

*CURRICULUM VITAE***Gail E. Dodge**

College of Sciences
Old Dominion University
Norfolk, VA 23529-0116

Email: gdodge@odu.edu
Office: (757) 683-3432
Fax: (757) 683-3034

EDUCATION:

- 1986 – 1992 Stanford University
Ph.D. in Physics, January 1993
Dissertation Advisor: S.S. Hanna (Physics)
Dissertation: “Proton Decay from the Giant Dipole Resonance in ^{12}C ”
MS in Physics, September 1988
- 1982 – 1986 Princeton University
BA in Physics, June 1986, Graduated with Honors

EMPLOYMENT:

- 2017 – present Dean, College of Sciences, Old Dominion University
2012 – 2014 Visiting Scientist, National Science Foundation
2005 – 2011 Chair, Department of Physics, Old Dominion University
2006 – present Professor of Physics, Old Dominion University
2004 – 2005 Research Leave (sabbatical), Jefferson Laboratory
2001 – 2006 Associate Professor of Physics, Old Dominion University
1995 – 2001 Assistant Professor of Physics, Old Dominion University
1992 – 1994 Postdoctoral Research Associate, Vrije Universiteit, Amsterdam
1987 – 1992 Research Assistant, Department of Physics, Stanford University
1986 – 1987 Teaching Assistant, Department of Physics, Stanford University

ACADEMIC AWARDS AND HONORS:

- 2016 APS Woman Physicist of the Month for February 2016
2015 Outstanding Faculty Award, State Council of Higher Education in Virginia
2013 Francis Slack Award, Southeastern Section of the American Physical Society
2012 Gene W. Hirschfeld Faculty Excellence Award
2003 College of Sciences Faculty Excellence Award
1991 Luise Meyer-Schutzmeister Memorial Award

PROFESSIONAL ORGANIZATIONS AND ACTIVITIES:

American Physical Society, Division of Nuclear Physics
Hall B Collaboration, Jefferson Lab
Jefferson Lab Users Group

SUMMARY of ADMINISTRATIVE EXPERIENCE:*Chair, Department of Physics, ODU*

(2005 to 2011)

- Formed the Center for Accelerator Science (CAS) in partnership with Jefferson Lab; hired the director and one other senior faculty member; worked with faculty in engineering and other sciences to establish interdisciplinary projects. CAS has brought in approximately \$9 million since it was established in 2008.
- Oversaw improvements in undergraduate education, which included revamping the introductory calculus-based physics courses, establishing the interactive “SCALE-UP” classroom, refurbishing the Pretlow Planetarium, and revising the astronomy courses
- Published department newsletter three times per year to establish a closer connection with alumni.
- Established a NSF-funded Research Experience for Undergraduates program focusing on nuclear and accelerator physics in partnership with Jefferson Lab. The REU has been renewed twice for a total of nine years (third renewal pending).

Program Manager, Experimental Nuclear Physics, NSF

(2012 – 2014)

- Managed proposal review and evaluation process; made funding recommendations in accordance with priorities in the field; responsible for \$17 million portfolio
- Performed oversight and review of awarded grants
- Mentored new faculty seeking funding
- Advocated for additional funding for nuclear physics
- Represented NSF in oversight of the National Superconducting Cyclotron Facility at Michigan State
- Coordinated with the Department of Energy Office of Nuclear Physics on projects of common interest
- Managed MRI, CAREER, and ARI proposals and awards
- Participated in the establishment of new accelerator science program within the division of physics

SUMMARY of RESEARCH EXPERIENCE:

- Research in experimental nuclear physics, primarily at Jefferson Lab, focusing on the structure of the nucleon with polarized and unpolarized targets
- PI or co-PI of more than \$13 million in grants and contracts, mostly as part of the experimental nuclear physics group at ODU (six faculty total).
- Co-author on 135 refereed papers; more than 8000 citations (from INSPIRE)
- Graduated 5 Ph.D. and 1 M.S. student; currently supervising one Ph.D. student
- Extensive professional service, including membership (2010 – 2012) on the Nuclear Science Advisory Committee and chairmanship of the Committee of Visitors to the DOE Office of Nuclear Physics in 2016; now serving as an elected member of the Executive Committee for the American Physical Society Division of Nuclear Physics

SUMMARY of TEACHING EXPERIENCE:

- Extensive teaching of introductory physics; currently teaching upper level laboratory courses for majors (303 and 413)
- Worked with several undergraduates as part of my research; supervised 4 complete senior thesis projects; currently supervising two senior thesis students
- Co-advisor to the women in physics group; mentoring of undergraduate and graduate students

TEACHING EXPERIENCE:*Courses Taught:*

- Physics 101N and 102N, Elementary Physics (4 credits each); conceptual
- Physics 111N and 112N, Introductory General Physics (4 credits each); algebra-based
- Physics 303, Intermediate Experimental Physics, ODU (3 credits)
- Physics 413, Methods of Experimental Physics, ODU (3 credits)
- Physics 415, Introductory Nuclear Physics, ODU (3 credits)
- Physics 491, Special Problems and Research, ODU (1 credit)
- Physics 499, Senior Thesis (3 credits)
- Physics 697/731/831, Graduate Seminar (1 credit)
- Physics 861, Topics: Nuclear Physics (3 credits)

SUPERVISION AND MENTORING:*Graduate Students:*

- Nathan Dzbenski, Ph.D. student, Summer 2015 - present
- Sharon Careccia, Ph.D. student, conferred May 2012
Thesis: Single and Double-Spin Asymmetries for π^- Electroproduction from the Deuteron
- Mary Hing-Hickman, Ph.D. conferred May 2011
Thesis: Epistemic Strategies for Solving Two-Dimensional Physics Problems
- Jixie Zhang, Ph.D. conferred May 2010
Thesis: Exclusive π^- Electro-production from the Neutron in the Resonance Region
- Amy Comer, M.S. conferred August 2003
Thesis: Measurement of the $^{15}\text{ND}_3$ Deuteron Target Polarization for the EG1 Experiment
- Vipuli Dharmawardane, Ph.D. conferred May 2004
Thesis: Spin Structure Functions of the Deuteron Measured with CLAS in and above the Resonance Region
- Mehmet Bektasoglu, Ph.D. conferred December 2002
Thesis: Measurement of the Double Spin Asymmetry in π^- Electroproduction with CLAS

Member, Ph.D. Dissertation Committees: 24 completed Ph.D.s since 2000

Undergraduate Senior Thesis Students:

Paul Ellison, 2016–2017, “Study of Maximum Drift Times in Cylindrical Proton Detector”
Ashlee Bradford, 2016–2017, “Measurement of Electron Energy Deposition in ArCO₂ Gas Using Gaseous Electron Multiplier Foils”
Heather Hagood, 2015–2016, “Investigation of Maximum Drift Time as a Function of Gas Mixture in a Drift Chamber”
Wesley Lacaze, 2015, “Gamma Spectroscopy Analysis of an Unknown Photopeak”
Vernon Ali Dayawan, 2011–2012, “Measurement of Drift Chamber Efficiency as a Function of Applied Potential Difference”
Billy Lactaen, 2006 – 2007, “Prototype Studies of a Drift Chamber for CLAS12”

Other Undergraduate Research Mentoring (recent):

Trenton Hagerman, Summer 2016
 April Savage, Spring 2017
 Eric Deir, Spring and Summer 2017

High School Students (recent):

Monica Getsova, co-supervised, Summer 2015
 Carter Hedinger, Summer 2017

Other:

Advisor, Women in Physics, 1995 - present
 Mentor, Preparing Future Faculty Academic Job Search website, Fall 2011
 Miscellaneous forums at Jefferson Lab for graduate students and postdocs
 Mentor, Lataveius Wallace, Spring 2012

COMMUNITY SERVICE (since 2000):

Tour and demonstrations for Boy Scouts working on the Nuclear Merit Badge, Aug. 30, 2016
 Talk for graduate students and postdocs, "Grant Writing: a Quick Overview for Graduate Students and Postdocs," Jefferson Lab, Jan. 19, 2016
 Interview on *Hearsay*, Jan. 14, 2016
 Talk for undergraduate and high school students, "Careers in Government," HUGS Career Day, Jefferson Lab, June 15, 2015
 Seminar for SULI and REU undergraduate students at Jefferson Lab, 2010 – 2012, 2015 – 2017 "Responsible Conduct of Research"
 Interview on *With Good Reason*, May 27, 2015
 Volunteer at the ODU Physics Department demonstration table at the Children's Festival – Fall, 1995 – 2000, 2003, 2007, 2008, 2011, 2014, 2016
 Judge at science fair, Grades 7 and 8, Swanson Middle School, Arlington, VA (Jan. 2014)
 Volunteer at ODU and Jefferson Lab open houses
 Presentation to Rotary Club in Hamilton-Wenham, MA, December 2011.
 Science presentations, WH Taylor Elementary School, 2009 and 2010
 Presenter, Career Fair for 4th and 5th graders at WH Taylor Elementary School, 2010, 2011
 Judge at science fair for homeschooled children grades K – 7, May 5, 2008
 Math tutor for Granby High School (90 minutes per week, Jan 2008 – Jan 2009);
 recruit math tutors from among the faculty and students in the College of Sciences
 Coordinated physics demonstrations at ODU basketball game, January 8, 2005
 Evaluator for physics mentorship presentations at the New Horizons Governor's School for Science and Technology, 1996 – 1998, 2000, 2004

DEPARTMENT SERVICE:

Deputy Director, Center for Accelerator Science, AYs 14-16
 Undergraduate Program Director, AY11-12
 Associate Department Chair, AY11-12
 Chair, Steering Committee for the Center for Accelerator Science, AY11-12
 Department Chair, August 2005 – June 2011
 Colloquium Organizer (2007 – 2009)

Physics Learning Center Coordinator
Senior Thesis Coordinator (2007 – 2011)
Chair, New Faculty Search Committee, Fall 2003 – Spring 2004
Department Chair Search Committee, Fall 2000 – Spring 2001
Computational Resources Committee – Summer 1998 – 1999
Teaching Space Committee – Spring 1998
Graduate Committee – Jan. 1995 to May 2004
 Graduate Advising Subcommittee – Fall 1997 to May 2004
 Chair, Examinations Subcommittee – Jan. 1995 to May 1997
Colloquium Committee – Sept. 1995 to May 2004

Other Activities

Organized and led meetings with undergraduate students on (a) How to be a Successful Student and (b) How to Get Involved in Research, Spring and Fall 2015
Presented physics demonstrations to high school chemistry and physics students visiting the ODU campus, Jan. 6, 2000
Recruiting Talks at the New Horizons Governor's School for Science and Technology, January 1998, November 1998, November 1999 and November 2000
Co-organizer of and volunteer in the Physics Learning Center

COLLEGE SERVICE:

Talk for Women in Science group, "A Career in Science: Opportunities and Challenges," April 16, 2015
Member, Diversity Committee, Fall 2015 – Spring 2017
Chair, Committee to Consider Graduate Health Insurance Options for the College, Spring 2011
Evaluator, Graduate TA Institute presentations, 2010 and 2011
Chair of the Department of Ocean, Earth and Atmospheric Sciences Chair Search Committee, AY09-10
Chair, Committee to Consider Overhead Issues in the College, Fall 2008
Chair of the Computer Science Chair Search Committee, 2008
Panelist, Ethics in Science and Engineering discussion, NASA SHARP Plus Program, 1997
Speaker at the Media Lunch featuring the College of Sciences, Sept. 7, 1995
Speaker at College of Sciences Faculty and Staff meeting, "Teaching Introductory Physics" Feb. 28, 2003

UNIVERSITY SERVICE:

Panelist in "*Partnering with your Program Officer*," organized by the Office of Research, April 14, 2016
Panelist in Promotion and Tenure Workshop, organized by the Women's Caucus, March 27, 2015
Talk organized by the ODU Center for Teaching and Learning, "Keeping Students Engaged in Large Lecture Courses," March 19, 2015
Panelist for "*Movin' On Up to Full Professor*," organized by the Women's Caucus, January 23, 2015
Talk organized by the Office of Research, "NSF: An Insider's View," Oct. 28, 2014
Chair, Ad-Hoc Committee to Consider IDC issues, Fall 2011 – Spring 2012

Member Strategic Planning Subcommittee on Graduate Programs, Spring 2009
 Organizer of Pre-calculus Refresher Course for incoming freshmen, Summer 2008
 ODU Representative, SURA Jefferson Lab Subcommittee
 Member, Commission on Enrollment Management Task Force on out-of-state recruitment and retention, 2005-2006
 Strategic Planning Committee, 1998-1999
 Subcommittee on Initiative #1 - Distinctive Programs
 Subcommittee on Initiative #9 - Graduate Programs
 Dean of the College of Sciences Search Committee, 1996 – 97
 Speaker at GTA Institute, August 2003, “Conducting Laboratory Sessions”

PROFESSIONAL SERVICE:

Elected Member, Executive Committee, Division of Nuclear Physics, American Physical Society, 2016 - 2018
 Chair, Committee of Visitors review of the Department of Energy Office of Nuclear Physics, March 1 – 3, 2016.
 Member, STAR Collaboration Site Review Team, organized by the Committee on the Status of Women in Physics, Brookhaven National Lab, June 4 – 5, 2015
 Program Director for Nuclear Physics, National Science Foundation, 2012 - 2014
 Member, Nuclear Science Advisory Committee, 2010 – 2012
 Member, APS Division of Nuclear Physics Nominating Committee, 2011 and 2012 (Chair)
 Member of the Committee of Visitors, DOE Office of Nuclear Physics, January 2010
 Member of the Committee of Visitors, NSF Physics Division, February 2009
 Member of the Hall B Steering Committee for the CLAS12 upgrade, 2005 – 2010
 Committee Chair, 2005 – 2008
 Member, Jefferson Lab Users Group Board of Directors, 2005 – 2007 and 1999-2001
 Proposal Reviewer, DOE, NSF, NSERC
 Member, NSF Panel for Nuclear Physics
 Member, NSF Panel for Academic Research Infrastructure Program
 Member, DOE panel, Office of Science
 Chair, Membership Committee, Hall B Collaboration, Jefferson Laboratory
 May 1997 to May 2000
CLAS Publication Review Committees:
 CLAS Collaboration Working Group Committee Review for P. Bosted, *et al.* “Spin Asymmetries in Exclusive π^+ and π^- electroproduction from the EG1b experiment”, 2014 – 2015.
 CLAS Collaboration Ad Hoc Committee for M.E. McCracken, *et al.* “Search for baryon-number and lepton-number violating decays of Λ hyperons using the CLAS detector at Jefferson Laboratory,” Phys. Rev. D **92**, 072002 (2015).
 CLAS Collaboration Ad Hoc Committee for A. Daniel, *et al.* “Measurement of the nuclear multiplicity ratio for K^0_s hadronization at CLAS,” Phys. Lett. B **706**, 26 (2012).
 CLAS Collaboration Ad Hoc Committee (Chair) for M. Williams, *et al.* “Differential Cross Sections for η and η' Photoproduction from the g11 Dataset,” Phys. Rev. C **80**, 045213 (2009).
 CLAS Collaboration Ad Hoc Committee for F. Girod *et al.*, “Deeply Virtual Compton Scattering Beam-Spin Asymmetries,” Phys. Rev. Lett. **100**, 162002 (2008).

CLAS Deep Processes Working Group Committee for S. Chen *et al.*, “Measurement of Deeply Virtual Compton Scattering with a Polarized-Proton Target,” Phys. Rev. Lett. **97**, 072002 (2006).

CLAS Ad Hoc Committee (Chair) for M. Osipenko *et al.*, “A Kinematically Complete Measurement of the Proton Structure Function F_2 in the Resonance Region and Evaluation of Its Moments,” Phys. Rev. D **73**, 045205 (2006).

CLAS Structure of the Nucleon Working Group Committee for R. Fatemi *et al.*, “Measurement of Proton Spin Structure Functions in the Resonance Region for Q^2 from 0.15 to 1.6 GeV²,” Phys. Rev. Lett. **91**, 222002 (2003).

Conference/Workshop Organization:

Member, Local Program Committee, 22nd International Symposium on Spin Physics (SPIN 2016), September 25 – 30, 2016, Urbana-Champaign, Illinois.

Organizer, Conference for Undergraduate Women in Physics (CUWiP), Jan. 15 – 17, 2016, Old Dominion University, Norfolk, Virginia

Member, Scientific Organizing Committee, 21st International Conference for Few-Body Problems in Physics, May 18 – 22, 2015, Chicago, Illinois

Co-organizer, Women in Science and Engineering Workshop, November 16, 2009, Jefferson Lab, Newport News, Virginia

Local Organizing Committee, 3rd International Symposium on the Gerasimov-Drell-Hearn Sum Rule and its Extensions (GDH2004), June 2-5, 2004, Norfolk, Virginia

GRANTS PENDING:

DOE proposal submitted Sep. 14, 2016, “Quarks to Nuclei,” \$3,406,692, PI: S. Bueltmann, co-PIs: M. Amaryan, G. Dodge, C. Hyde, S. Kuhn, L. Weinstein

GRANTS APPROVED:

NSF “IRES: Studying Nucleon Structure in Orsay, France,” \$248,238, PI: P. Schweitzer (U. Conn.); co-PIs: K. Joo (U. Conn), G. Dodge, June 1, 2017 – May 31, 2020

NSF “REU Site: Accelerator and Nuclear Physics,” \$259,050, PI: G. Dodge; co-PIs: H. Areti, S. Bueltmann, May 1, 2017 – April 30, 2020

DOE, “Quarks to Nuclei,” Co-Principal Investigator

March 15, 2014 - March 14, 2015 \$722,000

March 15, 2015 - March 14, 2016 \$722,000

Sept 1, 2015 – March 14, 2016 \$75,000 (supplement)

March 15, 2016 – March 14, 2017 \$744,000

March 15, 2016 – March 14, 2017 \$60,000 (supplement)

March 15, 2016 – March 14, 2017 \$30,000 (supplement)

DOE, “From Quarks to Nuclei,” Co-Principal Investigator

March 15, 2011 - March 14, 2012 \$760,000

March 15, 2012 - March 14, 2013 \$722,000 (revised from \$780,000)

March 15, 2013 – March 14, 2014 \$722,000 (revised from \$800,000)

NSF, “REU Site: Renewal of REU at ODU: Accelerator and Nuclear Physics,” \$233,400, Co-Principal Investigator (1st year only), May 1, 2011 – April 30, 2014

Jefferson Laboratory, “Construction and Testing of Region 2 Drift Chambers for CLAS 12,” \$525,530, Co-Principal Investigator, October 1, 2010 – September 30, 2012

Jefferson Science Associates, “JLab Women in Physics Initiatives Workshop,” \$6000, Co-Principal Investigator, October 1, 2008 – December 31, 2009

SURA / JSA Fellowship, "Fellowship of Jixie Zhang (2008-2009)," \$12,625,
 August 3, 2008 – May 30, 2009

NSF, "REU at ODU: Accelerator and Nuclear Physics," \$168,500, Co-Principal Investigator,
 May 15, 2008 – April 30, 2011

DOE, "From Quarks to Nuclei," Co-Principal Investigator
 March 15, 2008 - March 14, 2009 \$620,000
 March 15, 2009 - March 14, 2010 \$720,000
 March 15, 2010 – March 14, 2011 \$737,000

Jefferson Science Associates, "CLAS12 Architectural Model," Principal Investigator, \$4500,
 Jan. 7, 2008 – Sept. 26, 2008

Jefferson Lab, "Construction and Testing of the Region 1 Prototype Drift Chamber for the
 CLAS12 Detector," \$28,385, Co-Principal Investigator, May 30, 2007 – Dec. 31, 2007

Jefferson Science Associates, "Post-Doc Support for Henry Juengst," Principal Investigator,
 \$23,886, Aug. 23, 2007 – Dec. 22, 2007

SURA / JSA Fellowship, "Fellowship of Jixie Zhang (2007-2008)," \$12,063,
 August 16, 2007 – May 15, 2008

DOE, "From Quarks to Nuclei," Principal Investigator
 March 15, 2005 - March 14, 2006 \$600,000
 March 15, 2006 - March 14, 2007 \$560,000
 March 15, 2007 – March 14, 2008 \$560,000

DOE, "From Quarks to Nuclei," Co-Principal Investigator
 March 15, 2002 - March 14, 2003 \$535,000
 March 15, 2003 - March 14, 2004 \$535,000
 March 15, 2004 – March 14, 2005 \$560,000

DOE, "From Quarks to Nuclei," Co-Principal Investigator
 March 15, 1999 - March 14, 2000 \$450,000
 March 15, 2000 - March 14, 2001 \$450,000
 March 15, 2001 – March 14, 2002 \$465,000
 March 15, 2001 – March 14, 2002 \$35,000 supplemental funding

ODU, "Technology in Physics Instruction," \$6,000.
 Faculty Innovator Grant, Summer 1996, Co-Principal Investigator

DOE, "Experimental Nuclear Physics," Co-Principal Investigator
 March 15, 1996 - March 14, 1997 \$300,000.
 March 15, 1997 - March 14, 1998 \$378,000.
 March 15, 1998 - March 14, 1999 \$388,000.

CEBAF, "Physics Technician," \$18,171.
 May 12, 1995 – Feb. 29, 1996, Principal Investigator

NSF, "Coherent Pion Electroproduction on Light Nuclei," \$15,265.
 Aug. 1, 1995 – Jul. 31, 1996, Principal Investigator

TALKS:

- Invited talk, Southeastern Section of the American Physical Society, Charlottesville, Virginia, November 11, 2016, "My Career in Physics: The Importance of Mentoring"
- Invited colloquium, Virginia Commonwealth University, March 25, 2016, "Probing the Neutron with the BONuS Experiment at Jefferson Lab"
- Invited talk at the XVII International Workshop on Neutrino Factories and Future Neutrino Facilities, August 10 – 15, 2015, Rio de Janeiro, Brazil, "The BONuS Experiment: New Results and Future Plans"

- Invited seminar, James Madison University, October 2, 2014, “Investigating the Neutron in the Resonance Region”
- Invited talk at the Southeastern Section of the American Physical Society, Nov. 22, 2013, “Accelerator Science: Opportunities for Growth,” Bowling Green, KY
- Invited talk at the Photonuclear Reactions Gordon Conference, August 5 – 10, 2012, Holderness, NH, “Spin Structure Studies at Jefferson Lab”
- Talk at the AAAS annual meeting, February 14 – 18, 2008, Boston, Massachusetts, “The Nucleon Spin Puzzle,” invited to participate as part of the session, entitled “Nuclear Physics: New Answers, New Questions About the Visible Universe”
- Invited talk at the XII Advanced Research Workshop on High Energy Spin Physics, Sept. 3-7, 2007, Dubna, Russia, “Spin Physics with CLAS”
- Invited talk at the 6th Circum-Pan-Pacific Symposium on High Energy Spin Physics, July 30-Aug. 3, 2007, Vancouver, Canada, “The Spin Structure of the Proton and Deuteron: Recent Results from CLAS”
- Invited lecture at the ODU Institute for Learning in Retirement, April 5, 2007, “Peeking Inside the Atomic Nucleus: How Do We Study the Invisible?”
- Plenary talk at the Hall B Collaboration Meeting, November 2, 2006, “Technical Update on CLAS12”
- Invited talk at the 5th Circum-Pan-Pacific Symposium on High Energy Spin Physics, July 5-8, 2005, Tokyo, Japan, “Spin Structure Functions: Sum Rules, Moments and Spin-Hadron Duality”
- Plenary talk at the Hall B Collaboration Meeting, June 17, 2005, “EG1b Update”
- CLAS++ Upgrade Meeting, Dec. 17, 2004, “Cathode Chambers for the Central Tracker: Update 12/17/04”
- Invited seminar at the University of Virginia, Charlottesville, Virginia, November 30, 2004. “Spin Structure Functions: A Window into the Structure of Hadrons”
- First meeting of the APS Topical Group on Hadronic Physics, October 24–26, 2004. “Spin Structure Functions: A Window into the Structure of Hadrons”
- Meeting of the Deep Processes Working Group, Hall B Collaboration, October 15, 2004, “EG1b Update”
- Invited talk at the 3rd International Symposium on the Gerasimov-Drell-Hearn Sum Rule and its Extensions (GDH2004), June 2-5, 2004, Norfolk, Virginia. “The First Moment of g_1 Measured with the CLAS Detector”
- Meeting of the Deep Processes Working Group, Hall B Collaboration, April 23, 2004, “EG1b Update”
- Invited talk at the 4th Circum-Pan-Pacific Symposium On High Energy Spin Physics (SPIN 2003), August 4-7, 2003, Seattle, Washington. “Proton and Deuteron Spin Structure Functions Measured with CLAS”
- SPIN2002, XVth International Spin Physics Symposium, September 9-14, 2002, Long Island, New York. “Inclusive and Exclusive Spin Structure Measurements in the Resonance Region”
- Invited talk at DIS2001, IX International Workshop on Deep Inelastic Scattering, April 27 – May 1, 2001, Bologna, Italy. “Spin Structure Measurements in the Resonance Region with CLAS.”
- Undergraduate Seminar at University of Richmond, October 1999, “The NIKHEF Recoil Detector”

- Colloquium at Georgetown, March 1997, “Coherent π^0 Production at NIKHEF”
- Colloquium at William and Mary, October, 1996, “Coherent π^0 Production at NIKHEF”
- Seminar at University of Maryland:, April, 1994, “New Detectors at NIKHEF”
- Dutch Nuclear Physics Meeting (NNV, Sectie Kernfysica), October 1993, “Electron Distortions in Quasielastic $^{208}\text{Pb}(e,e'p)$ ”
- American Physical Society, Division of Nuclear Physics Fall Meeting, October 1989, “Study of Proton Decay from the Giant Resonance Region of ^{12}C Using the $^{12}\text{C}(e,e'p)$ Reaction”

CURRENT RESEARCH PROJECTS:

Neutron Structure Experiments at Jefferson Lab

We are studying the structure of the neutron by scattering electrons from a deuterium target at Jefferson Lab. In the EG1 experiment we have longitudinally polarized electrons incident upon longitudinally polarized proton and deuteron targets to investigate the spin structure of the neutron. In the unpolarized BONuS experiment we detect the low energy recoiling proton in a special Radial Time Projection Chamber built to cover backward angles. By tagging the spectator proton we can identify events in which the electron was scattered from a neutron (almost) at rest.

(a) Exclusive π^- Production from Deuterium

We have taken data on $D(e,e'\pi^-)p$ with unpolarized target as part of the BONuS experiment. I am working with my previous Ph.D. student, Jixie Zhang, to prepare a publication on these data.

(b) Preparations for the next phase of the BONuS Experiment

The BONuS experiment will run again with 11 GeV beam in 2018 or 2019. I am working with the BONuS collaboration to simulate, prototype, and build a newly designed Radial Time Project Chamber to detect the low energy backward protons. I am supervising one graduate student and several undergraduates on this experiment.

Drell Yan with Polarized Target at Fermi Lab

In hadron-hadron collisions the Drell-Yan process provides a complementary way to study hadron structure. In this process, a quark in one hadron annihilates with an anti-quark in the other hadron, producing two leptons in the final state. By choosing the beam and target, it is possible to emphasize the dynamics of particular quark or anti-quark flavors in certain kinematic regions. We have joined a new experiment planned for Fermi Lab in 2017-2018 in which unpolarized protons will be scattered from polarized proton and deuteron targets to probe transverse quark motion in the nucleon.

PUBLICATIONS:

Refereed Journals:

P.E. Bosted, *et al.* (The CLAS Collaboration), “Target and beam-target spin asymmetries in exclusive π^+ and π^- electroproduction with 1.6- to 5.7-GeV electrons,” Phys. Rev. C94, 055201 (2016).

X. Zheng, *et al.* (The CLAS Collaboration), “Measurement of target and double-spin asymmetries $\vec{e}\vec{p} \rightarrow e\pi^+(n)$ for the reaction in the nucleon resonance region at low Q^2 ,”

Phys. Rev. C **94**, 045206 (2016).

M.E. McCracken, *et al.* (The CLAS Collaboration), “Search for baryon-number and lepton-number violating decays of Λ hyperons using the CLAS detector at Jefferson Laboratory,” Phys. Rev. D **92**, 072002 (2015).

N. Guler, *et al.* (The CLAS Collaboration), “Precise Determination of the deuteron spin structure at low to moderate Q^2 with CLAS and extraction of the neutron contribution,” Phys. Rev. C **92**, 055201 (2015).

D. Adikaram, *et al.* (The CLAS Collaboration), “Towards a resolution of the proton form factor problem: new electron and positron scattering data,” Phys. Rev. Lett. **114**, 062003 (2015).

Y. Prok, *et al.* (The CLAS Collaboration), “Precision measurements of g_1 of the proton and the deuteron with 6 GeV electrons,” Phys. Rev. C **90**, 025212 (2014).

S. Tkachenko *et al.* (The CLAS Collaboration), “Measurement of the nearly free neutron structure function using spectator tagging in inelastic $^2\text{H}(e,e'p_s)X$ scattering with CLAS,” Phys. Rev. C **89**, 045206 (2014).

I. Pomerantz, *et al.* (The CLAS Collaboration), “Hard Two-body Photodisintegration of ^3He ,” Phys. Rev. Lett. **110**, 242301 (2013).

O. Hen, *et al.* (The CLAS Collaboration), “Measurement of transparency ratios for protons from short-range correlated pairs,” Phys. Lett. **B722**, 63 (2013).

K. Park, *et al.* (The CLAS Collaboration), “Deep exclusive π^+ electroproduction off the proton at CLAS,” Eur. Phys. J. **A49**, 16 (2013).

H. Fonvieille, *et al.* (Hall A Collaboration), “Virtual Compton Scattering and the Generalized Polarizabilities of the Proton at $Q^2 = 0.92$ and 1.76 GeV^2 ,” Phys. Rev. C **86**, 015210 (2012).

H. Baghdasaryan, *et al.* (CLAS Collaboration), “A Comparison of Forward and Backward pp pair knockout in $^3\text{He}(e,e'pp)n$,” Phys. Rev. C **85**, 064318 (2012).

L. El Fassi, *et al.* (CLAS Collaboration), “Evidence for the Onset of Color Transparency in ρ^0 Electroproduction off Nuclei,” Phys. Lett. B **712**, 326 (2012).

N. Baillie, *et al.* (The CLAS Collaboration), “Measurement of the neutron F_2 structure function via spectator tagging with CLAS,” Phys. Rev. Lett. **108**, 199902 (2012).

M. Amarian, *et al.*, “Observation of a narrow structure in $p(\gamma, K_s^0)X$ via interference with ϕ -meson production,” Phys. Rev. C **85**, 035209 (2012).

A. Daniel, *et al.* (The CLAS Collaboration), “Measurement of the nuclear multiplicity ratio for K_s^0 hadronization at CLAS,” Phys. Lett. B **706**, 26 (2011).

M. Aghasyan, *et al.* (The CLAS Collaboration), “Precise Measurements of Beam Spin Asymmetries in Semi-Inclusive π^0 production,” *Phys. Lett. B* **704**, 397 (2011).

H. Baghdasaryan, *et al.* (The CLAS Collaboration), “Tensor Correlations Measured in $^3\text{He}(e,e'pp)n$,” *Phys. Rev. Lett* **105**, 222501 (2010).

H. Avakian, *et al.* (The CLAS Collaboration), “Measurement of Single- and Double-Spin Asymmetries in Deep Inelastic Pion Electroproduction with a Longitudinally Polarized Target,” *Phys. Rev. Lett* **105**, 262002 (2010).

M. Williams, *et al.* (The CLAS Collaboration), “Partial wave analysis of the reaction $\gamma p \rightarrow p\omega$ and the search for nucleon resonances,” *Phys. Rev. C* **80**, 065209 (2009).

M. Williams, *et al.* (The CLAS Collaboration), “Differential cross sections and spin density matrix elements for the reaction $\gamma p \rightarrow p\omega$,” *Phys. Rev. C* **80**, 065208 (2009).

M. Williams, *et al.* (The CLAS Collaboration), “Differential cross sections for the reactions $\gamma p \rightarrow p\eta$ and $\gamma p \rightarrow p\eta'$,” *Phys. Rev. C* **80**, 045213 (2009).

R. Nasseripour, *et al.* (The CLAS Collaboration), “Photodisintegration of ^4He into $p + t$,” *Phys. Rev. C* **80**, 044603 (2009).

X. Qian, *et al.* (The CLAS Collaboration), “The Extraction of the π -N total cross section from $d(\gamma, pK^+K^-)n$,” *Phys. Lett. B* **680**, 417-422 (2009).

M. Battaglieri, *et al.* (The CLAS Collaboration), “Photoproduction of $\pi^+\pi^-$ meson pairs on the proton,” *Phys. Rev. D* **80**, 072005 (2009).

D. Carman, *et al.* (The CLAS Collaboration), “Beam-Recoil Polarization Transfer in the Nucleon Resonance Region in the Exclusive $\bar{e}p \rightarrow e'K^+\bar{\Lambda}$ and $\bar{e}p \rightarrow e'K^+\bar{\Sigma}^0$ Reactions at CLAS,” *Phys. Rev. C* **79**, 065205 (2009).

W. Chen, *et al.* (The CLAS Collaboration), “A measurement of the differential cross section for the reaction $\gamma n \rightarrow \pi^- p$ from deuterium,” *Phys. Rev. Lett.* **103**, 012301 (2009).

M. Dugger, *et al.* (The CLAS Collaboration), “ π^+ photoproduction on the proton for photon energies from 0.725 to 2.875 GeV,” *Phys. Rev. C* **79**, 065206 (2009).

G. Gavalian, *et al.* (The CLAS Collaboration), “Beam Spin Asymmetries in DVCS with CLAS at 4.8 GeV,” *Phys. Rev. C* **80**, 035206 (2009).

J. Lachniet, *et al.* (The CLAS Collaboration), “A Precise Measurement of the Neutron Magnetic Form Factor G_M^n in the Few-GeV² Region,” *Phys. Rev. Lett.* **102**, 192001 (2009).

M. Battaglieri, *et al.* (The CLAS Collaboration), “First measurement of direct $f_0(980)$ photoproduction on the proton,” *Phys. Rev. Lett.* **102**, 102001 (2009).

G.V. Fedotov, *et al.* (The CLAS Collaboration), “Electroproduction of $p \pi^+ \pi^-$ off protons at $0.2 < Q^2 < 0.6 \text{ GeV}^2$ and $1.3 < W < 1.57 \text{ GeV}$ with the CLAS detector,” *Phys. Rev. C* **79**, 015204 (2009).

M. Osipenko, *et al.* (The CLAS Collaboration), “Measurement of semi-inclusive π^+ electroproduction off the proton,” *Phys. Rev. D* **80**, 032004 (2009).

S.A. Morrow, *et al.* (The CLAS Collaboration), “Exclusive ρ^0 electroproduction on the proton at CLAS,” *Eur. Phys. J. A* **39**, 5-31 (2009).

M. Nozar, *et al.* (The CLAS Collaboration), “Search for the Photoexcitation of Exotic Mesons in the $\pi^+ \pi^+ \pi^-$ System,” *Phys. Rev. Lett.* **102**, 102002 (2009).

Y. Prok, *et al.* (The CLAS Collaboration), “Moments of the spin structure functions g_1^p and g_1^d for $0.05 < Q^2 < 3.0 \text{ GeV}^2$,” *Phys. Lett. B* **672**, 12 (2009).

I.G. Aznauryan *et al.* (The CLAS Collaboration), “Electroexcitation of the Roper resonance at $1.7 < Q^2 < 4.5 \text{ GeV}^2$ in $\vec{e}p \rightarrow en\pi^+$,” *Phys. Rev. C* **78**, 045209 (2008).

A. Biselli *et al.* (The CLAS Collaboration) “First measurement of target and double spin asymmetries for $\vec{e}p \rightarrow ep\pi^0$ in the nucleon resonance region above the $\Delta(1232)$,” *Phys. Rev. C* **78**, 045204 (2008).

A. Deur, P. Bosted, V. Burkert, D. Crabb, V. Dharmawardane, G.E. Dodge, T.A. Forest, K.A. Griffioen, S.E. Kuhn, R. Minehart, and Y. Prok, “Experimental Study of Isovector Spin Sum Rules,” *Phys. Rev. D* **78**, 032001 (2008).

J. P. Santoro *et al.* (The CLAS Collaboration) “Electroproduction of $\phi(1020)$ mesons at $1.4 < Q^2 < 3.8 \text{ GeV}^2$ measured with the CLAS spectrometer,” *Phys. Rev. C* **78**, 025210 (2008).

P.E. Bosted *et al.* (The CLAS Collaboration) “Ratio of $^{15}\text{N}/^{12}\text{C}$ and $^4\text{He}/^{12}\text{C}$ inclusive electroproduction cross sections in the nucleon resonance region,” *Phys. Rev. C* **78**, 015202 (2008).

M. H. Wood, *et al.* (The CLAS Collaboration) “Light vector mesons in the nuclear medium,” *Phys. Rev. C* **78**, 015201 (2008).

H. Fenker, N. Baillie, P. Bradshaw, S. Bueltmann, V. Burkert, M. Christy, G. Dodge, D. Dutta, R. Ent, J. Evans, R. Fersch, K. Giovanetti, K. Griffioen, M. Ispiryan, C. Jayalath, N. Kalantarians, C. Keppel, S. Kuhn, G. Niculescu, I. Niculescu, S. Tkachenko, V. Tvaskis and J. Zhang, “BoNus: Development and use of a radial TPC using cylindrical GEMs,” *Nucl. Instr. Meth. A* **592**, 273-286 (2008).

- R. Nasseripour, *et al.* (The CLAS Collaboration) “Polarized structure function σ_{LT} for $^1H(\vec{e}, e'K^+)\Lambda$ in the nucleon resonance region,” *Phys. Rev. C* **77**, 065208 (2008).
- F.X. Girod *et al.*, (CLAS Collaboration) “Measurement of Deeply Virtual Compton Scattering Beam-Spin Asymmetries,” *Phys. Rev. Lett.* **100**, 162002 (2008).
- R. De Masi *et al.*, (CLAS Collaboration) “Measurement of $ep \rightarrow ep\pi^0$ beam spin asymmetries above the resonance region,” *Phys. Rev. C* **77**, 042201 (2008).
- D.G. Ireland *et al.*, (CLAS Collaboration) “Bayesian Analysis of Pentaquark Signals from CLAS Data,” *Phys. Rev. Lett.* **100**, 052001 (2008).
- K. Park *et al.*, (CLAS Collaboration) “Cross Sections and Beam Asymmetries for $\bar{e}p \rightarrow en\pi^+$ in the Nucleon Resonance Region for $1.7 < Q^2 < 4.5 \text{ GeV}^2$,” *Phys. Rev. C* **77**, 015208 (2008).
- R. Nasseripour *et al.*, (CLAS Collaboration) “Search for Medium Modifications of the ρ meson,” *Phys. Rev. Lett.* **99**, 262302 (2007).
- T. Mibe *et al.*, (CLAS Collaboration) “Measurement of Coherent ϕ -Meson Photoproduction from the Deuteron at Low Energies,” *Phys. Rev. C* **76**, 052202 (2007).
- M. Dugger *et al.*, (CLAS Collaboration) “ π^0 Photoproduction on the Proton for Photon Energies from 0.675 to 2.875 GeV,” *Phys. Rev. C* **76**, 025211 (2007).
- H. Denizli *et al.*, (CLAS Collaboration) “ Q^2 dependence of the $S_{11}(1535)$ photocoupling and evidence for a P-wave resonance in η electroproduction,” *Phys Rev C* **76**, 015204 (2007).
- L. Guo *et al.*, (CLAS Collaboration) “Cascade production in the reactions $\gamma p \rightarrow K^+K^+(X)$ and $\gamma p \rightarrow K^+K^+\pi^-(X)$,” *Phys Rev C* **76**, 025208 (2007).
- K.S. Egiyan *et al.*, (CLAS Collaboration) “Experimental Study of Exclusive $^2H(e, e'p)n$ Reaction Mechanisms at High Q^2 ,” *Phys Rev Lett* **98**, 0262502 (2007).
- P. E. Bosted *et al.*, (CLAS Collaboration) “Quark-hadron duality in spin structure functions g_1^p and g_1^d ,” *Phys Rev C* **75**, 035203 (2007).
- R. K. Bradford *et al.*, (CLAS Collaboration) “First measurement of beam-recoil observables C_x and C_z in hyperon photoproduction,” *Phys Rev C* **75**, 035205 (2007).
- P. Ambrozewicz *et al.*, (CLAS Collaboration) “Separated structure functions for the exclusive electroproduction of $K^+\Delta$ and $K^+\Sigma^0$ final states,” *Phys Rev C* **75**, 045203 (2007).
- I. Hleiqawi *et al.*, (CLAS Collaboration) “Cross sections for the $\gamma p \rightarrow K^{*0}\Sigma^+$ reaction at $E_\gamma = 1.7\text{--}3.0 \text{ GeV}$,” *Phys Rev C* **75**, 042201 (2007).

- R. De Vita *et al.*, “Search for the Θ^+ pentaquark in the reactions $\gamma p \rightarrow K^0(\text{bar})K^+n$ and $\gamma p \rightarrow K^0(\text{bar})K^0p$,” *Phys. Rev. D* **74**, 032001 (2006).
- M. Ungaro *et al.*, “Measurement of the $N \rightarrow \Delta^+$ (1232) Transition at High-Momentum Transfer by π^0 Electroproduction,” *Phys. Rev. Lett.* **97**, 112003 (2006).
- K.V. Dharmawardane *et al.*, “Measurement of the x - and Q^2 -Dependence of the Asymmetry A_1 on the Nucleon,” *Phys. Lett.* **B641**, 11 (2006).
- S. Chen *et al.*, “Measurement of Deeply Virtual Compton Scattering with a Polarized-Proton Target,” *Phys. Rev. Lett.* **97**, 072002 (2006).
- V. Kubarovsky *et al.*, “Search for Θ^{++} Pentaquarks in the Exclusive Reaction $\gamma p \rightarrow K^+K^-p$,” *Phys. Rev. Lett.* **97**, 102001 (2006).
- S. Niccolai *et al.*, “Search for Θ^+ Pentaquark in the $\gamma d \rightarrow \Lambda n K^+$ Reaction Measured with the CLAS Spectrometer,” *Phys. Rev. Lett.* **97**, 032001 (2006).
- B. McKinnon *et al.*, “Search for the Θ^+ Pentaquark in the Reaction $\gamma d \rightarrow p K^- K^+ n$,” *Phys. Rev. Lett.* **96**, 212001 (2006).
- H. Egiyan *et al.*, “Single π^+ electroproduction on the proton in the first and second resonance regions at $0.25 \text{ GeV}^2 < Q^2 < 0.65 \text{ GeV}^2$,” *Phys. Rev. C* **73**, 025204 (2006).
- R. Bradford *et al.*, “Differential cross sections for $\gamma + p \rightarrow K^+ + Y$ for Λ and Σ^0 hyperons,” *Phys. Rev. C* **73**, 035202 (2006).
- M. Dugger *et al.*, “ η' Photoproduction on the Proton for Photon Energies from 1.527 to 2.227 GeV,” *Phys. Rev. Lett.* **96**, 062001 (2006).
- M. Battaglieri *et al.*, “Search for $\Theta^+(1540)$ Pentaquark in High-Statistics Measurement of $\gamma p \rightarrow \bar{K}^0 K^+ n$ at CLAS,” *Phys. Rev. Lett.* **96**, 042001 (2006).
- K. Egiyan *et al.*, “Measurement of Two- and Three-Nucleon Short-Range Correlation Probabilities in Nuclei,” *Phys. Rev. Lett.* **96**, 082501 (2006).
- A.V. Klimenko *et al.*, “Electron scattering from high-momentum neutrons in deuterium,” *Phys. Rev. C* **73**, 035212 (2006).
- M. Osipenko *et al.*, “Measurement of the Deuteron Structure Function F_2 in the Resonance Region and Evaluation of its Moments,” *Phys. Rev. C* **73**, 045205 (2006).
- S. Strauch *et al.*, “Beam-Helicity Asymmetries in Double-Charged-Pion Photoproduction on the Proton,” *Phys. Rev. Lett.* **95**, 162003 (2005).
- M.F.M. Steenbakketers *et al.*, “Quasifree π^0 and π^- Electroproduction on ^4He in the Δ -Resonance Region,” *Phys. Rev. Lett.* **95**, 172501 (2005).

K. Joo *et al.*, “Measurement of the polarized structure function σ_{LT} for pion electroproduction in the Roper-resonance region,” *Phys. Rev. C* **72**, 058202 (2005).

L. Morand *et al.*, “Deeply virtual and exclusive electroproduction of omega mesons,” *Eur. Phys. J.* **A24**, 445 (2005).

P. Rossi *et al.*, “Onset of asymptotic scaling in deuteron photodisintegration,” *Phys. Rev. Lett.* **94**, 012301 (2005).

D. Protopopescu *et al.*, “Survey of A_{LT} Asymmetries in Semi-Exclusive Electron Scattering on ^4He and ^{12}C ,” *Nucl. Phys. A* **748**, 357 (2005).

S. Taylor *et al.*, “Radiative Decays of the $\Sigma_0(1385)$ and $\Lambda(1520)$ Hyperon,” *Phys. Rev. C* **71**, 054609 (2005).

J.W. Price *et al.*, “Exclusive Photoproduction of the Cascade (Ξ) Hyperons,” *Phys. Rev. C* **71**, 058201 (2005).

C. Hadjidakis *et al.*, “Exclusive ρ^0 meson electroproduction from hydrogen at CLAS,” *Phys. Lett. B.* **605**, 256 (2005).

A. Deur *et al.*, “Experimental determination of the evolution of the Bjorken integral at low Q^2 ,” *Phys. Rev. Lett.* **93**, 212001 (2004).

S. Niccolai *et al.*, “Complete measurement of three-body photodisintegration of ^3He for photon energies between 0.35 and 1.55 GeV,” *Phys. Rev. C* **70**, 064003 (2004).

A.V. Stavinsky *et al.*, “Proton source size measurements in the $eA \rightarrow e'ppX$ reaction,” *Phys. Rev. Lett.* **93**, 192301 (2004).

K. Joo, *et al.*, “Measurement of Polarized Structure Function σ_{LT} for $p(e(\text{vec}), e'\pi^+)n$ in the Delta (1232) resonance region,” *Phys. Rev. C* **70**, 042201(R) (2004).

H. Avakian, *et al.*, “Measurement of Beam-Spin Asymmetries for π^+ Electroproduction Above the Baryon Resonance Region,” *Phys. Rev. D* **69**, 112004 (2004).

G. Laveissiere *et al.*, “Measurement of the generalized polarizabilities of the proton in virtual Compton scattering at $Q^2 = 0.92 \text{ GeV}^2$ and 1.76 GeV^2 ,” *Phys. Rev. Lett.* **93**, 122001 (2004).

M. Mirazita *et al.*, “Complete Angular Distribution Measurements of Two-Body Deuteron Photodisintegration between 0.5 and 3 GeV,” *Phys. Rev. C* **70**, 014005 (2004).

G. Laveissiere *et al.*, “Backward Electroproduction of π^0 Mesons on Protons in the Region of Nucleon Resonances at Four Momentum Transfer Squared $Q^2 = 1.0 \text{ GeV}^2$,” *Phys. Rev. C* **69**, 045203 (2004).

G. Laveissiere *et al.*, “Measurement of the Generalized Polarizabilities of the Proton in Virtual Compton Scattering at $Q^2 = 0.92 \text{ GeV}^2$ and 1.76 GeV^2 ,” *Phys. Rev. Lett.* **93**, 122001 (2004).

K. McCormick, *et al.*, “Tensor Polarization of the phi meson Photoproduced at High t ,” *Phys. Rev. C* **69**, 032203(R) (2004).

J. W. C. McNabb, *et al.*, “Hyperon Photoproduction in the Nucleon Resonance Region,” *Phys. Rev. C* **69**, 042201(R) (2004).

V. Kubarovsky, *et al.*, “Observation of an exotic baryon with $S = +1$ in photoproduction from the proton,” *Phys. Rev. Lett.* **92**, 032001 (2004).

R. Niyazov, *et al.*, “Two-Nucleon Momentum Distributions Measured in $^3\text{He}(e,e'pp)n$,” *Phys. Rev. Lett.* **92**, 052303 (2004).

S. Stepanyan, *et al.*, “Observation of an Exotic $S = +1$ Baryon in Exclusive Photoproduction from the Deuteron,” *Phys. Rev. Lett.* **91**, 252001 (2003).

R. Fatemi, *et al.*, “Measurement of the Spin Structure Functions in the Resonance Region for Q^2 from 0.15 to 1.6 GeV^2 ,” *Phys. Rev. Lett.* **91**, 222002 (2003).

K. Joo, *et al.*, “Measurement of Polarized Structure Function σ_{LT} for $p(e(\text{vec}),e'p)\pi^0$ from single π^0 electroproduction in the $\Delta(1232)$ resonance region,” *Phys. Rev. C, Rapid Comm.* **68**, 032201 (2003).

A. Biselli, *et al.*, “Study of the $\Delta(1232)$ using single and double polarization asymmetries,” *Phys. Rev. C* **68**, 035202 (2003).

K. Sh. Egiyan, *et al.*, “Observation of Nuclear Scaling in the $A(e,e')$ Reaction at $x_B > 1$,” *Phys. Rev. C* **68**, 014313 (2003).

M. Osipenko, *et al.*, “A Kinematically Complete Measurement of the Proton Structure Function F_2 in the Resonance Region and Evaluation of Its Moments,” *Phys. Rev. D* **67**, 092001 (2003).

M. Ripani, *et al.*, “ $ep \rightarrow e'p\pi^+\pi^-$ and baryon resonance analysis,” *Phys. Rev. Lett.* **91**, 022002 (2003).

D. Carman, *et al.*, “First Measurement of Transferred Polarization in the Exclusive $\bar{e}p \rightarrow e'K^+\bar{\Lambda}$ Reaction,” *Phys. Rev. Lett.* **90**, 131804 (2003).

J. Yun, *et al.*, “Measurement of Inclusive Spin Structure Functions of the Deuteron with CLAS,” *Phys. Rev. C* **67**, 055204 (2003).

- B. Mecking, *et al.*, “The CEBAF Large Acceptance Spectrometer,” *Nucl. Instr. and Meth.* **503/3**, 513 (2003).
- M. Battaglieri, *et al.*, “Photoproduction of the omega meson on the proton at large momentum transfer,” *Phys. Rev. Lett.* **90**, 022002 (2003).
- C.D. Keith *et al.*, “A Polarized Target for the CLAS Detector,” *Nucl. Instr. Meth. A* **501**, 327 (2003).
- M. Dugger, *et al.*, “Eta photoproduction on the proton for photon energies from 0.75 to 1.95 GeV,” *Phys. Rev. Lett.* **89**, 222002 (2002).
- C.M. Spaltro *et al.*, “The $^3\text{He}(e,e'd)p$ Reaction in $q\omega$ -constant Kinematics,” *Nucl. Phys. A* **706**, 403 (2002).
- K. Joo and the CLAS Collaboration, “ Q^2 Dependence of Quadrupole Strength in the $\gamma^*p \rightarrow \Delta^+(1232) \rightarrow p\pi^0$ Transition,” *Phys. Rev. Lett.* **88**, 122001 (2002).
- R. DeVita and the CLAS Collaboration, “First Measurement of the Double Spin Asymmetry $\bar{e}p \rightarrow e'\pi^+n$ in the Resonance Region,” *Phys. Rev. Lett.* **88**, 082001 (2002).
- M. Battaglieri and the CLAS Collaboration, “Photoproduction of ρ^0 Meson on the Proton at Large Momentum Transfer,” *Phys. Rev. Lett.* **87**, 172002 (2001).
- S. Barrow and the CLAS Collaboration, “Electroproduction of the Lambda(1520) Hyperon,” *Phys. Rev. C* **64**, 044601 (2001).
- S. Stepanyan and the CLAS Collaboration, “Observation of exclusive deeply virtual Compton scattering in polarized electron beam asymmetry,” *Phys. Rev. Lett.* **87**, 182002 (2001).
- K. Lukashin and the CLAS Collaboration, “Exclusive electroproduction of phi mesons at 4.2 GeV,” *Phys. Rev. C* **63**, 065205 (2001).
- R. Thompson and the CLAS Collaboration, “The $ep \rightarrow e'p\eta$ reaction at and above the $S_{11}(1535)$ baryon resonance,” *Phys. Rev. Lett.* **86**, 1702 (2001).
- E. Anciant and the CLAS Collaboration, “Photoproduction of $\phi(1020)$ Mesons on the Proton at Large Momentum Transfer,” *Phys. Rev. Lett.* **85**, 4682 (2000).
- M.D. Mestayer *et al.*, “The CLAS Drift Chamber System,” *Nucl. Instr. Meth. A* **449**, 81 (2000).
- M.J.M. van Sambeek *et al.*, “A Recoil Detector for electron scattering experiments with internal targets,” *Nucl. Instr. Meth. A* **434**, 279 (1999).
- C.M. Spaltro *et al.*, “ q and p_m Dependence of the $^3\text{He}(e,e'd)p$ Reaction,” *Phys. Rev. Lett.* **81**, 2870 (1998).

E. Frlez *et al.*, “Differential cross sections for pion charge exchange on the proton at 27.5 MeV,” *Phys. Rev. C* **57**, 3144 (1998).

J.J. van Leeuwe *et al.*, “High Missing-Momentum Components in the $^4\text{He}(e,e'p)^3\text{H}$ Reaction,” *Phys. Rev. Lett.* **80**, 2543 (1998).

L.M. Qin *et al.*, “Prototype Studies and Design considerations for the CLAS Region 2 Drift Chambers,” *Nucl. Instr. Meth. A* **411**, 265 (1998).

A. Pellegrino *et al.*, “Deuteron Electrodisintegration in the Δ -Resonance Region,” *Phys. Rev. Lett.* **78**, 4011 (1997).

H.B. van den Brink *et al.*, “Electroproduction of neutral pions on the proton,” *Nucl. Phys. A* **612**, 391 (1997).

I. Bobeldijk *et al.*, “Search for Nucleon-Nucleon Correlations in the Proton Spectral Function of ^{208}Pb ,” *Phys. Lett. B* **353**, 32 (1995).

H.B. van den Brink *et al.*, “Neutral-Pion Electroproduction on the Proton near Threshold,” *Phys. Rev. Lett.* **74**, 3561 (1995).

I. Bobeldijk *et al.*, “High-Momentum Protons in ^{208}Pb ,” *Phys. Rev. Lett.* **73**, 2684 (1994).

S.E. Kuhn *et al.*, “Multinucleon Effects in Muon Capture on ^3He at High Energy Transfer,” *Phys. Rev. C* **50**, 1771 (1994).

D. Pććanic' *et al.*, “Reaction $\pi^+ p \rightarrow \pi^+ \pi^0 p$ near Threshold and Chiral Symmetry Breaking,” *Phys. Rev. Lett.* **72**, 1156 (1994).

Z.E. Meziani *et al.*, “High Momentum Transfer $R_{\text{T,L}}$ Inclusive Response Functions for $^{3,4}\text{He}$,” *Phys. Rev. Lett.* **69**, 41 (1992).

A.K. Thompson *et al.*, “Quasielastic Scattering of Polarized Electrons from Polarized ^3He and Measurement of the Neutron's Form Factors,” *Phys. Rev. Lett.* **68**, 2901 (1992).

W.J. Cummings *et al.*, “Energetic Protons and Deuterons Emitted Following μ^- Capture by ^3He Nuclei,” *Phys. Rev. Lett.* **68**, 293 (1992).

S.E. Kuhn and G.E. Dodge, “A Fast Algorithm for Monte Carlo Simulations of Multiple Coulomb Scattering,” *Nucl. Instr. and Meth. A* **322**, 88 (1992).

J.P. Chen *et al.*, “Longitudinal and Transverse Response Functions in $^{56}\text{Fe}(e,e')$ at Momentum Transfer Near 1 GeV/c,” *Phys. Rev. Lett.* **66**, 1283 (1991).

A.E. Champagne *et al.*, “Gamma Decays of Isobaric Analog States Relevant to Neutrino Detection,” *Phys. Rev. C* **38**, 900 (1988).

Conference Proceedings

G.E. Dodge for the CLAS Collaboration, “The BONuS Experiment: New Results and Future Plans,” proceedings of the XVII International Workshop on Neutrino Factories and Future Neutrino Facilities, August 10 – 15, 2015, Rio de Janeiro, Brazil, <http://www.slac.stanford.edu/econf/C1508102/separado/23.pdf>

G.E. Dodge for the CLAS Collaboration, “Spin Physics with CLAS,” proceedings of the XII Advanced Research Workshop on High Energy Spin Physics (DSPIN-07), Sept. 3-7, 2007, Dubna, Russia, edited by A.V. Efremov and S.V. Goloskokov, pg. 263-269 (2008).

G.E. Dodge for the CLAS Collaboration, “Spin Structure Functions: A Window into the Structure of Hadrons,” proceedings of the First Meeting of the APS Topical Group on Hadronic Physics, October 24–26, 2004, Batavia, Illinois; J. Phys.Conf.Ser.9:256-259 (2005).

G.E. Dodge for the CLAS Collaboration, “The First Moment of g_1 Measured with the CLAS Detector,” proceedings of the 3rd International Symposium on the Gerasimov-Drell-Hearn Sum Rule and its Extensions (GDH2004), June 2–5, 2004, Norfolk, Virginia; World Scientific, edited by S. Kuhn and J.-P. Chen, pg. 62-71 (2005).

S.E. Kuhn, V. Dharmawardane, G.E. Dodge, S. Stepanyan, Y. Prok, R. Minehart, V. Burkert and the CLAS Collaboration, “Measurement of Spin Structure Functions at Moderate Q^2 using CLAS,” proceedings of the 16th International Conference on Particles and Nuclei (PANIC02), Osaka, Japan, Sep. 30-Oct. 4, 2002, Nucl. Phys. **A721**, 340c (2003).

G.E. Dodge for the CLAS Collaboration, “Inclusive and Exclusive Spin Structure Measurements in the Resonance Region” proceedings of the XVth International Spin Physics Symposium (SPIN2002), September 9-14, 2002, Long Island, New York; AIP Conf. Proc., **675** 596 (2003).

G.E. Dodge for the CLAS Collaboration, “Spin Structure Measurements in the Resonance Region with CLAS,” proceedings of the IX International Workshop on Deep Inelastic Scattering (DIS2001), April 27--May 1, 2001, Bologna, Italy; World Scientific, edited by G. Bruni, G. Iacobucci and R. Nania, pg. 567 (2002).

M.F.M. Steenbakkers *et al.*, “Quasi-free pion electroproduction on ^4He ,” *Proc. Conf. on Electromagnetic Interactions with Nucleons and Nuclei*, Santorini, Greece (1999).

T. Botto *et al.*, “Coherent π^0 electroproduction on ^4He ,” *Proc. Conf. on Electromagnetic Interactions with Nucleons and Nuclei*, Santorini, Greece (1999).

M.J.M. van Sambeek, *et al.*, “A recoil detector for the internal target facility of AmPS (NIKHEF),” *Nucl. Instr. Meth. A* **409**, 443-446 (1998).

M.J.M. van Sambeek *et al.*, “Coherent π^0 electroproduction on ^4He in the Δ region,” *Proc. XVth Int. Conf. on Few-Body Problems in Physics*, Groningen, 1997, *Nucl. Phys. A* **631**, 545c (1998).

J.J. van Leeuwe *et al.*, “The $^4\text{He}(e,e'p)$ cross section at high missing energy,” *Proc. XVth Int. Conf. on Few-Body Problems in Physics*, Groningen, 1997, *Nucl. Phys. A* **631**, 593c (1998).

C. M. Spaltro *et al.*, “Electron-induced deuteron knockout from ^3He and ^4He ,” *Proc. XVth Int. Conf. on Few-Body Problems in Physics*, Groningen, 1997.

A. Pellegrino *et al.*, “A study of the reaction $^2\text{H}(e,e'p)$ in the Δ -resonance region,” *Proc. Ninth Amsterdam Miniconference on Electromagnetic studies of the deuteron*, Amsterdam, pg. 202 (1996).

C. M. Spaltro *et al.*, “Investigation of the reactions $^{3,4}\text{He}(e,e'd)$,” *Proc. North-West Europe Nuclear Physics Conference*, Amsterdam, 1996.

E.C. Aschenauer *et al.*, “Probing nucleon-nucleon correlations with the $(e,e'p)$ and (γ,p) reaction on ^{12}C and ^{208}Pb ,” *Proc. North-West Europe Nuclear Physics Conference*, Amsterdam, 1996.

J.J. van Leeuwe *et al.*, “High missing momentum components in ^4He studied with the reaction $(e,e'p)$,” *Proc. North-West Europe Nuclear Physics Conference*, Amsterdam, 1996.

A. Pellegrino *et al.*, “A study of the reaction $^2\text{H}(e,e'p)$ in the Δ -resonance region,” *Proc. North-West Europe Nuclear Physics Conference*, Amsterdam, 1996.

A. Pellegrino *et al.*, “A study of the reaction $^2\text{H}(e,e'p)$ in the Δ -resonance region,” *Proc. XIV International Conference on Particles and Nuclei (PANIC)*, Williamsburg, 1996.

J.J. van Leeuwe *et al.*, “High missing-momentum components in ^4He studied with the reaction $(e,e'p)$,” *Proc. XIV International Conference on Particles and Nuclei (PANIC)*, Williamsburg, 1996.

C.M. Spaltro *et al.*, “Investigation of the reactions $^{3,4}\text{He}(e,e'd)$,” *Proc. XIV International Conference on Particles and Nuclei (PANIC)*, Williamsburg, 1996.

A. R. Pellegrino *et al.*, “A study of the reaction $^2\text{H}(e,e'p)$ in the Δ -resonance region,” *Proc. Int. Nuclear Physics Conf. (INPC'95)*, Peking, 1995.

I. Bobeldijk *et al.*, “High-momentum components in the spectral function of ^{208}Pb studied with the reactions $(e,e'p)$ and (γ,p) ,” *Proc. Int. Nuclear Physics Conf. (INPC'95)*, Peking, 1995.

C.M. Spaltro *et al.*, “Study of Proton-Neutron Correlations with the Reaction $^3\text{He}(e,e'd)$,” *Few-Body Systems Suppl.* **8**, 156 (1995).

J.J. van Leeuwe *et al.*, “High Missing-Momentum Components in ^4He Studied with the $(e,e'p)$ Reaction,” *Few-Body Systems Suppl.* **8**, 176 (1995).

S.S. Hanna *et al.*, “Proton Decay of Giant Resonances Excited by Electron Scattering,” *Proceedings of the 3rd International Conference on Weak and Electromagnetic Interactions in Nuclei*, Dubna, Russia, June 1992, ed. Ts.D. Vylov, World Scientific Publishing, Singapore 1993, p. 789.

Technical Reports

D.S. Carman *et al.*, “Hall B Test Run: Drift Chamber Studies,” CLAS-Note 97-001, 1997.

L.M. Qin *et al.*, “Performance of a Region II Drift Chamber Prototype and Region II Drift Chamber Tracking,” CLAS-Note 96-018, 1996.