

PAUL J NIENABER SJ

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OBJECTIVE: I am seeking a full-time position teaching in a physics department that shares my strong commitment to undergraduate education, preferably in a liberal arts context.

PERSONAL DATA:

Born January 25, 1955, Covington KY Member, Chicago Province of the Society of Jesus
U.S. citizenship ordained a Roman Catholic priest June 12, 1999

EDUCATIONAL RECORD:

Thomas More College, Covington KY B.A. (cum laude) May 1975
Physics and Mathematics

University of Illinois at M.S., Physics August 1976
Urbana-Champaign

Ph.D., Physics March 1988

Field of specialization: Experimental high energy particle physics (neutrino physics)

Thesis title: Single π^0 Production in Charged Current and Neutral Current Neutrino Interactions
(director: Thomas A. O'Halloran, Jr.)

Loyola University Chicago graduate study August 1990 - May 1992
philosophy and theology

Weston Jesuit School of Theology, M.Div. (with distinction) May 1998
Cambridge, MA

Catholic Theological Union Certificate, Pastoral Studies June 1999

EMPLOYMENT HISTORY:

Guest Scientist, Particle Physics Division August 2000 - present
Fermi National Accelerator Laboratory, Batavia, IL

Assistant Professor, Department of Physics August 2001 - May 2003
College of the Holy Cross, Worcester, MA

Assistant Professor, Department of Physics August 1999 - August 2000
Marquette University, Milwaukee, WI

Visiting Assistant Professor, Department of Physics, August 1992 - May 1995
Xavier University, Cincinnati, OH (Jesuit regency)

Assistant Professor, Department of Physics, August 1984 - August 1987
Eastern Illinois University, Charleston, IL

Instructor, Department of Physics, January 1983 - May 1984
Eastern Illinois University, Charleston, IL

Research Assistant, Department of Physics, August 1975 - August 1982
University of Illinois at Urbana-Champaign

Memberships: American Association of Physics Teachers, Sigma Pi Sigma,
American Physical Society Division of Particles and Fields

Research Interest and Activity:

- ◆ Since 1992, I have been working as a member of the NuTeV (Neutrino experiment at the Tevatron) collaboration, preparing and running Experiment E-815 in the Fixed Target neutrino line at the Fermi National Accelerator Laboratory. My participation was full-time during the summer, from 1992 to the present; I was able to be at the lab on an occasional basis during the academic year while teaching at Xavier (8/92 through 5/95). NuTeV ran from 4/96 through 9/97, and is now in the data analysis phase. My responsibilities on NuTeV included work on the detector (particularly in repairing and maintaining drift chambers), taking shift during the run, and work on the data analysis.
- ◆ In December 2000, I joined the MiniBooNE (Booster Neutrino Experiment) collaboration. MiniBooNE is a short baseline neutrino oscillation experiment at Fermilab; we started a two-year data collection run in August 2002. I have worked on detector construction, some specialty photomultiplier tube tests, shift taking, and am a part of the cross-section group, working on multiple pion final states and quasi-elastic scattering. I also am involved in the education and outreach efforts of the MiniBooNE collaboration, and am doing some writing and design work for a number of posters, articles, and brochures. I intend to submit a Cottrell grant proposal to the Research Corporation and a Research at Undergraduate Institutions (RUI) grant to the National Science Foundation; these grants would be used to purchase computer/electronic equipment, and to fund summer undergraduate research participation on MiniBooNE.
- ◆ In a different direction, I am attempting to begin some research on topics related to the intersections between contemporary physics and theology. I have done some course development work in this area in the past, and hope to pursue that in the near term future.

Teaching Experience and Interests:

- ◆ I have approximately ten years' experience in teaching physics at the undergraduate level (about five years at Eastern Illinois University before entering the Jesuits, three years at Xavier University as a Jesuit regent, and at Marquette and Holy Cross each for one year). I have taught courses in acoustics, introductory physics, and astronomy for non-science majors, general physics (calculus and non-calculus, lecture and laboratory), electronics (lecture and laboratory), and classical mechanics (including some engineering statics).
- ◆ I am interested in the applications of more recent physics education research and contemporary classroom techniques (e.g., cooperative and active learning modalities, non-traditional assessment and evaluation, strategies for adult learning), and in issues in science education. I try to be attentive to continue my own education in recent developments in science and in science education; in the 2002/3 academic year I participated in the NSF Chautauqua short course on The New Cosmology, held at the University of Chicago, and the Gordon Research Conference on Teaching Quantum Mechanics, at Mount Holyoke.
- ◆ Two MiniBooNE collaborators and I have designed a program called CoURSE (Consortium for Undergraduate Research in Science and Education). This is one-semester intensive undergraduate research experience program, based at Fermilab; our plan is to submit this as a three-year pilot program proposal to the National Science Foundation. I wrote the syllabus for the Communicating Science course component, a semester-long investigation of skills and techniques for conveying issues in science to its various publics.
- ◆ My studies as a Jesuit in philosophy and theology engage my curiosity about how those disciplines and the sciences can converse together more profitably. I have attended conferences and collaborated in writing grant proposals for multidisciplinary courses in science and theology.

Paul J Nienaber SJ — Selected Publications

NuTeV: E-815 AT FERMILAB / MINIBooNE: E-898 AT FERMILAB

SOLO ARTICLES

Neutrino Experiments at Fermilab in *Beam Line: A Periodical of Particle Physics*, Fall 2001 (31/3) pp 24-31.

CONFERENCE TALKS (presenter in parentheses):

Education and Outreach at MiniBooNE: Challenging Expectations.

By P Nienaber (College of the Holy Cross/Fermilab), American Physical Society/Division of Particles and Fields, Philadelphia PA, 5-8 April 2003.

JOURNAL ARTICLES:

A Precise Determination of Electroweak Parameters in Neutrino Nucleon Scattering.

By NuTeV Collaboration (G.P. Zeller et al.). FERMILAB-PUB-01-341-E, Oct 2001. 5pp.
Published in Phys.Rev.Lett.88:091802,2002; e-Print Archive: hep-ex/0110059

A Search for Muon-Neutrino --> Electron-Neutrino And Muon-Anti-Neutrino --> Electron-Anti-Neutrino Oscillations at NuTeV.

By S. Avvakumov, T. Adams, A. Alton, L. de Barbaro, P. de Barbaro, R.H. Bernstein, A. Bodek, T. Bolton, J. Brau, D. Buchholz, H. Budd, L. Bugel, J. Conrad, R.B. Drucker, B.T. Fleming, R. Frey, J.A. Formaggio, J. Goldman, M. Goncharov, D.A. Harris, R.A. Johnson, J.H. Kim, S. Koutsoliotas, M.J. Lamm, W. Marsh, D. Mason, J. McDonald, K.S. McFarland, C. McNulty, D. Naples, P. Nienaber, V. Radescu, A. Romosan, W.K. Sakumoto, H. Schellman, M.H. Shaevitz, P. Spentzouris, E.G. Stern, N. Suwonjandee, M. Tzanov, M. Vakili, A. Vaitaitis, U.K. Yang, J. Yu, G.P. Zeller, E.D. Zimmerman (Cincinnati U. & Columbia U. & Fermilab & Kansas State U. & Northwestern U. & Oregon U. & Pittsburgh U. & Rochester U.). UR-1640, FERMILAB-PUB-02-051-E, Mar 2002. 4pp.
Published in Phys.Rev.Lett.89:011804,2002; e-Print Archive: hep-ex/0203018

Extraction of $R = \text{Sigma}(L) / \text{Sigma}(T)$ from CCFR Fe-neutrino(muon) and Fe-anti-neutrino(muon) Differential Cross-sections.

By CCFR/NuTeV Collaboration (Un-Ki Yang et al.). UR-1587, Apr 2001. 4pp.
Published in Phys.Rev.Lett.87:251802,2001; e-Print Archive: hep-ex/0104040

A First Measurement of Low X Low Q^2 Structure Functions in Neutrino Scattering.

By CCFR Collaboration and NuTeV Collaboration (B.T. Fleming et al.). Nov 2000. 5pp.
Published in Phys.Rev.Lett.86:5430-5433,2001; e-Print Archive: hep-ex/0011094

Search for Light to Heavy Quark Flavor Changing Neutral Currents in Muon-neutrino N and Anti-muon-neutrino N Scattering at the Tevatron.

By A. Alton, T. Adams, T. Bolton, J. Goldman, M. Goncharov, D. Naples (Kansas State U.), R.A. Johnson, M. Vakili, N. Suwonjandee (Cincinnati U.), J. Conrad, B.T. Fleming, J. Formaggio, J.H. Kim, S. Koutsoliotas, C. McNulty, A. Romosan, M.H. Shaevitz, P. Spentzouris, E.G. Stern, A. Vaitaitis, E.D. Zimmerman (Columbia U.), R.H. Bernstein, L. Bugel, M.J. Lamm, W. Marsh, P. Nienaber, J. Yu (Fermilab), L. de Barbaro, D. Buchholz, H. Schellman, G.P. Zeller (Northwestern U.), J. Brau, R.B. Drucker, R. Frey, D. Mason (Oregon U.), S. Avvakumov, P. de Barbaro, A. Bodek, H. Budd, D.A. Harris, K.S. McFarland, W.K. Sakumoto, Un-Ki Yang (Rochester U.). Jul 2000. 20pp.
Published in Phys.Rev.D63:012001,2001; e-Print Archive: hep-ex/0007059

Observation of Neutral Current Charm Production in Muon Neutrino Fe Scattering at the Tevatron.

By NuTeV Collaboration (A. Alton et al.). Aug 2000. 22pp.
Published in Phys.Rev.D64:012002,2001, Int.J.Mod.Phys.A16S1B:764-766,2001; e-Print Archive: hep-ex/0008068

Observation of an Anomalous Number of Dimuon Events in a High-energy Neutrino Beam.

By NuTeV Collaboration (T. Adams et al.). Apr 2001. 5pp.
Published in Phys.Rev.Lett.87:041801,2001; e-Print Archive: hep-ex/0104037

Search for the Lepton Number Violating Process Anti-neutrino(muon) E- ---> Muon- Anti-neutrino(e).

By NuTeV Collaboration (J.A. Formaggio et al.). FERMILAB-PUB-01-080-E, Apr 2001. 4pp.
Published in Phys.Rev.Lett.87:071803,2001; e-Print Archive: hep-ex/0104029

Precise Measurement of Dimuon Production Cross-sections in Muon Neutrino Fe and Muon Anti-neutrino Fe Deep Inelastic Scattering at the Tevatron.

By NuTeV Collaboration (M. Goncharov et al.). Feb 2001. 31pp.
Published in Phys.Rev.D64:112006,2001; e-Print Archive: hep-ex/0102049

Physics at a Neutrino Factory.

By C. Albright, G. Anderson, Vernon D. Barger, R. Bernstein, G. Blazey, A. Bodek, E. Buckley Geer, A. Bueno, Mario Campanelli, D. Carey, D. Casper, A. Cervera, C. Crisan, F. DeJongh, S. Eichblatt, A. Erner, R. Fernow, D. Finley, J. Formaggio, J. Gallardo, S. Geer, M. Goodman, D. Harris, E. Hawker, J. Hill, R. Johnson, D. Kaplan, S. Kahn, B. Kayser, E. Kearns, B.J. King, H. Kirk, J. Krane, D. Krop, Z. Ligeti, J. Lykken, K. McDonald, Kevin S. McFarland, I. Mocioiu, J. Morfin, H. Murayama, J. Nelson, D. Neuffer, P. Nienaber, R. Palmer, S. Parke, Z. Parsa, R. Plunkett, E. Prebys, C. Quigg, R. Raja, S. Rigolin, A. Rubbia, H. Schellman, M. Shaevitz, P. Shanahan, R. Shrock, P. Spentzouris, R. Stefanski, J. Stone, L. Sulak, G. Unel, M. Velasco, K. Whisnant, J. Yu, E.D. Zimmerman (Argonne, PHY & Boston U. & Brookhaven & Michigan U. & Columbia U. & Valencia U. & Valencia U., IFIC & Zurich, ETH & Fermilab & IIT, Chicago & Iowa State U. & Los Alamos & Marquette U. & NSF, Wash., D.C. & Northwestern U. & Princeton U. & SUNY, Stony Brook & UC, Berkeley & UC, Irvine & Minnesota U. & Rochester U. & Wisconsin U., Madison & Northern Illinois U.). FERMILAB-FN-692, Aug 2000. 133pp. e-Print Archive: hep-ex/0008064

Search for a 33.9-MeV/C² Neutral Particle in Pion Decay.

By NuTeV Collaboration (J.A. Formaggio et al.). Dec 1999. 4pp.
Published in Phys.Rev.Lett.84:4043-4046,2000; e-Print Archive: hep-ex/9912062

Evidence for Diffractive Charm Production in Muon-Neutrino – Fe and Anti-muon-Neutrino – Fe Scattering at the Tevatron.

By NuTeV Collaboration (T. Adams et al.). FERMILAB-PUB-99-269-E, Sep 1999. 13pp.
Published in Phys.Rev.D61:092001,2000; e-Print Archive: hep-ex/9909041

Precision Calibration of the NuTeV Calorimeter.

By NuTeV Collaboration (D.A. Harris et al.). UR-1561, Aug 1999. 29pp.
Published in Nucl.Instrum.Meth.A 663:344-48, 2000; e-Print Archive: hep-ex/9908056

Search for Neutral Heavy Leptons in a High Energy Neutrino Beam.

By E815 Collaboration (A. Vaitaitis et al.). FERMILAB-PUB-99-223-E, Aug 1999. 5pp.
Published in Phys.Rev.Lett.83:4943-4946,1999; e-Print Archive: hep-ex/9908011

A Limit on Muon-neutrino (Anti-muon-neutrino) → Tau-neutrino (Anti-tau-neutrino) Oscillations from a Precision Measurement of Neutrino - Nucleon Neutral Current Interactions.

By K.S. McFarland, D. Naples, C.G. Arroyo, P. Auchincloss, P. de Barbaro, A.O. Bazarko, R.H. Bernstein, A. Bodek, T. Bolton, H. Budd, J. Conrad, R.B. Drucker, D.A. Harris, R.A. Johnson, J.H. Kim, B.J. King, T. Kinnel, G. Koizumi, S. Koutsoliotas, M.J. Lamm, W.C. Lefmann, W. Marsh, C.McNulty, S.R. Mishra, P.Nienaber, M. Nussbaum, M.J. Oreglia, L. Perera, P.Z. Quintas, A. Romosan, W.K. Sakumoto, B.A. Schumm, F.J. Sciulli, W.G. Seligman, M.H. Shaevitz, W.H. Smith, P. Spentzouris, R. Steiner, E.G. Stern, M. Vakili, U.K. Yang (Adelphi U. & Chicago U. & Cincinnati U. & Columbia U. & Fermilab & Kansas State U. & Oregon U. & Rochester U. & Wisconsin U., Madison & Xavier U.). FERMILAB-PUB-95-153, Jun 1995. 13pp.
Published in Phys.Rev.Lett.75:3993-3996,1995. e-Print Archive: hep-ex/9506007

THESIS-RELATED PUBLICATIONS

Single π^0 Production in Charged Current and Neutral Current Neutrino Interactions

By Paul Joseph Nienaber (Illinois U., Urbana). UMI 88-23214-mc (microfiche), 1988. 91pp. Ph.D.Thesis.

Search for Prompt Particle Production in p Cu Interactions at 30 GeV/c.

By P. Sokolsky, P. Coteus, M. Diesburg, R. Fine, W. Lee (Columbia U.), S. Fuess, P. Nienaber, T. O'Halloran (Illinois U., Urbana), Y.Y. Lee (Brookhaven). 1978. In *Oxford 1978, Proceedings, Neutrino Physics at Accelerators*, 248-251.

Measurement of Elastic Muon-neutrino and Anti-muon-neutrino Scattering on Protons.

By P. Coteus, M. Diesburg, R. Fine, W. Lee, P. Sokolsky (Columbia U.), R. Brown, S. Fuess, P. Nienaber, T. O'Halloran (Illinois U., Urbana), Y.Y. Lee (Brookhaven). 1981. Published in Phys.Rev.D24:1420-1423,1981

Automatic Digitization of Optical Spark Chamber Data Using Charge Coupled Devices.

By A. Bross, R. Brown, R. Downing, S. Fuess, J. Kohlmeier, P. Nienaber, D. Richardson, V. Simaitis, R. Virkus (Illinois U., Urbana). 1979.
Published in IEEE Trans.Nucl.Sci.26:4531-4542,1979, Nucl.Instrum.Meth.166:367-378,1979 (No.4)

Search for New Particles at the Alternating Gradient Synchrotron Beam Dump.

By P. Coteus, M. Diesburg, R. Fine, W. Lee, P. Sokolsky (Columbia U.), R. Brown, S. Fuess, P. Nienaber, T. O'Halloran (Illinois U., Urbana), Y.Y. Lee (Brookhaven). Published in Phys.Rev.Lett.42:1438-1440, 1979.

References:

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