. B **701**, 535 (2011) (inspire link) (*30 citations)*

12. CMS Collab., "Measurement of the Inclusive Z Cross Section via Decays to τ-Pairs in pp Collisions at $\sqrt{s} = 7$ TeV," JHEP **1108**, 117 (2011) (inspire link) (*18 citations)*

13. CMS Collab., "Measurement of the Polarization of W Bosons with Large Transverse Momenta in $W+$Jets Events at the LHC," Phys. Rev. Lett. **107**, 021802 (2011) (inspire link) (*17 citations)*

14. CMS Collab., "Measurement of the lepton charge asymmetry in inclusive W production in pp collisions at $\sqrt{s} = 7$ TeV," JHEP **1104**, 050 (2011) (inspire link) (*39 citations)*

15. CMS Collab., "Measurement of W^+W^- Production and Search for the Higgs Boson in pp Collisions at $\sqrt{s} = 7$ TeV," Phys. Lett. B **699**, 25 (2011) (inspire link) (*76 citations)*

16. CMS Collab., "Measurements of Inclusive W and Z Cross Sections in pp Collisions at $\sqrt{s} =$ 7 TeV," JHEP **1101**, 080 (2011). (inspire link) (inspire link) (*96 citations)*

17. CMS Collab., "First Measurement of the Underlying Event Activity in Proton-Proton Collisions at $\sqrt{s} = 0.9$ TeV," Eur.Phys.J. **C70** 555 (2010) (inspire link) (*30 citations)*

18. CMS Collab., "Transverse-momentum and pseudorapidity distributions of charged hadrons in pp collisions at $\sqrt{s} = 7$ TeV," Phys. Rev. Lett. **105**, 022002 (2010) (inspire link) (*36 citations)*

19. CMS Collab., "Transverse momentum and pseudorapidity distributions of charged hadrons in pp collisions at $\sqrt{s} = 0.9$ and 2.36 TeV," JHEP **1002**, 041 (2010) (doi link) (*182 citations)*

20. CMS Collab., "Alignment of the CMS Muon System with Cosmic-Ray and Beam-Halo Muons," JINST **5**, T03020 (2010) (doi link) (*6 citations)*

21. CMS Collab., "Precise Mapping of the Magnetic Field in the CMS Barrel Yoke using Cosmic Rays," JINST **5**, T03021 (2010) (doi link) (*18 citations)*

22. CMS Collab., "Performance of CMS Muon Reconstruction in Cosmic-Ray Events," JINST **5**, T03022 (2010) (doi link) (*29 citations)*

23. CMS Collab., "Measurement of the charge ratio of atmospheric muons with the CMS detector," Phys. Lett. B **692**, 83 (2010) (doi link) (*20 citations)*

24. CMS Collab., "Performance of the CMS Cathode Strip Chambers with Cosmic Rays," JINST **5**, T03018 (2010) (doi link) (*6 citations)*

25. CMS Collab., "Commissioning of the CMS Experiment and the Cosmic Run at Four Tesla," JINST **5**, T03001 (2010) (doi link) (*31 citations)*

26. CDF Collab., "A search for high-mass resonances decaying to dimuons at CDF," Phys. Rev. Lett. **102**, 091805 (2009) (doi link) (*102 citations)*

27. Y. Kahn, M. Schmitt, T. Tait, "Enhanced Rare Pion Decays from a Model of MeV Dark Matter," Phys. Rev. **D78** 115002 (2008) (doi link) (*26 citations)*

28. S. Heinemeyer, Y. Kahn, M. Schmitt, M. Velasco, "An Experiment to Search for Light Dark Matter in Low-Energy ep Scattering," arXiv:0705.4056 (*10 citations)*

29. A. Apyan, A. Apyan and M. Schmitt, "Detecting Neutrino Magnetic Moments with Conducting Loops," Phys. Rev. **D77** 037901 (2008) (doi link)

30. CDF Collab., "First Measurement of the Ratio of Central-Electron to Forward-Electron W Partial Cross Sections in p-pbar Collisions at $\sqrt{s} = 1.96$ TeV," Phys. Rev. Lett. **98**, 251801 (2007) (doi link) (*5 citations)*

31. CDF Collab., "Measurements of Inclusive W and Z Cross Sections in $p\bar{p}$ Collisions at $\sqrt{s} =$ 1.96 TeV," J. Phys. G **34**, 2457 (2007) (doi link) (*146 citations)*

32. A. Freitas, C. Milstene, M. Schmitt and A. Sopczak, "A Method for the Precision Mass Measurement of the Stop Quark at the International Linear Collider," JHEP **0809** 076 (2008) (doi link) (*7 citations)*

33. CDF Collab., "First Measurements of Inclusive W and Z Cross Sections from Run II of the Tevatron Collider," Phys. Rev. Lett. **94** 091803 (2005) (doi link) (*166 citations)*

34. CDF Collab., "Search for New High Mass Particles Decaying to Lepton Pairs in $p\bar{p}$ Collisions at $\sqrt{s} = 1.96$ TeV," Phys. Rev. Lett. **95** 252001 (2005) (doi link) (*48 citations)*

35. M. Schmitt, "Apparent excess in $e^+e^- \to$ hadrons," arXiv:hep-ex/0401034 (*1 citations)*

36. CDF Collab., "Search for pair production of scalar top quarks in R-parity violating decay modes in $p\bar{p}$ collisions at $\sqrt{s} = 1.8$ TeV," Phys. Rev. Lett. **92**, 051803 (2004) (doi link) (*18 citations)*

37. M. S. Carena, A. de Gouvea, A. Freitas and M. Schmitt, "Invisible Z-boson decays at e^+e^- colliders," Phys. Rev. D **68**, 113007 (2003) (doi link) (*14 citations)*

38. D. Asner *et al.*, "Higgs Physics with a $\gamma\gamma$ Collider Based on CLIC I," Eur. Phys. J. **C28** 27 (2003) (doi link) (*44 citations)*

39. B. C. Allanach *et al.*, "The Snowmass points and slopes: Benchmarks for SUSY searches," in *Proc. of the APS/DPF/DPB Summer Study on the Future of Particle Physics (Snowmass 2001)* ed. N. Graf, Eur. Phys. J. C **25**, 113 (2002) (doi link) (*728 citations)*

40. K. Hagiwara *et al.* [Particle Data Group], "Review of particle physics : Review of Supersymmetry - Experiment," Phys. Rev. D **66**, 010001 (2002). (doi link) (*4041 citations)*

41. U. Baur *et al.* [The Snowmass Working Group on Precision Electroweak Measurements], "Present and future electroweak precision measurements and the indirect determination of the mass of the Higgs boson," in *Proc. of the APS/DPF/DPB Summer Study on the Future of Particle Physics (Snowmass 2001)* ed. N. Graf, *In the Proceedings of APS / DPF / DPB Summer Study on the Future of Particle Physics (Snowmass 2001), Snowmass, Colorado, 30 Jun - 21 Jul 2001, pp P1WG1* arXiv:hep-ph/0202001 (*38 citations)*

42. D. Asner, B. Grzadkowski, J. F. Gunion, H. E. Logan, V. Martin, M. Schmitt and M. M. Velasco, "New results for a photon photon collider," arXiv:hep-ph/0208219 (*14 citations)*

43. M. Grunewald, U. Heintz, M. Narain and M. Schmitt, "Testing the standard model at the Fermilab Tevatron," in *Proc. of the APS/DPF/DPB Summer Study on the Future of Particle Physics (Snowmass 2001)* ed. N. Graf, *In the Proceedings of APS / DPF / DPB Summer Study on the Future of Particle Physics (Snowmass 2001), Snowmass, Colorado, 30 Jun - 21 Jul 2001, pp P117* eConf (*4 citations)*

44. D. Asner *et al.*, "Higgs physics with a gamma gamma collider based on CLIC 1," Eur. Phys. J. C **28**, 27 (2003) (doi link) (*44 citations)*

45. M. M. Velasco *et al.*, "Photon photon and electron photon colliders with energies below a TeV," in *Proc. of the APS/DPF/DPB Summer Study on the Future of Particle Physics (Snowmass 2001)* ed. N. Graf, *In the Proceedings of APS / DPF / DPB Summer Study on the Future of Particle Physics (Snowmass 2001), Snowmass, Colorado, 30 Jun - 21 Jul 2001, pp E3005* arXiv:hep-ex/0111055 (*28 citations)*

46. D. E. Groom *et al.* [Particle Data Group], "Review of particle physics : Review of Supersymmetry - Experiment," Eur. Phys. J. C **15**, 1 (2000). PDG web site (*3467 citations)*

47. CDF Collab., "Measurement of the W boson mass with the Collider Detector at Fermilab," Phys. Rev. D **64**, 052001 (2001) (doi link) (*110 citations)*

48. ALEPH Collab., "Measurement of the tau polarisation at LEP," Eur. Phys. J. C **20**, 401 (2001) (doi link) (*25 citations)*

49. M. S. Carena *et al.* [Higgs Working Group Collaboration], arXiv:hep-ph/0010338 (*421 citations)*

50. C. Caso *et al.* [Particle Data Group], "Review of particle physics : Review of Supersymmetry - Experiment," Eur. Phys. J. C **3**, 1 (1998). (doi link) (*3403 citations)*

51. ALEPH Collab., "Search for sleptons in e^+e^- collisions at centre-of-mass energies up to 184-GeV," Phys. Lett. B **433**, 176 (1998). (doi link) (*27 citations)*

52. ALEPH Collab., "Scalar quark searches in e^+e^- collisions at $\sqrt{s}$ = 181-GeV – 184-GeV," Phys. Lett. B **434**, 189 (1998) (doi link) (*27 citations)*

53. J. R. Ellis, T. Falk, G. Ganis, K. A. Olive and M. Schmitt, "Charginos and Neutralinos in the Light of Radiative Corrections: Sealing the Fate of Higgsino Dark Matter," Phys. Rev. D **58**, 095002 (1998) (doi link) (*109 citations)*

54. ALEPH Collab., "Searches for charginos and neutralinos in e^+e^- collisions at $\sqrt{s} = 161$-GeV and 172-GeV," Eur. Phys. J. C **2**, 417 (1998) (doi link) (*26 citations)*

55. ALEPH Collab., "Search for supersymmetry in the photon(s) plus missing energy channels at $\sqrt{s} = 161$-GeV and 172-GeV," Phys. Lett. B **420**, 127 (1998) (doi link) (*26 citations)*

56. ALEPH Collab., "Searches for scalar top and scalar bottom quarks at LEP-2," Phys. Lett. B **413**, 431 (1997) (doi link) (*25 citations)*

57. ALEPH Collab., "Search for sleptons in E^+e^- collisions at centre-of-mass energies of 161-GeV and 172-GeV," Phys. Lett. B **407**, 377 (1997) (doi link) (*16 citations)*

58. J. R. Ellis, T. Falk, K. A. Olive and M. Schmitt, "Constraints on neutralino dark matter from LEP-2 and cosmology," Phys. Lett. B **413**, 355 (1997) (doi link) (*112 citations)*

59. J. R. Ellis, T. Falk, K. A. Olive and M. Schmitt, "Supersymmetric dark matter in the light of LEP 1.5," Phys. Lett. B **388**, 97 (1996) (doi link) (*100 citations)*

60. ALEPH Collab., "Inclusive semileptonic branching ratios of b hadrons produced in Z decays," Eur. Phys. J. C **22**, 613 (2002) (doi link) (*15 citations)*

61. ALEPH Collab., "Tau leptonic branching ratios," Z. Phys. C **70**, 561 (1996) (doi link) (*44 citations)*

62. ALEPH Collab. "Tau hadronic branching ratios," Z. Phys. C **70**, 579 (1996) (doi link) (*60 citations)*

63. E665 Collab., "Diffractive production of $\rho^0(770)$ mesons in muon proton interactions at 470-GeV," Z. Phys. C **74**, 237 (1997). (doi link) (*82 citations)*

Publications in Preparation:

64. CMS Collab., "A Study of Final-State Radiation in Z Decays," *in preparation.*
This paper reports a unique analysis completed as part of the thesis work done by A. Kubik. It should be reviewed by the CMS Collaboration in fall, 2012.

65. CMS Collab., "Measurement of the Double-Differential Cross Section $d^2\sigma/dM\,dY$ for Drell-Yan Production of Lepton Pairs in pp Collisions at $\sqrt{s} = 8$ TeV," *in preparation*
This paper reports a major extension of the previous Drell-Yan cross section measurement, and will provide crucial information for constraining parton distribution functions. Such constraints are essential for the precision measurement of the W and t-qark masses.

Teaching: I have taught both upper-level undergraduate courses (numbers 3xx) and core courses in the graduate program (numbers 4xx). In addition, I have recently taught first-year, calculus-based physics in the summer term (numbers 135-x). The course Physics 361 "Radiation, Optics and Special Relativity," is wholly designed by me. It is a complete success and will be taught every two years. I also played a part in creating and designing the course Physics 371 "Non-Linear Mechanics." The course Physics 222 "Mathematics for Physics Majors" was not a complete success (it should be a two-quarter course, not a single quarter). A course of this sort is clearly needed and I will return to this in the next year. I will offer a new course on "Statistical Methods for Physicists," to be given in the spring term of academic year 2013–2014. My teaching record is as follows:

(2015 Spring	442-0	Statistical Methods for Physicists and Astronomers)
2014 Spring	442-0	Statistical Methods for Physicists and Astronomers
2013 Spring	414-2	Electrodynamics II
2013 Winter	414-1	Electrodynamics I
2012 Fall	361	Radiation, Optics, Special Relativity
2012 Summer	135-3	General Physics III
2012 Summer	135-2	General Physics II
2012 Spring	414-2	Electrodynamics II
2012 Winter	414-2	Electrodynamics I
"	125-2	ISP Electricity & Magnetism
2011 Summer	135-2	General Physics II
2011 Spring	414-2	Electrodynamics II
2011 Winter	414-1	Electrodynamics I
2010 Fall	361	Radiation, Optics, Special Relativity
2010 Spring	414-2	Electrodynamics II
2010 Winter	414-1	Electrodynamics I
2008 Spring	222	Mathematics for Physics Majors
2007 Fall	361	Radiation, Optics, Special Relativity
2007 Spring	333-2	Advanced Electricity & Magnetism II
2007 Winter	333-1	Advanced Electricity & Magnetism I
2006 Fall	330-1	Classical Mechanics
2006 Spring	333-2	Advanced Electricity & Magnetism II
2006 Winter	333-1	Advanced Electricity & Magnetism I
2005 Spring	125-3	ISP Modern Physics
2005 Winter	125-2	ISP Electricity & Magnetism
2004 Fall	333-1	Advanced Electricity & Magnetism I
2004 Spring	125-3	ISP Modern Physics
2004 Winter	125-2	ISP Electricity & Magnetism
2003 Spring	125-3	ISP Modern Physics
2003 Winter	125-2	ISP Electricity & Magnetism