

JULIE ROCHE

Professor of Physics

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APPOINTMENTS

2018-present: Professor, Ohio University.
2012-2018: Associate Professor, Ohio University.
2009-2012: Assistant Professor, Ohio University.
2006-2009: Assistant Professor, Ohio University/JLab.
2006: Visiting scientist, JLab and Rutgers University.

EDUCATION

2003-2005: Postdoctoral Fellow, JLab. Mentor: R. Ent (JLab).
1999-2002: Postdoctoral Fellow, The College of William and Mary (based at JLab¹).
Mentors: D. Armstrong (The College of William and Mary) and A. Lung (JLab).
1995-1998: PhD in Corpuscular Physics. Université B. Pascal (France). Research location: CEA-Saclay, France. Thesis advisors: N. d'Hose (CEA-Saclay) and H. Fonvieille (CNRS). Thesis topic: "Virtual Compton Scattering at the MAMI facility and measurement of generalized polarizabilities of the proton".

RESEARCH FOCUS AND SKILLS

My research focuses on the study of the internal structure of protons and neutrons. This structure is governed by the Strong force, one of the four fundamental forces of our universe. I also study the limits of our understanding of these four forces by looking for Physics beyond the Standard Model of particle physics in the precision frontier. As an experimentalist, I measure the products of reaction induced by high energy electrons impinging of proton or neutron targets. I currently work with the JLab electron beam.
Technical skills: assembly and testing of scintillators arrays and EM calorimeter, data analysis coordination, data taking coordination, analysis of absolute cross-sections and helicity correlated asymmetries.

Physics skills: hard exclusive reactions, GPDs, parity violation in electron scattering.

Spoke-person: for experiments E07-007, E12-06-114 and E12-13-110 at JLab.

Significant collaborations at JLab: NPS, DVCS@Hall A, QWEAK, G0.

¹JLab is a DOE national facility located in Virginia, USA.

RESEARCH SUPPORT (PAST AND CURRENT)

NSF general grant: “Study of the electroweak structure of the nucleon” Co-PI: P. King
2016-2019: \$540K, 2013-2016: \$498K, 2010-2014: \$491K, 2007-2010: \$375K

NSF MRI Consortium: ”Development of a Neutral Particle Spectrometer to Investigate the Quark Structure of the Proton at JLab 12 GeV”, Co-PIs: T. Horn (CUA), C. Hyde (ODU), 2015-2018: NSF Award #1530874, OU portion: \$137K.

JSA/JLab:

2016: Hall A/JLab, Teaching buy out, 15 weeks.

2014: JSA, ”Sabbatical and Research Leave Support”, \$18K

2014: JLab, ”Sabbatical Salary Supplement”, 3 months.

2006-2009: Academic Bridge appointment between OU and JLab, 10 weeks teaching buy out per year.

Ohio University, Internal grants:

Postdoctoral fellow support:

2009-2011: The Institute of Nuclear and Particle Physics of Ohio University, \$25K

2008-2010: The Office of the Vice-President for Research at Ohio University, \$25K

SIGNIFICANT PUBLICATIONS (full list at the end of this document)

Over 80 articles published in refereed physics journals. The 10 most significant publications are listed below. The full list of the publications is given at the end of this document.

1. D. Androic *et al.* [Qweak Collaboration], “Precision measurement of the weak charge of the proton,” *Nature* **557**, no. 7704, 207 (2018). doi:10.1038/s41586-018-0096-0
2. M. Defurne *et al.*, “A glimpse of gluons through deeply virtual compton scattering on the proton,” *Nature Commun.* **8**, no. 1, 1408 (2017) doi:10.1038/s41467-017-01819-3
3. M. Mazouz *et al.* [Jefferson Lab Hall A Collaboration], “Rosenbluth separation of the π^0 Electroproduction Cross Section off the Neutron,” *Phys. Rev. Lett.* **118**, no. 22, 222002 (2017) doi:10.1103/PhysRevLett.118.222002
4. M. Defurne *et al.* [Jefferson Lab Hall A Collaboration], “Rosenbluth separation of the π^0 electroproduction cross section,” *Phys. Rev. Lett.* **117**, no. 26, 262001 (2016)
doi:10.1103/PhysRevLett.117.262001
5. M. Defurne *et al.* [Hall A Collaboration], “The E00-110 experiment in Jefferson Lab’s Hall A: Deeply Virtual Compton Scattering off the Proton at 6 GeV,” *Phys. Rev. C* **92**, 055202 (2015) arXiv:1504.05453 [nucl-ex].

6. D. Androic *et al.* [Qweak Collaboration], “First Determination of the Weak Charge of the Proton,” *Phys. Rev. Lett.* **111**, no. 14, 141803 (2013)
doi:10.1103/PhysRevLett.111.141803
7. D. Androic *et al.* [G0 Collaboration], “Strange Quark Contributions to Parity-Violating Asymmetries in the Backward Angle G0 Electron Scattering Experiment,” *Phys. Rev. Lett.* **104**, 012001 (2010)
doi:10.1103/PhysRevLett.104.012001
8. R. D. Young, J. Roche, R. D. Carlini and A. W. Thomas, “Extracting nucleon strange and anapole form factors from world data”, *Phys. Rev. Lett.* **97**, 102002 (2006), [arXiv:nucl-ex/0604010].
9. D. S. Armstrong *et al.* [G0 Collaboration], “Strange quark contributions to parity-violating asymmetries in the forward G0 electron proton scattering experiment”, *Phys. Rev. Lett.* **95**, 092001 (2005), [arXiv:nucl-ex/0506021].
10. J. Roche *et al.* [VCS Collaboration], “The first determination of generalized polarizabilities of the proton by a virtual Compton scattering experiment”, *Phys. Rev. Lett.* **85**, 708 (2000), [arXiv:hep-ex/0007053].

SYNERGISTIC ACTIVITIES

Scientific community

- Chair of the JLab User Organization Board of Directors (in the chair line from 2015 to 2019): representing the interests of 1600 users from over 200 international institutions, elected position.
- Member of the Executive committee of DNP of APS (2019-2021), elected position.
- Member of the Program committee of DNP of APS (2017-2019): participate to the organization of bi-annual meetings with typically 500 contributions.
- Chair of the 2018 Photo-nuclear reactions Gordon Research Conference: international conference of about 125 participants, elected position.
- Member of the Executive committee of the Ohio section of APS (2015-2018): I am in charge of membership, I was able to increase membership by 9% since 2015, elected position.
- Member of the JSA/JLab Graduate Fellowship Evaluation Committee (2014-2017: 4 times, about 65 proposals evaluated).
- OU representative to the Southeastern University Research Association-JLab program committee (2014 - present).
- Ad-hoc Reviewer and Panelist member of research proposals for NSF and DOE : general grants & MRI (2007-present): 17 proposals reviewed.
- Member of the Committee of Visitors for the Division of Physics of NSF (2015).
- Spokesperson for three Deeply Virtual Exclusive JLab experiments: E07-007, E12-06-114 & E12-13-010 (2006-present).
- Chair (secretary the first year) of the JLab Hall A Collaboration committee (2013-2014),

elected position.

-Chair (member the first year) of the JLab Hall C Steering Committee (2007-2008), elected position.

-Member of the JLab User Group Board of Directors (2004-2006), elected position.

-Analysis Coordinator for the forward angle data of the G0 collaboration (2003-2005).

Outreach & Mentoring

-Organizer of monthly Women in Physics and Astronomy lunch meetings. Co-organizer: 2006-2013, organizer since 2015. Average participation: 10 persons.

-Web Forum host for the "Adopt a physicist" program (Fall 2018 and 4 others times): answers to high-schoolers questions in yearly forums that last 3 weeks, about 300 posts in my forums.

-Lead facilitator of the Physics workshop TechSavvy event organized by the Athens OH section of AAUW (June 2019 and three other times) target audience: girls in middle schools.

-Science fair judge (2019: Trimble Middle school, OH and 4 other times since 2004.

-Faculty mentor for the Ohio U local chapter of the Society of Physics Students. Spring 2017.

-Interviewee for the JLab 12 GeV Science magazine article Vol 347 Issue 6220 (2014).

-Guest speaker at the Women in Science and Engineering day (2012, 2011, 2010). Target audience: girls in middle schools.

-Mentor of the Ohio University Women center (2009:E. Banks, 2012:A. Sindelar, 2013:R. Curry).

-Facilitator at Open house events : OU physics department (2015,2013), JLab Open house (2003, 2005).

UNIVERSITY AND DEPARTMENT SERVICE

-Mentor for tenure track faculty member Z. Meisel (2017-present)

-Member of the Ohio University Research Council (2018-present)

-Chair of the P&A² Advanced Undergraduate Laboratory Committee (2006-present , chair since 2012).

-Chair of the P&A peer research evaluation committee (2019 and 4 other times, chair since 2017): about 25 dossiers evaluated per year.

-Judge at the Student Research Expo: 2019 and four other times.

-Chair of the P&A Scholarship Committee (2008-2014, chair from 2011): recommended about 30 recipients per year.

-Reviewer of the Provost Undergraduate Research Funds (2016 and one other time): 31 proposals.

-Member of P&A faculty hiring committees: experimental nuclear physics (2016), astrophysics (2013).

²P&A stands for the department of Physics and Astronomy

- Member of the P&A Colloquium Committee (2015-2016, 2006-2007): invite and host about 3 national-level speakers per semester.
- Member of the Graduate Admission Committee (2009-2014): evaluated about 40 applications per year.
- Member of the Selection Committee for the Ohio University Postdoctoral Fellowship (2009).
- Developer of a new class for the Quarter to Semester transition: wrote class description for the revised Advanced Nuclear and Particle Physics series (2009).

TEACHING EXPERIENCE

In-class teaching

G stands for graduate level classes while UG stands for undergraduate level classes. All classes were taught at Ohio University.

Research Seminar Nuclei & Particle Physics (G) Fa2017 and 5 other times.

Introduction to Nuclear and Particle Physics (G): Fa2015 and 4 other times.

Junior laboratory (UG): Fa2018 and 8 other times.

Electronics laboratory (UG): Sp2017 and 3 other times.

Introduction to Modern Physics (UG): Sp2019 and 1 other time.

First-year seminar (UG): Fa 2018.

Scale-Up: Calculus based Introductory Physics (UG): Fa2013.

Calculus based Introductory Physics (UG): Wi2011 and 3 other times.

Professional development:

ALPHA Laboratory immersion (Junior lab workshop), 3 days, 2017.

Faculty Learning Community: Evaluating students evaluation, 15 hours, 2016.

Conference on laboratory instruction beyond the 1st year of college, 3 days, 2012.

Workshop for new physics and astronomy faculty members, APS-AAPT, 3 days, 2008.

ACADEMIC ADVISING

Undergraduate students

Academic advisor since Fall 2016: I currently advise 10 undergraduate students.

Undergraduate summer internship directed (typically 8 weeks): 12 students/projects or about one every summer.

Undergraduate Student Honors Projects Directed:

2015: R. Radloff, "Simulation of an alternative trigger system for E12-06-114".

Graduate students

The following students are affiliated with Ohio University unless otherwise noted.

Thesis director:

-G. Hamad, thesis topic: TBD, 2019-present.

-J. Murphy, thesis topic: TBD, 2019-present.

-B. Karki, PhD thesis topic: “DVCS in Hall A”, 2015-present.

-M. Dlamini, PhD thesis title: “Measurement of Hard Exclusive Electroproduction of Neutral Meson Cross Section in Hall A of JLab with CEBAF at 12 GeV”, 2013-2018.

-G. Hamad, Master thesis topic: “Using the R-function to study the High-Resolution Spectrometer (HRS) acceptance for the 12 GeV era experiment E12-06-114 at JLAB”, 2016-2017.

-N. Israel, Master thesis title: “Commissioning of the Trigger module for the 12 GeV era experiment E12-06-114 at JLab”, 2013-2014.

-R. Beminiwattha, PhD thesis title: “A Measurement of the Weak Charge of the Proton through Parity Violating Electron Scattering using the Qweak Apparatus: A 21% Result”. **JSA/JLab 2014 Thesis prize winner**, 2007-2013.

-B. Waidyawansa, PhD thesis title: “A 3% Measurement of the Beam Normal Single Spin Asymmetry in Forward Angle Elastic Electron-Proton Scattering using the Qweak Setup”, 2007-2013.

Summer internship director (typically 3 months):

-G. Daumy (U. de Nantes, France visiting student), DVCS analysis, 2015.

-M. Ihaddadène (U. Paris VI, France, visiting student), DVCS analysis, 2012.

-S. Chandavar, Data taking for the DVCS experiment, 2010.

-S. Grégoire (U. J. Fourier, France, visiting student), DVCS hardware, 2007.

Member of PhD(5) - Master(5) dissertation Committees:

2016: M. Burrow (M-chair), 2015: C. Desnault (U Paris Sud), 2014: N. Rivelli, N. Israel (M), D. Divaratne, A. Marti (U of Valencia) 2013: A. Richard (M), A. Karki (M-chair), 2010: T. Edwards (M), 2009: S. Kizilgul.

Postdoctoral Research Associate

2009-2012: Dr J H Lee, co-advised with Asst. Prof. P. King (Ohio University) and Prof. D. Armstrong (The College of William and Mary).

PEER REVIEWED PUBLICATIONS

I have published over 80 papers in peer reviewed journals. Nine of these papers were co-authored with Ohio University students working under my supervision, shown with a * in the lists.

inSPIRE data base: <http://inspirehep.net/author/profile/J.Roche.1>

Key publications

1. M. Defurne *et al.* [94 authors including J. Roche]*, “A Glimpse of Gluons through Deeply Virtual Compton Scattering on the Proton,” *Nature Communications* **8**, 1408 (2017)
2. M. Mazouz *et al.* [Jefferson Lab Hall A Collaboration, 98 authors including J. Roche]*, “Rosenbluth separation of the π^0 Electroproduction Cross Section off the Neutron,” *Phys. Rev. Lett.* **118**, no. 22, 222002 (2017) [arXiv:1702.00835 [hep-ex]]. *
3. M. Defurne *et al.* [Jefferson Lab Hall A Collaboration, 98 authors including J. Roche]*, “Rosenbluth separation of the π^0 electroproduction cross section,” *Phys. Rev. Lett.* **117**, no. 26, 262001 (2016) [arXiv:1608.01003 [hep-ex]].*
4. M. Defurne *et al.* [Jefferson Lab Hall A Collaboration, 81 authors including J. Roche], “E00-110 experiment at Jefferson Lab Hall A: Deeply virtual Compton scattering off the proton at 6 GeV,” *Phys. Rev. C* **92**, no. 5, 055202 (2015) [arXiv:1504.05453 [nucl-ex]] *.
5. E. Fuchey, *et al.* [80 authors including J. Roche], “Exclusive Neutral Pion Electroproduction in the Deeply Virtual Regime,” *Phys. Rev.* **C83**, 025201 (2011) [arXiv:1003.2938 [nucl-ex]].
6. M. Mazouz *et al.* [Jefferson Lab Hall A Collaboration, 77 authors including J. Roche], “Deeply Virtual Compton Scattering off the neutron,” *Phys. Rev. Lett.* **99**, 242501 (2007) [arXiv:0709.0450 [nucl-ex]].
7. C. Munoz Camacho *et al.* [Jefferson Lab Hall A Collaboration, 77 authors including J. Roche], “Scaling tests of the cross section for deeply virtual Compton scattering,” *Phys. Rev. Lett.* **97**, 262002 (2006) arXiv:nucl-ex/0607029.
8. D. Androic *et al.* [Qweak Collaboration]*, “Precision measurement of the weak charge of the proton,” *Nature* **557**, no. 7704, 207 (2018). doi:10.1038/s41586-018-0096-0
9. T. Allison *et al.* [Qweak Collaboration, 128 authors including J. Roche]*, “The Q_{weak} experimental apparatus,” *Nucl. Instrum. Meth. A* **781**, 105 (2015) [arXiv:1409.7100 [physics.ins-det]]. *

10. D. Androic *et al.* [Qweak Collaboration, 97 authors including J. Roche], “First Determination of the Weak Charge of the Proton,” *Phys. Rev. Lett.* **111**, no. 14, 141803 (2013) [arXiv:1307.5275 [nucl-ex]]. *
11. D. S. Armstrong *et al.* [Qweak Collaboration, 50 authors including J. Roche], “Qweak: A precision measurement of the proton’s weak charge,” *AIP Conf. Proc.* **698**, 172 (2004) [*Eur. Phys. J. A* **24S2**, 155 (2005)] [arXiv:hep-ex/0308049].
12. J. Roche, W. T. H. van Oers, R. D. Young, “Searches for physics beyond the Standard Model,” *J. Phys. Conf. Ser.* **299**, 012012 (2011), part of a review book titled “Jefferson Lab: A long decade of Physics”.
13. R. D. Young, R. D. Carlini, A. W. Thomas and J. Roche, “Testing the Standard Model by precision measurement of the weak charges of quarks,” *Phys. Rev. Lett.* **99**, 122003 (2007) [arXiv:0704.2618 [hep-ph]], **ON THE COVER OF PRL**.
14. R. D. Young, J. Roche, R. D. Carlini and A. W. Thomas, “Extracting nucleon strange and anapole form factors from world data,” *Phys. Rev. Lett.* **97**, 102002 (2006) [arXiv:nucl-ex/0604010].
15. D. Androic *et al.* [G0 Collaboration, 67 authors including J. Roche], “Measurement of the parity-violating asymmetry in inclusive electroproduction of π^- near the Δ^0 resonance,” *Phys. Rev. Lett.* **108**, 122002 (2012) [arXiv:1112.1720 [nucl-ex]].
16. D. Androic *et al.* [G0 Collaboration, 130 authors including J. Roche], “The G0 Experiment: Apparatus for Parity-Violating Electron Scattering Measurements at Forward and Backward Angles,” *Nucl. Instrum. Meth.* **A646**, 59-86 (2011) [arXiv:1103.0761 [nucl-ex]].
17. D. Androic *et al.* [G0 Collaboration, 69 authors including J. Roche], “Transverse Beam Spin Asymmetries at Backward Angles in Elastic Electron-Proton and Quasi-elastic Electron-Deuteron Scattering,” *Phys. Rev. Lett.* **107**, 022501 (2011) [arXiv:1103.3667 [nucl-ex]].
18. D. Androic *et al.* [G0 Collaboration, 67 authors including J. Roche], “Strange Quark Contributions to Parity-Violating Asymmetries in the Backward Angle G0 Electron Scattering Experiment,” *Phys. Rev. Lett.* **104**, 012001 (2010) [arXiv:0909.5107 [nucl-ex]].
19. D. S. Armstrong *et al.* [G0 Collaboration, 106 authors including J. Roche], “Transverse Beam Spin Asymmetries in Forward-Angle Elastic Electron-Proton Scattering,” *Phys. Rev. Lett.* **99**, 092301 (2007) [arXiv:0705.1525 [nucl-ex]].
20. D. S. Armstrong *et al.* [G0 Collaboration, 108 authors including J. Roche], “Strange quark contributions to parity-violating asymmetries in the forward G0 electron-proton scattering experiment,” *Phys. Rev. Lett.* **95**, 092001 (2005). [nucl-ex/0506021].

21. P. Janssens *et al.* [25 authors including J. Roche], “Monte Carlo simulation of virtual Compton scattering below pion threshold,” Nucl. Instrum. Meth. A **566**, 675 (2006) [arXiv:physics/0608308].
22. J. Roche *et al.* [VCS and A1 Collaborations, 56 authors], “The First determination of generalized polarizabilities of the proton by a virtual Compton scattering experiment,” Phys. Rev. Lett. **85**, 708 (2000). [hep-ex/0007053].
23. J. M. Friedrich *et al.* [64 authors including J. Roche], “The first dedicated Virtual Compton Scattering experiment at MAMI,” Nucl. Phys. A **663**, 389 (2000).
24. S. Kerhoas *et al.* [62 authors including J. Roche], “The first virtual Compton scattering experiment at MAMI,” Nucl. Phys. **A666**, 44-47 (2000).
25. P. Bartsch *et al.* [VCS Collaboration, 64 authors including J. Roche], “Real and virtual Compton scattering (experiments),” Few Body Syst. Suppl. **11**, 316 (1999).
26. S. Kerhoas *et al.* [62 authors including J. Roche], “Virtual Compton scattering at MAMI $\gamma^*p \rightarrow \gamma'p'$,” Few Body Syst. Suppl. **10**, 523 (1999).
27. J. Roche *et al.* [62 authors], “Virtual compton scattering under π^0 threshold at $Q^2 = 0.33 \text{ GeV}^2$. Preliminary results,” Nucl. Phys. A **654**, no. 1, 547c (1999).

Other papers The following papers are those toward which I have contributed my general knowledge of performing experiments at JLab.

1. W. Armstrong *et al.* [SANE Collaboration], Phys. Rev. Lett. **122**, no. 2, 022002 (2019) doi:10.1103/PhysRevLett.122.022002 [arXiv:1805.08835 [nucl-ex]].
2. M. Carmignotto *et al.*, Phys. Rev. C **97**, no. 2, 025204 (2018) doi:10.1103/PhysRevC.97.025204 [arXiv:1801.01536 [nucl-ex]].
3. J. D. Maxwell *et al.*, Nucl. Instrum. Meth. A **885**, 145 (2018) doi:10.1016/j.nima.2017.12.008 [arXiv:1711.09089 [physics.ins-det]].
4. V. Tvaskis *et al.*, Phys. Rev. C **97**, no. 4, 045204 (2018) doi:10.1103/PhysRevC.97.045204 [arXiv:1606.02614 [nucl-ex]].
5. G. M. Huber *et al.* [Jefferson Lab $F\pi$ Collaboration, 88 authors including J. Roche], Phys. Rev. C **91**, no. 1, 015202 (2015) [arXiv:1412.5140 [nucl-ex]].
6. D. Wang *et al.*, Phys. Rev. C **91**, no. 4, 045506 (2015). *
7. G. M. Huber *et al.* [Jefferson Lab $F\pi$ Collaboration], Phys. Rev. C **91**, no. 1, 015202 (2015) [arXiv:1412.5140 [nucl-ex]].
8. L. Tang *et al.* [HKS Collaboration], Phys. Rev. C **90**, no. 3, 034320 (2014) [arXiv:1406.2353 [nucl-ex]].

9. G. M. Huber *et al.* [Jefferson Lab Fpi Collaboration, 88 authors including J. Roche], Phys. Rev. Lett. **112**, 182501 (2014) [arXiv:1404.3985 [nucl-ex]].
10. D. Wang *et al.* [PVDIS Collaboration, 101 authors including J. Roche], Nature **506**, no. 7486, 67 (2014). *
11. D. Wang *et al.* [Jefferson Lab Hall A Collaboration, 97 authors including J. Roche], Phys. Rev. Lett. **111**, no. 8, 082501 (2013) [arXiv:1304.7741 [nucl-ex]]. *
12. S. Abrahamyan *et al.* [HAPPEX and PREX Collaborations], Phys. Rev. Lett. **109**, 192501 (2012) [arXiv:1208.6164 [nucl-ex]]. *
13. N. Fomin *et al.* [67 authors including J. Roche], Phys. Rev. Lett. **108**, 092502 (2012) [arXiv:1107.3583 [nucl-ex]].
14. Z. Ahmed *et al.* [HAPPEX Collaboration, 104 authors including J. Roche], Phys. Rev. Lett. **108**, 102001 (2012) [arXiv:1107.0913 [nucl-ex]]. *
15. G. Ron *et al.* [Jefferson Lab Hall A Collaboration, 87 authors including J. Roche], Phys. Rev. C **84**, 055204 (2011) [arXiv:1103.5784 [nucl-ex]].
16. R. Asaturyan *et al.* [80 authors including J. Roche], Phys. Rev. C **85**, 015202 (2012) [arXiv:1103.1649 [nucl-ex]].
17. N. Fomin *et al.* [70 authors including J. Roche], Phys. Rev. Lett. **105**, 212502 (2010) [arXiv:1008.2713 [nucl-ex]].
18. S. Riordan *et al.* [118 authors including J. Roche], Phys. Rev. Lett. **105**, 262302 (2010) [arXiv:1008.1738 [nucl-ex]].
19. J. Glister *et al.* [89 authors including J. Roche], Phys. Lett. B **697**, 194 (2011) [arXiv:1003.1944 [nucl-ex]].
20. K. A. Aniol *et al.* [HAPPEX Collaboration, 115 authors including J. Roche], Phys. Lett. **B509**, 211-216 (2001). [nucl-ex/0006002] *
21. K. Slifer *et al.* [Resonance Spin Structure Collaboration, 73 authors including J. Roche], Phys. Rev. Lett. **105**, 101601 (2010). [arXiv:0812.0031 [nucl-ex]].
22. A. N. Villano *et al.* [58 authors including J. Roche], Phys. Rev. C **80**, 035203 (2009) [arXiv:0906.2839 [nucl-ex]].
23. S. P. Malace *et al.* [Jefferson Lab E00-115 Collaboration, 66 authors including J. Roche], Phys. Rev. C **80**, 035207 (2009) [arXiv:0905.2374 [nucl-ex]].
24. J. Seely *et al.* [71 authors including J. Roche], Phys. Rev. Lett. **103**, 202301 (2009) [arXiv:0904.4448 [nucl-ex]].
25. J. Glister *et al.* [22 authors including J. Roche], Nucl. Instrum. Meth. A **606**, 578 (2009) [arXiv:0904.1493 [nucl-ex]].

26. L. Tang *et al.* [E01-011/HKS Collaboration, 87 authors including J. Roche], Nucl. Phys. A **790**, 679C (2008).
27. H. P. Blok *et al.* [Jefferson Lab Collaboration, 87 authors including J. Roche], Phys. Rev. C **78**, 045202 (2008) [arXiv:0809.3161 [nucl-ex]].
28. G. M. Huber *et al.* [Jefferson Lab Collaboration, 87 authors including J. Roche], Phys. Rev. C **78**, 045203 (2008) [arXiv:0809.3052 [nucl-ex]].
29. P. Bosted *et al.* [36 authors including J. Roche], Phys. Rev. C **79**, 015209 (2009) [arXiv:0809.2284 [nucl-ex]].
30. O. Hashimoto *et al.* [87 authors including J. Roche], Nucl. Phys. A **804**, 125 (2008).
31. M. M. Dalton *et al.* [78 authors including J. Roche], Phys. Rev. C **80**, 015205 (2009) [arXiv:0804.3509 [hep-ex]].
32. H. Mkrtchyan *et al.* [79 authors including J. Roche], Phys. Lett. B **665**, 20 (2008) [arXiv:0709.3020 [hep-ph]].
33. F. Dohrmann *et al.* [63 authors including J. Roche], Phys. Rev. C **76**, 054004 (2007) [arXiv:0707.3059 [nucl-ex]].
34. G. Ron *et al.* [88 authors including J. Roche], Phys. Rev. Lett. **99**, 202002 (2007) [arXiv:0706.0128 [nucl-ex]].
35. A. Acha *et al.* [HAPPEX collaboration, 100 authors including J. Roche], Phys. Rev. Lett. **98**, 032301 (2007) [arXiv:nucl-ex/0609002].
36. T. Navasardyan *et al.* [80 authors including J. Roche], Phys. Rev. Lett. **98**, 022001 (2007) [arXiv:hep-ph/0608214].
37. F. R. Wesselmann *et al.* [RSS Collaboration, 72 authors including J. Roche], Phys. Rev. Lett. **98**, 132003 (2007) [arXiv:nucl-ex/0608003].
38. T. Horn *et al.* [Jefferson Lab F(pi)-2 Collaboration, 54 authors including J. Roche], Phys. Rev. Lett. **97**, 192001 (2006) [arXiv:nucl-ex/0607005].
39. M. K. Jones *et al.* [Resonance Spin Structure Collaboration, 72 authors including J. Roche], [arXiv:nucl-ex/0606015].
40. G. MacLachlan *et al.* [72 authors including J. Roche], Nucl. Phys. A **764**, 261 (2006),
41. B. Plaster *et al.* [Jefferson Laboratory E93-038 Collaboration, 74 authors including J. Roche], Phys. Rev. **C73**, 025205 (2006). [nucl-ex/0511025].
42. K. A. Aniol *et al.* [HAPPEX Collaboration, 78 authors including J. Roche], Phys. Lett. B **635**, 275 (2006) [arXiv:nucl-ex/0506011].

43. K. A. Aniol *et al.* [HAPPEX Collaboration, 78 authors including J. Roche], Phys. Rev. Lett. **96**, 022003 (2006) [arXiv:nucl-ex/0506010].
44. K. Kramer *et al.* [64 authors including J. Roche], Phys. Rev. Lett. **95**, 142002 (2005). [nucl-ex/0506005].
45. F. Dohrmann *et al.* [Jefferson Lab E91-016 Collaboration, 63 authors including J. Roche], Phys. Rev. Lett. **93**, 242501 (2004). [nucl-ex/0412027].
46. L. Yuan *et al.* [HNSS Collaboration, 133 authors including J. Roche], Phys. Rev. C **73**, 044607 (2006) [arXiv:nucl-ex/0408011].
47. X. Zheng *et al.* [Jefferson Lab Hall A Collaboration, 81 authors including J. Roche], Phys. Rev. **C70**, 065207 (2004). [nucl-ex/0405006].
48. K. A. Aniol *et al.* [HAPPEX Collaboration, 118 authors including J. Roche], Phys. Rev. **C69**, 065501 (2004). [nucl-ex/0402004].
49. T. Reichelt *et al.* [Jefferson Laboratory E93-038 Collaboration, 72 authors including J. Roche], Eur. Phys. J. A **18**, 181 (2003).
50. T. M. Ito *et al.* [SAMPLE Collaboration, 57 authors including J. Roche], Phys. Rev. Lett. **92**, 102003 (2004). [nucl-ex/0310001].
51. R. Madey *et al.* [72 authors including J. Roche], “Neutron electric form factor up to $Q^2 = 1.47-(\text{GeV}/c)^2$,” Eur. Phys. J. A **17**, 323 (2003).
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54. R. Madey *et al.* [E93-038 Collaboration, 76 authors including J. Roche], Phys. Rev. Lett. **91**, 122002 (2003). [nucl-ex/0308007].
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57. J. Reinhold *et al.* [96 authors including J. Roche], Nucl. Phys. **A684**, 470-474 (2001).
58. R. Hasty *et al.* [SAMPLE Collaboration, 35 authors including J. Roche], Science **290**, 2117 (2000). [nucl-ex/0102001].

INVITED RESEARCH TALKS

- June 2018: “Pion and eta production at JLab with 6 and 12 GeV”, Next-generation GPD studies with exclusive meson production at the EIC workshop, Brookhaven, NY.
- April 2018: “A Glimpse of Gluons through Deeply Virtual Compton Scattering on the Proton”, APS April 2018 meeting, Columbus OH.
- October 2017: “Building a tomographic picture of the nucleon”, Colloquium, Ohio University.
- September 2017: “L/T and flavor separation in π^0 electroproduction”, INT-U of Washington program on Spatial and Momentum Tomography of Hadrons and Nuclei.
- October 2016: “Nucleon spatial imaging”, DNP Fall 2016 meeting, Vancouver, Canada.
- June 2016: “Nucleon spatial imaging”, 6 hour class at the JLab graduate summer school HUGS2016.
- May 2015, “Precision studies of the DVCS process at JLab.”, Few Body 21 conference, Chicago, IL, USA.
- August 2014, “DVCS in the valence region.”, Gordon Research Conference (Photonuclear reactions), Holderness, NH.
- June 2014: “DVCS in Hall A: early 12 GeV experiment.”, JLab User group meeting, Newport News, Va, USA
- June 2012: Qweak: a search for physics beyond the Standard Model, HITES 2012, New Orleans, USA
- September 2011: QWEAK colloquium, Ohio University, Athens OH, USA.
- August 2010: “Deep Virtual Compton Scattering”, Gordon Research Conference (Photonuclear reactions), Tilton NH.
- April 2009: Third Workshop of the APS Topical Group in Hadron Physics, Denver OR, “The status of Parity Violating Electron Scattering”
- March 2008: GPD seminar, University of Kentucky, Lexington KY, USA.
- August 2006: Gordon Research Conference: Photonuclear Reactions, Tilton NH, “G0 experiment in Hall C @ JLab”
- September 2005 : G0 colloquium, Ohio University, Athens OH, USA.
- June 2005 : G0 seminar, Ohio University, Athens OH, USA.
- April 2005 : G0 seminar, Laurentian University, Sudbury ON, Canada.

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- October 2004 : G0 seminar, LPClermont-Ferrand, France.
 - June 2004 : Guest speaker at the Hampton University Graduate School (JLab summer school for advanced graduate students and post-doctoral research associates). G0.
 - September 2002 : Presentation of the G0 experiment, Accelerator Division at JLab, Newport News VA, USA.
 - November 1999 : VCS@Mainz, seminar, University of Maryland, USA.
 - August 1999 : VCS@Mainz, seminar, Jefferson Laboratory, USA.
 - February 1999 : VCS@Mainz, seminar, SPhN-CEA-Saclay, France.
 - August 1998 : INPC 1998, Paris, France, "Virtual Compton Scattering under π^0 threshold at $Q^2=0.33 \text{ GeV}^2$. Preliminary Results".

CONTRIBUTED RESEARCH TALKS

Only those for which I was the speaker.

- September 2014: "Future precision studies of the DVCS process at JLab", PANIC2014, Hamburg, Germany.
- April 2012: "The DVCS program in Hall A at Jefferson Lab", QNP2012, Orsay, France.
- June 2011: "DVCS update", Hall A summer collaboration meeting, Newport News VA, USA.
- December 2010: "Hall A software update for helicity", Hall A winter collaboration meeting, Newport News VA, USA.
- April 2007: "The future of the DVCS experiments in Hall A at JLab", Exclusive reaction workshop, Newport News VA, USA.
- October 2004 : "Status report of the G0 experiment", SPIN 2004, Trieste, Italy.
- October 2003 : "The G0 experiment", Fall Meeting, DNP/APS, Tucson AZ, USA.
- June 2004 : "VCS at low energies", GDH2004 symposium, Old Dominion University, Virginia.
- March 2002 : "The G0 experiment", Baryons'02, Newport News VA, USA.
- October 2001 : "The G0 experiment", Fall Meeting, DNP/APS, Maui HA, USA.
- October 1999 : VCS@Mainz, Fall meeting, DNP/APS, Monterey CA, USA.

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- September 1997 : VCS@Mainz, Workshop on Chiral Dynamics 1997, Mainz, Germany.
 - December 1996 : VCS@Mainz, Journées Jeunes Chercheurs, Aussois, France.
 - June 1996 : VCS@Mainz, Workshop on VCS, Clermont-Ferrand, France.

INVITED OUTREACH TALKS

- April 2019: “Wrestling the strongest force of the universe.” SPS meeting, Ohio University.
- September 2016: “Wrestling the strongest force of the universe.” SPS meeting, Ohio University.
- October 2013: “First Determination of the Weak Charge of the Proton.”, SACNAS 2013, San Antonio, TX, USA.
- October 2013: “Wrestling the strongest force of the universe.” SPS meeting, Ohio University.
- September 2012: “So they found the Higgs, now what? How I search for Physics beyond the Standard Model.”, Bowling Green University, OH.
- March 2008: “The strange shape of the proton”, Colloquium at dePauw University, IN, USA.
- February 2008: “Nucleon electro-weak structure: experimental nuclear physics”, SPS meeting, Ohio University.