

JOHN C. VAN DER VELDE

Birth

September 25, 1930, Holland, Michigan

Education

1952 A.B. Hope College
1953 M.A. University of Michigan
1958 Ph.D. University of Michigan

Positions

1958-61 Instructor, University of Michigan
1961-64 Assistant Professor, University of Michigan
1964-68 Associate Professor, University of Michigan
1968-95 Professor Physics, University of Michigan
1995 Emeritus Professor of Physics, University of Michigan

National Service, Awards, and Honors

1966-67 Visiting Scientist, Ecole Polytechnique, Paris, France
1972-74 Secretary, Users Executive Committee, National Accelerator
 Laboratory
1972-75 Member, Program Committee, Argonne National Laboratory
1972-76 President, Midwest Chapter, LISLE Fellowship
1974 Visiting Scientist, CEN - Saclay, France
1974-75 Vice President, Alliance Francaise of Ann Arbor
1976 Fellow, American Physical Society
1976 Member, Board of Governors, Michigan League
1976 Who's Who in America
1982 International Advisory Committee on ICOMAN '83
1983 International Advisory Committee on FWOGU '83
1983 Department of Energy Woods Hole Panel
1983 International Advisory Commission on ICOBAN '84
1983 Session Organizer at Gordon Conference
1984 Visiting Scientist, Orsay Laboratory, Paris, France
1985 Distinguished Alumnus Award, Hope College

- 1986 Resolution From Michigan Senate: One of Five Outstanding Scientists in Michigan
- 1988 Visiting Professor, Orsay University, Paris, France
- 1989 Co-winner, Rossi Prize of the American Astronomical Society
- 1989,90 Astronomy and Astrophysics Survey Committee of the National Academy of Sciences

University and Departmental Service

- 1961-62 Registration Committee
- 1962-63 Undergraduate Advisor
- 1963-66 Time Schedule and Announcements
- 1967-68 Member, Second Committee; Ad Hoc on Language Requirements
- 1968-69 Language Committee
- 1968-70 Chairman, Second Committee
- 1970-71 Physics Language Approvals
- 1970-74 Physics Executive Committee
- 1971- Foreign Language Approval
- 1972-73 Secretary, NAL Users
- 1972-74 Argonne Program Committee
- 1973-74 NAL Executive Committee
- 1976-77 Board of Governors, Michigan League; Wednesday Colloquium
- 1977-79 Physics Executive Committee
- 1981-82 Internal Review
- 1984-85 High Energy Search Committee
- 1985-87 Rackham Divisional Board
- 1987-90 Astrophysics Search Committee
- 1988-89 Astrophysics Planning Committee
- 1991-92 Astrophysics Institute Committee
- 1992- Wu Lectureship Committee
- 1992- Astrophysics Area Committee

Current Research

Search for nucleon decay, neutron-antineutron oscillations, monopole interactions, etc, in the IMB detector. Study of neutrino astronomy, muon astronomy, neutrinos from SN1987A.

Search for extraterrestrial gamma rays above 10^{14} eV using the Fly's Eye detector along with a surface array of electron counters and a subsurface array of muon counters.

Studies of 100 GeV gamma radiation from extragalactic sources identified by GRO/EGRET. (Proposal to Keck Foundation.)

Search for optical counterparts of gamma ray bursts. (Proposal to NASA.)

Research sponsored by DOE:

FY 1987: \$715,000 (with D. Sinclair)
FY 1988: \$782,000 (with D. Sinclair and D. Nitz)
FY 1989: \$715,000 (with D. Sinclair and D. Nitz)
FY 1990: \$735,000 (with D. Sinclair, D. Nitz, J. Matthews)
FY 1991: \$740,000 (with D. Sinclair, D. Nitz, J. Matthews)
FY 1992: \$720,000 (with D. Sinclair, D. Nitz, J. Matthews)
FY 1993: \$673,000 (with D. Sinclair, D. Nitz, J. Matthews)
FY 1994: \$500,000 (with D. Sinclair, D. Nitz, J. Matthews)
FY 1995: \$250,000 (with D. Nitz, J. Matthews)

Postdoctoral Associates

(List begins in 1985)

1985-89 Greg Thornton
1989-94 Kevin Green
1994-95 Michael Catanese

Publications (Journals)

1957

1. Charge Independence and Hyperon Production (with J.L. Brown, D.A. Glaser, D.I. Meyer, and M.L. Perl), *Phys. Rev.* **107**, 906 (1957).

1959

2. Direct Proof of θ_1^0 Neutral Decay (with J.L. Brown et al.), *Phys. Rev. Lett.* **3**, 51 (1959).
3. The Neutral Branching Ratios of Λ and K^0 Particles (with J.L. Brown, Bryant, Brunstein, Hartung, D.A. Glaser, Kadyk, Trilling, and van Putten), *Phys. Rev. Lett.* **3**, 563 (1959).

1961

4. Properties of Neutral Strange Particles Produced in the Xenon Bubble Chamber (with J.L. Brown, Bryant, Brunstein, Hartung, D.A. Glaser, Kadyk, Trilling, and van Putten), *Nuovo Cimento XIX*, 1155 (1961).

1963

5. New Determination of the K_1^0 Branching Ratio (with Brown, Kadyk, Trilling, and D. Sinclair), *Phys. Rev.* **130**, 769-755 (1963).
6. Search for ϕ Meson Production in 3.7 GeV/c $\pi^- - p$ Collisions (with Lee, Moebs, B. Roe, and D. Sinclair), *Phys. Rev. Lett.* **11**, 508 (1963). at AGS 20" H₂ BC.

1964

7. Determination of the Spin of the f^0 Resonance (with Lee, B. Roe, and D. Sinclair), *Phys. Rev. Lett.* **12**, 342 (1964).
8. Evidence that the f^0 has Isotopic Spin Zero (with Benson, Lovell, Marquit, B. Roe, D. Sinclair, and Weaver), *Phys. Rev. Lett.* **12**, 600 (1964).

1966

9. Is G Parity a Conserved Quantum?, *Phys. Rev. Lett.* **16**, 69 (1966).
10. Observation and Properties of the Neutral A_2 Meson (with G. Benson et al.), *Phys. Rev. Lett.* **16**, 1177 (1966).
11. Further Evidence for the H. Meson (with G. Benson et al.), *Phys. Rev. Lett.* **17**, 1234 (1966).

1967

12. Meson and Isobar Resonance Production in $\pi^- p$ Interactions at 3.73 BeV (with Lee et al.), *Phys. Rev.* **159**, 1156 (1967).

1968

13. Pion-Deuteron Elastic Scattering at 3.65 BeV/c (with Hsiung et al.), *Phys. Rev. Lett.* **21**, 187 (1968).
14. Extracting the Phase of Scattering Amplitude by Means of the Glauber Formula, *Phys. Rev.* **173**, 1544 (1968).
15. Search for Resonance Formation in Antiproton-proton Elastic Scattering at 1.6 to 2.2 GeV/c (with J. Lys et al.), *Phys. Rev. Lett.* **21**, 1116 (1968).
16. Cross Sections for the Reactions $\bar{p}p \rightarrow \pi^+\pi^-$ and K^+K^- near 2 GeV/c (with J.W. Chapman et al.), *Phys. Rev. Lett.* **21**, 1718-1721 (1968). *30-inch Hydrogen bubble chamber*

1968

17. A Measurement of the Ratios of the Rates $K_L^0 \rightarrow 3\pi^0/K_L^0 \rightarrow \pi^+\pi^-\pi^0$, and $K_L^0 \rightarrow 3\pi^0/K_L^0$ All Charged Modes, and $K_L^0 \rightarrow \pi\mu\nu/K_L^0 \rightarrow \pi e\nu$, and Tests of the $\Delta I = 1/2$ Rule (with Y.A. Budagov et al.), *Nuovo Cimento LVII* **182A**, (1968).
18. A Measurement of the Branching Ratio of the CP Violating Decay Mode $K_L^0 \rightarrow 2\pi^0$ (with Y.A. Budagov et al.), *Phys.Lett.* **28B**, 215 (1968).

1969

19. Omega and Eta Production in $\pi^+d \rightarrow pp\pi^+\pi^-\pi^0$ at 3.65 BeV/c (with G.C. Benson, B.P. Roe, and D. Sinclair), *Phys. Rev. Lett.* **22**, 1074-1077 (1969).

1970

20. Predications and Tests of the Hypothesis of Limiting Fragmentation, *Phys. Lett.* **32B**, 6, 501-504 (70).
21. Rho-Omega Interference in $\bar{p}p \rightarrow 4\pi$ at 1.6-2.2 GeV/c (with J.W. Chapman et al.), *Nucl. Phys.* **B24**, 455-452 (1970).

1971

22. Neutron Diffraction Dissociation and Coulomb Dissociation from Nuclei (with L.W. Jones, D.D. O'Brien, M. Davis, B.G. Gibbard, M. J. Longo, and M.N. Kreisler), *Phys. Lett.* **36B**, 560-562 (1971).
23. Reaction $\bar{p}p \rightarrow KK\pi\pi\pi$ at 1.6-2.2 GeV/c (with J.W. Chapman et al.) *Phys. Rev.* **D4**, 1275-1284 (71).

1972

24. Antiproton Annihilation at 1.6-2.2 into Final States with a K_L^0 Meson, *Nucl. Phys.* **B42**, 1-23 (72).
25. Decay Angular Distributions of p^{\pm} States Formed in Diffraction Dissociation of Neutrons on Carbon (with L.W. Jones et al.), *Nucl. Phys.* **B45**, 1-11 (1972).
26. Measurement of the Charged Particle Multiplicity in PP Collisions at 102 GeV/c (with J.W. Chapman, N. Green, B.P. Roe, A. Seidl, and D. Sinclair). *Phys. Rev. Lett.* **29**, 25, 1686-1688 (1972).

1973

27. Helicity Nonconservation in the Reaction $dP \rightarrow dP\pi^+\pi^-$ at 25 GeV/c (with J. Chapman, J. Cooper, B. Roe, and D. Sinclair), *Phys. Rev. Lett.* **30**, 2, 64-67 (1973).
28. Production of ν , Λ^0 , K_S^0 and Λ^0 in pp Collisions at 102 GeV/c (with J. Cooper, N. Green, B. Roe, A. Seidl, C.M. Bromberg, D. Cohen, T. Ferbel, and P. Slattery), *Phys. Rev. Lett.* **47B**, 5, 465-468 (1973).
29. Cross Sections and Charged Particle Multiplicities at 102 and 405 GeV/c (with 11 others), *Phys. Rev. Lett.* **31**, 1563-1566 (1973).

1974

30. Diffractive Component in pp Collisions at 102 and 405 GeV (with 8 others), *Phys. Rev. Lett.* **32**, 5, 257-260 (1974).
31. Pion Production in pp Collisions at 102 GeV/c (with C.M. Bromberg and 8 others), *Phys. Rev.* **D9**, 1964-1871 (1974).
32. Diffraction Dissociation and Coulomb Dissociation of High Energy Neutrons by Nuclei (with D.D. O'Brien et al.), *Nucl. Phys.* **B77**, 1-34 (1974).
33. Diffraction Dissociation of Neutrons in the Reaction $dp \rightarrow ppp\pi^-$ at 25 GeV/c (with J.W. Cooper and A.A. Seidl) *Nucl. Phys.* **B79**, 259-275 (1974).
34. Laboratory Angular Distributions for the Production of Charged Secondaries in Inelastic Proton-Proton Collisions at 102 GeV/c (with J.W. Cooper et al.), *Nucl. Phys.* **B80**, 239-246 (1974).
35. Production Properties of Low-Mass Systems in pp Collisions at 102 GeV/c (with J.P. deBrion et al.), *Phys. Lett.* **B52**, 477 (74).
36. Two-Pion Correlations in pp Collisions at 102 GeV/c (with J. Cooper and A. Seidl), *Phys. Rev. Lett.* **D10**, 3100-3104 (1974).

1975

37. Production of $\Delta(1236)$ in pp Collisions at High Energies (with J.P. DeBrion et al.), *Phys. Rev. Lett.* **34**, 910-913 (1975).
38. The Charge Structure of Multiparticle Final States in pp Collisions at 102 and 400 GeV/c (with C. Bromberg et al.), *Phys. Rev.* **D12**, 1224-1231 (1975).

1976

39. Multiplicity Distributions in High Energy Neutrino Interactions (with J.W. Chapman et al.), *Phys. Rev. Lett.* **36**, 124 (1976).
40. Inclusive Strange Particle Production by νp Interactions in the 10-200 GeV Region (with J.P. Berge et al.), *Phys. Rev. Lett.* **36**, 127 (1976).
41. π^+d and pd Collisions at 100 GeV/c, *Acta Phys. Pol.* **B7**, 211 (1976).
42. Experimental Study of Inclusive Deep Inelastic Neutrino-Proton Scattering (with J.P. Berge et al.), *Phys. Rev. Lett.* **36**, 639 (1976).
43. Multiplicity Distributions in π^+d and pd Collisions at 100 GeV/c (with S. Dado et al.), *Phys. Lett.* **60B**, 397 (1976).
44. Inclusive and Semi-Inclusive Pion Production in pp Collisions at 102 GeV/c and 400 GeV/c (with C. Bromberg et al.), *Nucl. Phys.* **B107**, 82 (1976).
45. Neutrino-Proton Interactions at Fermilab Energies: Experimental Arrangement, Analysis Procedures, and Qualitative Features of the Data (with J.W. Chapman et al.), *Phys. Rev.* **D14**, 5 (1976).
46. Inclusive Reactions $p + n \rightarrow p + x$ and $\pi^+ + n \rightarrow p + x$ at 100 GeV/c, (with W.J. Hanlon et al.), *Phys. Rev. Lett.* **37**, 967 (1976).

1977

47. Rescattering in 100-GeV/c Proton-Deuteron and π^+ -Deuteron Interactions (with J.E.A. Lys et al.), *Phys. Rev.* **D15**, 1857-1866 (1977).
48. Rapidity Correlations in pp Collisions at 102 and 400 GeV/c (with C. B. Bromberg et al.), *Phys. Rev.* **D15**, 1215 (1977).
49. Ratio of Neutral-Current to Charged-Current Cross Sections for Inclusive Neutrino Interactions in Hydrogen (with F.A. Harris et al.), *Phys. Rev. Lett.* **39**, 437-440 (1977).
50. Charged-Particle Multiplicity Distributions in 100 GeV/c pd , π^+d , p -nucleon, and π -nucleon Interactions (with J.E.A. Lys et al.), *Phys. Rev.* **D16**, 3127 (1977).

1978

51. Inclusive Neutral Strange Particle Production from High Energy νp Charged-Current Interactions (with Fermilab, LBL, U. of Hawaii), *Phys. Rev. D* **18**, 1359-1366 (1978).
52. Cross Section Measurements for the Reactions $\nu p \rightarrow \nu^- \pi^+ \rightarrow \mu^- K^+ p$ at High Energies (with Fermilab, LBL, U. of Hawaii), *Phys. Rev. Lett.* **41**, 1008-1011 (1978).
53. Study of the Reaction $\nu p \rightarrow \mu^- \Delta^{++}$ at High Energies and Comparisons with Theory (with Fermilab, LBL, U. of Hawaii), *Phys. Rev. Lett.* **41**, 1012-1015 (1978).
54. Diffractive Production of Vector Mesons in High-Energy Neutrino Interactions (with Fermilab, LBL, U. of Hawaii), *Phys. Rev. Lett.* **40**, 1226-1229 (1978).

1979

55. Experimental Study of Hadrons Produced in High-Energy Charged-Current Neutrino-Proton Interactions (with Fermilab, LBL, U. of Hawaii), *Phys. Rev. D* **19**, 1-16 (1979).
56. Experimental Properties of Neutrino-Induced Jets, *Phys. Scrip.* **19-2**, 173-178 (1979).

1983

57. Search for Proton Decay into $e^+ \pi^0$ (with R.M. Bionta et al.), *Phys. Rev. Lett.* **51**, 27 (1983).
58. Experimental Limits on Magnetic Monopole Catalysis of Nucleon Decay (with S. Errede et al.), *Phys. Rev. Lett.* **51**, 245 (1983).
59. The First Third of a Year...Proton Decay Physics from the IMB Detector (with L.R. Sulak et al.), *Hadronic J.* **6**, 1391, September 1983.

1984

60. Search for $N\bar{N}$ Oscillations in Oxygen (with T.W. Jones et al.), *Phys. Rev. Lett.* **52**, 720 (1984).
61. Search for Nucleon Decay into $\mu^+ K^0$ and νK^0 (with B.G. Cortez et al.), *Phys. Rev. Lett.* **52**, 1092 (1984).

1985

62. Experimental Limits on the Nucleon Lifetime for Two and Three Body Decay Modes (with H.S. Park et al.), *Phys. Rev. Lett.* **54**, 22 (1985).
63. Experimental Limits on the Free Proton Lifetime for Two and Three Body Decay Modes (with G. Blewitt et al.), *Phys. Rev. Lett.* **55**, 2114 (1985).

- 64. Test of Neutrino Oscillations Using Atmospheric Neutrinos (with J.M. LoSecco et al.), *Phys. Rev. Lett.* **54**, 2299 (1985).
- 65. Experimental Limits on Monopole Catalysis, NN Oscillations and Nucleon Lifetimes (with H.S. Park, et al.), *Nucl. Phys.* **B252**, 261 (1985).

1986

- 66. The Continuing Search for Proton Decay, *Physics News in 1985: An AIP Special Report*, *Physics Today*, January 1986.
- 67. The IMB Photomultiplier Test Facility (with C. Wuest, et al.), *Nucl. Instr. and Meth.* **A239**, 467 (1985).
- 68. Calculation of Atmospheric Neutrino-induced Backgrounds in a Nucleon Decay Search (with T.J. Haines et al.), *Phys. Rev. Lett.* **57**, 1986 (1986).
- 69. Comment on "Model for the Underground Muons Associated with Cygnus X-3", *Phys. Rev. Lett.* **57**, 2872 (1986).

1987

- 70. An Upper Limit on the Flux of Extraterrestrial Neutrinos (with R. Svoboda et al.), *Astrophysical Journal* **315**, 420 (1987).
- 71. Observation of a Neutrino Burst in Coincidence with Supernova 1987a in the Large Magellanic Cloud (with R.M. Bionta, et al.), *Phys. Rev. Lett.* **58**, 1494 (1987).
- 72. Investigation of Matter Enhanced Neutrino Oscillations Relevant to the Solar Neutrino Problem (with J.M. LoSecco et al.), *Phys. Lett.* **B184**, 305 (1987).
- 73. Limits on the Neutrino Lifetime (with J.M. LoSecco et al.), *Phys. Rev.* **D35**, 2073 (87).
- 74. Limits on the Flux of Energetic Neutrinos from the Sun (with J.M. LoSecco et al.), *Phys. Lett.* **B188**, 388 (1987).
- 75. Underground Search for Muons Associated with Cygnus X-3 (R.M. Bionta et al.), *Phys. Rev.* **D36**, 30 (1987).
- 76. A Waveshifter Light Collector for a Water Cherenkov Detector (with R. Claus et al.), *Nucl. Instr. Meth.* **A261**, 540 (1987).

1988

- 77. Neutrinos from SN1987A in the IMB Detector (with T. Haines, et al.), *Nucl. Instr. and Methods* **A264**, 28 (1988).
- 78. Angular Distribution of Events from SN1987A (with C.B. Bratton, et al.) *Phys. Rev.* **D37**, 3361 (1988).
- 79. Observation of SN1987A by Neutrino Light (with F. Reines), *Physics Reports* **163**, 137 (1988).
- 80. Search for Multitrack Nucleon Decay (with S. Seidel, et al.) *Phys. Rev. Lett.* **61**, 2522 (1988).

1989

81. Possible Evidence for a New Particle from SN1987A, *Phys. Rev.* **D39**, 1492 (1989).
82. Experimental Upper Limit to the Galactic Stellar-Collapse Rate (with S.T. Dye, et al.), *Phys. Rev. Lett.* **62**, 2069 (1989).
83. Search for Gamma Rays Above 10^{14} eV From Cyg X-3 During the June and July 1989 Radio Outbursts (with G.L. Cassiday, et al.), *Phys. Rev. Lett.* **63**, 2329 (1989).

1990

84. Search for > 200 TeV Photons from Cygnus X-3 in 1988 and 1989 (with D. Ciampa, et al.), *Phys. Rev.* **D42**, 281 (1990).
85. Search for Proton Decay into $e^+ + \pi^0$ in the IMB-3 Detector (with R. Becker-Szendy, et al.), *Phys. Rev.* **D42**, 2974 (1990).

1991

86. Search for Diffuse Cosmic Gamma Rays Above 200 TeV (with J. Matthews, et al.), *Ap. J.*, **375**, 202 (1991).
87. Measurement of Atmospheric Neutrino Composition with the IMB-3 Detector (with D. Casper, et al.), *Phys. Rev. Lett.* **66**, 2561 (1991).

1992

88. A Search for Discrete Sources of 100 TeV Gamma Radiation (with J.W. Cronin, et al.), *Phys. Rev.* **D45**, 4385 (1992).
89. Search for Compact Sources of Photons Above 200 TeV (with D.P. Ciampa, et al.), *Phys. Rev.* **D46**, 3248 (1992).
90. A Search for Muon Neutrino Oscillations with the IMB Detector (with R. Becker-Szendy, et al.), *Phys. Rev. Lett.* **69**, 1010 (1992).
91. Design Parameters for a 10^{20} eV Array (with K.D. Green, et al.), *Nucl. Phys.* **28B**, 130-134 (1992).

1993

92. The IMB-3 Detector (with R. Becker-Szendy, et al.), *Nucl. Inst. and Meth.* **A324**, 363 (1993).
93. A Northern Sky Survey for Astrophysical Point Sources of 100 TeV Gamma Radiation (with T.A. McKay et al.), *Astrophys. J.* **417**, 742 (1993).

1994

94. A Large Air Shower Array to Search for Astrophysical Sources Emitting Gamma-Rays with Energies $\geq 10^{14}$ Ev. (with A. Borione, et al.), Nucl. Instr. and Meth. A364, 329 (1994).
95. Observation of the Shadows of the Moon and the Sun Using 100 TeV Cosmic Rays. (with A. Borione et al.), Phys. Rev. D49, 1171 (1994).
96. A Search for Astrophysical Sources of Low-Energy Neutrinos Using the IMB Detector. (with R.S. Miller et al.), Ap. J. 428, 629 (1994).

1995

97. Calibration of the IMB Detector. (with R. Becker-Szendy, et al.), Nucl. Instr. and Meth. A352, 629 (1995).
98. A Search for Moderate- and High-Energy Neutrino Emission Correlated with Gamma-Ray Bursts. (with R. Becker-Szendy et al.) Ap.J. 444 415(1995)

1996

99. A Search for Ultra-high Energy Gamma Rays from EGRET-detected Active Galactic Nuclei with CASA-MIA. (with M. Catanese et al.) Ap.J. 469 572(1996)
100. A Search for Diffuse Sources of Ultra-high Energy Gamma Rays. (with A. Borione et al.) Nucl. Phys. B48 483(1996)

1997

101. A Search for Ultra-high Energy Gamma Ray Emission from the Crab Nebula and Pulsar. (with A. Borione et al.) Ap.J. 481 313(1997)
102. High Statistics Search for Ultra-high Gamma-ray Emission from Cygnus X-3 and Hercules X-1. (with A. Borione et al.) Phys Rev D55 1714(1997)
103. Limits on the Isotropic Diffuse Flux of Ultrahigh Energy Gamma Radiation. (with M.C. Chantell et al.) Phys Rev Lett 79 1805(1997)

1998

104. Constraints on Gamma-Ray Emission from the Galactic Plane at 300 TeV. (with A. Borione et al.) Astrophys J. 493 175(1998)

1999

105. The Cosmic Ray Energy Spectrum between 10^{14} and 10^{16} eV. (with M.A.K. Glasmacher et al.) *Astroparticle Phys.* 10 291(1999)
106. The Cosmic Ray Composition between 10^{14} and 10^{16} eV. (with M.A.K. Glasmacher et al.) *Astroparticle Phys* 12 1 (1999)
107. Search for Nucleon Decay using the IMB-3 Detector. (with C. McGrew et al.) *Phys Rev* D59 052004 (1999)

2000

108. Evidence for Changing of the Cosmic Ray Composition between 10^{17} and 10^{18} eV from Multi-Component Measurements. (with T. Abu-Zayyad et al.) *Phys Rev Lett* 84 4276 (2000)

2001

109. A Measurement of the Average Longitudinal Development Profile of Cosmic Ray Air Showers between 10^{17} and 10^{18} eV. (with T. Abu-Zayyad et al.) *Astropart. Phys* 16 1(2001)
110. Measurement of the Cosmic Ray Energy Spectrum from 10^{17} to $10^{18.3}$ using a Hybrid Fluorescence Technique. (with T. Abu-Zayyad et al.) *Astrophys J.* 557 686(2001)

Conference Proceedings

1. Properties of Strange Particles Produced in Propane by 1.1 BeV⁺ Mesons, (with J.L. Brown, J. Cronin, S. DeBenedetti, D.A. Glaser, D.I. Meyer, and M.L. Perl), International Conference on Mesons and Recently Discovered Particles, Summary of Communications (September 1957).
2. Observation of the Reaction $\pi^+ + p \rightarrow \Sigma^+ K^+$, (with J. Cronin and D.A. Glaser) Proceedings of the International Conference on Mesons and Recently Discovered Particles, Venice, (1957) 1, p. 33.
3. A Remark About the Fraction of Single Dissociation, Proceedings of the XVIth International Conference on High Energy Physics, Chicago (1972) 1, pp. 260-261.
4. Nucleon Diffraction Dissociation, Proceedings of the VIIth Recontre de Moriond, ed. J. Tran Than Van (1972) II, pp. 141-160.
5. Recent Results from the NAL Bubble Chamber, Stony Brook (1973), AIP Conference Proceedings, ed. C. Quigg, (1973) 15, pp. 124-146.
6. The Diffractive Component in pp Interactions as Seen in the NAL Bubble Chamber, Proceedings of 9th Recontre de Moriond, ed. J. Tran Than Van, Meribel-les-Allures (1974).
7. Conference Summary and Conclusions, Proceedings of the 9th Recontre de Moriond, ed. J. Tran Than Van, Meribel-les-Allures (1974).
8. Neutrino-Proton Interactions in the 15-foot Bubble Chamber and Properties of Hadron Jets, Proceedings of the Fourth International Winter Meeting on Fundamental Physics, Solarda, Spain (1976) ed. A. Ferrendo, pp. 291-314.
9. Properties of the Hadronic System Produced in Neutrino-Proton Interactions, VIth International Winter Meeting on Fundamental Physics, Madrid, Spain (February 1978) ed. M. Argular-Benitez.
10. A Review of Proton Decay Experiments, SLAC Summer Institute on Particle Physics, Stanford (August 1980).
11. The IMB Proton Decay Experiment, Proceedings of the 1981 International Conference on Neutrino Physics and Astrophysics, Maui, Hawaii (1981) 1, p. 205.
12. The IMB Nucleon Decay Detector Data Acquisition and Triggering System, (with J. LoSecco, B. Cortez, G.W. Foster, and E. Shumard) Proceedings of the Topical Conference on the Application of Microprocessors to High-Energy Physics Experiments, Cern 81-07 (July 17, 1981) pp. 471-478.
13. Applications of the IMB Detector to Cosmic Rays and Cosmology, (with R. Bionta et al.) Proceedings of the 17th International Cosmic Ray Conference, Paris, France (1981).

14. Status of the IMB Experiment, R.M. Bionta, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, T.W. Jones, W.R. Kropp, J. Learned, J.M. LoSecco, P.V. Ramana Murthy, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H. Sobel, J.L. Stone, L.R. Sulak, J.C. van der Velde, and C. Wuest, Proceedings of the International Conference on Baryon Nonconservation, Tata Institute, Bombay, (1982). pp. 137-142.
15. IMB Proton Lifetime Project, R.M. Bionta, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, J. Greenberg, T.W. Jones, W.R. Kropp, J. Learned, J.M. LoSecco, P.V. Ramana Murthy, H.S. Park, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H. Sobel, J.L. Stone, L.R. Sulak, J.C. van der Velde, and C. Wuest, Quarks, Leptons, and Supersymmetry, Proceedings of the Moriond Conference (Tran Than Van, ed.), Vol. 1, (1982) p. 447.
16. Status of the Irvine-Michigan-Brookhaven Nucleon Decay Search, R.M. Bionta, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, T.W. Jones, W.R. Kropp, J. Learned, J.M. LoSecco, P.V. Ramana Murthy, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H. Sobel, J.L. Stone, L.R. Sulak, J.C. van der Velde, and C. Wuest, Proceedings of the Third Workshop on Grand Unification, Chapel Hill (P. Frampton, S.L. Glashow, and H. van Dam, eds.) Birkhauser, (1982) p. 236.
17. Cosmic Ray Physics with the IMB Nucleon Decay Detector, R.M. Bionta, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, J. Greenberg, T.W. Jones, W.R. Kropp, J. Learned, E. Lehmann, J.M. LoSecco, P.V.R. Murthy, H.S. Park, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H. Sobel, J.L. Stone, R. Svoboda, L.R. Sulak, J.C. van der Velde, and C. Wuest, Proceedings of the Workshop on Very High Energy Cosmic Ray Interactions (M. Cherry, K. Lande, and R. Steinberg, eds.) University Penn. Press (1982) p. 339.
18. Results on Proton Decay from the IMB Detector, R.M. Bionta, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, J. Greenberg, T.J. Haines, T.W. Jones, D. Kielczewski, W.R. Kropp, J.G. Learned, E. Lehmann, J.M. LoSecco, P.V. Ramana Murthy, H.S. Park, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H.W. Sobel, J.L. Stone, L.R. Sulak, R. Svoboda, J.C. van der Velde, and C. Wuest, Proceedings of the XVIIIth Rencontre de Moriond, Les Arc, France, March, 1983 (Tran Than Van, ed.)
19. Search for Nucleon Decay, R.M. Bionta, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, J. Greenberg, T.J. Haines, T.W. Jones, D. Kielczewski, W.R. Kropp, J.G. Learned, E. Lehmann, J.M. LoSecco, P.V. Ramana Murthy, H.S. Park, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H. Sobel, R. Svoboda, J.C. van der Velde, and C. Wuest, submitted to the Proceedings of the 18th International Cosmic Ray Conference, India, 1983.

20. Muon Studies with the IMB Detector, R. Bionta, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, G. Greenberg, T.J. Haines, T.W. Jones, D. Kielczewski, W.R. Kropp, J.G. Learned, E. Lehmann, J.M. LoSecco, P.V.R. Murthy, H.S. Park, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H. Sobel, J.L. Stone, L.R. Sulak, R. Svoboda, J.C. van der Velde, and C. Wuest, submitted to the Proceedings of the 18th International Cosmic Ray Conference, India, 1983.
21. IMB Detector - The First 30 Days, R.M. Bionta, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, J. Greenberg, T.J. Haines, T.W. Jones, D. Kielczewski, W.R. Kropp, J.G. Learned, E. Lehmann, J.M. LoSecco, P.V. Ramana Murthy, H.S. Park, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H. Sobel, J.L. Stone, L.R. Sulak, R. Svoboda, J.C. van der Velde, and C. Wuest, Proceedings of the Orbis Scientiae Conference, 1983 (in press).
22. Report on the IMB Experiment, Fourth Workshop on Grand Unification, University of Pennsylvania, (April 21-23, 1983).
23. A Search for Proton Decay into $e^+\pi^0$, R.M. Bionta, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, J. Greenberg, T.J. Haines, T.W. Jones, D. Kielczewski, W.R. Kropp, J.G. Learned, E. Lehmann, J.M. LoSecco, P.V. Ramana Murthy, H.S. Park, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H. Sobel, J.L. Stone, L.R. Sulak, R. Svoboda, J.C. van der Velde, and C. Wuest, Proceedings of the International Conference on Matter Instability (E. Bellotti, ed.) Frascati, Italy, 1983 (in press).
24. Calibrating the World's Largest Calorimeter, R.M. Bionta, H.S. Park, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, J. Greenberg, T.J. Haines, T.W. Jones, D. Kielczewski, W.R. Kropp, J.G. Learned, E. Lehmann, J.M. LoSecco, P.V. Ramana Murthy, F. Reines, J. Schultz, E. Shumard, D. Sinclair, D.W. Smith, H.W. Sobel, J.L. Stone, L.R. Sulak, R. Svoboda, J.C. van der Velde, and C. Wuest, Proceedings of the Workshop on Calorimeter Calibration, Fermilab, April 29-30, 1983.
25. Results from the IMB Detector, R.M. Bionta, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, T.J. Haines, T.W. Jones, D. Kielczewski, W.R. Kropp, J.G. Learned, E. Lehmann, J.M. LoSecco, H.S. Park, F. Reines, J. Schultz, E. Shumard, D. Sinclair, H. Sobel, J.L. Stone, L.R. Sulak, R. Svoboda, J.C. van der Velde, and C. Wuest, Proceedings of the XIV International Symposium on Multiparticle Dynamics, Lake Tahoe, California, June 1983.
26. Recent Results from the IMB Detector, R.M. Bionta, G. Blewitt, C.B. Bratton, B.G. Cortez, S. Errede, G.W. Foster, W. Gajewski, M. Goldhaber, T.J. Haines, T.W. Jones, D. Kielczewski, W.R. Kropp, J.G. Learned, E. Lehmann, J.M. LoSecco, H.S. Park, F. Reines,

- J. Schultz, E. Shumard, D. Sinclair, H. Sobel, J.L. Stone, L.R. Sulak, R. Svoboda, J.C. van der Velde, and C. Wuest, Proceedings of the SLAC Topical Conference on Particle Physics, Stanford, California, July 1983.
27. Neutrino Oscillations and Neutrino Astronomy in a Large Flat Detector, Proceedings of the Monopole 83 Conference, J.L. Stone, ed., Ann Arbor (1983).
 28. Experimental Limits on Nuclear Decay and $WB=2$ Processes, Blackburn Miniconference on Low Energy Tests of Conservation Laws in Particle Physics, K. Goto, ed. (1983).
 29. Preliminary Results from Upward Muons, in Phenomenology of Gauge Theories, J. Tranthanhvan, ed. (1984).
 30. Experimental Status of Proton Decay, Proceedings of the First Aspen Winter Physics Conference, M.M. Block, ed. (1985). *Annals of the New York Academy of Sciences* 461, 615 (1986).
 31. Experimental Limits for 34 Nucleon Decay Modes from the IMB Detector, R.M. Bionta et al., Proc. XXth Rencontre de Moriond, J. Tran-Than-Van, ed. (1985).
 32. The University of Michigan Plans for Muon Detection at the Fly's Eye, Proc. of the UHE Cosmic Ray Workshop, Salt Lake City, UT (1987).
 33. Observation of a Neutrino Burst from Supernova 1987a, Proc. of the 22nd Rencontre de Moriond, J. Tran-Than-van, Ed. (1987).
 34. Neutrinos from SN1987A in the IMB Detector, Eighth Workshop on Grand Unification, Syracuse University, K.C. Wali, ed. (April 16, 1987).
 35. Neutrino Data from SN1987A, "Fifth Force and Neutrino Physics", VIII Moriond Workshop, Editions Frontieres, O. Fackler and J. Tran Thanh Van, Eds. (1988).
 36. Possible Evidence for Dark Matter from SN1987A, XXIII Rencontre de Moriond, Editions Frontieres, J. Tran Thanh Van, ed. (1988).
 37. A Possible Explanation of the Angular Distribution of Neutrinos from SN1987A, Vulcano Workshop 1988, Italian Physical Society Conference Proceedings, (F. Giovannelli and G. Mannocchi, eds).
 38. Muon and Electron Content of Extensive Air Showers above 10^{14} eV (with G.L. Cassiday *et al.*), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
 39. The Muon Content of Extensive Air Showers with $E > 2 \times 10^{17}$ eV (with G.L. Cassiday *et al.*), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
 40. Search for Proton Decay Into $e^+\pi^0$ in the IMB-3 Detector (with Z.J. Ajaltouni *et al.*), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
 41. Cygnus X-3 Results from the Utah Cerenkov Array (with G.L. Cassiday *et al.*), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
 42. Hercules X-1 Results from the Utah Cerenkov Array (with G.L. Cassiday *et al.*), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).

43. Search for Discrete Sources of Neutral Radiation above 10^{14} eV (with D. Ciampaet al.), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
44. Search for UHE Neutral Radiation from the Crab Nebula and Pulsar (with G.L. Cassiday et al.), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
45. Search for UHE Neutral Radiation from the Cygnus X-3 (with G.L. Cassiday et al.), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
46. Search for UHE Neutral Radiation from the Hercules X-1 (with G.L. Cassiday et al.), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
47. Search for Diffuse Emission of UHE Gamma Rays (with D. Ciampaet al.), *Proceedings of the 21st ICRC*, Adelaide, Australia (1990).
48. An Update on the IMB Search for Extraterrestrial Neutrinos (with R. Becker-Szendy, et al.), *International Workshop on Neutrino Telescopes*, Venice, 1988, Ed. by M. Baldo Ceolin.
49. Search for Diffuse Cosmic Gamma Rays Above 200 TeV with the Utah-Michigan Array (with J. Matthews, et al.), *Proc. International Conference on High Energy Gamma Ray Astronomy*, Ann Arbor, Michigan, Ed. by J. Matthews (1990).
50. A Search for Muon Neutrino Oscillations with the IMB Detector (R. Becker-Szendy, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
51. Muon and Electron Lateral Distribution in EAS from 10^{14} to 10^{16} eV As Observed by the UMC Detector (J.C. van der Velde, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
52. Study of Extensive Air Showers (EAS) Detected with the Fly's Eye and the UMC Air Shower Array (K.D. Green, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
53. A Search for 100 TeV Emission from the Crab Nebula and Pulsar Using the UMC Detector (K.G. Gibbs, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
54. A Search for Continuous 100 TeV Gamma-Ray Emission from Hercules X-1 (T.A. McKay, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
55. A Search for 100 TeV Gamma-Ray Emission from Cygnus X-3 Using the 49 Element UMC Array (H.A. Krimm, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
56. A Search for 100 TeV Gamma-Ray Emission from Cygnus X-3 (R.A. Ong, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
57. Search for Point Sources of U.H.E. Gamma Rays Using the Utah Cherenkov Array (S.C. Corbató, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
58. A Search for Diffuse Sources of 100 TeV Gamma-Ray Emission (C.E. Covault, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).

59. A Search for Discrete Sources of Neutral Radiation Above 10^{14} eV Using the 49 Element UMC Prototype (H.A. Krimm, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
60. A Search for UHE Sources of Neutral Radiation (D. Nitz, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
61. Spectra and Compositions Studies with the UMC Detector (J. Matthews, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
62. UMC: A Sensitive New Detector for UHE Gamma-Ray Astronomy (B.E. Fick, et al.), *Proceedings of the 22nd ICRC*, Dublin, Ireland (1991).
63. Design Parameters for a 10^{20} eV Array (with K.D. Green et al.), *Nucl. Phys. B* **25A** (1992).
64. A Search for 100 TeV Gamma-Rays from Cygnus X-3 and the Crab with CASA-MIA (with A. Borione, et al.), to be published *AIP Conference Proceedings* (1993).
65. A Northern Sky Survey for Astrophysical Point Sources of 100 TeV Gamma Radiation (A. Borione, et al.), to be published *AIP Conference Proceedings* (1993).

Invited Papers

1. Homogeneous Solid State Ionization Chamber, (with J.D. van Putten) , Annual National Meeting of the Professional Group on Nuclear Science, October 1960; I.R.E. Transactions on Nuclear Science NS-8 (1961) 1, p. 124.
2. Review of the H Meson, XIIIth International Conference on High Energy Physics, Berkeley, California (1966).
3. Review of Meson Production in pp Formation Experiments, First Annual Division of Particles and Fields Meeting, Boulder, Colorado (1969).
4. Diffraction Dissociation of the Nucleon, VIIth Recontre de Moriond, Meribel-les-Allues, France (1972).
5. Recent Results from the NAL Bubble Chamber, 5th International Conference on High Energy Collisions, Stony Brook (1973), AIP Conference Proceedings 15, ed. C. Quigg (1973) pp. 124-146.
6. The Diffractive Component in pp Interactions as Seen in the NAL Bubble Chamber, Proceedings of 9th Recontre de Moriond, ed. J. Tran Than Van, Meribel-les-Allues (1974).
7. Conference Summary and Conclusions, Proceedings of the 9th Recontre de Moriond, ed. J. Tran Than Van, Meribel-les-Allues (1974).
8. pd and π^+ + d Collisions at 100 GeV/c, 15th Cracow School of Theoretical Physics, Zakoponne, Poland (June 1975) Acta Phys. Pol. B7, 211 (1976).
9. Neutrino-Proton Interactions in the 15-foot Bubble Chamber and Properties of Hadron Jets, Proceedings of the Fourth International Winter Meeting on Fundamental Physics, Solardu, Spain (1976) ed. A. Ferrendo, pp. 291-314.
10. Lepton Interactions: Properties of the Hadron System, 1976 Gordon Conference, Tilton, New Hampshire (1976).
11. Neutrino-Proton Interactions in the 15-foot Bubble Chamber and Search for Charmed Particles, XIIth Recontre de Moriond, Flaine, France (1977).
12. Properties of the Hadronic System Produced in Neutrino-Proton Interactions, VIth International Winter Meeting on Fundamental Physics, Madrid, Spain (February 1978).
13. Experimental Properties of Neutrino-Induced Jets, Symposium on Jets in High Energy Collisions, Neils Bohr Institute, Copenhagen, Denmark (July 1978).
14. Neutrino Induced Structure Functions: Fermilab Bubble Chamber Results, Ettore Mojarana Center Conference on Probing Hadrons with Leptons, Erice, Sicily (March 1979).
15. Properties of Hadrons Produced by Neutrinos in Hydrogen, Ettore Mojarana Center Conference on Probing Hadrons with Leptons, Erice, Sicily (March 1979).

16. Proton Decay Experiments Using the Water Cerenkov Technique, XV Rencontre de Moriond, Les Arcs, France (1980).
17. Proton Decay Under Lake Erie, American Physical Society Meeting (Ohio Section), Toledo, Ohio (May 10, 1980).
18. A Review of Proton Decay Experiments, Summer Institute of Particle Physics, Stanford, California (August 6-8, 1980).
19. The IMB Proton Decay Experiment, Neutrino-81 International Conference on Neutrino Physics and Astrophysics, Maui, Hawaii (1981).
20. Status of the Irvine-Michigan-Brookhaven Experiment, International Conference on Baryon Nonconservation, Bombay, India (1982).
21. First Results from the IMB Proton Decay Experiment, International Conference on Matter Nonconservation, Frascati, Italy (January 1983).
22. Search for Proton Decay into $e^+\pi^0$, XVIII Rencontre de Moriond, LaPlagne, France (1983).
23. Neutrino Oscillations and Neutrino Astronomy in a Large Flat Detector, Monopole 83 Conference, Ann Arbor, Michigan (1983).
24. Experimental Limits on Nuclear Decay and $WB=2$ Processes, Blacksburg Miniconference on Low Energy Tests of Conservation Laws in Particle Physics, Blacksburg, Virginia (1983).
25. Preliminary Results from Upward Muons, XIV Rencontre de Moriond, LaPlagne, France (1984).
26. Experimental Status of Proton Decay, Aspen Winter Physics Conference, Aspen, Colorado (1985).
27. Preliminary Results from IMB on Underground Muons from Cygnus X-3, 19th ICRC Conference, San Diego, August, 1985.
28. The University of Michigan Plans for Muon Detection at the Fly's Eye Workshop on Cosmic Rays, Salt Lake City DPF Meeting (January 1987).
29. Search for WIMPS in the Sun and Other Sources, 3rd Aspen Winter Physics Conference, Aspen, Colorado, (January 1987).
30. Search for Underground Muons from Cygnus X-3, 3rd Aspen Winter Physics Conference, Aspen, Colorado, (January 1987).
31. Observation of a Neutrino Burst from Supernova 1987a, 22nd Rencontre de Moriond, Les Arcs, France (March 9, 1987).
32. Neutrinos from SN1987A in the IMB Detector, Eighth Workshop on Grand Unification, Syracuse University (April 16, 1987).
33. Summary of Neutrino Data from SN1987A, ICTP Summer Workshop in Cosmology, International Center for Theoretical Physics, Trieste (July 1987).

34. Summary of Results on Nucleon Decay, ICTP Summer Workshop in Cosmology, International Center for Theoretical Physics, Trieste (July 1987).
35. Summary of Neutrino Data from SN1987A, XXIII Recontres de Moriond, Neutrin-
nos and Exotic Phenomena (1988).
36. Angular Distribution of Neutrino Events from SN1987A, Topical Workshop on Su-
pernova 1987A, LaThuile, Italy, (February 1988).
37. Possible Evidence for Dark Matter from SN1987A, XXIII Recontres de Moriond,
Astrophysics Meeting on Dark Matter (1988).
38. Summary of Neutrino Data from SN1987A, Joint Symposium of the Division of
Particles and Fields and the Division of Astrophysics, Spring Meeting of the Amer-
ican Physical Society, Baltimore (1988).
39. Atmospheric Neutrinos in the IMB Detector, 9th Workshop on Grand Unification,
Aix-les-Bains, France (1988).
40. Angular Distribution of Neutrino Events from SN1987A, Vulcano Workshop 1988,
Vulcano Is., Italy.
41. First Results and Future Plans of the UMC Detector, Vulcano Workshop 1988,
Vulcano Is., Italy.
42. Neutrino Astronomy with Underground Detectors, Twelfth International Workshop
on Weak Interactions and Neutrinos, Ginosar, Israel (1989).
43. Design Parameters for a 10^{20} eV Array, International Workshop on Techniques to
Study Cosmic Rays with Energies Greater than 10^{19} eV, Paris, France, *Nucl. Phys*
B (Proc. Suppl.) **28B**, 130-134 (1992).

Seminars and Colloquia

1983

State University of New York (Stony Brook)

Michigan State University

Stanford Linear Accelerator Center

Rochester University

Saclay Laboratory

Indiana University

University of Illinois

1984

Ecole Polytechnique
Orsay
CERN

1985

University of Chicago
Columbia University
Ann Arbor Rotary Club

1986

Amer. Nuclear Society

1987

University of Michigan Research Club
University of Michigan Alumni Association, "Coffee with Faculty"
Orsay Laboratory
Brown University

1988

Orsay Laboratory
Hope College

1990

Niels Bohr Institute

1992

Wines School Science Day, "All Different Kinds of Waves"

1993

First Presbyterian Church Thursday Forum, "Is the Universe an Accident?"

1995

Physics demonstrations for visiting French elementary schoolers (In French) Physics Dept.

Teaching Assignments

| | | | |
|-------|-------------------|-------|----------------------------------|
| I-58 | 46 Lec | I-72 | Lab Supervisor |
| II-59 | 45 Rec | II-73 | Lab Supervisor |
| I-59 | 5 Lec | | 126 Lab |
| | 5 Lec | I-73 | 240 Disc (3) |
| II-60 | 6 Lec | II-74 | Sabbatical |
| | 6 Rec | I-74 | 140 Lec (2) |
| I-60 | 5 Lec | II-75 | 140 Lec (2) |
| | 5 Rec | I-75 | 240 Lec (2) |
| II-61 | 6 Lec | II-76 | 140 Lec (2) |
| I-61 | Research Leave | I-76 | 240 Lec (2) |
| II-62 | 106 Lec | II-77 | 140 Disc (2) |
| | 106 Rec | I-77 | 240 Lec (2) |
| I-62 | 146 Rec | II-78 | 140 Disc (3) |
| | 626 | I-78 | 407 Lab |
| II-63 | 146 Rec | | 409 |
| I-63 | 145 Rec | II-79 | 409 Lab |
| | 401 B | I-79 | 125 Disc (1D) |
| II-64 | 146 Rec | | Elem Lab (1) |
| | 401 | II-80 | 240 Lec (Honors) |
| I-64 | Research Leave | | 240 Disc (Honors) |
| II-65 | 154 Rec | I-80 | 240 Disc (2) |
| | 401 Lec | II-81 | 240 Disc (2) |
| I-65 | 145 Rec | I-81 | 140 Disc (3) |
| II-66 | 145 Lec | II-82 | Research |
| | 145 Lab | I-82 | Research |
| I-66 | Sabbatical | II-83 | 240 Disc (2) |
| II-67 | Sabbatical | I-83 | 140 Disc (2) |
| I-67 | 153 Rec | II-84 | Sabbatical |
| II-68 | 145 Rec | I-84 | Research |
| | 626 Sem (w/Jones) | II-85 | 465 Senior Seminar |
| I-68 | 146 Rec | I-85 | Discussions |
| II-69 | 240 Lec | II-86 | 465 Senior Seminar |
| I-69 | 240 Lec | I-87 | 140 Disc (3) |
| I-69 | 240 Rec | II-87 | 240 Disc (3) |
| II-70 | 140 Lec | II-88 | Sabbatical |
| | 242 Rec | I-88 | 140 Disc (3) |
| I-70 | 140 Lec | II-89 | 465 Senior Seminar, 409, 459 Lab |
| | 140 Lec | I-89 | 252 College Honors Seminar |
| II-71 | 140 Lec | I-90 | 103, 104 The Physical Universe |
| I-71 | 240 Rec | I-91 | 103, 104 The Physical Universe |
| II-72 | 140 Rec | I-92 | 103, 104 The Physical Universe |
| | 240 Rec | | |

Dissertation Committee Chairmanships

J.C. van der Velde

| <u>PhD Recipient</u> | <u>Degree Granted</u> | <u>Current Thesis Students</u> | <u>Year Entered/ Year Candidacy Attained</u> |
|--------------------------|---------------------------|------------------------------------|--|
| Lee, Yong Yung | 1964 | Kennedy, Margaret | 1992/1994 |
| Benson, George C. | 1965 | | |
| Gibbs, Walter | 1967 | | |
| Ring, Harvey | 1970 | | |
| Cooper, John W. | 1975 | | |
| Green, Nick | 1975 | | |
| Toothacker, William | 1977 | | |
| Shumard, Eric | 1984 | | |
| Park, Hye-Sook | 1985 | | |
| Seidel, Sally | 1987 | | |
| Chrysiopoulou, Tina | 1988 | | |
| Casper, David | 1990 | | |
| Ciampa, David | 1991 | | |
| Catanese, Michael | 1994 | | |

Dissertation Committee Memberships

| <u>Name</u> | <u>Physics</u> | <u>Other</u> |
|--------------------------|----------------|--------------|
| Cheam, T. (1982) | X | |
| Kaufman, W. (1986) | X | |
| Chrysiopoulou, P. (1989) | X | |
| McKee, S. (1991) | X | |
| Diehl, E. (1993) | X | |
| Baker, Richard | X | |