

**JOHN A. POIRIER****EMERITI PROFESSOR OF PHYSICS****TENURED****AT NOTRE DAME  
SINCE 1964****BORN:** May 15, 1932**AT:** Lewistown, Montana

University of Notre Dame; 1954; B.S.  
 Stanford University; 1955; M.S.  
 Stanford University; 1959; Ph.D.

NSF Predoctoral Fellowship, September 1954-1956  
 Lawrence Radiation Laboratory, January, 1959-1963  
 Lecturer, University of California at Berkeley and Staff Physicist, 1961-1963  
 NSF Postdoctoral Fellow at CERN, Switzerland, May, 1963-1964  
 Associate Professor, University of Notre Dame, 1964-1969  
 Professor, University of Notre Dame, 1969-present

**Honors**

Invited to submit proposals for the 1999 Nobel Prize in Physics by the Nobel Committee for Physics on behalf of the Royal Swedish Academy of Sciences.

**Research Area:**

Astrophysics  
 Cosmic Rays  
 Experimental research in high energy elementary particle physics

**Invited Addresses:**

American Physical Society, Mexico City, Mexico, August, 1966.  
 University of Michigan, Ann Arbor, Michigan, December, 1967.  
 Lawrence Radiation Laboratory, Berkeley, California, Sept. 1967.  
 Stanford Linear Accelerator Center, Stanford, California, July, 1967.  
 University of Illinois, Urbana, Illinois, November, 1968.  
 Ohio State University, Columbus, Ohio, May, 1969.  
 Argonne National Laboratory, October, 1971.  
 Third International Conference on Experimental Meson Spectroscopy, April, 1972.  
 Purdue University, West Lafayette, Indiana, 1972.  
 XVI International Conference on High Energy Physics, Chicago, Batavia, Illinois, September, 1972.  
 Michigan State University, East Lansing, Michigan, September, 1973.  
 XVII International Conference on High Energy Physics, London, July, 1974.  
 Montana State University, Bozeman, Montana, March, 1979.  
 Illinois Benedictine College, Lisle, Illinois, February, 1980.  
 XII International Symposium on Multiparticle Dynamics, Notre Dame, Indiana, June, 1981.  
 University of Maryland, College Park, Maryland, October, 1981.  
 Montana State University, Bozeman, Montana, November, 1981.

University of Notre Dame, Notre Dame, Indiana, September, 1986.  
 University of Rochester, Rochester, NY, June, 1987.  
 20<sup>th</sup> International Cosmic Ray Conference, Moscow, August, 1987.  
 GRANA Subcommittee Meeting of HEPAP, Baltimore, Maryland, April, 1988.  
 Cosmic Ray Cascade Simulation Workshop, University of Utah, Salt Lake City, UT,  
 March 2, 1989.  
 Workshop on the Physics and Experimental Techniques of High Energy Neutrino and VHE  
 and UHE Gamma-Ray Particle Astrophysics, University of Arkansas, Little Rock, AK,  
 May 10, 1989.  
 Chaired Session at Workshop on the Physics and Experimental Techniques of High Energy  
 Neutrino and VHE and UHE Gamma-Ray Particle Astrophysics, University of Arkansas,  
 Little Rock, AK, May 13, 1989.  
 21<sup>st</sup> International Cosmic Ray Conference, Adelaide, Australia, January 1990.  
 Workshop on Gamma Ray Astronomy Observations, Adelaide, Australia, January 1990.  
 22<sup>nd</sup> International Cosmic Ray Conference, Dublin, Ireland, August 1991.  
 Seventh International Symposium on Very High Energy Cosmic Ray Interactions, University  
 of Michigan, Ann Arbor, MI, June 1992.  
 23<sup>rd</sup> International Cosmic Ray Conference, Calgary, Canada, July 29, 1993.  
 Workshop on the Study of Cosmic Ray Interactions with New Extensive Air Shower Arrays,  
 Calgary, Canada, July 29, 1993.  
 24<sup>th</sup> International Cosmic Ray Conference, Rome, Italy, August 1995.  
 Keynote Address at the Annual Joint Meeting of the Northern Indiana Astronomical Group  
 Astronomy Convention and the Great Lakes Region Astronomical League Annual Meeting,  
 Camp Crosley, North Webster, Indiana, April 26-27, 1996.  
 Workshop on Tuning and Tracking Measurements in the Study of Extensive Air Shower  
 Longitudinal Development, Durban, South Africa, July 29, 1997.  
 25<sup>th</sup> International Cosmic Ray Conference, Durban, South Africa, July 30 - August 6, 1997.  
 26<sup>th</sup> International Cosmic Ray Conference, Salt Lake City, Utah, August 17-25, 1999.  
 27<sup>th</sup> International Cosmic Ray Conference, Hamburg, Germany, August 7-15, 2001.  
 Texas A&M University, College Station, Texas, April 17, 2002.

## List of Scientific Publications

1. "Scattering of 200-MeV Positrons by Electrons," John A. Poirier, D.M. Bernstein, and Jerome Pine, Phys. Rev. 117, 557(1960); 121, 1863 (1961).
2. "Test of Isotopic Spin Conservation from an Experimental Limit on  $\sigma(d+d \rightarrow He^4 + \pi^0)$ ," John A. Poirier and Morris Pripstein, Phys. Rev. 122, 1917 (1961).
3. "Charge-Exchange Production of Antineutrons and their Annihilation in Hydrogen," C. Keith Hinrichs, Burton J. Moyer, John A. Poirier, and Philip Ogden, Phys. Rev. 127, 617 (1962).
4. "Total Absorption Scintillation Counter for High-Energy Photons," William C. Bowman, Jim B. Carroll, and John A. Poirier, Rev. Sci. Instr. 33, 741 (1962).
5. "Energy Spectrum of Electrons in the Outer Radiation Belt," W.N. Hess and J.A. Poirier, Journ. Geo. Res. 67, 1699 (1962).
6. "New Limit for Isotopic Spin Conservation in Strong Interactions from an Experimental Limit on  $\sigma(d + d \rightarrow He^4 + \pi^0)$ ," John A. Poirier and Morris Pripstein, Phys. Rev. 130, 1171 (1963).
7. "Basic Theory and Application of Regge Poles," C. Edward Jones and John A. Poirier, UCRL-10677 (1963); (unpublished).
8. "Production and Asymmetric Decay of the  $\rho^0$  and Its Relation to the Proposed  $\varepsilon^0$  Scalar Meson," I. Derado, V.P. Kenney, J.A. Poirier, and W.D. Shephard, Phys. Rev. Letters 14, 872 (1965).
9. "Dipion Effective Mass Distributions for the  $\pi^-p$  Interaction at 8.09 GeV," I. Derado, V.P. Kenney, J.A. Poirier, W.D. Shephard, and E.H. Synn, Lectures in Theoretical Physics (University of Colorado Press) (1965), Vol. 8.
10. "Total and Differential Cross Sections for  $\pi^-p \rightarrow \eta\eta$  From Threshold to 1300 MeV," W.B. Richards, J.A. Poirier, et al., Phys. Rev. Letters 16, 1221 (1966).
11. "Determination of an Upper Limit for the Partial Width  $\Gamma(\rho\pi\gamma)$ ," G. Fidecaro, M. Fidecaro, J.A. Poirier, P. Schiavon, Phys. Letters 23, 163 (1966).
12. "Pion Production in  $\pi^0p$  Interactions at Energies 790, 830, and 870 MeV," N.M. Cason, I. Derado, J.W. Lamsa, V.P. Kenney, J.A. Poirier, W.D. Shephard (Notre Dame), and C.N. Vittitoe and J.L. Stautberg (Kentucky), Phys. Rev. 150, 1134 (1966).
13. I. Derado, V.P. Kenney, J.A. Poirier, W.D. Shephard, and Sr. E.M. Clinton, G.N.S.H., Proceedings of the 1966 International Conference on Instrumentation for High Energy Physics (Stanford University, 1966), p. 145.

14. "Evidence for Vector Meson Exchange in  $\rho^-$  Production at 8 GeV/c," I. Derado, J.A. Poirier, N.N. Biswas, N.M. Cason, V.P. Kenney, and W.D. Shephard, *Phys. Letters* 24B, 112 (1967).
15. "Total Pion-Pion Cross Sections for the 2 GeV Dipion Mass Region," N.N. Biswas, N.M. Cason, I. Derado, V.P. Kenney, J.A. Poirier, and W.D. Shephard, *Phys. Rev. Letters* 18, 273 (1967).
16. "Study of the  $\pi\rho$  System in the Reaction  $\pi^- + p \rightarrow \pi^- + \rho^0 + p$  at 8 GeV/c," N.M. Cason, J.W. Lamsa, N.N. Biswas, I. Derado, T.H. Groves, V.P. Kenney, J.A. Poirier, and W.D. Shephard, *Phys. Rev. Letters* 18, 880 (1967).
17. "Pion-Proton Charge-Exchange Scattering from 500 to 1300 MeV," Charles B. Chiu, Richard D. Eandi, A. Carl Helmholz, Robert W. Kenney, Burton J. Moyer, John A. Poirier, W. Bruce Richards, Robert J. Cence, Vincent Z. Peterson, Narendra K. Sehgal, and Victor J. Stenger, *Phys. Rev.* 156, 1415 (1967).
18. "The Reaction  $\pi^-p \rightarrow \pi^- \pi^+ n$  at 8 GeV/c," J.A. Poirier, N.N. Biswas, N.M. Cason, I. Derado, V.P. Kenney, W.D. Shephard, E.H. Synn (Notre Dame), and H. Yuta, W. Selove, R. Ehrlich, and A.L. Baker (Pennsylvania), *Phys. Rev.* 163, 1462 (1967).
19. "Observation of the Reaction  $\pi^-p \rightarrow \bar{p}p n$  at 8 GeV/c," J.W. Andrews, N.N. Biswas, N.M. Cason, I. Derado, V.P. Kenney, J.A. Poirier, and W.D. Shephard, *Phys. Rev.* 163, 1502 (1967).
20. "R. S. and T Resonances Produced in 8 GeV/c  $\pi^-p$  Interactions," N.N. Biswas, N.M. Cason, T.H. Groves, V.P. Kenney, J.A. Poirier, and W.D. Shephard, Proceedings of the 1967 Athens Topical Conference on Resonant Particles (Ohio University, Athens, Ohio, 1967).
21. "Branching Ratio  $\Gamma(\eta \rightarrow 3\pi^0)/\Gamma(\eta \rightarrow 2\gamma)$  Measured Using a 4 $\pi$  Spark Chamber," R.J. Cence, V.Z. Peterson, V.J. Stenger, C.B. Chiu, R.D. Eandi, A.C. Helmholz, R.W. Kenney, B.J. Moyer, J.A. Poirier, and W.B. Richards, *Phys. Rev. Letters* 19, 1393 (1967); [20, 175 (1968) (E)].
22. "Resonances Produced in the Reaction  $\pi^-p \rightarrow \pi^- \pi^- \pi^+ p$  at 8 GeV/c," J.W. Lamsa, N.M. Cason, N.N. Biswas, I. Derado, T.H. Groves, V.P. Kenney, J.A. Poirier, and W.D. Shephard, *Phys. Rev.* 166, 1395 (1968).
23. "Vector Dominance Model Comparison of  $\pi^+$  Photoproduction with Production by Pions," R. Diebold and J.A. Poirier, *Phys. Rev. Letters* 20, 1532 (1968).
24. "Observation of a  $\rho^- \rho^0$  Enhancement at 1710 MeV," N.N. Biswas, N.M. Cason, A.R. Dzierba, T.H. Groves, V.P. Kenney, J.A. Poirier, and W.D. Shephard, *Phys. Rev. Letters* 21, 50 (1968).

25. "The  $K^0_1 K^0_1$  Threshold Enhancement in  $\pi^-p \rightarrow K^0_1 K^0_1 n$  at 4 and 5 GeV/c," T.F. Hoang, D.P. Eartly, J.J. Phelan, A. Roberts, C.L. Sandler, S. Bernstein, S. Margulies, D.W. McLeod, T.H. Groves, N.N. Biswas, N.M. Cason, V.P. Kenney, J.M. Marraffino, J.T. McGahan, J.A. Poirier, and W.D. Shephard, Phys. Rev. Letters 21, 317 (1968).
26. "Low Energy  $\pi$ - $\pi$  Phase Shifts from Coulomb Interference," N.N. Biswas, N.M. Cason, P.B. Johnson, V.P. Kenney, J.A. Poirier, W.D. Shephard, and R. Torgerson, Phys. Letters 27B, 513 (1968).
27. "Discrepancy Between the Vector-Dominance Model and Pion Production by Polarized Photons," R. Diebold and J.A. Poirier, Phys. Rev. Letters 22, 255 (1969).
28. "Compilation of  $\pi$ - $p$  Data at 4 GeV/c: Backward Resonance Production and  $\pi\pi$  Scattering," P.B. Johnson, J.A. Poirier, N.N. Biswas, N.M. Cason, T.H. Groves, V.P. Kenney, J.T. McGahan, W.D. Shephard et al., Phys. Rev. 176, 1651 (1968).
29. "Rotation of Frame and the Vector-Dominance Discrepancy for  $\pi^\pm$  Production by Polarized Photons," R. Diebold and J.A. Poirier, Phys. Rev. Letters 22, 906 (1969).
30. "Investigation of  $\pi^-p \rightarrow K^0_1 K^0_1 n$  at 4 and 5 GeV/c," T.F. Hoang, D.P. Eartly, J.J. Phelan, A. Roberts, C.L. Sandler, S. Bernstein, S. Margulies, D.W. McLeod, T.H. Groves, N.N. Biswas, N.M. Cason, V.P. Kenney, J.M. Marraffino, J.T. McGahan, J.A. Poirier, and W.D. Shephard, Phys. Rev. 184, 1363 (1969).
31. "Reaction  $\pi^-p \rightarrow \pi^-\pi^0 p$  at 8 GeV/c," S.J. Barish, W. Selove, N.N. Biswas, N.M. Cason, P.B. Johnson, V.P. Kenney, J.A. Poirier, W.D. Shephard, and H. Yuta, Phys. Rev. 184, 1375 (1969). [D1, 375 (1970) (E)].
32. "Application of the Veneziano Model in the Reaction  $\pi^+ d \rightarrow \pi^+\pi^-\pi^+ d$  at 5.4 GeV/c," B.J. Deery, J.E. Mansfield, N.N. Biswas, N.M. Cason, V.P. Kenney, J.A. Poirier, and W.D. Shephard, Phys. Letters 31B, 82 (1970).
33. "Study of the Reaction  $\pi^-p \rightarrow p\pi^+\pi^-\pi^-\pi^0$  and  $\pi^-p \rightarrow n\pi^+\pi^+\pi^-\pi^-$  at 8 GeV/c," N.M. Cason, J.W. Andrews, N.N. Biswas, T.H. Groves, E.A. Harrington, P.B. Johnson, V.P. Kenney, J.A. Poirier, and W.D. Shephard, Phys. Rev. D1, 851 (1970).
34. "Production and Neutral Decay of the  $\eta$  Meson in  $\pi^-p$  Collisions," W.B. Richards, C.B. Chiu, R.D. Eandi, A.C. Helmholtz, R.W. Kenney, B.J. Moyer, J.A. Poirier, R.J. Cence, V.Z. Peterson, N.K. Sehgal, and V.J. Stenger, Phys. Rev. D1, 10 (1970).
35. "Reaction  $\pi^+p \rightarrow \pi^+\pi^+\pi^-\pi^0$  at 18.5 GeV/c," M.J. Hones, N.M. Cason, N. Biswas, J.A. Helland, V.P. Kenney, J.T. McGahan, J.A. Poirier, O.R. Sander, and W.D. Shephard, Phys. Rev. D2, 827 (1970).
36. "Examination of  $\rho^0$  Density Matrix Elements Used for Vector-Dominance-Model Tests," N.N. Biswas, N.M. Cason, P.B. Johnson, V.P. Kenney, J.A. Poirier, and W.D. Shephard, Phys. Rev. D1, 2705 (1970).

37. "Evidence for Structure in the  $f^0$  and  $g^0$  Dipion Mass Regions," P.H. Stuntebeck, V.P. Kenney, B.J. Deery, N.N. Biswas, N.M. Cason, A.R. Dzierba, M.S. Farber, J.A. Poirier, and W.D. Shephard, Phys. Letters 32B, 391 (1970).
38. "Study of  $\Delta^{++}$  (1236) + Boson Production in  $\pi^+p$  Interactions at 18.5 GeV/c," N.N. Biswas, N.M. Cason, M.S. Farber, J.A. Hellend, M.J. Hones, V.P. Kenney, J.T. McGahan, J.A. Poirier, J.T. Powers, O.R. Sander, and W.D. Shephard, Phys. Rev. D2, 2529 (1970).
39. "Study of the Reactions  $\pi^-p \rightarrow p\pi^- MM^0$  and  $\pi^-p \rightarrow p\pi^+\pi^-\pi^- MM^0$  at 8 GeV/c," A.R. Dzierba, W.D. Shephard, N.N. Biswas, N.M. Cason, P.B. Johnson, V.P. Kenney, and J.A. Poirier, Phys. Rev. D2, 2544 (1970).
40. "Double-Regge Analysis of Single-Pion Production in  $\pi^-p$  Interactions at 8 GeV/c," W.D. Shephard, A.R. Dzierba, N.N. Biswas, N.M. Cason, V.P. Kenney, and J.A. Poirier, Phys. Rev. D3, 113 (1971).
41. "Coherent Production of Pions in Deuterium at 5.4 GeV/c," B.J. Deery, N.N. Biswas, N.M. Cason, T.H. Groves, P.B. Johnson, V.P. Kenney, J.A. Poirier, O.R. Sander, P.H. Smith, and W.D. Shephard, Phys. Rev. D3, 635 (1971).
42. "Resonance Production in  $\pi^+d$  Reactions at 5.4 GeV/c," M.S. Farber, J.V. DePinto, N.N. Biswas, N.M. Cason, B.J. Deery, V.P. Kenney, J.A. Poirier, O.R. Sander, and W.D. Shephard, Nucl. Phys. B29, 237 (1971).
43. "Further Aspects of the Reaction  $\pi^-p \rightarrow \pi^-\pi^+$  at 8 GeV/c," K. Takahashi, T. Sato, T. Kitagaki, S. Tanaka, K. Abe, K. Hasegawa, M. Kondo, R. Sugahara, K. Tamai, H. Kichimi, T. Okusawa, S. Nugochi, S.J. Barish, W. Selove, J.A. Poirier, N.N. Biswas, and H. Yuta, Phys. Rev. D6, 1266 (1972).
44. "I=2 S- and D-wave  $\pi\pi$  Phase Shifts in the Low Energy Region," J.A. Poirier, XVI International Conference on High Energy Physics (Chicago-Batavia 1972).
45. "Energy Dependence of Backward  $\pi^+p$  Elastic Scattering from 2 to 6 GeV/c," W.F. Baker, D.P. Eartly, K.P. Pretzl, S.M. Pruss, A.A. Wehmann, P. Koehler, A.J. Lennox, J.A. Poirier, C.A. Rey, and O.R. Sander, Phys. Rev. Letters 32, 241 (1974).
46. "New Parameters for  $\Delta^{++}$  Resonances from 2170 to 3490 MeV in  $\pi^+p$  Backward Elastic Scattering," C.A. Rey, A.J. Lennox, J.A. Poirier, and K.P. Pretzl, Phys. Rev. Letters 32, 908 (1974), [33, 250 (1974) (E)].
47. " $\pi^+\pi^+ \rightarrow \pi^+\pi^+$  Scattering Below 0.7 GeV from  $\pi^+p \rightarrow \pi^+\pi^+n$  at 5 GeV/c," J.P. Prukop, O.R. Sander, J.A. Poirier, C.A. Rey, A.J. Lennox, B.C.-j. Chen, N.N. Biswas, N.M. Cason, V.P. Kenney, W.D. Shephard, R.D. Klem, and I. Spirn, Phys. Rev. D10, 2055 (1974).

48. "The Pion Radius," G.T. Adylov, F.K. Aliev, D. Yu. Bardin., W. Gajewski, I. Ion, B.A. Kulakov, G.V. Micelmacher, B. Niczyporuk, T.S. Nigmanov, E.N. Tsyganov, M. Turala, A.S. Vodopianov, K. Wala, E. Dally, D. Drickey, A. Liberman, P. Shepard, J. Tompkins, C. Buchanan, J. Poirier , Phys. Letters 51B, 402 (1974).
49. " $\pi^+p$  Backward Elastic Scattering from 2 to 6 GeV/c," A.J. Lennox, J.A. Poirier, C.A. Rey, O.R. Sander, W.F. Baker, D.P. Eartly, K.P. Pretzl, S.M. Pruss, A.A. Wehmann and P. Koehler, Phys. Rev. D11, 1777 (1975).
50. " $\pi^-\pi^+ \rightarrow \pi^-\pi^+$  Interactions Below 0.7 GeV from  $\pi^-p \rightarrow \pi^-\pi^+n$  Data at 5 GeV/c," V. Srinivasan, J.A. Helland, A.J. Lennox, J.A. Poirier, J.P. Prukop, C.A. Rey, O.R. Sander, N.N. Biswas, N.M. Cason, V.P. Kenney and W.D. Shephard, University of Notre Dame; R.D. Klem and I. Spirn (Argonne National Laboratory), Phys. Rev. D12, 681 (1975).
51. "Some Features of the Reaction  $pp \rightarrow \Delta^{++}(1236)n$  at 6 GeV/c," J.D. Mountz and G.A. Smith (Michigan State University ; A.J. Lennox, J.A. Poirier, J.P. Prukop, C.A. Rey and O.R. Sander (University of Notre Dame); P. Kirk, R.D. Klem and I. Spirn (Argonne National Laboratory), Phys. Rev. D12, 1211 (1975).
52. "The Slope of Forward Elastic  $\pi^+p$  Elastic Scattering from 4.4 to 6.0 GeV/c," C.A. Rey, J.A. Poirier, A.J. Lennox and V. Srinivasan (University of Notre Dame), and W.F. Baker, D.P. Eartly, S.M. Pruss and A.A. Wehmann (Fermi National Accelerator Laboratory), Phys. Rev. D15, 59 (1977).
53. "A Direct Measurement of the  $\pi^-$  Form Factor," E.B. Dally, D.J. Drickey, J.M. Hauptman, C.F. May, D.H. Stork, University of California at Los Angeles; J.A. Poirier, C.A. Rey and R.J. Wojslaw, University of Notre Dame, Notre Dame, Indiana; P.F. Shepard, University of Pittsburgh; A.J. Lennox, J.C. Tompkins, T.E. Toohig and A.A. Wehmann, Fermi National Accelerator Laboratory; and I.S. Ioan, T.S. Nigmanov, E.N. Tsyganov and A.S. Vodopianov, Joint Institute for Nuclear Research, Dubna, USSR., Phys. Rev. Letters 39, 1176 (1977).
54. "A Measurement of the Electromagnetic Size of the Pion from Direct Elastic Pion Scattering Data at 50 GeV/c," G.T. Adylov, F.K. Aliev, D. Yu Bardin, W. Gajewski, I. Ioan, B.A. Kulakov, G.V. Micelmacher, B. Niczyporuk, A.S. Vodopianov and K. Wala, E. Dally, D.J. Drickey, A.D. Liberman, P.F. Shepard, J.C. Tompkins, and C.D. Buchanan, J.A. Poirier, Nuclear Physics B128, 461 (1977).
55. "Experiences with Proportional Wire Chambers," John A. Poirier, Charles A. Rey, James T. Volk, and Richard Wojslaw, Nucl. Inst. & Meths. 153, 105 (1978).
56. "Fast Analog Logic for Multiwire Proportional Chambers," Charles A. Rey, Richard J. Wojslaw, John A. Poirier and James T. Volk, Nucl. Instr. & Methods 157, 401 (1978).

57. "Direct Measurement of the Negative-Kaon Form Factor," E.B. Dally, J.M. Hauptman, J. Kubicek, D.H. Stork, and Watson (UCLA); Z. Guzik, T.S. Nigmatov, V.D. Riabtsov, E.N. Tsyganov, and A.S. Vodopianov (Dubna); A. Beretvas, A. Grigorian, J.C. Tompkins, T.E. Toohig, and A.A. Wehmann (Fermilab); J.A. Poirier, C.A. Rey, and J.T. Volk (Notre Dame); and P. Rapp and P.F. Shepard (Pittsburgh), *Phys. Rev. Letter* **45**, 232 (1980).
58. "Wavelength Measurements of  $1s2s^3S-1s2p^3P$  Transitions in Helium-Like  $^{28}\text{Si}^{12+}$ ,  $^{32}\text{Si}^{14+}$  and  $^{35}\text{Cl}^{15+}$ ," A.E. Livingston, S.J. Hinterlong, J.A. Poirier, R. DeSerio, and H.G. Berry, *J. Phys. B: Atom. Molec. Phys.* **13**, L139 (1980).
59. "Measurement of the  $\pi^-$  Form Factor," E.B. Dally, D.J. Drickey, J.M. Hauptman, C.F. May, D.H. Stork, J.A. Poirier, C.A. Rey, R.J. Wojslaw, P.F. Shepard, A.J. Lennox, J.C. Tompkins, T.E. Toohig, A.A. Wehmann, I.X. Ioan, T.S. Nigmatov, E.N. Tsyganov, and A.S. Vodopianov, *Phys. Rev.* **D24**, 1718 (1981).
60. "Elastic-Scattering Measurement of the Negative-Pion Radius," E.B. Dally, J.M. Hauptman, J. Kubicek, D.H. Stork, and A.B. Watson, University of California, and Z. Guzik, T.S. Nigmatov, V.D. Riabtsov, E.N. Tsyganov, and A.S. Vodopianov, Joint Institute for Nuclear Research, Dubna, U.S.S.R., and A. Beretvas, A. Grigorian, J.C. Tompkins, T.E. Toohig, and A.A. Wehmann, Fermi National Accelerator Laboratory, and J.A. Poirier, C.A. Rey, and J.T. Volk, University of Notre Dame, and R.D. Rapp and P.F. Shepard, University of Pittsburgh, *Phys. Rev. Letter* **48**, 375 (1982).
61. "Search for resonant states from 1 to 5 GeV," J.A. Poirier in *Multiparticle Dynamics 1981: Proceedings of the XII International Symposium on Multiparticle Dynamics*, W.D. Shephard and V.P. Kenney, eds., Notre Dame, World Scientific Publishing, Singapore, 153 (1982).
62. "Diffractive Production of  $K_S^0 K_S^0 \pi^- n \pi^- N$  Interactions at 200 GeV/c," T.Y. Chen, E.W. Jenkins, K.J. Johnson, K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer (Univ. Arizona); H.C. Fenker, D.R. Green (Fermi National. Accelerator Lab.); J.R. Albright, R.N. Diamond, J.H. Goldman, S.L. Hagopian, J.E. Lannutti, J.E. Piper (Florida State Univ.); C.C. Chang, T.C. Davis, J.A. Poirier (Univ. of Notre Dame); A. Napier (Tufts Univ.); J.M. Marraffino, C.E. Roos, J.W. Waters, M.S. Webster, E.G.H. Williams (Vanderbilt Univ.); G.B. Collins, J.R. Ficenece, W.P. Trower (Virginia Polytechnic Inst.); *Phys. Rev.* **D28**, 2304 (1983).
63. "Diffraction and Resonance Production in  $\pi^- N \rightarrow V^0 V^0 X$  at 200 GeV/c," T.Y. Chen, E.W. Jenkins, K.W. Lai, J. LeBritton, Y.C. Lin, and A.E. Pifer (University of Arizona); H.C. Fenker and D.R. Green (Fermilab); J.R. Albright, R.N. Diamond, J.H. Goldman, S.L. Hagopian, J.E. Lannutti, and J.E. Piper (Florida State Univ.); C.C. Chang, T.C. Davis, K.J. Johnson, and J.A. Poirier (Univ. of Notre Dame); A. Napier and J. Schneps (Tufts Univ.); J.M. Marraffino, C.E. Roos, J.W. Waters, M.S. Webster, and E.G.H. Williams (Vanderbilt Univ.); G.B. Collins, J.R. Ficenece, S. Torres, and W.P. Trower (Virginia Tech), *Proceedings of the XIV International Symposium on Multiparticle Dynamics*, Lake Tahoe, CA, June, 1983, World Scientific Pub., p. 491.

64. “Baryon Production and Decay into Strange-Particle Final States in 200 GeV/c  $\pi^-$ -N Interactions,” H.C. Fenker, D.R. Green (Fermi National Accelerator Laboratory); T.Y. Chen, W. Dieterlie, E.W. Jenkins, K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer (University of Arizona); J.R. Albright, J.H. Goldman, S.L. Hagopian, J.E. Lannutti, J.E. Piper (Florida State University); C.C. Chang, T.C. Davis, R.N. Diamond, K.J. Johnson, J.A. Poirier (Univ. of Notre Dame); A. Napier, J. Schneps (Tufts University); J.M. Marraffino, J.W. Waters, M.S. Webster, E.G.H. Williams (Vanderbilt University); J.R. Ficenece, W.P. Trower (Virginia Polytechnic Institute and State Univ.), Phys. Rev. D30, 872 (1984).
65. “Forward  $K_S^0 K_S^0$  Production in 200 GeV/c  $\pi^-$ -N Interactions,” E.G.H. Williams, J.M. Marraffino, C.E. Roos, J.W. Waters, M.S. Webster (Vanderbilt University); R.N. Diamond, C.C. Chang, T.C. Davis, K.J. Johnson, R.W. Joyner, J.A. Poirier (University of Notre Dame); A. Napier, J. Schneps (Tufts University); T.Y. Chen, E.W. Jenkins, K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer (University of Arizona); H.C. Fenker, D.R. Green (Fermilab); J.R. Albright, J.H. Goldman, S.L. Hagopian, J.E. Lannutti, J.E. Piper (Florida State University); J.R. Ficenece, W.P. Trower (Virginia Polytechnic Institute and State University), Phys. Rev. D30, 877 (1984).
66. “Diffractive Production of  $K_S^0 K_S^0 \pi^+ \pi^- \pi^-$  in  $\pi^-$ -N Interactions at 200 GeV/c,” C.C. Chang, T.C. Davis, R.N. Diamond, K.J. Johnson, R.W. Joyner, and J.A. Poirier (Univ. of Notre Dame); T.Y. Chen, E.W. Jenkins, K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer (Univ. of Arizona); H.C. Fenker, and D.R. Green (Fermilab); J.R. Albright, J.H. Goldman, S.L. Hagopian, J.E. Lannutti, and J.E. Piper (Florida State Univ.); A. Napier (Tufts Univ.); J.M. Marraffino, J.W. Waters, M.S. Webster, and E.G.H. Williams (Vanderbilt Univ.); J.R. Ficenece and W.P. Trower (Virginia Polytechnic Inst.); Phys. Rev. D29, pp. 1888 (1984).
67. “ $K^{*\pm}(892)$  Production in  $\pi^-$ -N Interactions at 200 GeV/c,” A. Napier, J. Schneps (Tufts Univ.), T.Y. Chen, E.W. Jenkins, K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer (Univ. Ariz.), H.C. Fenker, D.R. Green (Fermilab), J.R. Albright, J.H. Goldman, S.L. Hagopian, J.E. Lannutti, J.E. Piper (Florida State Univ.), C.C. Chang, T.C. Davis, R.N. Diamond, K.J. Johnson, R.W. Joyner, J.A. Poirier (Univ. Notre Dame), J.M. Marraffino, C.E. Roos, J.W. Waters, M.S. Webster, E.G.H. Williams (Vanderbilt Univ.), J.R. Ficenece, S. Torres and W.P. Trower (Virginia Polytechnic Inst.), Phys. Letters 149B, 514 (1984).
68. “Observation of the Cabibbo-Suppressed Decay  $D^\pm \rightarrow \phi \pi^\pm$ ,” C. Georgiopoulos, A. Napier, J. Schneps (Tufts Univ.), K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer (Univ. Arizona), H.C. Fenker, D.R. Green (Fermilab), J.R. Albright, T.F. Davenport, J.H. Goldman, S.L. Hagopian, J.E. Lannutti (Florida State Univ.), G. Canough, C.C. Chang, T.C. Davis, R.W. Joyner, J.A. Poirier (Univ. of Notre Dame), J.M. Marraffino, J.W. Waters, M.S. Webster, E.G.H. Williams, J. Woosley (Vanderbilt Univ.), J.R. Ficenece, S. Torres and W.P. Trower (Virginia Polytechnic Inst.), Phys. Letters 152B, 428 (1985).

69. "Observation of Double Phi-Meson Production in 400 GeV/c Proton-Nucleon Interactions," T.F. Davenport, J.R. Albright, J.H. Goldman, S.L. Hagopian, J.E. Lannutti (Florida State Univ.), K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer, H.C. Fenker, D.R. Green (Fermilab), G.E. Canough, C.C. Chang, T.C. Davis, R.W. Joyner, J.A. Poirier (Univ. of Notre Dame), C.H. Georgiopoulos, A. Napier (Tufts Univ.), J.M. Marraffino, J.W. Waters, M.S. Webster, E.G.H. Williams, J. Woosley (Vanderbilt Univ.), J.R. Ficenecc, S. Torres, and W.P. Trower (Virginia Polytechnic Inst.), Phys. Rev. D33, 2519 (1986).
70. "Observation of a Narrow Enhancement in  $\phi$ KK and  $\phi\pi\pi$  Final States Produced in 400 GeV p-N Interactions," D.R. Green, H.C. Fenker, K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer (Fermilab), T.F. Davenport, J.H. Goldman, S.L. Hagopian, J.E. Lannutti (Florida State Univ.), G. Canough, C.C. Chang, T.C. Davis, R.W. Joyner, J.A. Poirier (Univ. of Notre Dame), C.H. Georgiopoulos, A. Napier, J. Schneps (Tufts Univ.), J.M. Marraffino, J.W. Waters, M.S. Webster, E.G.H. Williams, J.K. Woosley (Vanderbilt Univ.), J.R. Ficenecc, S. Torres, and W.P. Trower (Virginia Polytechnic Inst.), Phys. Rev. 56, 1639 (1986).
71. "Observation of  $\phi$ K $\pi$  Decay of the K $^{*0}$ (2060)," S. Torres, J.R. Ficenecc, S. Mikocki, W.P. Trower (Virginia Polytechnic Inst.), K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer, H.C. Fenker, D.R. Green (Fermilab), T.F. Davenport, J.H. Goldman, S.L. Hagopian, J.E. Lannutti (Florida State Univ.), G. Canough, C.C. Chang, T.C. Davis, R.W. Joyner, J.A. Poirier (Univ. of Notre Dame), C.H. Georgiopoulos, A. Napier (Tufts Univ.), J.M. Marraffino, J.W. Waters, M.S. Webster, E.G.H. Williams, J.K. Woosley (Vanderbilt Univ.), Phys. Rev. D34, 707 (1986).
72. "Inclusive Strange-Particle Production in Single-Vee Events in 200 GeV/c  $\pi$ -N Interactions," S. Mikocki, J.R. Ficenecc, S. Torres, W.P. Trower (Virginia Polytechnic Inst.), T.Y. Chen, E.W. Jenkins, K.W. Lai, J. LeBritton, Y.C. Lin, A.E. Pifer, H.C. Fenker, D.R. Green (Fermilab), J.R. Albright, J.H. Goldman, S.L. Hagopian, J.E. Lannutti, J.E. Piper (Florida State Univ.), C.C. Chang, T.C. Davis, R.N. Diamond, K.J. Johnson, J.A. Poirier (Univ. of Notre Dame), A. Napier, J. Schneps (Tufts Univ.), J.M. Marraffino, J.W. Waters, M.S. Webster, and E.G.H. Williams (Vanderbilt Univ.), Phys. Rev. D34, 42 (1986).
73. "A Multicell Threshold Cherenkov Counter," R. Brun, G. Canough, N. Giokaris and J. Poirier (Univ. of Notre Dame), Nucl. Inst. and Methods A248, 358 (1986).
74. "Observation of Massive  $\Lambda$ K $^0_s\pi^+\pi^+\pi^-\pi^-$  Events Above 5 GeV/c $^2$ ," M.W. Arenton, T.Y. Chen, L.R. Cormell, W.E. Dieterle, K.W. Lai, J. LeBritton, E. Prebys (Univ. of Arizona); T.C. Davis, R.N. Diamond, R. Joyner, J.A. Poirier (Univ. of Notre Dame); J.W. Waters, M.S. Webster, E.G.H. Williams and C. Roos (Vanderbilt Univ.), Nucl. Phys. B274, 707 (1986).

75. "Multiplicity of Charged Particles in 800 GeV p-p Interactions," R. Ammar, T. Aziz, S. Banerjee, J.F. Baland, S. Ball, R.C. Ball, C. Bromberg, R. Brun, G.E. Canough, T. Coffin, V. Commichau, R. Davis, T.O. Dershem, R.L. Dixon, H.C. Fenker, S.N. Ganguli, U. Gensch, N. Giokaris, P. Girtler, A.T. Goshaw, J. Gress, A. Gurtu, V.P. Henri, J.J. Hernandez, J. Hrubec, M. Iori, L.W. Jones, D. Knauss, D. Kuhn, N. Kwak, I.D. Leedom, P. Legros, J. Lemonne, H. Leutz, X. Liu, P.K. Malhotra, J.M. Marraffino, G.E. Mendez, S. Mikocki, R. Miller, T. Naumann, G. Neuhofer, A. Nguyen, M. Nikolic, H. Nowak, P. Pilette, A. Poppleton, J. Poirier, R. Raghavan, K. Rasner, S. Reucroft, W.J. Robertson, B.P. Roe, C.E. Roos, A. Roth, M. Senko, W. Struczinski, A. Subramanian, M.C. Touboul, B. Vonck, L. Voyvodic, W.D. Walker, J.W. Waters, M.F. Weber, M.S. Webster, J. Wickens, and C.F. Wild, *Phys. Letters* **B178**, 124 (1986).
76. "Inclusive Charm Cross Sections in 800 GeV/c p-p Interactions," R. Ammar, S. Banerjee, J.F. Baland, S. Ball, R.C. Ball, P.C. Bhat, C. Bromberg, R. Brun, G.E. Canough, T. Coffin, V. Commichau, R. Davis, T.O. Dershem, R.L. Dixon, H.C. Fenker, S.N. Ganguli, U. Gensch, N. Giokaris, P. Girtler, A.T. Goshaw, J. Gress, A. Gurtu, V.P. Henri, J.J. Hernandez, J. Hrubec, M. Iori, L.W. Jones, D. Knauss, D. Kuhn, N. Kwak, I.D. Leedom, P. Legros, J. Lemonne, H. Leutz, X. Liu, P.K. Malhotra, J.M. Marraffino, G.E. Mendez, S. Mikocki, R. Miller, T. Naumann, G. Neuhofer, A. Nguyen, M. Nikolic, H. Nowak, P. Pilette, A. Poppleton, J. Poirier, R. Raghavan, K. Rasner, S. Reucroft, W.J. Robertson, B.P. Roe, C.E. Roos, A. Roth, M. Senko, W. Struczinski, A. Subramanian, M.C. Touboul, B. Vonck, L. Voyvodic, W.D. Walker, J.W. Waters, M.F. Weber, M.S. Webster, J. Wickens, C.F. Wild, and S. Youtsey, *Phys. Letters* **B183**, 110 (1987).
77. "Improving the Angular Resolution of Existing Air Shower Arrays by Adding a Thin Layer of Lead," J. Poirier and S. Mikocki, *Nucl. Instr. Methods* **A257**, 473 (1987).
78. "The Differences in Delay Times for Air Showers Initiated by 100 TeV Gammas and Protons," S. Mikocki, J. Linsley, J. Poirier, and A. Wrotniak, *J. Phys. G: Nucl. Phys.* **13**, 85 (1987).
79. "A New Method to Identify Muons in an Extensive Air Shower Array," J. Linsley, S. Mikocki, and J. Poirier, *J. Phys. G: Nucl. Phys.* **13**, L163 (1987).
80. "Project GRAND: A New Method to Detect EAS by Directly Measuring the Angle of Secondaries with Muon Identification," J. Poirier, E. Funk, J. LoSecco, S. Mikocki, and T. Rettig, *Proc. of the 20th Intern. Cosmic Ray Conf.*, **2**, Moscow, USSR, 438 (1987).
81. "The Angular Distributions of Charged Particles in Extensive Air Showers at 100 TeV," *Proc. of the 20th Intern. Cosmic Ray Conf.*, **5**, Moscow, USSR, 452 (1987).
82. "The Time Structure of Charged Particles in Extensive Air Showers at 100 TeV," S. Mikocki, J. Linsley, J. Poirier, and A. Wrotniak, *Proc. of the 20th Intern. Cosmic Ray Conf.*, **6**, Moscow, USSR, 75 (1987).
83. "The Differences in Angular Distributions of Secondaries from EAS Initiated by Gammas and Protons," S. Mikocki and J. Poirier, *Journal of Physics G: Nucl. Phys* **13**, L217 (1987).

84. "Angular Distributions of Secondary Charged Particles in Showers Initiated by Gammas and Protons," J. Poirier, J. Linsley, and S. Mikocki, *Phys. Rev. D* 36, 1378 (1987).
85. "Electromagnetic-Shower Development in Concrete and the Punchthrough Effect," S. Mikocki and J. Poirier, *Phys. Rev. D* 36, 1381 (1987).
86. "Comparison of Methods for Determining the Centers of Extensive Air Showers," J. Poirier, E. Funk, S. Mikocki, and N. Rohrer, *Nucl. Instr. and Methods* A260, 280 (1987).
87. "A New Method to Detect Gamma Ray Extensive Air Showers Which Directly Measures Angles and Identifies Muons," J. Poirier, G. Canough, E. Funk, P. Kinney, J. LoSecco, S. Mikocki, and T. Rettig, *Nucl. Instr. and Methods* A264, 81 (1988).
88. "D meson production in 800 GeV/c pp interactions," G.E. Canough, J. Poirier, R. Ammar et. al. LEBC-MPS collaboration, *Phys. Rev. Lett.* 61, 2185 (1988).
89. "Diffractive production of  $\pi^-\pi^-\pi^+$  in 200 GeV/c  $\pi^-N$  Interactions," R.W. Joyner, C.C. Chang, T.C. Davis, R.N. Diamond, K.J. Johnson, S. Mikocki, J.A. Poirier, T.Y. Chen, E.W. Jenkins, K.W. Lai, Y.C. Lin, A.E. Pifer, H.C. Fenker, D.R. Green, J.R. Albright, J.H. Goldman, S.L. Hagopian, J.E. Lannutti, A. Napier, J. Schneps, J.M. Marraffino, J.W. Waters, M.S. Webster, J.R. Ficenec, and W.P. Trower, *Phys. Rev. D* 39, 7, 1865-1869 (1989).
90. "Monte Carlo Simulation of Electromagnetic EASs," S. Mikocki, J. Gress and J. Poirier, Proc. of the 21st International Cosmic Ray Conference, Adelaide, Australia, 9, 1 (1990).
91. "The Angular Distributions of Charged Secondaries in EASs at 100 and 1000 TeV," J. Poirier, J. Gress and S. Mikocki, Proc. of the 21st International Cosmic Ray Conference, Adelaide, Australia, 9, 46 (1990).
92. "Determination of the Centers of Extensive Air Showers," J. Poirier, E. Funk, S. Mikocki, and N. Rohrer, Proc. of the 21st International Cosmic Ray Conference, Adelaide, Australia, 9, 50 (1990).
93. "Difference in the Radial Distributions of Secondary Electrons and Muons in Proton EASs from  $10^{13}$  to  $10^{16}$  eV," J. Poirier, J. Gress and S. Mikocki, Proc. of the 21st International Cosmic Ray Conference, Adelaide, Australia, 9, 126 (1990).
94. "GRAND Proportional Wire Chambers," J. Gress, S. Mikocki, J. Poirier and T. Rettig, Proc. of the 21st International Cosmic Ray Conference, Adelaide, Australia, 10, 335 (1990).
95. "The Project GRAND Extensive Air Shower Array," J. Poirier, G. Canough, J. Gress, S. Mikocki and T. Rettig, Proc. of the International Workshop on the Physics and Experimental Techniques of High Energy Neutrinos and VHE and UHE Gamma-Ray Particle Astrophysics, University of Arkansas, Little Rock, Arkansas, *Nucl. Phys. B* 14A, 143-147 (1990).
96. "The angular distributions of charged secondaries in electromagnetic and hadronic extensive air showers at 10, 100, 1000 and 10000 TeV," A. Trzuppek, S. Mikocki, J. Gress,

- J. Kochocki and J. Poirier, *Journal of Phys. G: Nuclear Particle Physics* 17, L-19-L26 (1991).
97. "GRAND Particle Identification," J. Gress, Y. Lu, A. Anagnostopoulos, J. Kochocki, J. Olson, J. Poirier, S. Mikocki and A. Trzupek, AIP Conference Proceedings 220 - High Energy Gamma-Ray Astronomy, Amer. Inst. Phys., New York, NY, 242-245 (1991).
  98. "Identification of particles in air showers using tracking chambers and a thin absorber," J. Gress, Y. Lu, A. Anagnostopoulos, J. Kochocki, J. Poirier, S. Mikocki and A. Trzupek, *Nuclear Instruments and Methods in Physics Research A*302, 368-375 (1991).
  99. "Monte Carlo simulation of extensive air showers initiated by gamma rays and protons," S. Mikocki, A. Trzupek, J. Gress, J. Kochocki and J. Poirier, *Journal of Physics G: Nuclear and Particle Physics* 17, 1303-1315 (1991).
  100. "A multiprocessor controlled data acquisition system," Y. Lu, T. Markiewicz, J. Gress, J. Kochocki and J. Poirier, *Nuclear Instruments and Methods in Physics Research A*307, 425-429 (1991).
  101. "All-Sky Survey for Compact Stellar Sources Yielding Secondary Muons at Sea Level," J. Poirier, J. Kochocki, Y. Lu, and A. Trzupek, Proceedings of the 22nd International Cosmic Ray Conference, Vol. 1, p. 192, Dublin, Ireland (1991).
  102. "Angular Distributions of Muons and Electrons in Cosmic Ray Showers," J. Kochocki, Y. Lu, and J. Poirier, Proceedings of the 22nd International Cosmic Ray Conference, Vol. 4, p. 291, Dublin, Ireland (1991).
  103. "The Secondary Gamma Ray Composition of Cosmic Rays," A. Trzupek, J. Kochocki, Y. Lu, and J. Poirier, Proceedings of the 22nd International Cosmic Ray Conference, Vol. 4, p. 295, Dublin, Ireland (1991).
  104. "Status of Project GRAND," J. Poirier, J. Gress, J. Kochocki, Y. Lu and A. Trzupek, Proceedings of the 22nd International Cosmic Ray Conference, Vol. 4, p. 417, Dublin, Ireland (1991).
  105. "A Multi-Processor Controlled Data Acquisition System," Y. Lu, T. Markiewicz, J. Gress, J. Kochocki, and J. Poirier, Proceedings of the 22nd International Cosmic Ray Conference, Vol. 4, p. 421, Dublin, Ireland (1991).
  106. "Secondary Muon/Electron Identification in a Thin Steel Absorber," J. Kochocki, J. Gress, Y. Lu, J. Poirier, and A. Trzupek, Proceedings of the 22nd International Cosmic Ray Conference, Vol. 4, p. 425, Dublin, Ireland (1991).
  107. "Measurement of the Angular Correlation Between Primary Cosmic Rays and Single Muons at Sea Level Using the Moon's Shadow," Y. Lu, J. Kochocki, J. Poirier, and A. Trzupek, Proceedings of the 22nd International Cosmic Ray Conference, Vol. 4, p. 583, Dublin, Ireland (1991).
  108. "The secondary gamma composition from hadronic and electromagnetic extensive air showers at 10, 100, 1000, and 10,000 TeV," A. Trzupek, J. Kochocki, Y. Lu, and J. Poirier, *Journal of Physics G: Nuclear Particle Physics* 18, 1849-1861 (1992).

109. "GRAND: An Extensive Air Shower Array of Proportional Wire Chambers," J. Poirier, J. Gress, J. Kochocki, Y. Lu, and A. Trzupek, AIP Conference Proceedings 276, Very High Energy Cosmic-Ray Interactions, VIIth International Symposium, New York, L. Jones, ed., p. 614 (1993).
110. "Secondary Gammas in Extensive Air Showers," A. Trzupek, J. Kochocki, Y. Lu, and J. Poirier, AIP Conference Proceedings 276, Very High Energy Cosmic-Ray Interactions, VIIth International Symposium, New York, L. Jones, ed., p. 566 (1993).
111. "A Correction to the Scale of Primary Energies Derived from Extensive Air Showers," A. Trzupek, Y. Lu, and J. Poirier, AIP Conference Proceedings 276, Very High Energy Cosmic-Ray Interactions, VIIth International Symposium, New York, L. Jones, ed., p. 560 (1993).
112. "The Energy Scale of Extensive Air Showers" A. Trzupek, Y. Lu, and J. Poirier, Proceedings of the 23rd International Cosmic Ray Conference, Vol. 4, p. 359-362, Calgary, Alberta, Canada (1993).
113. "Is There a Moon Shadow in Single Muon Data?," A. Trzupek, Y. Lu, and J. Poirier, Proceedings of the 23rd International Cosmic Ray Conference, Vol. 4, p. 422-425, Calgary, Alberta, Canada (1993).
114. "Survey for Stellar Sources Using Identified Single Muons at Sea Level," A. Trzupek, Y. Lu, and J. Poirier, Proceedings of the 23rd International Cosmic Ray Conference, Vol. 4, p. 454-457, Calgary, Alberta, Canada (1993).
115. "A New Candidate for a Long-lived Neutral Particle at VHE/UHE from Stellar Sources," J. Poirier, Proceedings of the 23rd International Cosmic Ray Conference, Vol. 4, p. 633-636, Calgary, Alberta, Canada (1993).
116. "Production and Transmission of a Possible New Long-lived Neutral Particle at VHE/UHE from Stellar Sources," J. Poirier, Proceedings of the 23rd International Cosmic Ray Conference, Vol. 4, p. 637-640, Calgary, Alberta, Canada (1993).
117. "Is There a Correlation of Single Muon Angles with the Galactic Plane?," John Poirier, Pawel Fischer, Joseph Gress, Younan Lu, and Adam Trzupek, Proceedings of the 24th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 1, p. 634-637, Rome, Italy (1995).
118. "A New Variable,  $H_h$ , to Use in Measuring the Chemical Composition of Cosmic Ray Primaries," John Poirier, Pawel Fischer, Joseph Gress, Younan Lu, and Adam Trzupek, Proceedings of the 24th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 3, p. 532-535, Rome, Italy (1995).
119. "On the Origin of Gamma-Ray Bursts," John Poirier, Proceedings of the 24th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 160-163, Rome, Italy (1995).

120. "A Search for Correlations Between Gamma Ray Bursts and Secondary Cosmic Ray Muons," Joseph Gress, John Poirier and Younan Lu, Proceedings of the 24th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 144-147, Rome, Italy (1995).
121. "Search for Enhancements from Nearby AGNs with Identified Single Muons," J. Poirier, G. Herczeg, and J. Gress, Proceedings of the 25th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 3, p. 289-292, Durban, South Africa, (1997).
122. "Properties of Extensive Air Showers Measured by Project GRAND," J. Poirier and J. Gress, Proceedings of the 25th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 6, p. 221-224, Durban, South Africa, (1997).
123. "Measured Direction Angle Differences for Extensive Air Shower Muons," J. Gress, J. Poirier, A. Trzupsek, and P. Fiszer, Proceedings of the 25th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 6, p. 225-228, Durban, South Africa, (1997).
124. "Single Muon Angular Distribution for Project GRAND," B. Fields, J. Gress, J. Poirier, and Y. Lu, Proceedings of the 25th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 6, p. 365-368, Durban, South Africa, (1997).
125. "Search for Stellar Point Sources with an Enlarged Sample of Identified Single Muons," J. Poirier, N. Cunningham, J. Gress, and Y. Lu, Proceedings of the 25th International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 6, p. 369-372, Durban, South Africa, (1997).
126. "Can EGRET's Gamma Ray Sources  $> 100$  MeV Be Seen with Single Secondary Cosmic Muons from Gammas  $> 30$  GeV?" J. Carpenter, S. Desch, T.F. Lin, J. Poirier, and A. Roesch, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 60-63, Salt Lake City, Utah, (1999); astro-ph/0005415 (2000).
127. "Secondary Cosmic Muon Angular Distributions with High Statistics," J. Poirier, J. Gress, and T.F. Lin, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 64-67, Salt Lake City, Utah, (1999); astro-ph/0004398 (2000).
128. "Asymmetries of Secondary Cosmic Muons with High Statistics and Low Systematics," T.F. Lin, B. Fields, J. Gress, and J. Poirier, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 100-103, Salt Lake City, Utah, (1999); astro-ph/0004396 (2000).
129. "A Search for Point Sources of Cosmic Primary Rays Which Produce Muon Tracks at Ground Level," A. Roesch, J. Carpenter, S. Desch, J. Gress, T.F. Lin, and J. Poirier, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 104-107, Salt Lake City, Utah, (1999); astro-ph/0008405 (2000).

130. "A Monte Carlo Calculation of Muon Flux at Ground Level from Primary Cosmic Gamma Rays," A. Fasso and J. Poirier, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 127-130, Salt Lake City, Utah, (1999).
131. "Corrections to the Predictions for Atmospheric Neutrino Observations," J. Poirier, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 147-150, Salt Lake City, Utah, (1999); astro-ph/0008407 (2000).
132. "The South Atlantic Magnetic Field Anomaly and Its Effect on the Calculated Production of Atmospheric Neutrinos," J. Poirier, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 2, p. 253-256, Salt Lake City, Utah, (1999); astro-ph/0008409 (2000).
133. "Possible Detection of Gamma Ray Air Showers in Coincidence with BATSE Gamma Ray Bursts," T.F. Lin, J. Carpenter, S. Desch, J. Gress, J. Poirier, and A. Roesch, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 4, p. 24-27, Salt Lake City, Utah, (1999); astro-ph/0005180 (2000).
134. "Composition of UHE Cosmic Ray Primaries," J. Poirier, J. Carpenter, J. Gress, T.F. Lin, and A. Roesch, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 4, p. 172-175, Salt Lake City, Utah, (1999); astro-ph/0005089 (2000).
135. "Status Report on Project GRAND: An Extensive Air Shower Array of Proportional Wire Chambers," J. Poirier, J. Carpenter, S. Desch, J. Gress, T.F. Lin, Y. Lu, and A. Roesch, Proceedings of the 26<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, Vol. 5, p. 304-307, Salt Lake City, Utah, (1999); astro-ph/0004394 (2000).
136. "Sub-TeV Gammas in Coincidence with BATSE Gamma Ray Bursts," J. Poirier, T.F. Lin, J. Gress, P.C. Fragile, G.J. Mathews; astro-ph/0004379.
137. "Spatial and energy distribution of muons in  $\gamma$ -induced air showers," A. Fassò and J. Poirier, Phys. Rev. D 63, 036002; astro-ph/0006196 (2000).

138. "Status of project GRAND's proportional wire chamber array," J. Poirier, D. Baker, J. Barchie, C. D'Andrea, M. Dunford, M. Green, J. Gress, T. Lin, D. Race, R. Skibba, G. VanLaecke, and M. Wysocki, Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 602-604, Hamburg, Germany (2001); astro-ph/0109489 (2001).
139. "Calculation of atmospheric muons from cosmic gamma rays," J. Poirier, S. Roesler, and A. Fassò, Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 1037-1040, Hamburg, Germany (2001).
140. "Muon angles at sea level from cosmic gamma rays below 10 TeV," J. Poirier, S. Roesler, and A. Fasso, Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 1041-1044, Hamburg, Germany (2001).
141. "A project GRAND study of the GLE of July 14, 2000," J. Poirier, C. D'Andrea, and M. Dunford, Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 3387-3389, Hamburg, Germany (2001); astro-ph/0109481 (2001).
142. "A measurement of secondary muon angular distributions," J. Poirier and C. D'Andrea, Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 3923-3926, Hamburg, Germany (2001); astro-ph/0109490 (2001).
143. "Secondary muon asymmetries at sea level with low systematics," J. Poirier, C. D'Andrea, and M. Dunford, Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 3930-3933, Hamburg, Germany (2001); astro-ph/0109462 (2001).
144. "Variation of muon counts versus solar time," J. Poirier and C. D'Andrea, Proceedings of the 27<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 3934-3937, Hamburg, Germany (2001); astro-ph/0109478 (2001).
145. "Distributions of secondary muons at sea level from cosmic gamma rays below 10 TeV," J. Poirier, S. Roesler, and A. Fassò, *Astroparticle Physics* 17, 4, 441-458; astro-ph/0103030 (2002).
146. "Ground level muons in coincidence with the solar flare of April 15, 2001," J. Poirier and C. D'Andrea, *J. Geophys. Res., Space Physics*, Vol. 107(A11) 1376-1384; astro-ph/0211490 (2002).
147. "A proportional wire chamber array: GRAND's status," J. Poirier, C. D'Andrea, M. Lopez del Puerto, E. Strahler, and J. Vermedahl, Proceedings of the 28<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 993-996, Tsukuba, Japan; astro-ph/0306371 (2003).

148. “Search for sub-TeV gamma rays coincidence with BATSE gamma ray bursts,” J. Poirier, C. D’Andrea, J. Gress, and D. Race, Proceedings of the 28<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 2709-2712, Tsukuba, Japan; astro-ph/0306370 (2003).
149. “A study of the ground level event of April 15, 2001 with GRAND,” C. D’Andrea and J. Poirier, Proceedings of the 28<sup>th</sup> International Cosmic Ray Conference, International Union of Pure and Applied Physics, p. 3423-3426, Tsukuba, Japan; astro-ph/0306363 (2003).
150. “Search for sub-TeV gamma rays in coincidence with gamma ray bursts,” J. Poirier, C. D’Andrea, P.C. Fragile, J. Gress, G.J. Mathews, and D. Race, *Phys. Rev. D* **67**, 042001, 1-6; astro-ph/0306370 (2003).
151. “Constraints on models for TeV gamma rays from gamma-ray bursts,” P.C. Fragile, G.J. Mathews, J. Poirier, T. Totani, *Astroparticle Physics* **20**, 591-607 (2004); astro-ph/0206383
152. “Ground level muons coincident with the 20 January 2005 solar flare,” C. D’Andrea and J. Poirier, *Geophys. Res. Lett.* **32**, L14102 (2005); astro-ph/0211490
153. “A study of the Forbush decrease event of September 11, 2005 with GRAND,” J. Poirier, M. Herrera, P. Hemphill, C. D’Andrea, Proceedings of the 30<sup>th</sup> International Cosmic Ray Conference, R. Caballero, J.C. D’Olivo, G. Medina-Tanco, L. Nellen, F.A. Sánchez, J.F. Valdés-Galicia (eds.), Universidad Nacional Autónoma de México, Mexico City, Mexico, Vol. 1, pp. 351-354 (2008)
154. “Status report on project GRAND,” J. Poirier, C. D’Andrea, E. Fidler, J. Gress, M. Herrera, P. Hemphill, C. Swartzendruber, Proceedings of the 30<sup>th</sup> International Cosmic Ray Conference, Proceedings of the 30<sup>th</sup> International Cosmic Ray Conference, R. Caballero, J.C. D’Olivo, G. Medina-Tanco, L. Nellen, F.A. Sánchez, J.F. Valdés-Galicia (eds.), Universidad Nacional Autónoma de México, Mexico City, Mexico, Vol. 5, pp. 1577-1580 (2008)
155. “Detection of high-energy solar neutrons and protons by ground level detectors on April 15, 2001,” Y. Muraki, Y. Matsubara, S. Masuda, S. Sakakibara, T. Sako, K. Watanabe, R. Bütikofer, E.O. Flückiger, A. Chilingarian, G. Hovsepyan, F. Kakimoto, T. Terasawa, Y. Tsunesada, H. Tokuno, A. Velarde, P. Evenson, J. Poirier, T. Sakai, *Astroparticle Physics* **29**, pp. 229-242 (2008)