

UNIVERSITY OF MARYLAND

Department of Physics
College Park, Maryland 20742

Curriculum Vitae

Nicholas S. Chant
Professor of Physics

II. Education:

B.A. Downing College, Cambridge, 1962
M.A. Downing College, Cambridge, 1966
D.Phil. Lincoln College, Oxford, 1966

II. Experience:

1966-67 Research Fellow, Nuclear Physics Lab, Oxford
1968-70 Research Associate, Nuclear Physics Lab, Univ. of Washington
1970-72 Research Associate, Nuclear Physics Lab, Univ. of Minnesota
1972-77 Assistant Professor, Department of Physics and Astronomy, University of Maryland
1977-83 Associate Professor, Department of Physics and Astronomy, University of Maryland
1982-84 Associate Chairman for Facilities & Personnel, Department of Physics and Astronomy, University of Maryland
1983- Professor, Department of Physics and Astronomy, University of Maryland
1990-99 Associate Chairman for Facilities & Personnel, Department of Physics and Astronomy, University of Maryland
1999- Associate Chairman for Graduate Education, Department of Physics, University of Maryland

IV. Experience Other than Higher Education:

1967-68 Research Fellow, Rutherford Lab, Harwell, England

V. Publications:

See Attached List

VI. Professional Activities:

Member, American Physical Society
Member, Local Organizing Committee, 2nd International Conference on Clustering Phenomena in Nuclei (College Park, 1975)
Member, International Organizing Committee for US-Australia Joint Seminar/Workshop on the "Determination of Momentum Densities in Nuclei, Atoms, and Molecules"
Reviewer, Research proposals for National Science Foundation and Department of Energy, Physical Review, Physical Review Letters, Physics Letters, and Nuclear Physics
Session Chairman, American Physical Society Meetings, International Conferences
Chairman-Elect, Indiana University Cyclotron Facility Users Executive Committee, 1984-85

Chairman, Indiana University Cyclotron Facility Users Executive Committee, 1985-86
Member, Scientific Organizing Committee, 5th Indiana University Fall Workshop on
"Nuclear Structure at High-Spin, High Excitation, and High Momentum Transfer"

VIII. **Honors Received:**

Exhibition, Downing College, Cambridge, 1960
Joliot-Curie Bursary, Universite Paris-Sud, Orsay, September 1977
Visiting Scientist, Universite Paris-Sud, Orsay, September 1978
University of Maryland Faculty Research Grant, Spring Semester, 1981
University of Maryland Faculty Research Grant, Fall Semester, 1985

IX. **Theses Directed:**

Wang, Chang Wan, A study of the quasi-free ($\alpha, 2\alpha$) reaction induced by 140 MeV alpha particles on ^9Be , ^{12}C , ^{16}O , and ^{20}Ni targets, Ph.D. thesis, 1978.

Samanta, Chhanda, A study of proton and alpha particle induced quasifree knockout reactions, Ph.D. thesis, 1981.

Rees, Lawrence B., The quasifree knockout of protons and deuterons from calcium, oxygen, and carbon targets induced by 150 MeV polarized protons, Ph.D. thesis, 1983.

Mack, David Joseph, Inclusive and exclusive measurements of positive pion absorption on oxygen-16 at 115 MeV, Ph.D. thesis, 1987.

Gu, Tao, Measurements of the (\vec{p}, p') and ($\vec{p}, p'x$) reactions on ^2H and $^3,^4\text{He}$ at 200 MeV, Ph.D. thesis, 1995.

Huffman, Jeffrey D., A study of the exclusive ($\vec{p}, ^2p$) reaction on ^2H and $^3,^4\text{He}$ at 200 MeV, Ph.D. thesis, 1996.

A. Papers published (or accepted for publication) in refereed journals

Physics research

- 1) Intermediate structure in ^{13}N , D. K. Scott, P. S. Fisher, and N. S. Chant, Nucl. Phys. **A99**, 177 (1967).
- 2) Asymmetries and differential cross sections for the $^{12}\text{C}(p,d)^{11}\text{C}$ and $^{16}\text{O}(p,d)^{15}\text{O}$ reactions induced by polarized protons, N. S. Chant, P. S. Fisher and D. K. Scott, Nucl. Phys. **A99**, 669 (1967).
- 3) A DWBA analysis of polarization analysing powers and differential cross sections for the (p,d) reaction on ^{28}Si and ^{40}Ca , N. S. Chant and J. M. Nelson, Nucl. Phys. **A117**, 385 (1968).
- 4) A unique set of phase shifts for the scattering of protons by helium, D. J. Plummer, T. A. Hodges, K. Ramavataram, D. G. Montague, and N. S. Chant, Nucl. Phys. **A115**, 253 (1968).
- 5) Levels excited in the reaction $^{58}\text{Ni}(p,t)^{56}\text{Ni}$, W. G. Davies, J. E. Kitching, W. McLatchie, D. G. Montague, K. Ramavataram, and N. S. Chant, Phys. Lett. **27B**, 363 (1968).
- 6) $^{20}\text{Ne}(p,t)^{18}\text{Ne}$ reaction as a test of the ^{18}Ne and ^{20}Ne wave functions, J. L'Ecuyer, R. D. Gill, K. Ramavataram, N. S. Chant, and D. G. Montague, Phys. Rev. C **2**, 116 (1970).
- 7) The reactions $^{14}\text{N}(p,^3\text{He})^{12}\text{C}$, $^{14}\text{N}(d,\alpha)^{12}\text{C}$, $^{13}\text{C}(p,d)^{12}\text{C}$ and the 4^+ level of ^{12}C , D. K. Scott, P. M. Portner, J. M. Nelson, A. C. Shotter, A. J. Mitchell, N. S. Chant, D. G. Montague, and K. Ramavataram, Nucl. Phys. **A141**, 497 (1970).
- 8) An improved method of calculating finite range corrections in two-nucleon transfer reactions, N. S. Chant and N. F. Mangelson, Nucl. Phys. **A140**, 81 (1970).
- 9) A study of some (p,t) and $(p,^3\text{He})$ reactions induced by 49.5 MeV polarized protons, J. M. Nelson, N. S. Chant, and P. S. Fisher, Nucl. Phys. **A156**, 406 (1970).
- 10) A comparison of polarization analyzing powers of two-nucleon transfer reactions leading to mirror final states, J. M. Nelson, N. S. Chant, and P. S. Fisher, Phys. Lett. **31B**, 445 (1970).
- 11) Gross structure in the spectra of helium ions inelastically scattered from heavy nuclei with large energy loss, G. Chenevert, N. S. Chant, I. Halpern, C. Glashausser, and D. L. Hendrie, Phys. Rev. Lett. **27**, 434 (1971).
- 12) Possible explanation for gross-structure observations in the direct scattering of helium ions, N. S. Chant and E. M. Henley, Phys. Rev. Lett. **27**, 1657 (1971).
- 13) A search for high-lying levels in the mass $A=5$ nuclei, M. P. Baker, J. M. Cameron, N. S. Chant, and N. F. Mangelson, Nucl. Phys. **A184**, 97 (1972).
- 14) States in ^{86}Sr , ^{84}Sr , and ^{87}Y populated in the (p,t) reaction, D. G. Montague, K. Ramavataram, N. S. Chant, W. C. Davies, J. E. Kitching, W. McLatchie, and J. M. Morton, Z. Phys. **261**, 155 (1973).
- 15) The multipole expansion method for finite range calculations of two-nucleon transfer reactions, N. S. Chant, Nucl. Phys. **A211**, 269 (1973).

- 16) Elastic proton scattering from ^3He and ^4He and the $^4\text{He}(p, d)^3\text{He}$ reaction at 85 MeV, L. G. Votta, P. G. Roos, N. S. Chant, and R. Woody, III, Phys. Rev. C **10**, 520 (1974).
- 17) The $\alpha - d$ and $\tau - t$ cluster structure of ^6Li , P. G. Roos, D. A. Goldberg, N. S. Chant, R. Woody, III, and W. Reichart, Nucl. Phys. **A257**, 317 (1976).
- 18) Analysis of the $^{12}\text{C}(d, ^3\text{He})^{11}\text{B}(\text{g.s.})$ reaction at 80 MeV, J.-P. Didelez, C. C. Chang, N. S. Chant, H. D. Holmgren, R. I. Steinberg, and J. R. Wu, Phys. Rev. C **13**, 1388 (1976).
- 19) Normalization and finite-range effects in distorted wave born-approximation calculations for $(d, ^3\text{He})$ and (d, t) reactions, N. S. Chant and J. N. Craig, Phys. Rev. C **14**, 1763 (1976).
- 20) The quasi-elastic knockout of alpha particles from ^{16}O and ^{28}Si by 0.65 and 0.85 GeV alpha particles, N. Chirapatpimol, J. C. Fong, M. M. Gazzaly, G. Igo, A. D. Liberman, R. J. Ridge, S. L. Verbeck, C. A. Whitten, Jr., D. G. Kovar, V. Pere-Mendez, N. S. Chant, and P. G. Roos, Nucl. Phys. **A264**, 379 (1976).
- 21) Normalization of the $(d, ^3\text{He})$ reaction, N. S. Chant, N. S. Wall, C. F. Clement, S. M. Perez, and J. N. Craig, Phys. Rev. C **15**, 53 (1977).
- 22) Distorted-wave impulse-approximation calculations for quasifree cluster knockout reactions, N. S. Chant and P. G. Roos, Phys. Rev. C **15**, 57 (1977).
- 23) Absolute spectroscopic factors from the $(p, p\alpha)$ reaction at 100 MeV on $1p$ -shell nuclei, P. G. Roos, N. S. Chant, A. A. Cowley, D. A. Goldberg, H. D. Holmgren, and R. Woody, III, Phys. Rev. C **15**, 69 (1977).
- 24) $(p, d^3\text{He})$ reaction as a quasi-free reaction process, A. A. Cowley, P. G. Roos, N. S. Chant, R. Woody, III, H. D. Holmgren, and D. A. Goldberg, Phys. Rev. C **15**, 1650 (1977).
- 25) High spin states in $^{206,204,202}\text{Tl}$ observed in (d, α) reactions at 80 MeV, N. Frascaria, J.-P. Didelez, N. S. Chant, and C. C. Chang, Phys. Rev. C **16**, 603 (1977).
- 26) Study of the (p, pn) reaction in light nuclei, C. N. Waddell, E. M. Diener, R. G. Allas, L. A. Beach, R. O. Bondelid, E. L. Petersen, A. G. Pieper, R. B. Theus, C. C. Chang, and N. S. Chant, Nucl. Phys. **A281**, 418 (1977).
- 27) Is there specific alpha clustering in light nuclei?, N. S. Chant, P. G. Roos, and C. W. Wang, Phys. Rev. C **17**, 8 (1978).
- 28) $d + d$ four-body breakup reaction at 80 MeV, B. Th. Leeman, H. G. Pugh, N. S. Chant, and C. C. Chang, Phys. Rev. C **17**, 410 (1978).
- 29) Experimental test of the factorization approximation in the reaction $^{40}\text{Ca}(p, 2p)^{39}\text{K}$ at 148.2 MeV, P. G. Roos, N. S. Chant, D. W. Devins, D. L. Friesel, W. P. Jones, A. C. Attard, R. S. Henderson, I. D. Svalbe, B. M. Spicer, V. C. Officer, and G. G. Shute, Phys. Rev. Lett. **40**, 1439 (1978).
- 30) $(\alpha, \alpha p)$ quasi-free proton knockout reaction on ^2H , ^6Li and ^{19}F , A. Nadasen, T. A. Carey, P. G. Roos, N. S. Chant, C. W. Wang, and H. L. Chen, Phys. Rev. C **19**, 2099 (1979).
- 31) Spin-orbit effects in medium energy $(p, 2p)$ reactions, N. S. Chant, P. Kitching, P. G. Roos, and L. Antonuk, Phys. Rev. Lett. **43**, 495 (1979).
- 32) $^3\text{He} + ^4\text{He}$ elastic scattering at $E_{\text{c.m.}} = 60.2$ MeV and 113.1 MeV, P. G. Roos, A. Nadasen,

- P. E. Frisbee, N. S. Chant, T. A. Carey, M. T. Collins, B. Th. Leeman, P. J. Griffin, and R. D. Koshel, *Phys. Rev. C* **21**, 799 (1980).
- 33) Quasi-free ($\alpha, 2\alpha$) reaction induced by 140 MeV alpha particles on ^9Be , ^{12}C , ^{16}O , and ^{20}Ne , C. W. Wang, N. S. Chant, P. G. Roos, A. Nadasen, and T. A. Carey, *Phys. Rev. C* **21**, 1705 (1980).
- 34) Non-coplanar ($p, p\alpha$) and ($p, d^3\text{He}$) reactions on ^9Be at 101.5 MeV, A. Nadasen, N. S. Chant, P. G. Roos, T. A. Carey, R. Cowen, C. Samanta, and J. Wesick, *Phys. Rev. C* **22**, 1394 (1980).
- 35) Alpha-clustering systematics from the quasifree ($p, p\alpha$) knockout reaction, T. A. Carey, P. G. Roos, N. S. Chant, A. Nadasen, and H. L. Chen, *Phys. Rev. C* **23**, 576 (1981).
- 36) $^{40}\text{Ca}(p, p\alpha)^{36}\text{Ar}$ reaction in a non-coplanar geometry, A. Nadasen, P. G. Roos, N. S. Chant, A. A. Cowley, C. Samanta, and J. Wesick, *Phys. Rev. C* **23**, 2353 (1981).
- 37) Energy dependence of the $^{208}\text{Pb}(^4\text{He}, t)$ and ($^4\text{He}, ^3\text{He}$) reaction from 10 to 20 MeV/nucleon, R. Perry, A. Nadasen, D. L. Hendrie, P. G. Roos, and N. S. Chant, *Phys. Rev. C* **24**, 1471 (1981).
- 38) Distorted wave impulse approximation calculations of ($\pi^+, 2p$) reactions in a quasideuteron model, P. G. Roos, L. Rees, and N. S. Chant, *Phys. Rev. C* **24**, 2647 (1981).
- 39) Production of ^6He , ^6Li , ^7Li and ^7Be in the $\alpha + \alpha$ reaction between 60-160 MeV, B. G. Glagola, V. E. Viola, Jr., H. Breuer, N. S. Chant, A. Nadasen, P. G. Roos, Sam M. Austin, and G. J. Mathews, *Phys. Rev. C* **25**, 34 (1982).
- 40) Distorted-wave analysis of the reaction $^{12}\text{C}(\pi^+, \pi^+p)^{11}\text{B}$, N. S. Chant, L. Rees, and P. G. Roos, *Phys. Rev. Lett.* **48**, 1784 (1982).
- 41) Deuteron breakup by 140 MeV alpha particles at quasifree scattering conditions, J. M. Lambert, P. A. Treado, P. G. Roos, N. S. Chant, A. Nadasen, I. Slaus, and Y. Kioke, *Phys. Rev. C* **26**, 357 (1982).
- 42) $^{40}\text{Ca}(p, pn)^{39}\text{Ca}$ and $^{40}\text{Ca}(p, pn)^{47}\text{Ca}$ neutron knockout reactions at 149.5 MeV, J. W. Watson, M. Ahmad, D. W. Devins, B. S. Flanders, D. L. Friesel, N. S. Chant, P. G. Roos, and J. Wastell, *Phys. Rev. C* **26**, 961 (1982).
- 43) Discrepancy between proton- and alpha-induced cluster knockout reactions on ^{16}O , C. Samanta, N. S. Chant, P. G. Roos, A. Nadasen, and A. A. Cowley, *Phys. Rev. C* **26**, 1379 (1982).
- 44) Distortion effects in ($\pi, \pi p$) quasifree knockout reactions, L. Rees, N. S. Chant, and P. G. Roos, *Phys. Rev. C* **26**, 1580 (1982).
- 45) Spin orbit effects in quasifree knockout reactions, N. S. Chant and P. G. Roos, *Phys. Rev. C* **27**, 1060 (1983).
- 46) Reaction $\pi^+d \rightarrow p + p$ at 65 to 140 MeV, B. G. Ritchie, G. S. Blanpied, R. S. Moore, B. M. Preedom, K. Gotow, R. C. Minehart, J. Boswell, G. Das, H. J. Ziock, N. S. Chant, P. G. Roos, W. J. Burger, S. Gilad, and R. P. Redwine, *Phys. Rev. C* **27**, 1685 (1983).
- 47) Isospin effects in π^\pm -carbon elastic scattering from ^{12}C , ^{13}C , and ^{14}C at 65 and 80 MeV, M. Blecher, K. Gotow, R. L. Burman, M. V. Hynes, M. J. Leitch, N. S. Chant, L. Rees, P. G. Roos, F. E. Bertrand, E. E. Gross, F. E. Obenshain, T. P. Sjoreen, G. S. Blanpied, B. M.

- Freedom, and B. G. Ritchie, Phys. Rev. C **28**, 2033 (1983).
- 48) Alpha particle spectroscopic strengths using the $(p, p\alpha)$ reaction at 101.5 MeV, T. A. Carey, P. G. Roos, N. S. Chant, A. Nadasen, and H. L. Chen, Phys. Rev. C **29**, 1273 (1984).
 - 49) Role of pion absorption on quasi-deuterons in $^{12}\text{C}(\pi^+, 2p)$, B. G. Ritchie, N. S. Chant, and P. G. Roos, Phys. Rev. C **30**, 969 (1984).
 - 50) Neutron-knockout reactions from ^2H , ^{40}Ca and ^{48}Ca , Munir Ahmad, J. W. Watson, D. W. Devins, B. S. Flanders, D. L. Friesel, N. S. Chant, P. G. Roos, and J. Wastell, Nucl. Phys. **A424**, 92 (1984).
 - 51) $^9\text{Be}(p, p\alpha)^5\text{He}$ cluster knockout reaction with polarized beam at 150 MeV, C. W. Wang, P. G. Roos, N. S. Chant, G. Ciangaru, F. Khazaie, D. Mack, A. Nadasen, S. J. Mills, and R. E. Warner, Phys. Rev. C **31**, 1662 (1985).
 - 52) Reply to "Role of pion absorption on quasi-deuterons in $^{12}\text{C}(\pi^+, 2p)$ ", B. G. Ritchie, N. S. Chant, and P. G. Roos, Phys. Rev. C **32**, 334 (1985).
 - 53) Comparison of the noncoplanar $^6\text{Li}(p, dp)^4\text{He}$ reactions at 120 and 200 MeV, R. E. Warner, J.-Q. Yang, D. L. Friesel, P. Schwandt, G. Caskey, A. Galonsky, B. Remington, A. Nadasen, N. S. Chant, F. Khazaie, and C. Wang, Nucl. Phys. **A443**, 64 (1985).
 - 54) Isospin effect in π^\pm ^{14}C elastic scattering at 50 MeV, C. S. Mishra, B. M. Freedom, B. G. Ritchie, R. S. Moore, M. Blecher, K. Gotow, R. L. Burman, M. V. Hynes, E. Piasetzky, N. S. Chant, P. G. Roos, F. E. Bertrand, T. Sjoreen, F. E. Obenshain, and E. E. Gross, Phys. Rev. C **32**, 995 (1985).
 - 55) $^2\text{H}, ^3\text{He}(\vec{p}, p')$ and $^3\text{He}(\vec{p}, d')$ continuum yields for 100 and 150 MeV protons, J. S. Wesick, P. G. Roos, N. S. Chant, C. C. Chang, A. Nadasen, L. Rees, N. R. Yoder, A. A. Cowley, S. J. Mills, and W. W. Jacobs, Phys. Rev. C **32**, 1474 (1985).
 - 56) Distortion effects in the $(e, 2e)$ spectroscopy of helium at high momentum, A. D. Smith, M. A. Coplan, D. J. Chornay, J. H. Moore, J. A. Tossell, J. Mrozek, V. H. Smith, Jr., and N. S. Chant, J. Phys. B: At. Mol. Phys. **19**, 969 (1986).
 - 57) The $^{58}\text{Ni}(\pi^+, 2p)$ reaction at 165 MeV, W. J. Burger, E. Beise, S. Gilad, R. P. Redwine, P. G. Roos, N. S. Chant, H. Breuer, G. Ciangaru, J. D. Silk, G. S. Blanpied, B. M. Freedom, B. G. Ritchie, M. Blecher, K. Gotow, D. M. Lee, and H. Ziock, Phys. Rev. Lett. **57**, 58 (1986).
 - 58) Tests of the factorized distorted wave impulse approximation for $(p, 2p)$ reactions, C. Samanta, N. S. Chant, P. G. Roos, A. Nadasen, J. Wesick, and A. A. Cowley, Phys. Rev. C **34**, 1610 (1986).
 - 59) $^{16}\text{O}(\alpha, \alpha p)$ and $^{40}\text{Ca}(\alpha, \alpha p)$ reactions at 139.2 MeV incident energy, C. Samanta, N. S. Chant, P. G. Roos, A. Nadasen, and A. A. Cowley, Phys. Rev. C **35**, 333 (1987).
 - 60) (π^\pm, p) reactions at low excitation energy, G. S. Blanpied, C. S. Mishra, G. S. Adams, B. M. Freedom, C. S. Whisnant, J.-P. Egger, C. L. Morris, H. Breuer, N. S. Chant, B. G. Ritchie, B. H. Wildenthal, B. Höistad, and B. A. Brown, Phys. Rev. C **35**, 1567 (1987).
 - 61) Pion-induced nucleon knockout from polarized nuclei, N. S. Chant and P. G. Roos, Phys. Rev. C **38**, 787 (1988).
 - 62) Exclusive quasi-deuteron absorption of pions in ^{16}O and ^{18}O at 116 MeV, R. A. Schumacher,

- P. A. Amaudruz, C.H.Q. Ingram, U. Sennhauser, H. Breuer, N. S. Chant, A. E. Feldman, B. S. Flanders, F. Khazaie, D. J. Mack, P. G. Roos, J. D. Silk, and G. S. Kyle, in *Phys. Rev. C* **38**, 2205 (1988).
- 63) J -dependence in the reaction $^{16}\text{O}(\pi^+, 2p)^{14}\text{N}$ at 116 MeV, N. S. Chant and P. G. Roos, *Phys. Rev. C* **39**, 957 (1989).
- 64) Proton propagation in nuclei in the A -dependence of the $(e, e'p)$ reaction in the quasifree region, D. F. Geesaman, R. Gilman, M. C. Green, R. J. Holt, J. P. Schiffer, B. Zeidman, G. Gerino, M. Saber, R. E. Segel, E. J. Beise, G. W. Dodson, S. Hoibraten, L. D. Pham, R. P. Redwine, W. W. Sapp, C. F. Williamson, S. A. Wood, N. S. Chant, P. G. Roos, J. D. Silk, M. Deady, X. K. Maruyama, *Phys. Rev. Lett.* **63**, 734 (1989).
- 65) $(p, p\alpha)$ cluster-knockout reaction on ^9Be at 200 MeV, A. Nadasen, P. G. Roos, N. S. Chant, C. C. Chang, G. Ciangaru, H. F. Breuer, J. Wesick, and E. Norbeck, *Phys. Rev. C* **40**, 1130 (1989).
- 66) $^{16}\text{O}(\pi^+, 2p)$ reaction at 165 MeV, S. D. Hyman, D. J. Mack, H. Breuer, N. S. Chant, F. Khazaie, B. G. Ritchie, P. G. Roos, J. D. Silk, P.-A. Amaudruz, Th. S. Bauer, C. H. Q. Ingram, G. S. Kyle, D. Renker, R. A. Schumacher, U. Sennhauser, and W. J. Burger, *Phys. Rev. C* **41**, R409 (1990).
- 67) Reaction $^{58}\text{Ni}(\pi^+, pp)$ at $T_{\pi^+} = 160$ MeV, W. J. Burger, E. Beise, S. Gilad, R. P. Redwine, P. G. Roos, N. S. Chant, H. Breuer, G. Ciangaru, J. D. Silk, G. S. Blanpied, B. M. Freedom, B. G. Ritchie, M. Blecher, K. Gotow, D. M. Lee, and H. Ziock, *Phys. Rev. C* **41**, 2215 (1990).
- 68) Proton propagation in nuclei studied in the $(e, e'p)$ reaction, G. Garino, M. Saber, R. E. Segel, D. F. Geesaman, R. Gilman, M. C. Green, R. J. Holt, J. P. Schiffer, B. Zeidman, E. J. Beise, G. W. Dodson, S. Høibråten, L. D. Pham, R. P. Redwine, W. W. Sapp, C. F. Williamson, S. A. Wood, N. S. Chant, P. G. Roos, J. D. Silk, M. Deady, and X. K. Maruyama, *Phys. Rev. C* **45**, 780, (1992).
- 69) Dominance of the two-nucleon mechanism in $^{16}\text{O}(\pi^+, pp)$ at 115 MeV, D. Mack, H. Breuer, N. S. Chant, S. D. Hyman, F. Khazaie, B. G. Ritchie, P. G. Roos, J. D. Silk, G. Kyle, P. A. Amaudruz, Th. S. Bauer, C. H. Q. Ingram, D. Renker, R. A. Schumacher, U. Sennhauser, and W. Burger, *Phys. Rev. C* **45**, 1767 (1992).
- 70) Pion absorption on polarized nuclear targets, Mohammad G. Khayat, N. S. Chant, P. G. Roos, and T.-S. H. Lee, *Phys. Rev. C* **46**, 2415 (1992).
- 71) N^* electroproduction and propagation in nuclei, L. B. Weinstein, J. Morrison, A. Perry, H. Baghaei, W. Bertozzi, W. U. Boeglin, J. M. Finn, J. Glickman, C. E. Hyde-Wright, N. Kalantar-Nayestanaki, R. W. Lourie, J. A. Nelson, S. Penn, W. W. Sapp, C. P. Sargent, P. E. Ulmer, B. H. Cottman, L. Ghedira, E. J. Winhold, J. R. Calarco, J. Wise, P. Boberg, C. C. Chang, N. S. Chant, P. G. Roos, D. Chang, K. Aniol, M. B. Epstein, D. J. Margaziotis, C. Perdrisat, V. Punjabi, and R. Whitney, *Phys. Rev. C* **47**, 225 (1993).
- 72) Energy dependence of two-nucleon pion absorption on ^{16}O , S. D. Hyman, D. J. Mack, P. G. Roos, H. Breuer, N. S. Chant, F. Khazaie, B. G. Ritchie, J. D. Silk, G. S. Kyle, P. A. Amaudruz, Th. S. Bauer, C. H. Q. Ingram, D. Renker, R. A. Schumacher, U. Sennhauser, and W. J. Burger, *Phys. Rev. C* **47**, 1184 (1993).
- 73) Distorted-wave impulse approximation calculations of proton polarization following π^+ ab-

- sorption in nuclei, Mohammad G. Khayat, N. S. Chant, and P. G. Roos, Phys. Rev. C **51**, 776 (1995).
- 74) Analyzing powers for the ${}^2\text{H}(\vec{p}, pn){}^1\text{H}$ reaction at 200 MeV, W. Pairsuwan, J.W. Watson, M. Ahmad, N.S. Chant, B.S. Flanders, R. Madey, P.J. Pella, and P.G. Roos, Phys. Rev. C **52**, 2552 (1995).
- 75) Photopion production from polarized nuclear targets, P. G. Roos and N. S. Chant, Phys. Rev. C **52**, 2591 (1995).
- 76) Analyzing powers for ${}^1\bar{\text{H}}(\pi^+, \pi^+p)$ at $T_\pi = 165$ and 240 MeV, B. A. Raue, T. A. Greco, M. G. Khayat, F. Adimi, B. van den Brandt, H. Breuer, T. Chang, N. S. Chant, H. Chen, T. A. Dooling, A. P. Dvoredsky, B. S. Flanders, T. Gu, J. P. Haas, P. Hautle, J. Huffman, J. J. Kelly, A. Klein, K. Koch, J. A. Konter, A. I. Kovalev, G. S. Kyle, J. J. Lawrie, Z. Lin, S. Mango, P. Markowitz, R. Meier, T. Payerle, S. Ritt, P. G. Roos, and M. Wang, Phys. Rev. C **53**, 1005 (1996).
- 77) Spin-dependent scattering of deeply bound nucleons, C. A. Miller, K. H. Hicks, R. Abegg, M. Ahmad, N. S. Chant, D. Frekers, P. W. Green, L. G. Greeniaus, D. A. Hutcheon, P. Kitching, D. Mack, W. J. McDonald, W. C. Olsen, R. Schubank, P. Roos, and Y. Ye, Phys. Rev. C **57**, 1756 (1998).
- 78) Cross sections and analyzing powers for the (\vec{p}, n) reaction on ${}^3\text{He}$ and ${}^4\text{He}$ at 200 MeV, M. Plarczyk, C. M. Riedel, D. Dehnhard, M. A. Espy, M. A. Francy, J. L. Langenbrunner, L. C. Bland, D. S. Carman, B. Brinkmüller, R. Madey, Y. Wang, J. W. Watson, and N. S. Chant, Phys. Rev. C **58**, 645 (1998).
- 79) Quasifree $(e, e'p)$ reactions and proton propagation in nuclei, D. J. Abbott, A. Ahmidouch, Ts. A. Amatuni, C. Armstrong, J. Arrington, K. A. Assamagan, K. Bailey, O. K. Baker, S. Barrow, K. Beard, D. Beatty, S. Y. Beedoe, E. Beise, E. Belz, C. Bochna, H. Breuer, E. E. W. Bruins, R. Carlini, J. Cha, N. Chant, C. Cothran, W. J. Cummings, S. Danagoulian, D. Day, D. DeSchepper, J.-E. Ducret, F. Duncan, J. Dunne, D. Dutta, T. Eden, R. Ent, H. T. Fortune, V. Frolov, D. F. Geesaman, H. Gao, R. Gilman, P. Gueye, J. O. Hansen, W. Hinton, R. J. Holt, C. Jackson, H. E. Jackson, C. E. Jones, S. Kaufman, J. J. Kelly, C. Keppel, M. Khandaker, W. Kim, E. Kinney, A. Klein, D. Koltenuk, L. Kramer, W. Lorenzon, K. McFarlane, D. J. Mack, R. Madey, P. Markowitz, J. Martin, A. Mateos, D. Meekins, M. A. Miller, R. Milner, J. Mitchell, R. Mohring, H. Mkrtchyan, A. M. Nathan, G. Niculescu, I. Niculescu, T. G. O'Neill, D. Potterveld, J. W. Price, J. Reinhold, C. Salgado, J. P. Schiffer, R. E. Segel, P. Stoler, R. Suleiman, V. Tadevosyan, L. Tang, B. Terburg, D. van Westrum, Pat Welch, C. Williamson, S. Wood, C. Yan, Jac-Choon Yang, J. Yu, B. Zeidman, W. Zhao, and B. Zihlmann, Phys. Rev. Lett. **80**, 5072 (1998).
- 80) Longitudinal and transverse cross sections in the ${}^1\text{H}(e, e'K^+)\Lambda$ reaction, G. Niculescu, R. M. Mohring, P. Gueye, D. Abbott, A. Ahmidouch, Ts. A. Amatuni, P. Ambrozewicz, T. Angelescu, C. S. Armstrong, K. Assamagan, S. Avery, K. Bailey, O. K. Baker, K. Beard, S. Beedoe, E. Beise, H. Breuer, R. Carlini, J. Cha, C. C. Chang, N. Chant, E. Cisbani, G. Collins, W. Cummings, S. Danagoulian, R. De Leo, F. Duncan, J. Dunne, D. Dutta, T. Eden, R. Ent, L. Eyraud, L. Ewell, M. Finn, T. Fortune, V. Frolov, S. Frullani, C. Furget, F. Garibaldi, D. Gaskell, D. F. Geesaman, K. K. Gustafsson, J.-O. Hansen, M. Harvey, W. Hinton, E. Hungerford, M. Iodice, C. Jackson, C. Keppel, W. Kim, K. Kino, D. Koltenuk, S. Kox, L. Kramer, T. Leone, G. Lolos, A. Lung, D. Mack, R. Madey, M. Maeda, S. Majewski, P. Markowitz,

- C. J. Martoff, D. Meekins, A. Mihul, J. Mitchell, H. Mkrtchyan, S. Mtingwa, I. Niculescu, R. Perrino, D. Potterveld, J. W. Price, B. A. Raue, J.-S. Real, J. Reinhold, P. Roos, T. Saito, G. Savage, R. Sawafta, R. Segel, S. Stepanyan, P. Stoler, V. Tadevosian, L. Tang, L. Teodorescu, T. Terasawa, H. Tsubota, G. M. Urciuoli, J. Volmer, W. Vulcan, P. Welch, R. Williams, S. Wood, C. Yan, and B. Zeidman, *Phys. Rev. Lett.* **81**, 1805 (1998).
- 81) Alpha spectroscopic factors ${}^6\text{Li}$, ${}^7\text{Li}$, ${}^9\text{Be}$ and ${}^{12}\text{C}$ from the $(\vec{p}, p\alpha)$ reactions at 296 MeV, T. Yoshimura, A. Okihana, R. E. Warner, N. S. Chant, P. G. Roos, C. Samanta, S. Kakigi, N. Koori, M. Fujiwara, N. Matsuoka, K. Tamura, E. Kubo, and K. Ushiro, *Nucl. Phys.* **A641**, 3 (1998).
- 82) Measurements of deuteron photodisintegration up to 4.0 GeV, C. W. Bochna, B. P. Terburg, D. J. Abbott, A. Ahmidouch, C. S. Armstrong, J. Arrington, K. A. Assamagan, O. K. Baker, S. P. Barrow, D. P. Beatty, D. H. Beck, S. Y. Beedoe, E. J. Beise, J. E. Belz, P. E. Bosted, E. J. Brash, H. Breuer, R. V. Cadman, L. Cardman, R. D. Carlini, J. Cha, N. S. Chant, G. Collins, C. Cothran, W. J. Cummings, S. Danagoulian, F. A. Duncan, J. A. Dunne, D. Dutta, T. Eden, R. Ent, B. W. Filippone, T. A. Forest, H. T. Fortune, V. V. Frolov, H. Gao, D. F. Geesaman, R. Gilman, P. L. J. Gueye, K. K. Gustafsson, J.-O. Hansen, M. Harvey, W. Hinton, R. J. Holt, H. E. Jackson, C. E. Keppel, M. A. Khandaker, E. R. Kinney, A. Klein, D. M. Koltenuk, A. F. Lung, D. J. Mack, R. Madey, P. Markowitz, K. W. McFarlane, R. D. McKeown, D. G. Meekins, Z.-E. Meziani, M. A. Miller, J. H. Mitchell, H. G. Mkrtchyan, R. M. Moring, J. Napolitan, A. M. Nathan, G. Niculescu, I. Niculescu, T. G. O'Neill, B. R. Owen, S. F. Pate, D. H. Potterveld, J. W. Price, G. L. Rakness, R. Ransome, J. Reinhold, P. M. Rutt, G. Savage, R. E. Segel, N. Simicevic, P. Stoler, R. Suleiman, L. Tang, D. Van Westrum, W. F. Vulcan, S. Williamson, M. T. Witkowski, S. A. Wood, C. Yan, and B. Zeidman, *Phys. Rev. Lett.* **81**, 4576 (1998).
- 83) A precise measurement of the deuteron elastic structure function $A(Q^2)$, D. Abbott, A. Ahmidouch, H. Anklin, J. Arvieux, J. Ball, S. Beedoe, E. J. Beise, L. Bimbot, W. Boeglin, H. Breuer, R. Carlini, N. S. Chant, S. Danagoulian, K. Dow, J.-E. Ducret, J. Dunne, R. Ent, L. Ewell, L. Eyraud, C. Furget, M. Garçon, R. Gilman, C. Glashauser, P. Gueye, K. Gustafsson, K. Hafidi, A. Honegger, J. Jourdan, S. Kox, G. Kumbartzki, L. Lu, A. Lung, D. Mack, P. Markowitz, J. McIntyre, D. Meekins, F. Merchez, J. Mitchell, R. Moring, S. Mtingwa, H. Mkrtchyan, D. Pitz, L. Qin, R. Ransome, J.-S. Real, P. G. Roos, P. Rutt, R. Sawafta, S. Stepanyan, R. Tieulent, E. Tomasi-Gustafsson, W. Turchinets, K. Vansyoc, J. Volmer, E. Voutier, W. Vulcan, C. Williamson, S. A. Wood, C. Yan, J. Zhao, and W. Zhao, *Phys. Rev. Lett.* **82**, 1379 (1999).
- 84) Quasifree inclusive and exclusive analyzing powers at 200 MeV, D. S. Carman, L. C. Bland, N. S. Chant, T. Gu, G. M. Huber, J. Huffman, A. Klyachko, B. C. Markham, P. G. Roos, P. Schwandt, and K. Solberg, *Phys. Rev. C* **59**, 1869 (1999).
- 85) Quasifree inclusive and exclusive cross sections at 200 MeV, D. S. Carman, L. C. Bland, N. S. Chant, T. Gu, G. M. Huber, J. Huffman, A. Klyachko, B. C. Markham, P. G. Roos, P. Schwandt, and K. Solberg, *Phys. Lett. B* **451**, 8 (1999).
- 86) A neutron detector for (p, np) coincidence studies, D. S. Carman, L. C. Bland, N. S. Chant, A. Eads, T. Gu, G. M. Huber, J. Huffman, A. Klyachko, B. C. Markham, P. G. Roos, P. Schwandt, and K. Solberg, *Nucl. Instrum. Methods A* **430**, 382 (1999).
- 87) Coherent π^0 photoproduction on the deuteron up to 4 GeV, D. G. Meekins, D. J. Abbott, A.

Ahmidouch, T. Amatuoni, C. S. Armstrong, J. Arrington, K. A. Assamagan, O. K. Baker, S. P. Barrow, D. P. Beatty, D. H. Beck, S. Y. Beedoe, E. J. Beise, J. E. Belz, C. Bochna, P. E. Bosted, E. J. Brash, H. Breuer, R. V. Cadman, L. Cardman, R. D. Carlini, J. Cha, N. S. Chant, G. Collins, C. Cothran, W. J. Cummings, S. Danagoulian, F. A. Duncan, J. A. Dunne, D. Dutta, T. Eden, R. Ent, B. W. Filippone, T. A. Forest, H. T. Fortune, V. Frolov, H. Gao, D. F. Geesaman, R. Gilman, P. L. J. Gueye, K. K. Gustafsson, J.-O. Hansen, M. Harvey, W. Hinton, R. J. Holt, H. E. Jackson, C. E. Keppel, M. A. Khandaker, E. R. Kinney, A. Klein, D. M. Koltenuk, G. Kumbartzki, A. F. Lung, D. J. Mack, R. Madey, P. Markowitz, K. W. McFarlane, R. D. McKeown, A.-E. Meziani, M. A. Miller, J. H. Mitchell, H. G. Mkrtchyan, R. M. Mohring, J. Napolitano, A. M. Nathan, G. Miculescu, I. Niculescu, T. G. O'Neill, B. R. Owen, S. F. Pate, D. H. Potterveld, J. W. Price, G. L. Rakness, R. D. Ransome, J. Reinhold, P. M. Rutt, C. W. Salgado, G. Savage, R. E. Segel, N. Simicevic, P. Stoler, R. Suleiman, L. Tang, B. P. Terburg, D. van Westrum, W. F. Vulcan, S. E. Williamson, M. T. Witkowski, S. A. Wood, C. Yan, and B. Zeidman, *Phys. Rev. C* **60**, 052201 (1999).

- 88) Phenomenology of the deuteron electromagnetic form factors, D. Abbott, A. Ahmidouch, H. Anklin, J. Arvieux, J. Ball, S. Beedoe, E. J. Beise, L. Bimbot, W. Boeglin, H. Breuer, R. Carlini, N. S. Chant, S. Danagoulian, K. Dow, J.-E. Ducret, J. Dunne, L. Ewell, L. Eyraud, C. Furget, M. Garçon, R. Gilman, C. Glashauser, P. Gueye, K. Gustafsson, K. Hafidi, A. Honegger, J. Jourdan, S. Kox, G. Kumbartzki, L. Lu, A. Lung, P. Markowitz, J. McIntyre, D. Meekins, F. Merchez, J. Mitchell, R. Mohring, S. Mtingwa, H. Mrktchyan, D. Pitz, L. Qin, R. Ransome, J.-S. Réal, P. G. Roos, P. Rutt, R. Sawafta, S. Stepanyan, R. Tieulent, E. Tomasi-Gustafsson, W. Turchinets, K. Vansyoc, J. Volmer, E. Voutier, C. Williamson, S. A. Wood, C. Yan, J. Zhao, and W. Zhao (The Jefferson Lab t_{20} Collaboration), *Eur. Phys. J. A* **7**, 421 (2000).
- 89) Measurement of tensor polarization in elastic electron-deuteron scattering at large momentum transfer, D. Abbott, A. Ahmidouch, H. Anklin, J. Arvieux, J. Ball, S. Beedoe, E. J. Beise, L. Bimbot, W. Boeglin, H. Breuer, R. Carlini, N. S. Chant, S. Danagoulian, K. Dow, J.-E. Ducret, J. Dunne, R. Ent, L. Ewell, L. Eyraud, C. Furget, M. Garçon, R. Gilman, C. Glashauser, P. Gueye, K. Gustafsson, K. Hafidi, A. Honegger, J. Jourdan, S. Kox, G. Kumbartzki, L. Lu, A. Lung, D. Mack, P. Markowitz, J. McIntyre, D. Meekins, F. Merchez, J. Mitchell, R. Mohring, S. Mtingwa, H. Mrktchyan, D. Pitz, L. Qin, R. Ransome, J.-S. Réal, P. G. Roos, P. Rutt, R. Sawafta, S. Stepanyan, R. Tieulent, E. Tomasi-Gustafsson, W. Turchinets, K. Vansyoc, J. Volmer, E. Voutier, W. Vulcan, C. Williamson, S. A. Wood, C. Yan, J. Zhao, and W. Zhao, *Phys. Rev. Lett.* **84**, 5053 (2000).
- 90) Separated spectral functions for the quasifree $^{12}\text{C}(c, c'p)$ reaction, D. Dutta, D. van Westrum, D. Abbott, A. Ahmidouch, Ts. A. Amatuni, C. Armstrong, J. Arrington, K. A. Assamagan, K. Bailey, O. K. Baker, S. Barrow, K. Beard, D. Beatty, S. Beedoe, E. Beise, E. Belz, C. Bochna, P. E. Bosted, H. Breuer, E. E. W. Bruins, R. Carlini, J. Cha, N. Chant, R. E. Chrien, C. Cothran, W. J. Cummings, S. Dnagoulian, D. Day, D. DeSchepper, J.-E. Ducret, F. Duncan, J. Dunne, T. Eden, R. Ent, H. T. Fortune, V. Frolov, D. F. Geesaman, H. Gao, R. Gilman, P. Guèye, J. O. Hansen, W. Hinton, R. J. Holt, C. Jackson, H. E. Jackson, C. Jones, S. Kaufman, J. J. Kelly, C. Keppel, M. Khandaker, W. Kim, E. Kinney, A. Klein, D. Koltenuk, L. Kramer, W. Lorenzon, K. McFarlane, D. J. Mack, R. Madey, P. Markowitz, J. Martin, A. Mateos, D. Meekins, E. Meier, M. A. Miller, R. Milner, J. Mitchell, R. Mohring, H. Mkrtchyan, A. M. Nathan, G. Niculescu, I. Niculescu, T. G. O'Neill, D. Potterveld, J. W. Price, J. Reinhold, C. Salgado, J. P. Schiffer, R. E. Segel, P. Stoler, R. Suleiman, R. Sawafta,

R. J. Sutter, V. Tadevosyan, L. Tang, B. Terburg, T. P. Welch, C. Williamson, S. Wood, C. Yan, Jae-Choon Yang, J. Yu, B. Zeidman, W. Zhao, and B. Zihlmann, *Phys. Rev. C* **61**, 061602(R) (2000).

- 91) Measurement of the charged pion electromagnetic form-factor, J. Volmer, D. Abbott, H. Anklin, C. Armstrong, J. Arrington, K. Assamagan, S. Avery, O. K. Baker, H. P. Blok, C. Bochna, E. J. Brash, H. Breuer, N. Chant, J. Dunne, T. Eden, R. Ent, D. Gaskell, R. Gilman, K. Gustafsson, W. Hinton, G. M. Huber, H. Jackson, M. K. Jones, C. Keppel, P. H. Kim, W. Kim, A. Klein, D. Koltenuk, M. Liang, G. J. Lolos, A. Lung, D. J. Mack, D. McKee, D. Meekins, J. Mitchell, H. Mkrtchian, B. Mueller, G. Niculescu, I. Niculescu, D. Pitz, D. Potterveld, L. M. Qin, J. Reinhold, I. K. Shin, S. Stepanian, V. Tadevosian, L. G. Tang, R. L. J. van der Meer, K. Vansyoc, D. Van Westrum, W. Vulcan, S. Wood, C. Yan, W. X. Zhao, B. Zihlmann, The Jefferson Lab F(π) Collaboration), *Phys. Rev. Lett.* **86**, 1713 (2001).
- 92) Measurement of the electric form factor of the neutron through $\vec{d}(\vec{e}, e'n)p$ at $Q^2 = 0.5(\text{GeV}/c)^2$, H. Zhu, A. Ahmidouch, H. Anklin, H. Arenhvel, C. Armstrong, C. Bernet, W. Boeglin, H. Breuer, P. Brindza, D. Brown, S. Bltman, R. Carlini, N. Chant, A. Cowley, D. Crabb, S. Danagoulian, D. B. Day, T. Eden, R. Ent, Y. Farah, R. Fatemi, K. Garrow, C. Harris, M. Hauger, A. Honegger, J. Jourdan, M. Kaufmann, M. Khandaker, G. Kubon, J. Lichtenstadt, R. Lindgren, R. Lourie, A. Lung, D. Mack, S. Malik, P. Markowitz, K. McFarlane, P. McKee, D. McNulty, G. Milanovich, J. Mitchell, H. Mkrtchyan, M. Mhlbauer, T. Petitjean, Y. Prok, D. Rohe, E. Rollinde, O. A. Rondon, P. Roos, R. Sawafta, I. Sick, C. Smith, T. Southern, M. Steinacher, S. Stepanyan, V. Tadevosyan, R. Tieulent, A. Tobias, W. Vulcan, G. Warren, H. Whrle, S. Wood, C. Yan, M. Zeier, J. Zhao, and B. Zihlmann, *Phys. Rev. Lett.* **87**, 081801 (2001).
- 93) Analyzing power reduction in quasifree pion nucleon knockout reactions, Mohammad G. Khayat, P. G. Roos, N. S. Chant, A. P. Dvoredsky, H. Breuer, J. J. Kelly, B. S. Flanders, T. M. Payerle, F. Adimi, T. Gu, J. Huffman, A. Klein, T. Dooling, T. Greco, G. S. Kyle, T. Chang, Z. Lin, and M. Wang, R. Meier, S. Ritt, K. Koch, J. Konter, S. Kovalev, S. Mango, B. Van Den Brandt, and J. Lawrie, *Phys. Rev. C* **64**, 064606 (2001).
- 94) Measurement of the High Energy Two-Body Deuteron Photodisintegration Differential Cross Section, E. C. Schulte, A. Ahmidouch, C. S. Armstrong, J. Arrington, R. Asaturyan, S. Avery, O. K. Baker, D. H. Beck, H. P. Blok, C. W. Bochna, W. Boeglin, P. Y. Bosted, M. Bouwhuis, H. Breuer, D. S. Brown, A. Bruell, R. V. Cadman, R. Carlini, N. S. Chant, A. Cochran, L. Cole, S. Danagoulian, D. B. Day, J. A. Dunne, D. Dutta, R. Ent, H. C. Fenker, B. Fox, L. Gan, H. Gao, K. Garrow, D. Gaskell, A. Gasparian, D. F. Geesaman, R. Gilman, C. Glashauser, P. Gueye, M. Harvey, R. J. Holt, H. E. Jackson, X. Jiang, C. E. Keppel, E. R. Kinney, Y. Liang, W. Lorenzon, A. F. Lung, D. J. Mack, P. E. Markowitz, J. Martin, K. McIlhany, D. McKee, D. G. Meekins, M. A. Miller, R. G. Milner, J. H. Mitchell, H. Mkrtchyan, B. A. Mueller, A. M. Nathan, G. Niculescu, I. Niculescu, T. G. O'Neill, V. Papavassiliou, S. F. Pate, R. B. Piercey, D. H. Potterveld, R. D. Ransome, J. Reinhold, E. Rollinde, P. Roos, A. Saha, A. J. Sarty, R. Sawafta, E. Segebia, T. Shin, S. Stepanyan, S. Strauch, M. F. Sutter, V. Tadevosyan, L. Tang, R. Tieulent, A. Uzzle, W. F. Vulcan, S. A. Wood, F. Xiong, L. Yuan, M. Zeier, B. Zihlmann, and V. Ziskin, *Phys. Rev. Lett.* **87**, 102302 (2001).
- 95) Longitudinal Electroproduction of Charged Pions from ^1H , ^2H , and ^3He , D. Gaskell, A. Ahmidouch, P. Ambrozewicz, H. Anklin, J. Arrington, K. Assamagan, S. Avery, K. Bailey, O. K. Baker, S. Beedoe, B. Beise, H. Breuer, D. S. Brown, R. Carlini, J. Cha, N. Chant, A.

- Cowley, S. Danagoulian, D. De Schepper, J. Dunne, D. Dutta, R. Ent, L. Gan, A. Gasparian, D. F. Geesaman, R. Gilman, C. Glashauser, P. Gueye, M. Harvey, O. Hashimoto, W. Hinton, G. Hofman, C. Jackson, H. E. Jackson, C. Keppel, E. Kinney, D. Koltenuk, G. Kyle, A. Lung, D. Mack, D. McKee, J. Mitchell, H. Mkrtchyan, B. Mueller, G. Niculescu, I. Niculescu, T. G. O'Neill, V. Papavassiliou, D. Potterveld, J. Reinhold, P. Roos, R. Sawafta, R. Segel, S. Stepanyan, V. Tadevosyan, T. Takahashi, L. Tang, B. Terburg, D. Van Westrum, J. Volmer, T. P. Welch, S. Wood, L. Yuan, B. Zeidman, and B. Zihlmann, *Phys. Rev. Lett.* **87**, 202301 (2001).
- 96) Nuclear transparency from quasielastic $A(e, e'p)$ reactions up to $Q^2 = 8.1$ (GeV/c)², K. Garrow, D. McKee, A. Ahmidouch, C. S. Armstrong, J. Arrington, R. Asaturyan, S. Avery, O. K. Baker, D. H. Beck, H. P. Blok, C. W. Bochna, W. Boeglin, P. Bosted, M. Bouwhuis, H. Breuer, D. S. Brown, A. Bruell, R. D. Carlini, N. S. Chant, A. Cochran, L. Cole, S. Danagoulian, D. B. Day, J. Dunne, D. Dutta, R. Ent, H. C. Fenker, B. Fox, L. Gan, D. Gaskell, A. Gasparian, H. Gao, D. F. Geesaman, R. Gilman, P. L. J. Guèye, M. Harvey, R. J. Holt, X. Jiang, C. E. Keppel, E. Kinney, Y. Liang, W. Lorenzon, A. Lung, D. J. Mack, P. Markowitz, J. W. Martin, K. McIlhany, D. Meekins, M. A. Miller, R. G. Milner, J. H. Mitchell, H. Mkrtchyan, B. A. Mueller, A. Nathan, G. Niculescu, I. Niculescu, T. G. O'Neill, V. Papavassiliou, S. Pate, R. B. Piercey, D. Potterveld, R. D. Ransome, J. Reinhold, E. Rollinde, P. Roos, A. J. Sarty, R. Sawafta, E. C. Schulte, E. Segbefia, C. Smith, S. Stepanyan, S. Strauch, V. Tadevosyan, L. Tang, R. Tieulent, A. Uzzle, W. F. Vulcan, S. A. Wood, F. Xiong, L. Yuan, M. Zeier, B. Zihlmann, and V. Ziskin, *Phys. Rev. C* **66**, 044613 (2002).
- 97) Separation of the longitudinal and transverse cross sections in the $p(e, e'K^+)\Lambda$ and $p(e, e'K^+)\Sigma^0$ reactions, R. M. Mohring, D. Abbott, A. Ahmidouch, Ts. A. Amatuni, P. Ambrozewicz, T. Angelescu, C. S. Armstrong, J. Arrington, K. Assamagan, S. Avery, K. Bailey, K. Beard, S. Beedoe, E. J. Beise, H. Breuer, R. Carlini, J. Cha, C. C. Chang, N. Chant, E. Cisbani, G. Collins, W. Cummings, S. Danagoulian, R. De Leo, F. Duncan, J. Dunne, D. Dutta, T. Eden, R. Ent, L. Eyraud, L. Ewell, M. Finn, T. Fortune, V. Frolov, S. Frullani, C. Furget, F. Garibaldi, D. Gaskell, D. F. Geesaman, P. Gueye, K. K. Gustafsson, J.-O. Hansen, M. Harvey, W. Hinton, E. Hungerford, M. Iodice, C. Jackson, C. Keppel, W. Kim, K. Kino, D. Koltenuk, S. Kox, L. Kramer, T. Leone, G. Lolos, A. Lung, D. Mack, R. Madey, M. Maeda, S. Majewski, P. Markowitz, C. J. Martoff, D. Meekins, A. Mihul, J. Mitchell, H. Mkrtchyan, S. Mtingwa, G. Niculescu, I. Niculescu, R. Perrino, D. Potterveld, J. W. Price, B. A. Raue, J.-S. Real, J. Reinhold, P. Roos, T. Saito, G. Savage, R. Sawafta, R. Segel, S. Stepanyan, P. Stoler, V. Tadevosian, L. Tang, L. Teodorescu, T. Terasawa, H. Tsubota, G. M. Urciuoli, J. Volmer, W. Vulcan, P. Welch, R. Williams, S. Wood, and C. Yan, *Phys. Rev. C* **67**, 055205 (2003).

B. Papers presented at scientific meetings

1. Invited papers

Quasi-free scattering and reactions on alpha clusters in light nuclei, Gordon Research Conference on Nuclear Structure, July 1974.

Distorted wave impulse approximation calculations for quasi-free cluster removal reactions, Second International Conference on Cluster Phenomena in Nuclei, College Park, MD, April 1975.

Cluster knockout reactions,* N. S. Chant, P. G. Roos, and H. D. Holmgren, International Symposium on Nuclear Physics at Cyclotron Energies, Calcutta, India, September 1977 (*presented by H. D. Holmgren).

Alpha cluster spectroscopic factors from quasi-free knockout reactions, APS Annual Meeting, San Francisco, CA, January 1978; Bull. Am. Phys. Soc. **23**, 42 (1978).

Clustering aspects of medium and high energy reactions, 3rd International Conference on Clustering Aspects of Nuclear Structure and Nuclear Reactions, University of Manitoba, Winnipeg, Canada, June 1978.

Quasifree knockout of nucleons and nucleon clusters, US-Australia Joint Seminar/Workshop on the Determination of Momentum Densities in Nuclei, Atoms, and Molecules, Flinders Park, Australia, February 1982.

Information from quasi-elastic scattering on the nucleon-nucleon interaction in nuclei, IUCF Conference on the Interaction Between Medium Energy Nucleons in Nuclei, Bloomington, IN, October 1982.

Quasifree scattering and knockout, University of Alberta/TRIUMF Workshop on Studying Nuclei with Intermediate Energy Protons, Edmonton, Alberta, July 1983.

Quasifree knockout reactions induced by hadrons, IUCF Workshop on Nuclear Structure at High Spin, Excitation, and Momentum Transfer, Bloomington, IN, October 21-23, 1985.

Distorted wave impulse approximation calculations for the $(e, 2e)$ reaction on atomic helium, $(e, 2e)$ Spectroscopy Workshop, University of Maryland, College Park, MD, August 1989.