

# Publications and Presentations

## IUCF – 2004

### Refereed Publications

\*experimental work done at IUCF  
§ NSF support not acknowledged

\* *Axial Observables in  $\vec{d}\vec{p}$  Breakup and the Three-Nucleon Force*, H.O. Meyer, T.J. Whitaker, R.E. Pollock, B. von Prezowski, T. Rinckel, J. Doskow, J. Kuroś-Żolnierczuk, P.V. Pancella, T. Wise, P. Thörngren-Engblom, B. Lorentz, F. Rathmann, Phys. Rev. Lett. **93**, 112502 (2004).

*Azimuthal anisotropy at Relativistic Heavy Ion Collider: the first and fourth harmonics*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **92**, 062301 (2004).

*Azimuthally Sensitive Hanbury Brown-Twiss Interferometry in Au+Au Collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **93**, 012301 (2004).

*Cross Sections and Transverse Single-Spin Asymmetries in Forward Neutral Pion Production from Proton Collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **92**, 171801 (2004).

*Development of a tagged neutron facility at intermediate energies*, T. Peterson, S.E. Vigdor, C. Allgower, B. Bergenwall, L.C. Bland, J. Blomgren, J. Doskow, T. Hossbach, W.W. Jacobs, C. Johansson, T. Kinashi, J. Klug, A.V. Klyachko, P. Nadel-Turonski, L. Nilsson, N. Olsson, M. Planinic, S. Pomp, J. Rapaport, T. Rinckel, E.J. Stephenson, U. Tippawan, S.W. Wissink, Y. Zhou, Nucl. Instrum. Methods A **527**, 432 (2004).

*Exclusive eta production in proton-proton reactions*, F. Balestra, Y. Bedfer, R. Bertini, L. C. Bland, A. Brenschede, F., Brochard, M. P. Bussa, Seonho Choi, M. L. Colantoni, R. Dressler, M. Dzemidzic, J.-Cl. Faivre, A. Ferrero, L. Ferrero, J. Foryciarz, I. Froehlich, V. Frolov, R. Garfagnini, A. Grasso, S. Heinz, W. W. Jacobs, W. Kuehn, A. Maggiora, M. Maggiora, A. Manara, D. Panzieri, H.-W. Pfaff, G. Piragino, A. Popov, J. Ritman, P. Salabura, V. Tchalyshv, F. Tosello, S. E. Vigdor, and G. Zosi (DISTO Collaboration), Phys. Rev. C **69**, 064003 (2004).

\* *Faddeev calculations of breakup reactions with realistic experimental constraints*, J. Kuroś-Żolnierczuk, P. Thörngren-Engblom, H.O. Meyer, T. J. Whitaker, H. Witała, J. Golak, H. Kamada, A. Nogga and R. Skibiński, Few-Body Systems **34**, 259 (2004).

\* *First Spin Flipping of a Stored Spin-1 Polarized Beam*, V.S. Morozov, Z.B. Etienne, M.C. Kandes, A. D. Krisch, M.A. Leonova, D.W. Sivers, V.K. Wong, and K. Yonehara, V.A. Anferov, H.O. Meyer, P. Schwandt, E.J. Stephenson, and B. von Przewoski, Phys. Rev. Lett **91**, 214801 (2003).

*Identified particle distributions in p+p and Au+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **92**, 112301 (2004).

*A measurement of parity-violating gamma-ray asymmetries in polarized cold neutron capture on  $^{35}\text{Cl}$ ,  $^{113}\text{Cd}$ , and  $^{139}\text{La}$* , G. S. Mitchell, C. S. Blessinger, J. D. Bowman, T. E. Chupp, K. P. Coulter, M. Gericke, G. L. Jones, M. B. Leuschner, H. Nann, S. A. Page, S. I. Penttilä, T. B. Smith, W. M. Snow, and W. S. Wilburn, Nucl. Instrum. Methods A**521**, 468 (2004).

*Multi-Strange Baryon Production in Au+Au collisions at  $\sqrt{s_{NN}} = 130$  GeV*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **92**, 182301 (2004).

*Net charge fluctuations in Au Au collisions at  $\sqrt{s_{NN}} = 130$  GeV*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. C **68**, 044905 (2003).

*Neutron Cross Section for  $^3\text{He}$  at Epithermal Energies*, C. D. Keith, Z. Chowdhuri, D. R. Rich, W. M. Snow, J. D. Bowman, S. I. Penttilä, E. I. Sharapov, D. A. Smith, M. B. Leuschner, V. R. Pomeroy, and G. L. Jones, Phys. Rev. C **69**, 034005 (2004).

*§ New Method of Measuring Electric Dipole Moments in Storage Rings*, F.J.M. Farley, K. Jungmann, J.P. Miller, W.M. Morse, Y.F. Orlov, B.L. Roberts, Y.K. Semertzidis, A. Silenko, and E.J. Stephenson, Phys. Rev. Lett. **93**, 052001 (2004).

*\* Observation of the Charge Symmetry Breaking  $d+d \rightarrow ^4\text{He} + \pi^0$  Reaction near Threshold*, E.J. Stephenson, A.D. Bacher, C.E. Allgower, A. Gårdestig, C.M. Lavelle, G.A. Miller, H. Nann, J. Olmsted, P.V. Pancella, M.A. Pickar, J. Rapaport, T. Rinckel, A. Smith, H.M. Spinka, and U. van Kolck, Phys. Rev. Lett. **91**, 142302 (2003).

*Particle-Type Dependence of Azimuthal Anisotropy and Nuclear Modification of Particle Production in Au+Au Collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **92**, 052302 (2004).

*Pion-Kaon correlations in central Au+Au collisions at  $\sqrt{s_{NN}} = 130$  GeV*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **91**, 262302 (2003).

*Precision neutron interferometric measurement of the  $n$ - $^3\text{He}$  coherent neutron scattering length*, P.R. Huffman, D.L. Jacobson, K. Schoen, M. Arif, T.C. Black, W.M. Snow, and S.A. Werner, Phys. Rev. C **70**, 014004 (2004).

*Production of  $e^+e^-$  Pairs Accompanied by Nuclear Dissociation in Ultra-Peripheral Heavy Ion Collisions*, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. C **70**, 031902 (2004).

$\rho^0$  Production and Possible Modification in Au+Au and p+p Collisions at  $\sqrt{s_{NN}} = 200$  GeV, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **92**, 092301 (2004).

Progress Toward a New Measurement of the Parity Violating Asymmetry in  $\vec{n} + p \rightarrow d + \gamma$ , W. M. Snow, W. S. Wilburn, J. D. Bowman, M. B. Leuschner, S. I. Penttilä, V. R. Pomeroy, D. R. Rich, E. I. Sharapov, and V. Yuan, Nucl. Instrum. Methods. A **515**, 563 (2003).

Search for  $\pi^0 \rightarrow \nu_\mu \bar{\nu}_\mu$  Decay in LSND, L.B. Auerbach, R.L. Burman, D.O. Caldwell, E.D. Church, A.K. Cochran, J.B. Donohue, A.R. Fazely, G.T. Garvey, R.M. Gunasingha, R.L. Imlay, G. Kahrmanis, W.C. Louis, R. Majkic, A. Malik, K.L. McIlhane, W.J. Metcalf, G.B. Mills, D. Rupnik, V.D. Sandberg, D. Smith, R.F. Somodi, I. Stancu, W.D. Strossman, M. Snug, R. Tayloe, G.J. VanDalen, W. Vernon, N. Wadia, D.H. White, S. Yellin, and H. Yi, Phys. Rev. Lett. **92**, 091801 (2004).

Simultaneous Polarization Analysis of Zeeman Splitting of Surface Scattered Neutrons Using a Polarized  $^3\text{He}$  Neutron Spin Analyzer, D. Hussey, C. Bailey, W. M. Snow, D. Rich, S. Fan, B. Neff, G. P. Felcher, and S. te Velthuis, Applied Physics A **74**, S234 (2003).

\* Spin exchange in polarized deuterium, B. v. Przewoski, H.O. Meyer, J. Balewski, W.W. Daehnick, J. Doskow, W. Haeberli, R. Ibal, B. Lorentz, P.V. Pancella, R.E. Pollock, F. Rathmann, T. Rinckel, Swapan K. Saha, B. Schwartz, P. Thörngren-Engblom, A. Wellinghausen, T.J. Whitaker, T. Wise, Phys. Rev. A **68**, 042705 (2003).

Three-Pion Hanbury-Brown-Twiss Correlations in Relativistic Heavy-Ion Collisions from the STAR Experiment, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **91**, 262301 (2003).

Transverse-momentum and collision-energy dependence of high- $p_T$  hadron suppression in Au+Au collisions at ultrarelativistic energies, J. Adams *et al.*, (The STAR Collaboration), Phys. Rev. Lett. **91**, 172302 (2003).

\* Vector-and tensor polarization lifetimes for a stored deuteron beam, B. v. Przewoski, V.A. Anferov, H.O. Meyer, P. Schwandt, E.J. Stephenson, V.S. Morozov, Z.B. Etienne, M.C. Kandes, M.A. Leonova, D.W. Sivers and K. Yonehara, Phys. Rev. E **68**, 046501 (2003).

## Submitted

A Polarized  $^3\text{He}$  Compression System Using Metastability-Exchange Optical Pumping, D. S. Hussey, D. R. Rich, A. S. Belov, X. Tong, H. Yang, C. Bailey, X. Fei, C. D. Keith, J. Hartfield, B. Neff, D. Allen, M. Flamini, B. Paturalski, G. Hall, T. Gentile, W. C. Chen, G.L. Jones, E. Wildman, and W. M. Snow, submitted to Rev. Sci. Instrum.

A Current Mode Detector Array for Gamma Asymmetry Measurements, M. T. Gericke, C. Blessinger, J. D. Bowman, R. C. Gillis, J. Hartfield, T. Ino, M. Leuschner, Y. Masuda, G. S.

Mitchell, S. Muto, H. Nann, S. A. Page, S. I. Penttilä, W. S. Ramsay, P. N. Seo, W. M. Snow, J. Tasson, and W. S. Wilburn, submitted to Nucl. Instrum. Methods.

\* *Analyzing Powers and Spin Correlation Coefficients for p-d Elastic Scattering at 135 and 200 MeV*, B. V. Przewoski, H.O. Meyer, J.T. Balewski, W.W. Daehnick, J. Doskow, W. Haeberli, R. Ibal, B. Lorentz, R.E. Pollock, P.V. Pancella, F. Rathmann, T. Rinckel, Swapan K. Saha, B. Schwartz, P. Thörngren-Engblom, A. Wellinghausen, T.J. Whitaker, T. Wise and H. Witała, accepted for publication in Phys. Rev. C.

*Azimuthal anisotropy and correlations at large transverse momenta in p+p and Au+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), submitted to Phys. Rev. Lett.

*Centrality and pseudorapidity dependence of charged hadron production at Intermediate  $p_T$  in Au+Au collisions at  $\sqrt{s_{NN}} = 130$  GeV*, J. Adams *et al.*, (The STAR Collaboration), accepted for publication in Phys. Rev. C.

*Continuously operating compact  $^3\text{He}$  polarizer*, G. L. Jones, J. Baker, W. C. Chen, B. Collett, M. F. Dias, T. R. Gentile, C. Hoffman, T. Koetzle, W. T. Lee, M. Miller, A. Schultz, W. M. Snow, X.Tong, H. Yan, and A. Yue, submitted to Physica B.

*Event-by-event  $p_t$  fluctuations in Au-Au collisions at  $\sqrt{s_{NN}} = 130$  GeV*, J. Adams *et al.*, (The STAR Collaboration), submitted to Phys. Rev. Lett.

*Hadronization geometry and charge-dependent number autocorrelations on axial Momentum space in Au–Au collisions at  $\sqrt{s_{NN}} = 130$  GeV*, J. Adams *et al.*, (The STAR Collaboration), submitted to Phys. Rev. Lett.

*Measurements of transverse energy distributions in Au+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), accepted for publication in Phys. Rev. C.

*$\phi$  meson production in Au+Au and p+p collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), submitted to Phys. Rev. Lett.

*Open charm yields in d+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), submitted to Phys. Rev. Lett.

*Photon and neutral pion production in Au+Au collisions at  $\sqrt{s_{NN}} = 130$  GeV*, J. Adams *et al.*, (The STAR Collaboration), accepted for publication in Phys. Rev. C.

*Pion, kaon, proton and anti-proton transverse momentum distributions from p+p and d+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), submitted to Phys. Rev. Lett.

*Polarized  $^3\text{He}$  spin filters in neutron scattering*, T.R. Gentile, E. Babcock, J. Baker, J.A. Borchers, W.C. Chen, J. Cowan, F. Dias, C. Hoffmann, D. Hussey, G.L. Jones, T. Koetzle, W.T. Lee, C.F. Majzrak, K.V. O'Donovan, A. Schultz, W.M. Snow, X. Tong, S.G.E. te Velthuis, T.G. Walker, and H. Yan, submitted to Physica B (2004).

*Pseudorapidity Asymmetry and Centrality Dependence of Charged Hadron Spectra in d+Au Collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The Star Collaboration) accepted for publication in Phys. Rev. C.

*Rapidity and Centrality Dependence of Proton and Anti-proton Production from  $^{197}\text{Au}+^{197}\text{Au}$  Collisions at  $\sqrt{s_{NN}} = 130$  GeV*, J. Adams *et al.*, (The STAR Collaboration), accepted for publication in Phys. Rev. C (Rapid Communications).

*The NPDGamma Low-Noise Preamplifier*. W. S. Wilburn, J. D. Bowman, S. I. Penttilä, and M. T. Gericke, accepted for publication in Nucl. Instrum. Methods.

*Transverse – momentum dependent modification of dynamic texture in central Au+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV*, J. Adams *et al.*, (The STAR Collaboration), submitted to Phys. Rev. Lett.

### Conference Proceedings

- invited, ○ contributed, ¶ poster

### Proceedings on prior conferences published in FY 2004

11<sup>th</sup> International Symposium on Capture Gamma Ray Spectroscopy and Related Techniques, Pruhonice near Prague, Czech Republic, September 2-6, 2002, ed. J. Kvasil, P. Cejnar, and M. Krticka (World Scientific, Singapore, 2003).

- *A Measurement of the Parity Violating Gamma-Ray Asymmetry in Neutron-Proton Capture*, S. I. Penttilä, J. D. Bowman, R. D. Carlini, T. Case, W. C. Chen, T. E. Chupp, K. P. Coulter, S. J. Freedman, T. R. Gentile, M. Gericke, G. L. Greene, B. Hersman, S. Ishimoto, G. L. Jones, M. B. Leuschner, Y. Masuda, G. S. Mitchell, K. Morimoto, H. Nann, S. A. Page, W. D. Ramsay, E. I. Sharapov, T. B. Smith, W. M. Snow, S. W. Wilburn, and Y. W. Yuan, p. 604.

Proceedings of the XX<sup>th</sup> CFIF Fall Workshop: Nuclear Dynamics: From Quarks to Nuclei, Lisbon, Portugal, October 31 – November 2, 2002, ed. M.T. Peña, A. Stadler, A.M. Eiró, and J. Adam, Few-Body Systems, Suppl. **15**.

- *Recent Results and Prospects from the STAR Detector and RHIC*, W.W. Jacobs, p. 105.

Proceedings of the 17<sup>th</sup> International Conference on the Applications of Accelerators in Research and Industry, Denton, Texas, November 12-16, 2002, eds. J.L. Duggan and I.L. Morgan (AIP Conf. Proc. **680**, New York, 2003).

- *A University Based Cold Neutron Source*, D.V. Baxter, J.M. Cameron, D.L. Friesel, H. Nann, T.C. Rinckel, W.M. Snow, and J.W. Zwanziger, p. 265.

Proceedings of the 16th Meeting of the International Collaboration on Advanced Neutron Sources, Dusseldorf, Germany, May 12-15, 2003, Report ISSN 1443-559X, ESS 03-136-M1, Forschungszentrum Jülich GmbH, Jülich, Germany (2003).

- *LENS- A University-Based Pulsed Neutron Source for Education and Research*, D. V. Baxter, J. M. Cameron, M. B. Leuschner, H. Nann, W. M. Snow, and J. Zwanziger, p. 95.

Proceedings of the 17<sup>th</sup> International IUPAP Conference on Few-Body Problems in Physics, Durham, NC, June 5-10, 2003, eds. W. Glöckle and W. Tornow (Elsevier, Amsterdam, 2004).

- *Neutron Interferometry and Optics Facility for Precision Scattering Length Measurements*, D. L. Jacobson, P. R. Huffman, M. Arif, K. Schoen, S. A. Werner, T. C. Black, and W. M. Snow, p. S363.

- *Observation of the  $d+d\rightarrow^4\text{He}+\pi^0$  reaction near threshold*, E.J. Stephenson, A.D. Bacher, C.E. Allgower, A. Gårdetig, C.M. Lavelle, G.A. Miller, H. Nann, J. Olmsted, P.V. Pancella, M.A. Pickar, J. Rapaport, T. Rinckel, A. Smith, H.M. Spinka, and U. van Kolck, p. S275.

Congress of the Canadian Association of Physicists, Winnipeg, Canada, June 13-16, 2004.

- *Observation of Charge Symmetry Breaking in the Reaction  $d + d \rightarrow ^4\text{He} + \pi^0$* , Andrew D. Bacher.

5<sup>th</sup> Int. Conf. On Nuclear Physics at Storage Rings, Uppsala, Sweden, June 16-20, 2002, eds. H. Calén and C. Ekström, Physica Scripta **T104** (2003).

- *Polarization Experiments with Storage Rings*, H. Meyer, p. 19.

Polarized Neutrons in Condensed Matter Investigations, Jülich, Germany, September 19, 2002, Physica B **335** (2003).

- *Polarized  $^3\text{He}$  Analyzers for Neutron Reflectometry*, W. Chen, C. Bailey, J. A. Borchers, R. F. C. Farrow, T. Gentile, D. Hussey, C. F. Makjrzak, K. A. O'Donovan, N. Remmes, W. M. Snow, and A. K. Thompson, p. 196.

Proceedings of the Workshop on Quark Mixing and CKM Unitarity, Heidelberg, Germany, September 20, 2002, eds. H. Abele and D. Mund (Mattes Verlag, Heidelberg, 2003).

- *Measurement of the Neutron Lifetime by Counting Trapped Protons*, F. E. Weitfeldt, M. S. Dewey, D. M. Gilliam, J. S. Nico, X. Fei, W. M. Snow, G. L. Greene, J. Pauwels, R. Eykens, A. Lamberty, and J. Van Gestel, p. 107.

Proceedings of PANIC02, the XVI International Conference on Particles and Nuclei, Osaka, Japan, September 30 – October 4, 2002, Nuclear Physics A **721** (2003).

- *Parity-violating gamma-ray asymmetry in neutron-proton capture*, Y. Masuda, J. D. Bowman, R. D. Carlini, T. Case, T. E. Chupp, K. P. Coulter, S. J. Freedman, T. R. Gentile, M. Gericke, G. L. Greene, B. Hersman, T. Ino, S. Ishimoto, G. L. Jones, M. B. Leuschner, G. S. Mitchell, K. Morimoto, S. Muto, H. Nann, S. A. Page, W. D. Ramsay, E. I. Sharapov, T. B. Smith, W. M. Snow, W. S. Wilburn, and V. W. Yuan, p. 485.

### Conferences held in FY 2004

Division of Nuclear Physics of the American Physical Society Fall 2003 Meeting, Tucson, Arizona, October 30 – November 1, 2003.

- *A low noise CsI detector array for the measurement of parity nonconservation in  $\bar{n} + p \rightarrow d + \gamma$* , Michael Gericke, NPDGamma Collaboration.
- *A Measurement of  $G_A^S$  via Neutrino Scattering with FINeSSE*, R. Tayloe.
- *Axial Spin Observables in  $dp$  Breakup*, T.J. Whitaker, H.O. Meyer, B. von Przewoski, T. Rinckel, J. Doskow, R. Ibal, P.V. Pancella, P. Thörngren-Engblom, T. Wise, F. Rathmann, and B. Lorentz.

Second Electron-Ion Collider Workshop, Thomas Jefferson National Accelerator Facility, Newport News, Virginia, March 15-17, 2004.

- *Short Baseline Oscillation and  $\nu$  Scattering Physics*, R. Tayloe.

International Conference on Precision Measurements with Slow Neutrons, Gaithersburg, MD, April 5-7, 2004.

¶ *A Gamma Polarimeter for Neutron Polarization Measurement in a Liquid Deuterium Target for Parity Violation in Polarized Neutron Capture on Deuterium*, A. Komives, A. K. Sint, M. Bowers, and W. M. Snow.

- *Commissioning of the NPDGamma detector Array: Counting Statistics in Current Mode Operation and Parity Violation in the capture of Cold Neutrons on  $^{14}\text{C}$  and  $^{27}\text{Al}$* , M. Gericke, J.D. Bowman, R.D. Carlini, T. Case, T.E. Chupp, K.P. Coulter, M. Dabaghyan, D. Desai, S.J. Freedman, T.R. Gentile, S. Page, R.C. Gillis, G. L. Greene, F.W. Hersman, T. Ino, S. Ishimoto, G.L. Jones, B. Lauss, M.B. Leuschner, B. Losowski, R. Mahurin, Y. Masuda, G.S. Mitchell, H.

Nann, S.I. Penttilä, W.D. Ramsay, S. Santra, P.-N. Seo, E.I. Sharapov, T.B. Smith, W.M. Snow, W.S. Wilburn, V. Yuan, and H. Zhu.

- *Measurement of Neutron Decay Parameters: the abBA Experiment*, W. S. Wilburn, J. D. Bowman, G. S. Mitchell, J. M. O'Donnel, S. I. Penttila, P. N. Seyo, J. L. Calarco, F. W. Hersman, T. E. Chupp, K. P. Coulter, T. V. Cianciolo, K. P. Rykaczewski, G. L. Young, R. DeSouza, W. M. Snow, D. Desai, G. L. Greene, R. K. Grzywacz, E. Frlez, D. Pocanic, V. Gudkov, and G. L. Jones.

- *Measurement of Parity Violation in np Capture: the NPDGamma Experiment*, S. A. Page, J.D. Bowman, R.D. Carlini, T. Case, T.E. Chupp, K.P. Coulter, M. Dabaghyan, D. Desai, S.J. Freedman, T.R. Gentile, M.T. Gericke, R.C. Gillis, G. L. Greene, F.W. Hersman, T. Ino, S. Ishimoto, G.L. Jones, B. Lauss, M.B. Leuschner, B. Losowski, R. Mahurin, Y. Masuda, G.S. Mitchell, H. Nann, S.I. Penttilä, W.D. Ramsay, S. Santra, P.-N. Seo, E.I. Sharapov, T.B. Smith, W.M. Snow, W.S. Wilburn, V. Yuan, and H. Zhu.

- *Measurement of the parity-violating neutron spin rotation in  $^4\text{He}$* , C. D. Bass, M. Sarsour, D. Luo, A. Micherdzinska, M. Dawkins, M. Snow, B. Heckel, H. Swanson, J. Nico, D. Markoff, P. Huffman, and P. Mumm.

- *Neutron measurements and the Weak Nucleon-Nucleon Interaction*, W. M. Snow.

- *New Pulsed Cold Neutron Beam Line for Fundamental Nuclear Physics at LANSCE*, P. N. Seo, J. D. Bowman, M. Gericke, R. C. Gillis, G. L. Greene, M. B. Leuschner, J. Long, R. Mahurin, G. S. Mitchell, S. I. Penttilä, G. Peralta, E. I. Sharapov, and W. S. Wilburn.

- *The Fundamental Neutron Physics Beamline at the Spallation Neutron Source*, G. Greene, V. Cianciolo, P. Koehler, R. Allen, W. M. Snow, P. Huffman, C. Gould, D. Bowman, M. Cooper, and J. Doyle.

- *The Weak NN Interaction and Low Energy Neutrons*, M. Snow.

2004 International Conference on Quarks and Nuclear Physics, Bloomington, IN, May 23-28, 2004.

- *The  $d+d \rightarrow ^4\text{He} + \pi^0$  Reaction: Charge Symmetry Breaking and Radiative Capture*, E.J. Stephenson.

International Conference on Polarized Neutrons in Condensed Matter Investigations, Washington, DC, June 4, 2004.

- *Polarized  $^3\text{He}$  Neutron Spin Filters*, M. Snow.

16<sup>th</sup> National Summer School in Nuclear Physics, Bar Harbor, Maine, June 13-18, 2004.

- *Neutron Physics*, M. Snow.

International Conference on Electron-Nucleus Scattering VIII, Elba, Italy, June 23, 2004.

- *The Weak NN Interaction and Low Energy Neutrons*, M. Snow.

Int. Top. Meeting on Neutron Radiography, Munich, Germany, July 26-30, 2004.

- *Low-Energy Neutron Source (LENS), a new facility @ IUCF*, H.O. Meyer.

Third Meeting on CPT and Lorentz Symmetry, Bloomington, Indiana, August 4-7, 2004.

- *An Analysis of the Directional Dependence of the LSND Signal*, R. Tayloe and T. Katori.

19<sup>th</sup> European Conference on Few-Body Problems in Physics, Groningen, The Netherlands, August 23-27, 2004.

- *Charge Symmetry Breaking*, E.J. Stephenson.

The 3<sup>rd</sup> Int. Workshop on Nuclear and Particle Physics a J-PARC, KEK, Japan, August 24-26, 2004.

- *A Measurement of the Nucleon Spin Structure with Neutrino Scattering*, R. Tayloe.

International Conference on Nuclear Data for Science and Technology, Santa Fe, NM, September 28, 2004.

- *Fundamental Physics with Slow Neutrons*, W.M. Snow.

### **Colloquia**

*Nuclear and Particle Physics with Cold and Ultracold Neutrons*, M. Snow, Physics Department, Purdue University, Oct. 2, 2003.

*Neutrons*, M. Snow, Physics Department, Ball State University, Oct. 16, 2003.

*Nuclear and Particle Physics with Neutrons*, M. Snow, Physics Department, University of Missouri, Dec. 8, 2003.

### **Seminars**

*Neutrinos: A Probe of the Axial Structure of the Proton*, R. Tayloe, University of Illinois, Urbana-Champaign, Illinois, February 25, 2004.

*A Measurement of the Nucleon Spin Structure with Neutrino Scattering*, R. Tayloe, Brookhaven National Laboratory, Upton, New York, May 6, 2004.

*Large impact parameters in the transverse momentum resummation formalism*, A. Konychev, Southern Methodist University, Dallas, TX, June 24, 2004.

*The Weak NN Interaction and Low Energy Neutrons*, M. Snow, Technical University of Munich, Munich, Germany, June 29, 2004.

*Charge Symmetry Breaking in the Few Nucleon System*, E.J. Stephenson, NSCL, Michigan State University, Sept. 1, 2004.

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