Sridhara Rao Dasu

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Personal Data

Date of Birth:	August 25, 1961 in Hyderabad, India
Nationality:	United States (Naturalized)

Education

1988	Ph.D. Physics, University of Rochester, Rochester, NY Thesis: *Precision Measurement of x, Q^2 and A-dependence of $R = \sigma_L/\sigma_T$ and F_2 in Deep Inelastic Scattering* (Advisor: Prof. Arie Bodek)
1983	M.Sc. Physics, University of Hyderabad, Hyderabad, India
1981	B.Sc., Nizam College (Osmania University), Hyderabad, India

Positions Held

2010 – Present	Full Professor, University of Wisconsin-Madison
2006 – 2009	Associate Professor, University of Wisconsin-Madison
2000 – 2005	Assistant Professor, University of Wisconsin-Madison
2000 – 2000	Associate Scientist, University of Wisconsin-Madison
1992 – 1999	Assistant Scientist, University of Wisconsin-Madison
1988 – 1992	Research Associate, Stanford Linear Accelerator Center
1983 – 1988	Research/Teaching Assistant, University of Rochester

Honors

2016 Adjunct Professor, Tata Institute of Fundamental Research, Mumbai, India
2012 Elected Fellow of American Physical Society
2012 Vilas Associate, University of Wisconsin
1988 David Dexter Prize, University of Rochester, New York
1981 University Merit Scholarship, University of Hyderabad, India

Collaborations

2012 – now	LZ experiment at SURF – Direct search for dark matter
1993 – now	CMS experiment at CERN – High Energy Proton-Proton Collisions
1997 – 2010	BaBar experiment at SLAC – e^+e^- Annihilations at Upsilon(4S)
1992 – 1997	ZEUS experiment at DESY – High Energy Electron-Proton Collisions
1992 – 1993	SDC experiment at SSC Laboratory – High Energy Proton-Proton Collisions
1988 – 1992	SLD experiment at SLAC – e^+- e^- Annihilations at Z^0
1985 – 1992	E140 experiment at SLAC – Measurement of R in Deep Inelastic Scattering
1985 – 1988	E141 experiment at SLAC – Search for Short Lived Axions in Beam Dump

Professional Activities

Collaboration Management Responsibilities

2014 – 2016	Chair of US CMS Collaboration
2014 – 2016	Member of CMS Management & Collaboration Boards
2012 – 2013	Co-convener of the Higgs to Taus group of CMS
2012 – 2014	Trigger and Data Acquisitions Resource Manager
2010 – 2011	Upgrade Physics Coordinator for CMS
2008 – 2009	Co-convener of the Electroweak Physics group of CMS
2005 – 2007	Co-convener of the Online Selection group of CMS
2005 – Present	Manager of the CMS Tier-2 Computing Center at Wisconsin
2003 – Present	Head of the Technical Board of the Grid Laboratory Of Wisconsin
1998 – Present	USCMS Level-3 Manager of CMS L1 Calorimeter Trigger System

Community and Collaboration Service

2007 – 2015	Member, US LHC Users Organization Executive Committee
2004-07, 13-16	Member, LHC Physics Center Advisory Board
2007 – 2009	Member, US CMS Institutional Advisory Board
2000 – 2007	Member/Chair(03-07), USCMS Advisory Software & Comp. Board
2001 – 2002	Chair, SLAC Users Organization Executive Committee
2000 – 2003	Member, SLAC Users Organization Executive Committee

Publications

Prof. Dasu is an author of over a thousand papers published in peer-reviewed journals by BaBar, CMS, SLD, ZEUS and fixed target experiments at SLAC. Recently >150 publications per year are made, of which ~10 per year have direct scientific involvement. For complete list and citations, … see:

http://inspirehep.net/search?ln=en&ln=en&p=find+a+dasu+and+ps+published&of=hcv&action_search=Search&sf=&so=d&rm=&rg=25&sc=0

Selected Publications (those with significant direct contributions)

1. CMS Collaboration, "*Reconstruction and identification of τ lepton decays to hadrons and ν_τ at CMS*", JINST 11 (2016) no.01, P01019.
2. CMS Collaboration, "*Search for a very light NMSSM Higgs boson produced in decays of the 125 GeV scalar boson and decaying into τ leptons in pp collisions at √s=8 TeV*", JHEP 1601 (2016) 079.
3. CMS Collaboration, "*Searches for a heavy scalar boson H decaying to a pair of 125 GeV Higgs bosons hh or for a heavy pseudoscalar boson A decaying to Zh, in the final states with h→ττ*", Phys.Lett. B755 (2016) 217-244.
4. CMS Collaboration, "*Search for single production of scalar leptoquarks in proton-proton collisions at √s= 8 TeV*", Phys.Rev. D93 (2016) no.3, 032005.

5. CMS Collaboration, "*Search for lepton-flavour-violating decays of the Higgs boson*", Phys.Lett. B749 (2015) 337-362..
6. CMS Collaboration, "Search for neutral MSSM Higgs bosons decaying to a pair of tau leptons in pp collisions", JHEP 10 (2014) 160.
7. CMS Collaboration, Evidence for the direct decay of the 125 GeV Higgs boson to fermions, Nature Phys. 10 (2014)
8. CMS Collaboration, Measurement of the properties of a Higgs boson in the four-lepton final state, *Phys. Rev. D* 89 (2014) 092007
9. CMS Collaboration, "Study of the Mass and Spin-Parity of the Higgs Boson Candidate via Its Decays to Z Boson Pairs", PRL 110 (2013) 081803.
10. CMS Collaboration, Search for a standard-model-like higgs boson with a mass up to 1 TeV, Submitted for publication, Eur. Phys. J. C 73 (2013) 2469.
11. CMS Collaboration, "Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC", Phys.Lett. B716 (2012) 30-61.
12. CMS Collaboration, "Search for neutral Higgs bosons decaying to tau pairs in pp collisions at $\sqrt{s}$=7 TeV", Phys. Lett. B 713 (2012) 68-90.
13. CMS Collaboration, "Search for the standard model Higgs boson in the $H \to ZZ \to l^+l^-\tau^+\tau^-$ decay channel in pp collisions at $\sqrt{s}$=7 TeV", J. High Energy Phys. 03 (2012) 081.
14. CMS Collaboration, "Search for the standard model Higgs boson in the decay channel $H \to ZZ \to 4l$ in pp collisions at $\sqrt{s}$ = 7 TeV", Phys. Rev. Lett. 108 (2012) 111804.
15. CMS Collaboration, "*Rates of Jets Produced in Association with W and Z Bosons production in pp collisions at* $\sqrt{s}$ *= 7 TeV*", J. High Energy Phys. 01 (2012) 010.
16. CMS Collaboration, " *Search for Neutral MSSM Higgs Bosons Decaying to Tau Pairs in pp Collisions at* $\sqrt{s}$ *= 7 TeV*", Phys. Rev. Lett. **106**, 231801, 2011
17. CMS Collaboration, "*Measurement of the Inclusive Z Cross Section via Decays to Tau Pairs in pp Collisions at* $\sqrt{s}$ *= 7 TeV*", J. High Energy Phys. **08** (2011) 117
18. CMS Collaboration, "*Performance of τ-lepton reconstruction and identification in CMS*", J. Instrum. **7** (2012) P01001
19. CMS Collaboration, "*Measurement of the Inclusive Z Cross Section via Decays to Tau Pairs in pp Collisions at* $\sqrt{s}$ *= 7 TeV*", J. High Energy Phys. **08** (2011) 117
20. CMS Collaboration, "*Search for First Generation Scalar Leptoquarks in the evjj Channel in pp Collisions at* $\sqrt{s}$ *= 7 TeV*", Phys. Lett. **B 703** (2011) 246-266
21. CMS Collaboration, "*Measurement of Wγ and Zγ production in pp collisions at* $\sqrt{s}$ *= 7 TeV*", Phys.Lett. **B701**, 535-555, 2011
22. CMS Collaboration, " *Search for Neutral MSSM Higgs Bosons Decaying to Tau Pairs in pp Collisions at* $\sqrt{s}$ *= 7 TeV*", Phys. Rev. Lett. **106**, 231801, 2011
23. CMS Collaboration, "*Measurement of the Isolated Prompt Photon Production Cross Section in pp Collisions at* $\sqrt{s}$ *= 7 TeV* ", Phys. Rev. Lett. **106**, 082001, 2011
24. CMS Collaboration, "*Measurements of Inclusive W and Z Cross Sections in pp Collisions at* $\sqrt{s}$ *= 7 TeV*", JHEP **1101**, 080, 2011
25. CMS Collaboration, "*Search for Pair Production of First-Generation Scalar Leptoquarks in pp Collisions at* $\sqrt{s}$ *= 7 TeV*. ", Phys. Rev. Lett. **106**, 201802, 2011
26. CMS Collaboration, "*Search for Pair Production of Second-Generation Scalar Leptoquarks in pp Collisions at* $\sqrt{s}$ *= 7 TeV*. ", Phys. Rev. Lett. **106**, 201803, 2011
27. BaBar Collaboration, "*Search for the Rare Decay* $B \to K \nu\nu$ ", Phys. Rev. **D82**, 112002, 2010

28. BaBar Collaboration, "*Direct CP, Lepton Flavor and Isospin Asymmetries in the Decays* $B \to K^* l^+ l^-$, Phys. Rev. Lett. **102**, 091803 (2009)
29. BaBar Collaboration, "*Angular Distributions in the Decays* $B \to K^* l^+ l^-$", Phys. Rev. **D79**, 031102 (2009)
30. CMS Collaboration, "*Performance of the CMS Level1 Trigger during Commissioning with Cosmic Ray Muons and LHC beams*", J. Instrum. **5** (2010) T03002
31. CMS Collaboration, "*Commissioning of the CMS High-Level Trigger with Cosmic Rays*", J. Instrum. **5** (2010) T03005
32. CMS Collaboration, "*The CMS experiment at the CERN LHC"*, JINST 0803, S08004 (2008)
33. CMS Collaboration, "*CMS Physics Technical Design Report, Vol. 2*", CERN/LHCC 2006-021 (2006), J. Phys. G: Nucl. Part. Phys. 34 (2007) 995-1579
34. CMS HLT Group, "*The CMS high level trigger*", Euro. Phys. J. C46, 605 (2006)
35. CMS Collaboration, "*CMS Physics Technical Design Report, Vol. 1*", CERN/LHCC 2006-001 (2006)
36. BaBar Collaboration, "*Search for Radiative Penguin Decays* $B^+ \to \rho^+ \gamma$, $B^0 \to \rho^0 \gamma$, *and* $B^0 \to \omega^0 \gamma$," *Phys. Rev. Letters* **94**, 011801 (2005)
37. CMS Collaboration, "*The Computing Project - Technical Design Report"*, CERN/LHCC 2005-023 (2005)
38. BaBar Collaboration, *"Measurements of the* $B \to X_s \gamma$ *branching fraction and photon spectrum from a sum of exclusive final states*", Phys. Rev. **D72** (2005) 052004
39. BaBar Collaboration, *"Measurement of branching fractions, and CP and isospin asymmetries, for* $B^0 \to K^* \gamma$," *Phys. Rev.* **D70**, 112006 (2004)
40. S. Dasu [CMS Collaboration], "*CMS Trigger And Event Selection"*, Eur. Phys. J. **C4S1**, 09 (2002)
41. BaBar Collaboration, "*The BaBar Detector*", Nucl. Instrum. Meth. A 479, 1 (2002)
42. CMS Collaboration, "*The Trigger and Data Acquisition Project, Volume II: The High Level Trigger and Data Acquisition - Technical Design Report*", CERN/LHCC 2002-026 (2002)
43. CMS Collaboration, "*The Trigger and Data Acquisition Project, Volume I: The Level-1 Trigger - Technical Design Report*", CERN/LHCC 2000-038 (2000)
44. ZEUS Collaboration, "*Measurement of the* F_2 *structure function in deep inelastic ep scattering using 1994 data from the ZEUS detector at HERA*", Z.Phys. **C72** (1996) 399-424
45. ZEUS Collaboration, "*Measurement of the proton structure function* F_2 *at low x and low* Q^2 *at HERA*", Z.Phys. **C69** (1996) 607-620
46. CMS Collaboration, "*The Compact Muon Solenoid - Technical Proposal*", CERN/LHCC 94-38 (1994)
47. SLD Collaboration, "*Performance of the SLD barrel CRID during the 1992 physics data run"*, IEEE Trans.Nucl.Sci. 40 (1993) 589-592
48. R. C. Walker, et al., "*Measurements of the proton elastic form-factors at SLAC*", Phys. Rev. D49 (1994), p.5671.
49. S. Dasu, et al., "*Measurement of kinematic and nuclear dependence of* $R=\sigma_L/\sigma_T$ *in deep inelastic electron scattering*", Phys. Rev. D49 (1994), p.5641

50. SLD Collaboration, "*First measurement of the left-right cross-section asymmetry in Z boson production by e+ e- collisions*", Phys.Rev.Lett. **70** (1993) 2515-2520
51. L.W. Whitlow, et al., "*Precise measurements of the proton and deuteron structure functions from a global analysis of the SLAC deep inelastic electron scattering cross sections*", Phys. Lett. **B282** (1992), p.475
52. L.W. Whitlow, S. Rock, A. Bodek, S. Dasu and E. M. Riordan, "*A precise extraction of $R=\sigma_L/\sigma_T$ from a global analysis of the SLAC deep inelastic e-P and e-D scattering cross sections*", Phys. Lett. **B250** (1990), p.193.
53. R.C. Walker, et al., "*Measurement of the proton elastic form-factors*", Phys. Lett. **B224** (1989), p.353.
54. S. Dasu, et al., "*Precision measurement of $R=\sigma_L/\sigma_T$ and F_2 in deep inelastic electron scattering*", Phys. Rev. Lett. **61** (1988), p.1061.
55. S. Dasu, et al., "*Measurement of the difference in R and F_2 in deep inelastic e-D, e-Fe and e-Au scattering*", Phys. Rev. Lett. **60** (1988), p.2591.
56. E.M. Riordan, et al., "*A search for short lived axions in an electron beam dump experiment*", Phys. Rev. Lett. **59** (1987), p.755.

Technical Reports

Member of the Editorial Board: "CMS. The TriDAS project." Technical Design Report, Vol 1: The Trigger CERN-LHCC-2000-038

Co-editor: "Proceedings of the DIS2005." AIP 792, ISBN 0-7354-0283-3.

Member of the Editorial Board: "Technical Proposal for the Upgrade of the CMS detector through 2020" CERN-LHCC-2011-006

Invited Presentations, Colloquia and Seminars

Conferences

1. *Flavor at High PT Frontier,* International Conference on Supersymmetry, SUSY2015, August 2015, Lake Tahoe, CA.
2. *Heavy Flavor Results from CMS,* International Conference on Supersymmetry, SUSY2015, August 2015, Lake Tahoe, CA.
3. *What's Next at the LHC in Higgs Physics,* Symposium on What's Next at LHC, January 2014, TIFR, Mumbai, India.
4. *Dark Matter Searches at the LHC,* SERC School on High Energy Physics, December 2013, IIT, Chennai, India.
5. *From an Idea to Higgsteria, Public Talk, Wisconsin Festival of Ideas 2013, Madison, WI.*
6. *Recent Results on Higgs Physics from CMS, SUSY 2013, September 2013, Trieste, Italy.*
7. *Exploring the Higgs Sector, DAE Symposium on High Energy Physics, January 2013, Shanti Niketan, India.*
8. *Beyond the SM Higgs, Workshop on LHC Physics, November 2012, Chicago, Illinois.*
9. *CMS Physics Results in Tau Final States*, Workshop on LHC Physics, May 2012, Chicago, Illinois.
10. *Beyond the SM Higgs*, Moriond EWK, March 2012, La Thuile, Italy.
11. *Using Vector Bosons to Probe QCD at LHC*, Workshop on Quarks, Gluons and Hadrons at LHC, August 2011, Mumbai, India.
12. *Latest Results from CMS at LHC*, Lake Louise Winter Institute in Particle Physics, February 2011, Lake Louise, Canada.
13. *Rare B decays using BaBar*, Workshop on Synergy between Energy and Luminosity Frontiers, SEL2011, January 2011, TIFR, Mumbai, India
14. *Establishing the Standard Model at LHC*, Workshop on Synergy between Energy and Luminosity Frontiers, SEL2011, January 2011, TIFR, Mumbai, India
15. *LHC Status and Its Physics Potential,* DAE-BRNS Symposium on High Energy Physics, December 2008, Varanasi, India.
16. *Rapid-response Adaptive Computing Environment for CMS,* International Conference on Computing in High Energy and Nuclear Physics, September 2007, Victoria, Canada.
17. *CMS Status and HLT Exercise,* CERN Theory Workshop, August 2007, CERN, Geneva, Switzerland.
18. *Standard Model Higgs at LHC*, 2007 Aspen Winter Conference: New Physics at the Electroweak Scale and New Signals at Hadron Colliders, January 2007, Aspen, CO.
19. *CMS Trigger Strategy*, West Coast LHC Theory Network, May 2006, San Diego, CA.
20. *Grid Laboratory Of Wisconsin and DISUN*, Condor Week, April 2006, Madison, WI.
21. *Contribution of Condor and GLOW to LHC*, International Conference on Computing in High Energy and Nuclear Physics, February 2006, Mumbai, India.
22. *Grid Laboratory Of Wisconsin (GLOW),* Global Grid Forum Workshop on Campus Grids, Harvard University, September 2005, Cambridge, MA.
23. *Computing in High Energy Physics and its Relevance for Other Sciences,* Genomic Sciences Training Program, June 2005, Madison, WI.
24. *Challenges of LHC: Trigger,* 2005 Aspen Winter Conference: The Highest Energy Physics, Aspen, Colorado, February, 2005
25. *Use of Condor and GLOW for CMS Simulation Production,* CHEP'04, International conference on computing in high energy physics, Interlaken, Switzerland, Sep. 2004.

26. *Search for New Physics at B-Factories,* The 12th International Conference on Supersymmetry and Unification of Fundamental Interactions, Tsukuba, Japan, Jun 2004
27. *Grid Computing - A Primer* WiscNet Future Technologies Conference, Madison, WI, USA, April 2004
28. *Probing the Standard Model with Electroweak Penguin B Decays,* XXIII Physics in Collision, Zeuthen, Germany, June 26-28, 2003.
29. *Higgs Search At LHC,* IXth International Symposium on Particles, Strings and Cosmology, PASCOS '03, Mumbai, India, January 3-8, 2003
30. *Prospects for measurement of V_{td}/V_{ts} using of b to sγ and dγ at the B factories,* Workshop on the CKM Unitarity Triangle, Geneva, Switzerland, Feb 2002
31. *Physics at CMS Trigger and Event Filter Level,* III International Symposium on LHC Physics and Detectors, Chia, Sardinia, Italy, October 2001.
32. *Physics at B Factories,* Phenemenology Symposium, Madison, WI, April 2000.
33. *Physics at LHC,* Aspen Winter Conference on Particle Physics - Vistas on XXIst Century Particle Physics, Aspen, USA, January 16-22, 2000
34. *Search for new physics at LHC,* The Second International Conference on Physics beyond the Standard Model; Beyond the Desert'99 – Accelerator, Non-Accelerator and Space approaches into the Next Millenium, Tegernsee, Germany, Jun 6-12, 1999
35. *CMS Calorimeter Regional Trigger Prototypes,* LEB'99, Fifth Workshop on Electronics for LHC Experiment, Snowmass, USA, September, 1999.
36. *CMS/LHC Status and Physics Prospects*, Fermilab Users Meeting, July 1998.
37. *The Standard model physics from HERA,* Pheno-CTEQ Symposium 1998 - From non-perturbative QCD to new physics, Madison, Wisconsin, Mar 23-26, 1998.
38. *Event logging and distribution for the BaBar Online System,* CHEP'98, International conference on computing in high energy physics, Chicago, USA, September, 1998.
39. *The calorimeter trigger system for CMS detector,* CHEP'98, International conference on computing in high energy physics, Chicago, USA, September, 1998.
40. *Physics potential of CMS/LHC,* 4th International conference on physics potential and development of μ+μ– colliders, San Francisco, California, Dec 10-12, 1997.
41. *High speed data processing for the CMS calorimeter trigger*, IEEE Nuclear Science Symposium, Albuquerque, New Mexico, November 1997
42. *Calorimeter trigger electronics for CMS detector at LHC*, CHEP'97, International conference on computing in high energy physics, Berlin, Germany, April, 1997.
43. *Extraction of the gluon density in proton from the ZEUS DIS cross section,* DPF'96, Minneapolis, Minnesota, Aug 10-15, 1996.
44. *CMS calorimeter trigger circuits,* Trigger electronics for capturing physics with CMS detector at LHC, DPF'96, Minneapolis, Minnesota, Aug 10-15, 1996.
45. *CMS level-1 calorimeter trigger,* International conference on computing in high energy physics, Rio de Janeiro, Brazil, September 18-22, 1995.
46. *Level-1 calorimeter trigger for LHC,* The fifth international conference on calorimetry in high energy physics, Brookhaven, New York, September 26-30, 1994.
47. *SDC level-1 calorimeter trigger*, International conference on computing in high energy physics, San Fransisco, California, April 21-27, 1994.
48. *SDC level-1 calorimeter trigger,* The fourth international conference on calorimetry in high energy physics, La Biodola, Isola d'Elba, Italy, September 19-25, 1993.
49. *Study of nuclear effects in the deuteron and extraction of $R=\sigma_L/\sigma_T$,* The 4th conference on intersections between particle and nuclear physics, Tucson, Arizona, May, 1991.
50. *Measurement of kinematic and nuclear dependence of $R=\sigma_L/\sigma_T$,* International

Europhysics conference on high energy physics, Uppsala, Sweden, June, 1987.

51. *Measurement of kinematic and nuclear dependence of* $R=\sigma_L/\sigma_T$, The 2nd Lake Louise winter institute on new frontiers in particle physics, Lake Louise, Canada, Feb. 1987.

Colloquia and Seminars:

1. CMS Trigger Upgrade for HL-LHC, April 2016, India-CMS Group.
2. What's Next at LHC, Seminar, January 2016, TIFR, Mumbai, India.
3. Trigger and DAQ for Hadron Collider Physics, Guest Lectures, TIFR, Mumbai, India
4. Shedding Light on the Mystery of Dark Matter, January 2016, TIFR, Hyderabad, India.
5. Lepton Flavor Violation in Higgs Sector, Seminar, July 2014, TIFR, Mumbai, India.
6. Discovery of the Higgs Boson, Public Lecture, July 2014, VJIT, Hyderabad, India.
7. Discovery of the Higgs Boson, Public Lecture, January 2014, IIIT, Hyderabad, India.
8. Understanding the Higgs Boson, Physics Colloquium, University of Rochester, NY.
9. Understanding the Higgs Boson, Physics Colloquium, Madison, WI.
10. Public Lecture, Wisconsin Festival of Ideas, University of Wisconsin, April 2013
11. Public Lecture, B. M. Birla Science Center, Hyderabad, India, January 2013
12. Colloquium, Indian Institute of Mathematical Sciences, Chennai, India, January 2013
13. Seminar, Tata Institute of Fundamental Research, Mumbai, India, January 2013
14. Public Lecture, University of Wisconsin, July 2012
15. Public Lecture, B.M. Birla Science Center, Hyderabad, India, December 2011
16. Seminar, Indian Institute of Mathematical Sciences, Chennai, India, December 2011
17. Public Lecture, The Harker School, San Jose, CA, September 2011
18. Colloquium, University of Wisconsin, Madison, WI, September 2011
19. Seminar, Indian Institute of Technology, Mumbai, India, January 2011
20. Seminar, Stanford Linear Accelerator Center, Menlo Park, CA, November 2010
21. Seminar, Rice University, Houston, January 2008
22. Seminar, CERN, Geneva, Switzerland, July 2005
23. Seminar, Stanford Linear Accelerator Center, Menlo Park, CA, June 2005
24. Seminar, University of Illinois, Urbana-Champagne, IL, April 2004
25. Seminar, University of Wisconsin, Madison, WI, April 2004
26. Seminar, Argonne National Laboratory, Chicago, IL, September 2003
27. Seminar, University of Hyderabad, Hyderabad, India, January 2003
28. Seminar, University of Hyderabad, Hyderabad, India, January 2003
29. Colloquium, University of Alabama, Tuscaloosa, AL, March 2000
30. Colloquium, University of Wisconsin, Madison, WI, February 2000
31. Seminar, University of Wisconsin, Madison, WI, November 2000
32. Seminar, California Institute of Technology, Pasadena, CA, 1999
33. Seminar, Stanford Linear Accelerator Center, Menlo Park, CA, 1998
34. Colloquium, University of Notre Dame, IN, February 1997
35. Seminar, University of Notre Dame, IN, February 1997
36. Seminar, State University of New York, Stony Brook, NY, December 1996
37. Seminar, University of Hyderabad, Hyderabad, India, January 1995
38. Colloquium, Tata Institute of Fundamental Research, Bombay, India, January 1995
39. Seminar, Tata Institute of Fundamental Research, Bombay, India, January 1995
40. Colloquium, DESY Laboratory, Hamburg, Germany, 1994
41. Seminar, University of Wisconsin, Madison, WI, September 1991
42. Seminar, SSC Laboratory, Dallas, TX, September 1991
43. Seminar, University of California-Davis, Davis, CA, 1990
44. Seminar, University of Chicago, Chicago, IL, December 1987

45. Seminar, Fermi National Accelerator Laboratory, Batavia, IL, December 1987
46. Seminar, Stanford Linear Accelerator Center, Menlo Park, CA, November 1987

List of Primary Collaborators with Shared Funding/Responsibilities

Prof. Wesley Smith	Wisconsin	CMS
Prof. Matt Herndon	Wisconsin	CMS
Prof. Kimberly Palladino	Wisconsin	LZ
Prof. Duncan Carlsmith	Wisconsin	LZ

List of Research Staff

Current Postdoctoral Researchers and Professionals

Dr. Bhawna Gomber	Research Associate, CMS and LZ
Dr. Isobel Ojalvo	Research Associate, CMS
Dr. Pamela Klabbers,	Senior Scientist, CMS
Dr. Sascha Savin	Senior Scientist, CMS
Dr. Carl Vuosalo	Research Software Developer, CMS
Dr. Ajit Mohapatra,	Researcher (Physics Computing), CMS
Mr. Chad Seys	Software Engineer, UW
Mr. Dan Bradley,	Director of Computing, UW
Ms. Jes Tikalsky	Systems Software Developer, CMS
Mr. Ales Svetek	Firmware Developer, CMS
Mr. Marcelo Vicente	Firmware Developer, CMS
Mr. Tom Gorski,	Electronics Engineer, CMS
Mr. Robert Fobes,	Electronics Technician, CMS

Past Postdoctoral Researchers and Professionals

Dr. Tapas Sarangi, CMS	Computing Services, Wisconsin
Dr. Maria Cepeda, CMS	Marie Curie Fellow, CERN, Switzerland
Mr. Mathias Blake, CMS	Engineering Services, Wisconsin
Dr. Evan Friis, CMS	Google, California
Dr. Monika Grothe, CMS	Teaching, Italy
Dr. Jonathan Efron, CMS	Industry, Minnesota
Dr. Francesca Di Lodovico, BaBar,	Professor, Queen Mary College, England.
Dr. Ajit Mohapatra, BaBar,	Researcher, University of Wisconsin
Dr. Maurizio Pierini, BaBar	Fellow, CERN
Dr. Kevin Flood, BaBar	Research Scientist, MIT
Mr. Will Maier,	Computer Systems Engineer, Oregon

List of Students

Current Graduate Students

Ms. James Buchanan	Ph.D. Student, CMS
Mr. Tyler Ruggles	Ph.D. Student, CMS
Mr. Devin Taylor	Ph.D. Student, CMS
Mr. Aaron Levine	Ph.D. Student, CMS
Mr. Usaama Hussain	Ph.D. Student, CMS (advisor Prof. Smith)
Mr. Nicholas Smith	Ph.D. Student, CMS (advisor Prof. Smith)
Mr. Nate Woods	Ph.D. Student, CMS (advisor Prof. Smith)
Mr. Laura Dodd	Ph.D. Student, CMS (advisor Prof. Smith)
Mr. Tom Perry	Ph.D. Student, CMS (advisor Prof. Smith)

Past Graduate Students

Mr. Austin Belknap	Ph.D. (CMS) 2015, Epic Systems, Wisconsin, (advisor Prof. Smith)
Ms. Isobel Ojalvo	Ph.D. (CMS) 2014, Res Assoc, UW-Madison (advisor Prof. Smith)
Mr. Joshua Swanson	Ph.D. (CMS) 2013, Intel, Oregon (advisor Prof. Smith)
Dr. Ian Ross	Ph.D. (CMS) 2013, Researcher, Comp Sci, UW-Madison
Dr. Lindsey Gray,	Ph.D. (CMS) 2012, FNAL Scientist
Dr. Michal Bachtis,	Ph.D. (CMS) 2012, CERN Scientist
Dr. Mike Anderson,	Ph.D. (CMS) 2011, Industry, TX
Dr. Kira Grogg	Ph.D. (CMS) 2011, Harvard Medical School (advisor Prof. Smith)
Dr. Marc Weinberg	Ph.D. (CMS) 2011, Florida State, (advisor Prof. Smith)
Dr. Christos Lazaridis	Ph.D. (CMS) 2011, CERN Fellow, (advisor Prof. Smith)
Dr. Jessica Leonard	Ph.D. (CMS) 2011, DESY Fellow, (advisor Prof. Smith)
Dr. Carl Vuosalo,	Ph.D. (BaBar) 2009, Researcher, Physics, UW-Madison
Dr. Jonathan Hollar,	Ph.D. (BaBar) 2006, Belgium (advisor Prof. Prepost)
Dr. Ping Tan	Ph.D. (BaBar) 2005, Researcher, University of Iowa
Dr. Andrew Eichenbaum	Ph.D. (BaBar) 2004, Industry, CA (advisor Prof. Prepost)

Past Masters Students

Ms. Ada Rubin	M.S. (Physics) 2004, Ph. D. Student, Iowa State
Ms. Meghan O'Connell,	M.S. (Physics Education) 2005
Ms. Kendra Rand,	M.S. (Physics Education) 2005
Mr. V. Mehta	M.S. (EE/CS) 2007, Industry, Santa Clara, CA
Mr. V. Puttabuddhi,	M.S. (EE/CS) 2005, Industry, Mountain View, CA
Mr. R. Gowrishankara,	M.S. (EE/CS) 2004, Industry, Boston, MA
Mr. R. Rajamani,	M.S. (EE/CS) 2002, Industry, Palo Alto, CA

Summary of Research Activities

Recent research of Prof. Sridhara Dasu is focused on understanding the mechanism of electro-weak symmetry breaking and search for new physics, including particle dark matter candidates, using proton-proton collision data acquired with the CMS detector at the LHC. He played a leading role in the most important observation in particle physics in recent times with the discovery of a new boson in its decays to four leptons and τ-pairs. His group is now making most sensitive measurements of coupling of new boson to τ-leptons, its exotic couplings and continuing to search for its exotic partners, e.g., heavy MSSM higgs bosons and doubly charged bosons. His group has also measured di-boson production cross-sections and setting limits on anomalous triple gauge boson couplings.

Earlier at LHC, Prof. Dasu's team played a crucial role in measuring the production cross sections for electro-weak bosons (W and Z) inclusively, reconstruction of Z boson using difficult to measure τ-pair mode, W and Z in association with jets and in pairs (e.g., Wγ and Zγ). These measurements in part established the Standard Model (SM) at the new energy regime of the LHC. Special emphasis was placed on the triggering, reconstruction and validation of τ-leptons, as they are difficult to study in hadronic environment but are crucial for studying EWSB.

Prof. Dasu studied the flavor-changing neutral current electro-weak decays of the B-meson, which are suppressed at the tree-level in the SM model, using the data acquired with the BaBar detector at PEP-II e^+-e^- collider at SLAC. The primary goal of that research was to look for deviations from the SM predictions of these rare B-decay rates and asymmetries, due to the presence of new physics contributions, e.g., those due to charged Higgs bosons of the MSSM, in the penguin loop. These studies also yielded measurements of parameters that characterize the B-hadron and SM CKM elements V_{td} and V_{ts}. The B-decay processes studied were: semi-inclusive $b\rightarrow s\gamma$, and, exclusive $B\rightarrow K^*\gamma$ and $B\rightarrow\rho\gamma$, $B\rightarrow K^{(*)}ll$ and $B\rightarrow K^{(*)}\nu\nu$.

Prof. Dasu studied the deep inelastic electron-proton scattering using the data collected by the fixed target experiments at SLAC extensively, and also using ZEUS detector at HERA briefly. The measurement of proton structure functions F_2 and especially F_L allowed precision testing of QCD, and are the basis for extraction of parton densities in proton.

Prof. Dasu made large contributions to the design and implementation of trigger and computing systems for CMS data acquisition, developing processing software for BaBar, helping build Cherenkov ring imaging detector for SLD and the particle ID and calorimeter systems for the E140 experiment. He continues to contribute to the designs for CMS upgrades.

Most recently Prof. Dasu worked on upgrading the calorimeter trigger in preparation for higher energy and luminosity operation of the LHC starting in 2015. Innovative ideas coupled with high-speed field programmable electronics and multi-giga-bit optical links were used to improve the trigger capabilities for the LHC research program, especially in the detailed study of the newly discovered boson and searches for new physics that it should accompany.

Prof. Dasu and his team have built up formidable resources for LHC data analysis at Wisconsin and also worked on improving worldwide CMS computing systems for 2015-2017 operations.

They collaborated with Nebraska and UCSD colleagues on a project, called AAA, that provides efficient data access on the wide area network, liberating prior strong requirement of colocation of storage and computational resources. The products that they developed are now adopted by CMS and are likely to result in significant reduction in storage resources by eliminating need for multiple copies of data stored at its computing centers around the world.

Summary of Research Plans

My research program in the coming several years will be dedicated to the study of the nature of the newly discovered Higgs boson like particle, using the CMS detector. This discovery is an important landmark event in the field of particle physics. However, it is now of paramount importance to fully characterize this new Higgs boson like particle. The LHC accumulated ~25 fb^{-1} data at 8 TeV energy in 2011-2012 data taking period. However, sufficient understanding of the nature of the new particle remains a mystery, begging to be explored thoroughly. Thorough understanding of the electro-weak symmetry breaking mechanism will require 100s of fb^{-1} of LHC data at full energy 14 TeV. Of particular interest is to discover if there are other Higgs bosons, or if this boson has unusual decays. During the current 13-TeV run one of the main pursuits is to find evidence for weakly interacting dark matter particle candidates, especially its connection to the Higgs boson, using LHC collisions. Weakly interacting massive particles that exist in the super-symmetric theories are ideal dark matter candidates. These SUSY theories require at least five Higgs bosons including an electrically charged pair. So, direct searches for additional Higgs bosons will continue to be a major part of my research program. I am also initiating complementary direct searches using liquid-Xenon TPC technology by building LZ experiment in a mine in South Dakota

The LHC plan for the coming three years is to accumulate about 100 fb^{-1} of data, at the center-of-mass energy of 13 TeV, and is called Run-2. My research plan is to stay focused on LHC for this period lasting through the end of this decade, pursuing the Higgs physics. Run-2 will be followed by another shutdown followed by several years of operation accumulating 300 fb^{-1} of data. During this period, (extended) Higgs sector, dark particle searches and the 13-TeV energy frontier will be thoroughly explored, enabling discoveries at TeV scale.

For instance, the new particle is observed in its decays to two photons or two Z-bosons, the latter being a physics analysis focus of my group. This observation confirms that the new particle is indeed a boson, but it is not certain whether it is a spin-zero particle with positive parity as expected in the Standard Model or a spin-two. Other quantum numbers of the particle are also important to measure. My immediate focus will be the study of the ZZ mode further, because it is most promising mode for such detailed studies because of its low background.

If this boson is indeed the Standard Model Higgs boson, it should provide masses for all the particles including the fermions. Searches of decays of this boson to two τ-leptons are very important. Current τ-lepton analysis pioneered by our group cannot conclusively determine if the coupling of the new boson to τ-lepton pairs is as predicted in the Standard Model. A 5-sigma evidence in τ-lepton pair mode requires about 100 fb^{-1} luminosity. A 10% measurement of the coupling to τ-lepton pairs will require several hundred fb^{-1}, stretching this program out to 2020.

The Higgs sector in nature may not be the simplest version included in the Standard Model. The Minimal Super-symmetric Standard Model Higgs sector with three neutral and two charged Higgs bosons is especially interesting. For certain favored regions of its parameter space, the heavy Higgs boson coupling to τ-leptons is significantly enhanced. I would also like to continue to search for these heavy Higgs bosons.

Ultimately, the definitive proof that this boson is indeed a Standard Model boson comes from careful study of both production and decay rates in various modes. Double Higgs production which measures the self-coupling of the Higgs field is the most important proof, yet is the most challenging measurement to make. The 300 fb^{-1} collected by 2020 is most likely not sufficient to measure the self-coupling. The LHC plans are to move to high-luminosity phase, called HL-LHC to collect over a 1000 fb^{-1} data, which can result in evidence for self-coupling.

However, depending on what is (not) found in the early operations at full energy (14 TeV), it may be appropriate to consider a dedicated electron-positron collider to make thorough measurements of the higgs sector. I plan to be involved in planning for this next high-energy machine alongside the LHC program through 2020.

The above physics program requires adiabatic upgrades to the CMS detector capabilities. I have already been deeply involved in the trigger systems upgrade design. My technical efforts in this regard will involve completion of designs, construction of the electronics systems, development of firmware, validation and commissioning of the systems. In the first long shutdown period, 2013-2014, we have deployed an upgraded trigger system, which is currently being commissioned. In during the next shutdown in 2018, further improvements are possible. with the upgraded trigger hardware and firmware.

On the computing front, the industry trend to move to multi-core systems to keep up with the Moore's law has been both a blessing and a problem. While the raw processing power has improved the bandwidth to memory has not kept up. On the other hand the CMS executable size has grown, resulting in extremely poor use of the multi-processor systems. I intend to work on improving the CMS software stack to make better use of such systems. The long shutdown period provides a good opportunity for making bulk software changes. My group has experienced software developers who can contribute to this work.

On the grid computing front, the scaling of operations to a million parallel processes looming around the corner. Pleasantly, the wide area network bandwidth has become comparable to the local disk IO bandwidth. With our "Any Data, Any Where, Any Time" collaboration I intend to continue to develop a paradigm shifting changing to provide seamless global access to multi-petabyte storage systems, to provide location independent high-throughput computing environment. This NSF supported project is in its final year, and is ripe to deliver fully as the time LHC resumes operation in 2015.

Statement on Teaching

I have fifteen years of experience teaching physics, bulk of which is in teaching an introductory non-calculus physics sequence to a diverse collection of students ranging from aspiring medical professionals to majors in humanities. I have also taught particle physics to graduate students several times and undergraduate physics major courses in optics, electronics and particle physics on occasion. My teaching duties also include direct supervision of Masters and Ph.D. students, and help in preparation of their theses.

Teaching upper division physics major or graduate courses is *easy*, because most students understand the purpose and are dedicated to master the subject. The aspect that I have noticed and tried to correct is the relative emphasis on mathematical techniques for problem solving, which are important, versus the imbibing of main physical principles involved. Often the delivery of lectures involves derivations of equations and the success in the course is measured by the problem solving skills. While that is important, I tend to stress the physical principles by providing examples of how the concepts are applicable in various contexts at a conceptual level. My courses tend to be a shade lighter on the mathematical detail, leaving such things to homework, with a bit more on physics principles.

I will focus remainder of my teaching statement on the introductory physics sequence, which I consider is very *difficult* to teach, and how I adapted myself to master the technique. The key concept I realized is to focus on improving student *learning* rather than simply focus on my *teaching/lecturing* abilities. The primary problem of the large lecture classes is that most students in the class are not motivated to learn, but rather feel compelled to take the course because of an academic requirement of their major. I draw attention of the students to this issue at the very outset and focus their attention to the importance of physics concepts in various professions, be it imaging technologies for medical sciences or settling debates on perpetual energy machines for a politician. Second problem that the students face is due to the deluge of concepts introduced on a weekly basis. Yet it is a very slow build-up over two semesters to get to the interesting physics issues pertaining to their domains. I overcome this challenge by keeping their interest in the subject by providing fun demonstrations and interactive Q&A during the lectures and reminding the students that the concepts illustrated will be used repeatedly throughout the physics sequence. Third problem that the students face and bitterly complain about is that the lectures are not sufficient to learn physics, which is indeed very true. As such, I have modified the introductory physics program at Wisconsin to emphasize small group problem solving and laboratory sections. My teaching assistants do not lecture at the board or solve problems for students, but supervise the 3-student group work on either back-of-the-book problems or laboratory experiments. This builds student confidence in solving homework and weekly (online) quizzes on their own. My course format at Wisconsin also reduces the teaching chores such as grading for the TAs and faculty alike, and liberates them to focus on more important and interesting engagement with students on physics. My methods, which are derived from various publications on physics teaching methods, are adapted to work within the Wisconsin constraints. About a thousand students are taught every semester using my course plan and materials at Wisconsin.

I truly enjoy teaching and look forward to new courses. When asked to teach a new course, I study the student needs and institutional constraints to adapt my teaching accordingly.

Research Funding

Lead PI:

Title: Vilas Associate
Agency: Wisconsin Alumni Research Foundation
Award Amount: $ 84745
Dates: Jul 2013 – Jun 2015

Title: Research Associate Support
Agency: Wisconsin Alumni Research Foundation
Award Amount: $ 56,636
Dates: Jul 2013 – Jun 2015

Title: Research Associate Support
Agency: Wisconsin Alumni Research Foundation
Award Amount: $ 34,112
Dates: Jul 2012 – Sep 2013

Title: U.S. CMS Operations at the LHC (Support for Tier-2 Computing Center at UW)
Agency: Princeton University (National Science Foundation subcontract)
Award Amount: $2,891,182 (Total @ Princeton $50M)
Dates: Jan 2012 – Dec 2016

Title: Any Data, Anytime, Anywhere
Agency: National Science Foundation
Award Amount: $710,171
Dates: Sep 2011 – Mar 2016

Title: Fall Competition
Agency: Wisconsin Alumni Research Foundation
Award Amount: $33,735
Dates: Jul 2009 – Jun 2010

Title: Data Intensive Science University Network (DISUN)
Agency: UCLA (National Science Foundation subcontract)
Award Amount: $2,303,000 (Total @ UCLA $10 M)
Dates: May 2005 - May 2010

Title: Rapid-response Adaptive Computing Environments
Agency: National Science Foundation
Award Amount: $750,000
Dates: Sep 2004 - Aug 2008

Title: USCMS Research Program – Software & Computing and Maintenance & Operation
Agency: UCLA (National Science Foundation subcontract)
Award Amount: $284,000
Dates: May 2005 – February 2006

Title: A Portal to the Distributed Computer Grid for the CMS at LHC
Agency: National Science Foundation
Award Amount: $162,000
Dates: Sep 2002-Aug 2004

Title: US CMS Software & Computing Subsystem
Agency: Fermi National Accelerator Laboratory
Award Amount: $293,143
Dates: Aug 2002 - Sep 2006

Title: Probing Matter/Anti-matter Asymmetry,
Agency: Wisconsin Alumni Research Foundation
Award Amount: $26,660
Dates: Jul 2004 - Jun 2005

Title: Probing the Origin of Mass and Matter/Anti-matter Asymmetry,
Agency: Wisconsin Alumni Research Foundation
Award Amount: $24,420
Dates: Jul 2003 - Jun 2004

Title: Large Scale Distributed Computing for HEP Research
Agency: Wisconsin Alumni Research Foundation
Award Amount: $19,374
Dates: Jul 2002 - Jun 2003

Title: Condor: CMS Trigger Simulation
Agency: Wisconsin Alumni Research Foundation
Award Amount: $32,500
Dates: Jul 2000 - Jun 2003

Title: Startup Package
Agency: Wisconsin Alumni Research Foundation
Award Amount: $108,333
Dates: Jul 2000 - Jun 2003

Title: Startup Package
Agency: UW Physics Department
Award Amount: $150,000
Dates: Jul 2000 - Jun 2005

Co-PI:

Title: CMS @ LHC
Agency: US Department of Energy
Award Amount: ~$ 17,509,174 (PI: Prof. Smith)
Dates: Nov 1996 - Mar 2017

Title: Collaborative Research: Design and Integration of Complex Digital Systems for HEP
Agency: National Science Foundation
Award Amount: $183,828 (PI: Prof. Schulte)
Dates: Sep 2008 - Aug 2011

Title: Electromagnetic & Weak Interactions at SLAC
Agency: US Department of Energy
Award Amount: $ 5,877,087 (PI: Prof. Prepost)
Dates: Nov 1996 - Oct 2010

Title: ARRA: Research Infrastructure for Particle Physics
Agency: US Department of Energy
Award Amount: $286,100
Dates: Nov 2009 – Oct 2010

Title: MRI: Acquisition of the second phase of GLOW
Agency: NSF
Award Amount: $500,000 (PI: Prof. Livny)
Dates: Sep 2007 – Aug 2010

Title: Data Analysis Facility
Agency: US Department of Energy
Award Amount: $160,000 (PI: Prof. Smith)
Dates: Nov 2000 - Oct 2007

Title: Grid Laboratory of Wisconsin
Agency: National Science Foundation
Award Amount: $1,186,405 (PI: Prof. Livny)
Dates: Sep 2003 - Aug 2006

Title: Matching for NSF MRI: GLOW
Agency: Wisconsin Alumni Research Foundation
Award Amount: $508,459 (PI: Prof. Livny)
Dates: Sep 2003 - Aug 2006