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## Curriculum Vitae Mary Hall Reno

### Contact information:

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### Education:

1985	PhD	Physics	Stanford University
1980	BA	Physics	Reed College

### Employment:

2009-present	Chair, Physics & Astronomy, University of Iowa
2002-present	Professor, Physics & Astronomy, University of Iowa
1995-2002	Associate Professor, Physics & Astronomy, University of Iowa
1990-1995	Assistant Professor, Physics & Astronomy, University of Iowa
1988-1990	Visiting Professor, Fisica, Centro de Investigacion y Estudios Avanzados del Instituto Politecnico National (CINVESTAV, Mexico City)
1985-1988	Postdoctoral research associate, Theory Group, Fermilab

### Honors and Awards:

2010	Fellow, American Physical Society
2003-2006	Faculty scholar award, University of Iowa
1999-2001	Dean's scholar award, College of Liberal Arts, University of Iowa

Mary Hall Reno, Physics and Astronomy

## 1. Scholarship

### 1.a. Journal Articles

1. Y. S. Jeong, C. S. Kim and M. H. Reno, "Majorana dark matter cross sections with nucleons at high energies," arXiv:1207.1526[hep-ph] (6 pages).
2. T. Guver, A. E. Erkoca, M. H. Reno and I. Sarcevic, "On the capture of dark matter by neutron stars, " arXiv:1201.2400[hep-ph] (12 pages).
3. Y. S. Jeong, M. H. Reno and I. Sarcevic, "Radio Cherenkov signals from the Moon: Neutrinos and cosmic rays," *Astroparticle Physics* 35 (2012) 383 (13 pages)
4. A. E. Erkoca, M. H. Reno and I. Sarcevic, "Probing dark matter models with neutrinos from the Galactic center, *Physical Review D* 82 (2010) 113006 (20 pages)
5. A. Bulmahn and M. H. Reno, "Secondary atmospheric tau neutrino production," *Physical Review D* 82 (2010) 057302 (4 pages)
6. Y. S. Jeong and M. H. Reno, "Tau neutrino and antineutrino cross sections," *Physical Review D* 82 (2010) 033010 (6 pages)
7. A. E. Erkoca, G. Gelmini, M. H. Reno and I. Sarcevic, "Muon fluxes and showers from dark matter annihilation in the Galactic center," *Physical Review D* 81 (2010) 096007 (13 pages)
8. Y. S. Jeong and M. H. Reno, "Quark mass effects in the high energy neutrino nucleon cross section," *Physical Review D* 81 (2010) 114012 (8 pages)
9. A. Bulmahn and M. H. Reno, "High energy leptons form muons in transit," *Physical Review D* 81 (2010) 053003 (11 pages)
10. A. E. Erkoca, M. H. Reno and I. Sarcevic, "Muon fluxes from dark matter annihilation," *Physical Review D* 80 (2009) 043514 (11 pages)
11. A. Bulmahn and M. H. Reno, "Cross sections and energy loss for lepton pair production in muon transport," *Physical Review D* 79 (2009) 053008 (8 pages)
12. R. Enberg, M. H. Reno and I. Sarcevic, "High energy neutrinos from charm in astrophysical sources," *Physical Review D* 79 (2009) 053006 (6 pages)
13. R. Enberg, M.H. Reno and I. Sarcevic, "Prompt neutrino fluxes from atmospheric charm," *Physical Review D* (2008) 043005 (13 pages) [50+ citations]

14. I. Schienbein ... M.H. Reno ... et al, "A review of target mass corrections," Journal of Physics G 35 (2008) 053101 (32 pages)
15. M. H. Reno, I. Sarcevic and J. Uscinski, "Cosmogenic neutrinos and quasi-stable supersymmetric particles," Physical Review D 76 (2007) 125030 (11 pages)
16. Y. Huang, M. H. Reno, I. Sarcevic and J. Uscinski, "Weak interactions of supersymmetric taus at high energies," Physical Review D 74 (2006) 115009 (7 pages)
17. M. H. Reno, "Electromagnetic structure functions and neutrino nucleon scattering," Physical Review D 74 (2006) 033001 (8 pages)
18. S. I. Dutta, Y. Huang and M. H. Reno, "Tau neutrino propagation and tau energy loss," Physical Review D 72 (2005) 013005 (10 pages)
19. M. H. Reno, I. Sarcevic and S. Su, "Propagation of supersymmetric charged sleptons at high energies," Astroparticle Physics 24 (2005) 107 (9 pages).
20. S. Kretzer, F. Olness, J. Pumplin, D. Stump, W.-K. Tung and M. H. Reno, "The parton structure of the nucleon and precision determination of the Weinberg angle in neutrino scattering," Physical Review Letters 93 (2004) 041802 (4 pages).[50+ citations]
21. J. Jones, I. Mocioiu, M. H. Reno and I. Sarcevic, "Tracing very high energy neutrinos from cosmological distances in ice," Physical Review D 69 (2004) 033004 (12 pages)
22. S. Kretzer and M. H. Reno, "Target mass corrections to electro-weak structure functions and perturbative neutrino cross sections," Physical Review D 69 (2004) 034002 (14 pages)
23. S. Kretzer and M. H. Reno, "Tau neutrino deep inelastic charged current interactions, Physical Review D 66 (2002) 113007 (12 pages)
24. S. Iyer Dutta, M. H. Reno and I. Sarcevic, "Secondary neutrinos from tau neutrino interactions in Earth," Physical Review D 66 (2002) 077302 (4 pages).
25. S. Iyer Dutta, M. H. Reno and I. Sarcevic, "On black hole detection with the OWL/Airwatch telescope," Physical Review D 66 (2002) 033002 (6 pages). [50+ citations]
26. S. Iyer Dutta, M. H. Reno and I. Sarcevic, "High-energy signals of four neutrino mixing," Physical Review D 64 (2001) 113015 (7 pages).
27. S. Iyer Dutta, M. H. Reno, I. Sarcevic and D. Seckel, "Propagation of muons and taus at high energies," Physical Review D 63 (2001) 094020 (10 pages). [100+ citations]
28. S. Iyer Dutta, M. H. Reno and I. Sarcevic, "Tau neutrinos underground: Signals of  $\nu_\mu \rightarrow \nu_\tau$  oscillations with extragalactic neutrinos," Physical

- Review D 62 (2000) 123001 (20 pages). Also contributed paper to Neutrino 2000, Sudbury, Canada, June 2000. [50+ citations]
29. S. Iyer, M. H. Reno and I. Sarcevic, ``Searching for  $\nu_\mu \rightarrow \nu_\tau$  oscillations with extragalactic neutrinos," Physical Review D 61 (2000) 053003 (4 pages)
  30. L. Pasquali and M. H. Reno, ``Tau neutrino fluxes from atmospheric charm," Physical Review D 59 (1999) 093003 (4 pages). [50+ citations]
  31. L. Pasquali, M. H. Reno and I. Sarcevic, ``Lepton fluxes from atmospheric charm," Physical Review D 59 (1999) 034020 (10 pages). [50+ citations]
  32. R. Gandhi, C. Quigg, M. H. Reno and I. Sarcevic, ``Neutrino interactions at ultrahigh energies," Physical Review D 58 (1998) 093009 (15 pages). [400+ citations]
  33. H. Baer, B. W. Harris and M. H. Reno, ``Next-to-leading order slepton pair production at hadron colliders," Physical Review D 57 (1998) 5871-5874
  34. L. Pasquali, M. H. Reno and I. Sarcevic, ``Secondary decays in atmospheric charm contributions to the flux of muons and muon neutrinos," Astroparticle Physics 9 (1998) 193-202.
  35. M. J. Duncan and M. H. Reno\*, ``Z polarization in the Higgs boson signal at the LHC," Physical Review D 56 (1997) 3129-3134.
  36. H. Baer and M. H. Reno, ``Multiple parton emission effects in next-to-leading-order direct photon production," Physical Review D 54 (1996) 2017-2022
  37. R. Gandhi, C. Quigg, M. H. Reno and I. Sarcevic, ``Ultrahigh Energy Neutrino Interactions," Astroparticle Physics 5 (1996) 81-110. [400+ citations]
  38. K. R. Barger and M. H. Reno\*, ``Hadron collider limits on anomalous  $WW\gamma$  couplings," Physical Review D 51 (1995) 90-98.
  39. M. H. Reno, ``Relative distributions of W's and Z's at low transverse momenta," Physical Review D 49 (1994) R4326-4330.
  40. H. Baer, C. Chen and M. H. Reno, ``An estimate of jet activity in  $t\bar{t}$  events," Physical Review D 48 (1993) 5168-5174.
  41. H. Baer and M. H. Reno, ``QCD corrections to leptonic and hadronic observables from  $p\bar{p} \rightarrow W^+X \rightarrow \bar{\tau} \nu_\tau X$ ," Physical Review D 47 (1993) 3906-3913.
  42. K. R. Barger and M. H. Reno\*, ``Theoretical uncertainties in the QCD predictions for transverse momentum distributions in  $\pi$ - nucleon production of lepton pairs," Physical Review D 47 (1993) 933-939.
  43. H. Baer and M. H. Reno, ``W and Z production at  $p\bar{p}$  colliders: parton showers merged with  $O(\alpha_s)$  Monte Carlo approach," Physical Review D 45 (1992) 1503-1511.

44. H. Baer and M. H. Reno, "A complete  $O(\alpha_s)$  event generator for  $p\bar{p} \rightarrow W^+ X \rightarrow e^+ \nu X$  with parton showering," *Physical Review D* 44 (1991) 3375-3378.
45. H. Baer and M. H. Reno, "  $O(\alpha_s)$  corrections to observables from  $p\bar{p} \rightarrow W^+ X \rightarrow e^+ \nu X$ ," *Physical Review D* 43 (1991) 2892-2899.
46. P. Arnold, R. K. Ellis and M. H. Reno, "High  $p_T$  W and Z production at the Fermilab Tevatron," *Physical Review D* 40 (1989) 912-913.
47. P. Arnold and M. H. Reno, "The complete computation of high- $p_T$  W and Z production in 2nd-order QCD," *Nuclear Physics B* 319 (1989) 37-71; Errat.-ibid B330 (1990) 284. [200+ citations]
48. M. H. Reno and D. Seckel, "Primordial nucleosynthesis: the effects of injecting hadrons," *Physical Review D* 38 (1988) 3441-3462. [100+ citations]
49. M. H. Reno and C. Quigg, "On the detection of ultrahigh energy neutrinos," *Physical Review D* 37 (1988) 657-664. [50+ citations]
50. V. Barger, N. G. Deshpande, W.-Y. Keung, M. H. Reno and M. Ruiz-Altaba, "Signals of  $E_6$  vector leptons at the SSC," *Mod. Phys. Lett. A* 2 (1987) 437-446.
51. M. Soldate, M. H. Reno and C. T. Hill, "Nonabelian family symmetry and the origin of fermion masses and mixing angles," *Physics Letters* 179B (1986) 95-102.
52. C. Quigg, M. H. Reno and T. P. Walker, "Interactions of ultrahigh energy neutrinos," *Physical Review Letters* 57 (1986) 774-777. [50+ citations]
53. H. Haber and M. H. Reno, "Signatures of heavy neutrino production at the CERN collider," *Physical Review D* 34 (1986) 2732-2738.
54. J. Bagger, S. Dimopoulos, E. Masso' and M. H. Reno, "Experimental consequences of family unification," *Physical Review Letters* 54 (1985) 2199-2202.
55. J. Bagger, S. Dimopoulos, E. Masso' and M. H. Reno, "A realistic theory of family unification," *Nuclear Physics B* 258 (1985) 565-600. [50+ citations]
56. F. J. Gilman and M. H. Reno, "Restrictions from the neutral K and B meson systems on left-right-symmetric gauge theories," *Physical Review D* 29 (1984) 937-944. [50+ citations]
57. F. J. Gilman and M. H. Reno, "Restrictions on left-right symmetric gauge theories from the neutral kaon system and B decays," *Physics Letters* 127B (1983) 426-428.
58. R. E. Crandall and M. H. Reno\*\*, "Ground state energy bounds for potentials  $|x|^\nu$ ," *Journal of Mathematical Physics* 23 (1982) 64 (7 pages)

## 1.b. Conference Proceedings

1. M. H. Reno, "Prompt leptons from atmospheric charm production," submitted to Proceedings of the 11<sup>th</sup> Conference on the Intersections of Particle and Nuclear Physics, [St. Petersburg, FL, May 29-June 3, 2012] (5 pages).
2. M. H. Reno, "Neutrinos from charm production: atmospheric and astrophysical applications," in the Proceedings of the Eleventh Workshop on Non-Perturbative QCD, [Paris, France, June 6-10, 2011], B. Mueller, Mary Ann Rotondo and Chung-I Tan, eds., electronic publication [www.slac.stanford.edu/econf/C1106064/](http://www.slac.stanford.edu/econf/C1106064/) (10 pages).
3. M. H. Reno, "Neutrinos from dark matter," in the Proceedings of the 12<sup>th</sup> ICATPP Conference on Astroparticle, Particle, Space Physics and Detectors for Physics Applications, [Villa Olmo, Como, Italy, October 7-8, 2010], ed. S. Giani, C. Leroy and P. G. Rancoita (World Scientific, Singapore, 2011), 603-612 (10 pages).
4. M. H. Reno, I Sarcevic and J. Uscinski, "Weak interactions and quasi-stable particle energy loss," in the proceedings of the 2<sup>nd</sup> Workshop on TeV Astrophysics, [Madison, Wisconsin, August 2006] J. Phys. Conf. Ser. (2007) 203 (4 pages).
5. J. Jones, I. Mocioiu, I. Sarcevic and M. H. Reno, "Ultrahigh-energy tau neutrinos," in Proceedings of the 8th Workshop on Nonperturbative QCD [Paris, France, June 7-11, 2004] International Journal of Modern Physics A 20 (2005) 4656 (10 pages).
6. M. H. Reno, "Deep inelastic neutrino interactions," in Proceedings of the 8th Workshop on Nonperturbative QCD [Paris, France, June 7-11, 2004] International Journal of Modern Physics A 20 (2005) 4664 (6 pages).
7. M. H. Reno, "Neutrino cross sections at HERA and beyond," in Proceedings of the 13th International Symposium on Very High-Energy Cosmic Ray Interactions [Pylos, Greece, September 6-12, 2004] Nucl. Phys. Proc. Suppl. 151 (2006) pp 255-259
8. M. H. Reno, "High energy neutrino cross sections," in Proceedings of the 21st International Conference on Neutrino Physics and Astrophysics, [Paris, France, June 14-19, 2004] Nucl. Phys. (Proceedings Supplement) 143 (2005) pp 407-413 (7 pages).
9. S. Kretzer and M. H. Reno, " $\sigma_{\text{DIS}}(\nu N)$ , NLO perturbative QCD and  $O(1 \text{ GeV})$  mass corrections," in Proceedings of the 3rd International Workshop on Neutrino Nucleus Interactions in the Few GeV Region (NUINT04) [Assergi, Italy, March 17-21, 2004] Nucl. Phys. Proceedings Supplement 139 (2005) 134 (6 pages).

10. S. Kretzer and M. H. Reno, "Neutrino scattering in perturbative QCD and implications for the Weinberg angle," in Proceedings of the 8th Conference on the Intersections of Particle and Nuclear Physics (CIPANP 2003) [New York, May 19-24, 2003] AIP Conf. Proc. 698 (2004) pp. 165-167.
11. S. Iyer Dutta, I. Mocioiu, M. H. Reno and I. Sarcevic, "Tau neutrinos at EeV energies," in Proceedings of the 28th International Cosmic Ray Conference [Tsukuba, Japan, July 29-August 8, 2003] pp 1435-1438.
12. S. Kretzer and M. H. Reno, "Deep inelastic neutrino interactions," in Proceedings of NUINT02 [Irvine, California, December 2002].
13. S. Iyer Dutta, M. H. Reno and I. Sarcevic, "Ultrahigh energy neutrinos," in Neutrinos and Implications for Physics Beyond the Standard Model [Stony Brook, NY, October 11-13, 2002], ed. R. Shrock, World Scientific (New Jersey, 2003) pp. 339-350 and Int. J. Mod. Phys. A 18 (2003) 4085.
14. S. Iyer Dutta, M. H. Reno and I. Sarcevic, "High energy tau neutrinos," Cosmology and Elementary Particle Physics, Coral Gables Conference on Cosmology and Elementary Particle Physics [Ft. Lauderdale, FL, December 12-16, 2001], ed. B. N. Kursunoglu, S. L. Mintz and A. Perlmutter, AIP Conference Proceedings, Vol. 624, 271-279.
15. S. Iyer Dutta, M. H. Reno and I. Sarcevic, "Ultrahigh energy neutrinos in the light of SuperK," Proceedings of Snowmass 2001, The Future of Particle Physics, Snowmass, Colorado, June 30-July 21, 2001, ed. Norman Graf, SLAC-R-599 (CD publication), P403.
16. M. H. Reno, I. Sarcevic, G. Sterman, M. Stratmann and W. Vogelsang, "Ultrahigh energy neutrinos, small  $\alpha_s$  and unitarity," in Proceedings of Snowmass 2001, The Future of Particle Physics, Snowmass, Colorado, June 30-July 21, 2001, ed. Norman Graf, SLAC-R-599 (CD publication), P508.
17. D. Seckel, M. H. Reno, S. Iyer Dutta and I. Sarcevic, "Electromagnetic energy loss for muons and taus at high energies," in Proceedings of the 27th International Cosmic Ray Conference, Hamburg, Germany, August 7-15, 2001, pp 1046-1049.
18. L. Pasquali, M. H. Reno and I. Sarcevic, "Neutrinos and muons from atmospheric charm," in Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, Salt Lake City, Utah, August 15-25, 1999, edited by D. Kieda, M. Salamon and B. Dingus, Vol. 2, pp 244-247.
19. L. Pasquali, M. H. Reno and I. Sarcevic, "Atmospheric neutrinos from charm," in Proceedings of the International Workshop on Particle Physics and the Early Universe, Asilomar, Monterey, California, November 15-20, 1998, edited by D. Caldwell, pp 408-411.

20. L. Pasquali, M. H. Reno and I. Sarcevic, "Muon and muon neutrino fluxes from atmospheric charm," in Proceedings of the Fifth International Workshop on Topics in Astroparticle and Underground Physics, Gran Sasso, Italy, September 7-11, 1997, Nuclear Physics B (Proc. Suppl.) 70 (1999) 361.
21. R. Gandhi, C. Quigg, M. H. Reno and I. Sarcevic, "Detecting neutrinos from AGNs and topological defects with neutrino telescopes," in the Proceedings of the 1996 Annual Divisional Meeting of the Division of Particles and Fields, Minneapolis, MN, August 10-15, 1996.
22. R. Gandhi, C. Quigg, M. H. Reno and I. Sarcevic, "Ultrahigh-Energy Neutrino Interactions and Neutrino Telescope Event Rates," in Proceedings of the International Conference on Neutrino Mass, Dark Matter and Gravitational Waves, pp. 121-130, Miami Beach, Florida, January 25-28, 1996.
23. R. Gandhi, C. Quigg, M. H. Reno and I. Sarcevic, "Small- $x$  parton densities from HERA and neutrino telescope event rates," in Proceedings of the Fourth International Workshop on Theoretical and Phenomenological Aspects of Underground Physics, Toledo, Spain, September 17-21, 1995, Nuclear Physics Proceedings Supplement 48 (1996) 475.
24. R. Gandhi, C. Quigg, M. H. Reno and I. Sarcevic, "Small- $x$  parton densities from HERA and the ultra-high energy neutrino-nucleon cross section," in Proceedings of the VIth Blois Workshop on Frontiers in Strong Interactions, pp. 215-219, Blois, France, June 1995.
25. M. J. Duncan and M. H. Reno, " $Z$  polarization in  $pp \rightarrow ZZ \rightarrow e^+e^- \nu \bar{\nu}$  at the LHC," in Proceedings of the Eighth Meeting of the Division of Particles and Fields of the American Physical Society, University of New Mexico, Albuquerque, New Mexico, August 2--6, 1994, ed. S. Seidel, p. 473-477.
26. M. J. Duncan and M. H. Reno, "Enhancing the Higgs signal in  $pp \rightarrow ZZ \rightarrow e^+e^- \nu \bar{\nu}$ ," in the Proceedings of the Workshop on Physics at Current Accelerators and Supercolliders, Argonne National Laboratory, Argonne, Illinois, June 2--5, 1993, ed. J. L. Hewett, A. R. White and D. Zeppenfeld, p. 413-420.
27. M. H. Reno, "The total neutrino cross section at very high energies," in Proceedings of the Workshop on High Energy Neutrino Astrophysics, University of Hawaii, Honolulu, Hawaii, March 23-26, 1992, ed. V. J. Stenger, J. G. Learned, S. Pakvasa and X. Tata, p. 211--220.
28. M. H. Reno, "Complete  $O(\alpha_s)$  calculation of  $W$  production with parton showering," in Proceedings of the Joint International Lepton-



- Photon Symposium and Europhysics Conference on High Energy Physics, Geneva, Switzerland, July 25--August 1, 1991, ed. S. Hegarty, K. Potter and E. Quercigh, Vol. 1, p. 423.
29. H. Baer and M. H. Reno, "Observables from  $\bar{p} \rightarrow W^+ X \rightarrow e^+ \nu X$  beyond leading order," in Beyond the Standard Model II: Proceedings of the International Conference on High Energy Physics, Norman, Oklahoma, November 1--3, 1990, ed. K. Milton, R. Kantowski and M. A. Samuel, p. 121--123.
  30. M. H. Reno, "Introduction to Perturbative QCD," in Proceedings of the Second Workshop on Particles and Fields, *Rivista Mexicana de Fisica* 36 Suplemento 1 (1990), Puebla, Mexico, November 13--17, 1989, p. S20--S64.
  31. P. B. Arnold and M. H. Reno, "Order  $\alpha_s^2$  corrections to  $W$  and  $Z$  transverse momentum distributions at the SPS and Tevatron colliders," in Proceedings of the Seventh Topical Workshop on Proton-Antiproton Collider Physics, Batavia, Illinois, June 20--24, 1988, ed. R. Raja, A. Tollestrup and J. Yoh, p. 336--344.
  32. M. H. Reno, "Primordial nucleosynthesis: the effects of injecting hadrons," in Proceedings of the Third ESO/CERN Symposium, Astronomy, Cosmology and Fundamental Physics, Bologna, Italy, May 16--20, 1988, ed. M. Caffo, R. Fanti, G. Giacomelli and A. Renzini, p. 461-465.
  33. N. G. Deshpande, J. Gunion, D. Kosower, M. H. Reno and A. Soni, "Signals of horizontal symmetries at the SSC," in Proceedings of the 1986 Summer Study on the Physics of the Superconducting Supercollider, June 23--July 11, 1986, ed. Rene Donaldson and Jay Marx, p. 250--253.
  34. V. Barger, N. G. Deshpande and J. F. Gunion, et al., "Signatures for exotic quark singlets from superstrings," in Proceedings of the 1986 Summer Study on the Physics of the Superconducting Supercollider, June 23--July 11, 1986, ed. Rene Donaldson and Jay Marx, p. 216--220.
  35. V. Barger, N. G. Deshpande, W.-Y. Keung, M. H. Reno and M. Ruiz-Altaba, "Heavy vector leptons at the SSC," in Proceedings of the 1986 Summer Study on the Physics of the Superconducting Supercollider, June 23--July 11, 1986, ed. Rene Donaldson and Jay Marx, p. 221--223.

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## 2. Grants and Contracts

### EXTERNAL:

- 2002 Co-Investigator, "Theoretical investigations in neutrino physics," part of Task D of Department of Energy contract, 2002-2012, approximately \$50,000/year through February 28, 2013.
- 2004 Principal Investigator, "REU Site: Undergraduate research in physics and astronomy at the University of Iowa," National Science Foundation, 2004-2006, \$217,613.
- 1998 Principal Investigator, "Theoretical calculations for high energy particles in the atmosphere and in underground and accelerator experiments," National Science Foundation, 1998-2002, \$78,000.
- 1995 Principal Investigator, "QCD corrections to Drell-Yan and lepton-nucleon scattering," National Science Foundation, 1993-1996, \$45,500.
- 1991 Principal Investigator, "QCD corrections to observables in W and W+gamma production," National Science Foundation, 1991-1994, \$36,500.

### INTERNAL:

- 1996 "Muons and neutrinos from atmospheric charmed particle production," CIFRE Award, 1/97-6/97, \$8,280.
- 1991 "An assessment of the feasibility of a measurement of the W magnetic moment at the Tevatron Collider," Old Gold Summer Fellowship, 7/91-8/91, \$3,500.

### OTHER GRANTS AND CONTRACTS:

- 2009 Co-Principal Investigator, "Committee on the Status of Women in Physics, APS", Elsevier Foundation New Scholars grant, 2009-2011, \$15,000 to help support childcare expenses of APS meeting attendees.

### OTHER:

- 2010 UI PI for proposal "Iowa Regents Modeling Workshops in Physics," Contact, Jeffrey Weld, Director of Iowa Math and Science Education Partnership (IMSEP) submitted to the Carver Charitable Trust. Requested amount \$270,475, awarded amount \$78,420 for the teacher preparation workshop at Iowa State University (2011), awarded amount \$87,225 for teacher preparation workshop at the University of Iowa (2012).

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### 3. Lectures, Conference Presentations and Invited Talks since September 1990

#### International:

1. "Prompt leptons from atmospheric charm production," *Eleventh Conference on the Intersections of Particle and Nuclear Physics*, St. Petersburg, FL, May 29-June 3, 2012
2. "Neutrinos from charm production: atmospheric and astrophysical applications," *Eleventh Workshop on Non-Perturbative QCD*, l'Institut d'Astrophysique de Paris, France, June 6-10, 2011
3. "Neutrinos from dark matter," *ICATPP Conference on Cosmic Rays for Particle and Astroparticle Physics*, Villa Olmo, Como, Italy, October 7-8, 2010.
4. "Neutrino signals of dark matter," Universite de Paris VII, October 5, 2010.
5. "Very high energy astrophysical neutrinos," *International Workshop on Next Generation Nucleon Decay and Neutrino Detectors (NNN09)*, Estes Park, Colorado, October 8-10, 2009.
6. "Astrophysical neutrinos," *Third International Workshop on the Interconnections Between Particle Physics and Cosmology (PPC2009)*, University of Oklahoma, Norman, Oklahoma, May 19-22, 2009.
7. "Neutrino nucleon cross sections: from GeV to ZeV," *Nu HoRIzons 09, Neutrinos in Physics, Astrophysics and Cosmology*, Harish-Chandra Institute, Allahabad, India, January 7-9, 2009.
8. "Sources, propagation and detection of ultra-high energy neutrinos I and II," two lectures to graduate students at the Harish-Chandra Institute, Allahabad, India, January 12, 2009.
9. "Electromagnetic structure functions and neutrino-nucleon scattering," *Parton Structure of Hadrons*, European Center for Theoretical Studies in Nuclear Physics and Related Areas (ECT\*), Trento, Italy, May 9-14, 2005.
10. "Neutrino cross sections at HERA and beyond," *13th International Symposium on Very High Energy Cosmic Rays*, Pylos, Greece, September 6-12, 2004.
11. "High energy neutrino cross sections," *21st International Conference on Neutrino Physics and Astrophysics*, Paris, France, June 14-19, 2004.
12. "Deep inelastic neutrino interactions," *8th Workshop on Nonperturbative QCD*, Paris, France, June 7-11, 2004.
13. " $\sigma_{\text{DIS}}(\nu N)$ , NLO perturbative QCD and  $O(1 \text{ GeV})$  mass corrections," *3rd International Workshop on Neutrino Nucleus Interactions in the Few GeV Region (NUINT04)*, Assergi, Italy, March 17-21, 2004.
14. "Neutrino interactions with matter," "High Energy Neutrinos: Sources and Fluxes Workshop at the School and Workshop on Neutrino Particle Astrophysics, Les Houches, France, January 25-26, 2002 (talk reproduced on CD).
15. "Neutrinos and Muons from Atmospheric Charm," *26th International Cosmic Ray Conference*, Salt Lake City, Utah, August 17-25, 1999.

16. "Muon and muon neutrino fluxes from atmospheric charm," *5th International Workshop on Topics in Astroparticle and Underground Physics*, Gran Sasso, Italy, September 7-11, 1997.
17. "Monte Carlo simulations of W and Z production," Universit'e Catholique Louvain-la-Neuve, Belgium, January 6, 1992.
18. "Complete  $O(\alpha_s)$  calculation of W production with parton showering," at *the Joint International Lepton-Photon Symposium and Europhysics Conference on High Energy Physics*, Geneva, Switzerland, July 25--August 1, 1991.
19. "Observables from  $p\bar{p} \rightarrow W^+X \rightarrow e^+\nu X$  beyond leading order," at the *Beyond the Standard Model II: International Conference on High Energy Physics*, Norman, Oklahoma, November 1--3, 1990.

#### Poster Presentations

1. "Electromagnetic structure functions and neutrino-nucleon scattering," *Neutrino 2006*, Santa Fe, NM, June 14--19, 2006.
2. "Tau neutrinos at EeV energies," *28th International Cosmic Ray Conference*, Tsukuba, Japan, July 31--August 7, 2003.

#### National

1. "Radio Cherenkov Signals from the Moon: Neutrinos and Cosmic Rays," seminar at the University of Arizona, January 12, 2012.
2. Argonne National Lab High Energy Physics seminar, "Neutrinos from charm production: atmospheric and astrophysical applications," June 1, 2011.
3. University of Arizona Colloquium and ADVANCE lecture, "Neutrinos, nature's messengers," December 3, 2010.
4. University of Oklahoma Colloquium, "Cosmic rays and atmospheric leptons: probes of the standard model and beyond," November 4, 2010.
5. "Neutrino signals of dark matter in the galactic center," *Novel Searches for Dark Matter 2010 Workshop*, Center for Cosmology and Astroparticle Physics, Ohio State University, July 5-6, 2010.
6. "Neutrino cross sections at 5-50 GeV," *Low-Energy Neutrino Workshop*, Penn State University, July 1-2, 2010.
7. "Ultrahigh-energy neutrinos," *Minute Particulars and Hidden Symmetries*, Fermilab, December 14-15, 2009.
8. "High energy neutrinos," Aspen Center for Physics workshop: *Neutrino physics on Earth, in the stars and in the cosmos*, June 18, 2009.
9. Kansas State University Colloquium, "Cosmic rays and atmospheric leptons: probes of the standard model and beyond," October 13, 2008.
10. Pennsylvania State University Seminar, "Atmospheric and Astrophysical Neutrinos from Charm," April 2, 2008.
11. "Ultrahigh energy neutrino propagation effects in astrophysical sources," *Ultrahigh energy cosmic rays, neutrinos and photons workshop*, Penn State University, May 16--17, 2007.

12. "Neutrino cross sections at low energy: estimates from electromagnetic structure functions," *Midwest Theory Conference*, University of Kansas, Lawrence, KS, April 21--22, 2007.
13. "Quasi-stable particle energy loss: implications for neutrino telescopes," *Miami 2006*, Miami, Florida, December 13-16, 2006.
14. "Weak interactions and quasi-stable particle energy loss," *2nd Workshop on TeV Particle Astrophysics*, Madison, Wisconsin, August 28-31, 2006.
15. "Electromagnetic structure functions and neutrino nucleon scattering," *PHENO 2006 Symposium*, University of Wisconsin, May 15--17, 2006.
16. "Low energy neutrino cross sections," *Workshop on Intersections of Nuclear Physics with Neutrinos and Electrons*, Jefferson Lab, Newport News, VA, May 4-5, 2006.
17. University of Arizona Seminar, "Neutrino-nucleon interactions: what can we learn from electromagnetic interactions?," March 9, 2006.
18. University of Arizona graduate student seminar, "Strangeness asymmetry, isospin violation and the weak mixing angle," March 7, 2006.
19. University of Florida Seminar, "Theoretical perspectives on ultrahigh energy tau neutrino signals," April 19, 2005.
20. "Ultrahigh energy tau neutrinos: propagation and tau energy loss," contributed talk to the meeting of the American Physical Society, Tampa, Florida, April 2005.
21. University of Arizona seminar, May 2004.
22. "Theoretical perspectives on ultrahigh energy tau neutrino signals," Brookhaven National Laboratory, February 6, 2004.
23. "QCD Corrections to Neutrino Cross Sections," *Weak Interactions and Neutrinos*, Lake Geneva, WI, October 5-7, 2003.
24. "Ultrahigh Energy Neutrinos," *Neutrinos and Implications for Physics Beyond the Standard Model*, Stony Brook, NY, October 13, 2002.
25. "Tau Neutrino Interactions," Fermi National Accelerator Laboratory June 20, 2002.
26. "Tau Neutrino Interactions," Argonne National Laboratory, June 11, 2002.
27. "High energy tau neutrinos," *Coral Gables Conference on Cosmology and Elementary Particle Physics*, Ft. Lauderdale, Florida, December 12-16, 2001.
28. "Ultrahigh energy neutrinos, small  $x$  and unitarity," *Snowmass 2001, The Future of Particle Physics*, Snowmass, Colorado, July 5, 2001.
29. "Tau Neutrinos Underground," Iowa State University, January 31, 2001,
30. "Tau Neutrinos Underground," Johns Hopkins University, November 17, 2000,
31. "Tau Neutrinos Underground," Grinnell College, November 14, 2000,
32. "Tau Neutrinos Underground," University of Kansas, October 30, 2000
33. "Upward Tau Neutrinos," *Neutrinos with Mass Workshop*, Aspen Center for Physics, Aspen, Colorado, July 13, 2000.
34. "Tau Neutrinos Underground," University of Hawaii, March 14, 2000.
35. "Lepton fluxes from atmospheric charm," *Neutrino Physics and Astrophysics: from Solar to Ultrahigh Energy Neutrinos*, Aspen Center for Physics, June 22, 1998.
36. "Ultrahigh Energy Neutrinos," colloquium, University of Arizona, April 22, 1998.

37. "Neutrinos from Atmospheric Charm," Argonne National Laboratory, April 6, 1998
38. "Ultrahigh energy neutrinos," *1998 Aspen Winter Conference on Particle Physics*, January 25-31, 1998.
39. "Ultrahigh Energy Neutrinos," colloquium, Kansas State University, May 1, 1997
40. " $K_T$  effects in direct photon production," Kansas State University, April 30, 1997
41. "Ultrahigh Energy Neutrinos," Southern Methodist University, April 7, 1997
42. " $K_T$  effects in direct photon production," *D0 QCD Workshop*, Michigan State University, December 15-18, 1996.
43. "Z polarization in Higgs boson signals at the LHC", at Snowmass, July 3, 1996.
44. "Direct photons in next-to-leading order QCD", at *The Interface between Soft and Hard QCD* at the Aspen Center for Physics, June 1996.
45. "Ultrahigh Energy Neutrino Cross Sections," Argonne National Laboratory, April 24, 1996.
46. "Neutrino Telescopes and the Ultra-high Energy Neutrino Cross Section," University of Arizona, November 14, 1995.
47. "Polarization signals in  $pp \rightarrow H \rightarrow ZZ \rightarrow e^+e^- \nu \bar{\nu}$ ," International Institute of Theoretical and Applied Physics, Iowa State University, August 24, 1994.
48. "Z polarization in  $pp \rightarrow ZZ \rightarrow \ell^+ \ell^- \nu \bar{\nu}$  at the LHC," at *DPF'94, Eighth Meeting of the Division of Particles and Fields of the American Physical Society*, University of New Mexico, Albuquerque, New Mexico, August 2-6, 1994.
49. "Polarization signal in heavy Higgs decay," Brookhaven National Laboratory, July 1, 1994
50. "Low  $p_T$  W's and Z's," at *Physics Doesn't Stop, Recent Developments in Phenomenology*, University of Wisconsin, Madison, Wisconsin, April 11-13, 1994.
51. "Ratio of W/Z transverse momenta at low  $p_T$ ," Fermi National Accelerator Laboratory, (CDF Experimental Group) November 10, 1993.
52. " $p_T$  distributions for  $\mu^+ \mu^-$  pairs at the NA10 experiment: theoretical uncertainties," Florida State University, January 12, 1993.
53. "Theoretical uncertainties in the QCD predictions for the  $q_T$  distribution in  $\pi^+ N$  production of lepton pairs," University of Kansas, Lawrence, December 1, 1992.
54. "Weak gauge bosons at hadron colliders," colloquium, University of Kansas, Lawrence, November 30, 1992
55. "The total neutrino cross section at very high energies," at the *Workshop on High Energy Neutrino Astrophysics*, University of Hawaii, Honolulu, Hawaii, March 23-26, 1992.
56. "Monte Carlo simulations of  $W$  and  $Z$  production," Iowa State University, October 23, 1991.
57. "Observables from  $p \bar{p} \rightarrow W^+ X \rightarrow e^+ \nu_e X$  beyond leading order," Johns Hopkins University, May 20, 1991,

58. "Observables from  $\bar{p} \rightarrow W^+ X \rightarrow e^+ \nu_e X$  beyond leading order," University of Wisconsin, Madison, March 20, 1991.

#### Summer School Lectures

1. "Structure Functions: Perturbation Theory and Beyond," at the *22nd Annual Hampton University Studies Program, HUGS 2007*, Jefferson Lab, Newport News, Virginia, 5 lectures, June 6-8, 2007.

#### University of Iowa Seminars and Colloquia

1. "The velocity of neutrinos," Colloquium, October 10, 2011.
2. "Neutrino signals from dark matter," October 11, 2010.
3. "Atmospheric and astrophysical neutrinos from charm," March 31, 2008.
4. "Theoretical perspectives on ultrahigh energy tau neutrinos," May 1, 2006.
5. "Electromagnetic structure functions and neutrino nucleon scattering," April 24, 2006.
6. "Strangeness asymmetry, isospin violation and the weak mixing angle," November 1, 2004.
7. "Perspectives on the NuTeV measurement of  $\sin^2 \theta_W$ ," September 3, 2003.
8. "Muon and Tau Energy Loss at High Energies," November 13, 2002.
9. "Neutrino Physics with Cosmic Beams," October 15, 2001 (Colloquium).
10. "Big Bang Nucleosynthesis," March 6, 2001 (Cosmology Seminar).
11. "Neutrino Observations Underground," April 18, 2000 (Astrophysics Seminar).
12. "Tau Neutrinos Underground," March 29, 2000.
13. "Searching for  $\nu_\mu \rightarrow \nu_\tau$  oscillations with extragalactic neutrinos," October 6, 1999.
14. "QCD Corrections to Virtual W-Boson Production," February 4, 1998.
15. "High Energy Physics Calculations with the FORM Symbolic Manipulation Program," October 16, 1996.
16. "Underground Neutrino Telescopes and the Total Neutrino Cross Section,"
17. "The Discoveries Behind the 1995 Nobel Prize in Physics," October 18, 1995.
18. "The Neutrino-Nucleon Cross Section at Very High Energies," March 8, 1995.
19. "Polarization signal in heavy Higgs decay," October 5, 1994.
20. "The top quark," October 27, 1993.
21. "Monte Carlo simulation of  $W$  production III," October 9, 1991.
22. "Monte Carlo simulation of  $W$  production II," October 2, 1991.
23. "Monte Carlo simulation of  $W$  production I," September 25, 1991.
24. "Electroweak radiative corrections," April 24, 1991.
25. "The physics behind the 1990 Nobel Prize," November 12, 1990.

#### Public Lectures/Non-physics Audiences

1. "Neutrinos - faster than the speed of light?," October 20, 2011, Café Scientifique, Iowa City.

2. ``Neutrinos in physics and astrophysics," October 15, 2008, in Living/Learning Community on Explorations in Science, Math and Computing, Hillcrest Dorm.
3. ``Neutrinos: Messengers from the biggest explosions in the universe," May 4, 2004, Department of Physics and Astronomy, and Talk of Iowa call-in.

#### Invited Longterm Visits Since September 1990

1. Aspen Center for Physics, June 7-28, 2009.
2. Aspen Center for Physics, June 9-29, 2003.
3. Fermi National Accelerator Laboratory, Theory Group, June 9--22, 2002.
4. Aspen Center for Physics, June 26--July 14, 2000. Workshop organizer for {\it Neutrinos with Masses and Mixings}.
5. Aspen Center for Physics, June 7--18, 1999.
6. Aspen Center for Physics, June 15--July 12, 1998.
7. CERN Theory Group Scientific Associate (unpaid), sabbatical leave, July 1--December 31, 1997.
8. Aspen Center for Physics, June 10--23, 1996.
9. Fermi National Accelerator Laboratory, Theory Group, August 6--August 18, 1995
10. Aspen Center for Physics, June 19--July 9, 1995.
11. Brookhaven National Laboratory, Theory Group, June 20--July 1, 1994.
12. Aspen Center for Physics, July 2--9, 1994.
13. Aspen Center for Physics, June 21--July 11, 1993.
14. Fermi National Accelerator Laboratory, Theory Group, July 5--August 1, 1992.
15. Aspen Center for Physics, July 1--21, 1991.



## Mary Hall Reno, Physics and Astronomy

### 4. Teaching

#### Course assignments 2001-present

029:130	Electricity and Magnetism II	Spring 2001
029:029	Physics III	Fall 2001, Fall 2002
029:192	Nuclear and Particle Physics	Spring 2002, Spring 2003
029:247	Quantum Field Theory	Fall 2003
029:027	Physics I	Fall 2004, Fall 2005, Fall 2006
029:275	Particle Physics	Spring 2007
029:140	Quantum Mechanics I	Fall 2007
029:141	Quantum Mechanics II	Spring 2008
029:081	Introductory Physics I	Spring 2009
610:030	Explorations in Computing, Math and Science	Fall 2009
029:039	First year seminar: The physics of space and time	Fall 2010
029:225	Scholarly Integrity in Research	Fall 2011, Fall 2012

#### Graduate Students Supervised (Chair)

Yu Seon Jeong	PhD	July 2011	Postdoctoral appointment, Yonsei University, Korea
Alexander Bulmahn	PhD	May 2010	Instructor, University of Montana
Yiwen Huang	MS	May 2005	Degree in statistics, employment in industry
Lara Pasquali	PhD	May 1999	Postdoctoral appointment at Dortmund University, Germany; currently employed in financial industry
Dal Soo Oh	PhD	December 1998	Government job, Korea
Kevin R. Barger	ABD	May 1992	unknown

## Mary Hall Reno, Physics and Astronomy

### 5. Service

#### 1. Departmental Service - selected

- Chair (Fall 2009-present)
- Associate Chair and Director of Graduate Studies, (Fall 2006-Spring 2009)
- Executive Committee (Ex-officio Fall 2006-Spring 2009, Fall 2004-Spring 2006, Chair 2005-2006, Fall 1998-Spring 2000)
- Education and Operations Committee (Ex-officio Fall 2006-Spring 2009, Fall 1995-Spring 1997)
- Research Experiences for Undergraduates (REU), Director (2004-2006)
- Undergraduate (Co-)Director (Fall 2001-Spring 2006)
- First-year undergraduate student advisor (Fall 2000-Spring 2006)
- Initiatives for Departmental Improvement, committee chair (Fall 1998-Spring 1999)
- Graduate Student Admissions Committee (Fall 1992-Spring 1995)
- Policy, Planning and Budget committee (Fall 1991-Spring 1994)

#### 2. College of Liberal Arts and Sciences & University Committees - selected

- Departmental Representative at the Statewide Articulation Conference, February 10, 2012, hosted by the Liaison Advisory Committee on Transfer Students (LACTS), reviewing physics standards.
- Ad-hoc committee to review the WISE Program, (Fall 2011-Spring 2012)
- CLAS Executive Committee (Fall 2008-Spring 2011)
- Presidential Scholarship Selection Committee (Spring 2010, Spring 2011, Spring 2012)
- College of Education 5-year review of the Dean (Spring 2009)
- Student Success Team: Committee on Student Academic Engagement (Fall 2008-Spring 2009)
- Student Success Team (Fall 2007-Fall 2008): Early Intervention Task Force
- Physics department coordinator for the Living/Learning Community on Explorations in Science, Math and Computing (Fall 2007-Spring 2010)
- CLAS Scholarship Committee (Fall 2006-Spring 2009)

- NCA Self-Study Subcommittee on Entry and Transition (Spring 2006-Spring 2007)
  - Women in Science and Engineering (WISE) (Program Faculty, Fall 1999-2002; Advisory Board Member, Fall 1998-Spring 1999, Search committee member for WISE director, Spring 1998)
  - Advisory Committee in the Physical and Mathematical Sciences (academic years 1999-2001 and 1996-1997, convener 2000-2001)
3. Referee/Consultant
- Journal referee for Physical Review Letters, Physical Review D, Astroparticle Physics, Journal of Physics G: Nuclear Physics B, Nuclear Physics A
  - National Science Foundation Proposals
  - Department of Energy Proposal
  - National Science Foundation panel, 2005, 2007, 2008 (NSF Graduate Fellowships), 2011.
  - Department of Energy panel, 2011
  - CONICET – Chile proposal review 2010.
  - Oxford University Press (textbooks)
  - Addison Wesley Longman (textbooks)
  - American College Testing
4. Other professional service - selected
- Member, Executive Board of the Iowa Mathematics and Science Education Partnership (IMSEP), July 2009-June 2012.
  - Member, Committee on the Status of Women in Physics, 2007-2009, (vice chair 2008, chair 2009, co-PI of CSWP proposal to Elsevier Foundation to fund childcare grants at APS meetings, funded at \$5000/year for 3 years beginning 2009)
  - Team member, CSWP site visit to physics department, May 2009, September 2010.
  - Chair, CSWP program organization for the April Meeting of the American Physical Society (May 2-5, 2009)
  - Member, selection committee for the M. Hildred Blewett Awards, American Physical Society, 2009, 2010, 2011.
  - Member, selection committee for the Katherine Weimer Award, American Physical Society, 2008.
  - Member, nominating committee, Division of Particles and Fields, American Physical Society, 2004-2005, 2011.
5. Conferences

- Co-organizer (with I. Sarcevic, J. Learned and M. Goodman), Neutrinos with Mass and Oscillations, Present and Future Experiments, Aspen Center for Physics, June 26-July 16, 2000
6. Other Science Related/Outreach – selected, past 2 years Mary
- Panel member, WISE Grad/Post-Doc Professional Development Workshop, “Negotiating your first tenure-track faculty position in the sciences and engineering,” April 2012.
  - Presenter, Café Scientifique, October 20, 2011, “Neutrino experiments and the speed of neutrinos.”
  - Presenter, “Magnets and Motors,” Lincoln Elementary School 4<sup>th</sup>-6<sup>th</sup> grade science class, March 8, 2012.
  - Panel member, WISE Grad/Post-Doc Professional Development Workshop, “Negotiating your first tenure-track faculty position in the sciences and engineering,” April 16, 2009, April 2010.