Richard T. Jones, PhD
Professor of Physics
University of Connecticut
Curriculum Vitæ

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Birthdate: Dec. 17, 1959

Birthplace: Sandy Point, Nova Scotia, Canada

Citizenship: Canadian, permanent U.S. resident

Mailing address:
Dept. of Physics, University of Connecticut unit 3046,
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Education:
Bob Jones University, Greenville, S.C. Physics B. Sc. 1981
Virginia Polytechnic Institute, Blacksburg VA Physics Ph. D. 1988
University of Illinois, Urbana IL Nuclear Physics postdoc 1988-1990

Appointments:
Scientific Associate, CERN, Geneva, Switzerland, 1990-1992
Research Staff, CERN, Geneva, Switzerland, 1992-1996
Assistant Professor, Department of Physics, University of Connecticut, 1996-2002
Associate Professor, Department of Physics, University of Connecticut, 2002-present

Professional society memberships:
American Physical Society, Division of Nuclear Physics

Honours and Distinctions:
graduated Summa Cum Laude with B.Sc., 1981
received a NATO grant for collaboration with University of Geissen, 1985
received Cunningham dissertation fellowship, 1986

Visiting professorships:
I.N.F.N. visiting professor, University of Genova, Italy, 4/1996-7/1996

Field of research specialization:

Experimental Nuclear/Particle Physics

Teaching experience:

Courses taught:

Phys 1401/1402 Introductory Physics with Calculus for Scientists
Phys 1501 Introductory Physics with Calculus for Engineers
Phys 1600 Introduction to Modern Physics
Phys 2300 Development of Quantum Mechanics
Phys 2501/2502 Mechanics and Electromagnetics Laboratory I and II
Phys 3103/3104 Intermediate Physics I and II (modern physics)
Phys 3201 Electromagnetism I
Phys 3401 Quantum Mechanics I
Phys 3402 Quantum Mechanics II
Phys 3989 Undergraduate Research (independent study)
Phys 4350/6320 Particles and Nuclei (combined undergrad and grad)
Phys 4099 Experimental Monte Carlo Methods (independent study)
Phys 5600 Modern Physics (grad)
Phys 5401 Quantum Mechanics I (grad)
Phys 5402 Quantum Mechanics II (grad)

Students mentored in research:

UConn Mentor Connection mentoring (high school students): 25
Undergraduate honors students supervised: 9
Undergraduate independent study projects: 15
Undergraduate summer projects: 18
Summer interns supervised (students from other universities): 6
Undergraduate research study abroad supervised: 1
PhD students graduated: 7
PhD students at present: 1

Research Experience:

Detector R&D:

1. RICH detector using a solid radiator and pixel MWPC readout 1990-1993
2. Thin diamond monocrystals as coherent bremsstrahlung targets 1999-present
3. High-resolution X-ray topography of single diamond crystals 2002-present
4. Photon tagging detector array with two-dimensional readout 2007-present
5. Active collimator for high-energy coherent bremsstrahlung source 2001-present
6. Silicon photomultiplier devices for scintillating fiber readout 2006-present
7. Shaped diamond milling using UV laser ablation 2009-present
8. Open GEM detector for ambient radon decay rate measurement 2016-present

Detector systems integration:

1. Upgrade of Jetset experiment to incorporate a forward RICH 1993-1994
2. Adaptation of Jetset barrel lead-scintillating-fiber calorimeter for use in the Radphi experiment 1998-1999

Monte Carlo detector simulation software written:

1. Physics simulation code for the Jetset experiment 1992-1996
2. Physics simulation of Radphi experiment 1998-2005
3. Physics simulation of GlueX beamline and detector 2001-present
4. Simulation of Hall C Compton polarimeter for Qweak 2003-2006
5. Simulation of the Hall D tagger and electron beamline 2006-present

Data analysis management:

1. Analysis coordinator for Jetset experiment 1994-1998
2. Analysis coordinator for Radphi experiment 2000-2005

Partial-wave analysis:

1. Author of PWA formalism and code for Jetset 1995-1996
2. Co-author of PWA results from Jetset experiment 1999-2000
3. PWA toolkit development for GlueX 2007-present

Research collaborations:

1. Jetset Experiment at CERN/LEAR 1990-1998
2. Radphi Experiment at Jefferson Lab 1997-2005
3. GlueX Experiment at Jefferson Lab 1999-present
4. Qweak Experiment at Jefferson Lab 2000-present

Research grants received (reverse order):

1. “Shared Computing Infrastructure for Large-Scale Science Problems”, 2019-2021 R.T. Jones PI, National Science Foundation, $400,000
2. “Research and Education with GlueX”, R.T. Jones PI, National Science Foundation, $363,000 2018-2021
3. “Research and Education with GlueX”, R.T. Jones PI, National Science Foundation, $405,000. 2015-2018
4. “Diamond Radiator Fabrication and Assembly”, target construction contract with Jefferson Science Associates, $75,000. 2013-2015
5. “Science DMZ to Enhance Data-Intensive Research at UConn”, 2013-2015 B. Wang PI, R.T. Jones co-PIs, NSF CC-NIE Network Infrastructure grant to build 10GB research network at UConn, $500,000.
6. “Research and Education with GlueX”, R.T. Jones PI, National Science Foundation, $375,000. 2012-2015

7. “Fabrication of the Hall D Microscope and Active Collimator”, detector construction contract with Jefferson Science Associates, $110,432. 2012-2014
8. “Defect Free, Ultra-Rapid Thinning/Polishing of Diamond Crystal Radiator (20μm) for Highly Linearly Polarized Photon Beams”, A. Arjunan (Sinmat Inc.) PI and R.T. Jones co-PI, Department of Energy STTR Phase II Grant, $225,000. 2011-2013 Targets
9. “Defect Free, Ultra-Rapid Thinning/Polishing of Diamond Crystal Radiator (20μm) for Highly Linearly Polarized Photon Beams”, A. Arjunan (Sinmat Inc.) PI and R.T. Jones co-PI, Department of Energy STTR Phase I Grant, $30,000. 2010-2011 Targets
10. “UV Laser Refurbishment for Milling Research-Grade Diamonds”, R.T. Jones PI, UConn Research Foundation Large Faculty Grant Competition, $13,500. 2010
11. “Nuclear Physics Research and Education with GlueX”, R.T. Jones PI, National Science Foundation, $225,000. 2009-2012
12. “Development of a Prototype Tagger Microscope for Hall D” R.T. Jones PI, TJNAF contract for detector prototyping, $91,390. 2007-2008
13. “Collaborative Analysis Toolkit for Large Datasets on a Grid”, Curtis Meyer (CMU), Alex Dzierba (IU), and R.T Jones co-PIs, National Science Foundation Physics at the Information Frontier multi-university grant, UConn portion $325,000. 2007-2010
14. “Development of Hall D Tagger and Beam Line Instrumentation”, R.T. Jones PI, TJNAF contract for R&D, $25,000. 2006
15. 1-year sabbatical at Jefferson Lab, R.T. Jones, $59,000. 2005-2006
16. “Research Program in Experimental Intermediate Energy Physics”, R.T. Jones PI, U.S. National Science Foundation $85,000. 2004-2006
17. “Research Program in Experimental Intermediate Energy Physics”, R.T. Jones PI, U.S. National Science Foundation $75,000. 2003-2004
18. “Development of Precise Polarimetry of Coherent Bremsstrahlung Radiation Energy Range 0.3-2GeV using Pair Production Processes on Nuclei Atomic Electrons”, A. Sirunian (YerPhi) and R.T. Jones co-PIs, U.S. Civilian Research and Development Foundation, $64,000. 2002-2004 in the and
19. “Research Program in Experimental Intermediate Energy Physics”, R.T. Jones PI, National Science Foundation $252,186. 2000-2003
20. “A Seed for a Physics Simulation Farm using Commodity Processors and Internet 2 Connectivity”, R.T. Jones PI, R. Côté, J. Javanainen co-PIs, Research Foundation Large Equipment Competition, $16,100. 2000 UConn
21. “A forward RICH for kaon identification in the Jetset experiment”, Jones PI , M. Renevey and M. Price co-PI’s, CHF 450,000. 1991-1994 R.T.

Colloquia, seminars, unpublished presentations:

1. R.T. Jones, “Search for Gluonic Resonances with GlueX”, Physics Department Colloquium series, Temple University, Philadelphia, PA, April 16, 2018.

2. “The Search for Exotic Mesons with GlueX”, graduate student research seminar series, University of Connecticut, Storrs, CT, Sept. 1, 2017.
3. R.T. Jones, “GlueX Experience with the Open Science Grid”, Computing Round Table seminar series, Jefferson Lab, Newport News, CT, July 11, 2017.
4. R.T. Jones, “Detector Simulations”, invited talk at Exascale Requirements Review for Nuclear Physics Workshop: Data/Experiment, Gaithersburg, MD, June 15-17, 2016.
5. R.T. Jones, “Polarized Photoproduction of Hybrid Mesons with GlueX”, contributed talk at DNP2014, Waikoloa, Hawaii, Oct. 7–11, 2014.
6. R.T. Jones, “The Higgs Boson and the Origin of Mass”, invited CLIR public lecture, Storrs, CT, Mar. 28, 2014, updated and presented twice again at other venues in 2015.
7. R.T. Jones, “High Throughput Computing on the Open Science Grid”, invited talk at BECAT Workshop on High Performance Computing, Storrs, May 16, 2013.
8. S. Engel, “GlueX Team Nears Needed Throughput on OSG”, interview with R.T. Jones, Open Science Grid Newsletter, March issue, 2013.
9. R.T. Jones, “Collimation and Tagging Instrumentation for the GlueX Photon Beamline”, contributed talk at DNP-2012, Newport Beach, Oct. 24-26, 2012.
10. R.T. Jones, “GlueX VO Status Report”, invited presentation at annual meeting of the Open Science Grid Council, Chicago, Sept. 11, 2012.
11. R.T. Jones, “Probing the Force Between Quarks with Photons”, invited presentation to the UConn Graduate Student Research Seminar series, Nov. 18, 2011.
12. “Probing Meson Structure with Polarized Photons”, invited presentation at the Nuclear Physics Symposium on "Nucleon Structure and Electroweak Precision Tests: Past and Future", University of Illinois, Urbana, May 20, 2010.
13. “Lighting Up the Glue in the Proton”, invited Robert Vojtek Physics Seminar, Central Connecticut College, New Britain, April 5, 2010.
14. R.T. Jones, “GlueX Experience with the Open Science Grid”, invited presentation at the All-Hands Meeting of the Open Science Grid community, Chicago, Mar. 8, 2010.
15. “Hadron Physics with Polarized Photons at 9 GeV with Gluex”, invited UMass Nuclear/High Energy Seminar, Amherst, Nov. 20, 2009.
16. “Diamond Radiator Assessment using Rocking Curve Topography at CHESS” invited presentation to NSLS weekly user’s meeting, Upton, July 7, 2009.
17. “Diagnostics for Deformation in Thin Diamonds for Coherent Bremsstrahlung Radiators”, contributed presentation at DNP-2008, Oakland, Oct. 23, 2008.
18. “Morphology of Diamonds from Analysis of X-ray Rocking Curves”, invited presentation to the CHESS annual User’s Meeting, Ithaca, June 10, 2008.
19. “Experimenting with Quarks”, invited presentation to the Darien High School Science Symposium, Darien, Connecticut, May 28, 2008
20. “A Coherent Gamma Source”, invited presentation to the CHESS weekly seminar series, Cornell University, Ithaca, Aug. 15, 2006.
21. “The GlueX Experiment”, invited presentation at the Cascades Workshop, Jefferson Lab, Newport News, Dec. 1, 2005.
22. “Searching for Phi Radiative Decays with the Radphi experiment”, Nuclear Physics Seminar series, Florida State University, Tallahassee, Nov. 19, 2004.

23. “Hunt for the Hybrid Meson”, Physics and Astronomy Colloquium, Dartmouth College, Hanover, Feb. 7, 2004.
24. “Hunt for the Hybrid Meson”, Frontiers in Physics Colloquium, University of Connecticut, Storrs, June 26, 2003.
25. R.T. Jones, “Preliminary design of a Compton Polarimeter for Hall C”, Electron Beam Polarimetry Workshop, Newport News, June 9-10, 2003.
26. R.T. Jones, “PWA results from the Jetset experiment”, Gluonic Excitations Workshop, Newport News, May 14-16, 2003.
27. “Is there a Quark Model within the Standard Model”, Physics Department colloquium series, University of Iowa, Iowa City, Feb. 11, 2002.
28. “Is there a Quark Model within the Standard Model?” Nuclear Physics seminar series, University of Glasgow, Glasgow, U.K., Jan. 17, 2002.
29. “The Quark Model and the Standard Model: are they consistent?”, Physics Department colloquium series, Wayne State University, Detroit, Feb. 22, 2001.
30. “Bridging the Gap between the Quark Model and the Standard Model”, Physics Department colloquium series, University of Connecticut, Storrs, Sept. 10, 1999.
31. “An Experimental Test of Bell’s Inequalities”, Physics Department colloquium series, Indiana University, Bloomington, Sept. 22, 1995.

Bibliography:

1. S. Adhikari et al., (GlueX Collaboration), “Measurement of Spin Density Matrix Elements in Λ(1520) Photoproduction at 8.2GeV to 8.8GeV”, Phys. Rev. **C105** (2022) 035201.
2. S. Adhikari et al., (GlueX Collaboration), “Search for photoproduction of axionlike particles with GlueX”, Phys.Rev. **D105** (2021) 052007.
3. S. Adhikari et al., (GlueX Collaboration), “Measurement of beam asymmetry for $\pi^-\Delta^{++}$ photoproduction on the proton at E_γ = 8.5 GeV”, Phys.Rev. **C101**, (2021) L022201.
4. S. Adhikari et al., (GlueX Collaboration), “The GlueX beamline and detector”, Nucl. Instr. Meth. **A987** (2021) 164807.
5. S. Adhikari et al., (GlueX Collaboration), “Measurement of the photon beam asymmetry in gamma p to K+ Sigma0 at 8.5 GeV”, Phys.Rev. **C101**, (2020) 065206.
6. D. Androic et.al., (Qweak Collaboration), “Parity-violating inelastic electron-proton scattering at low Q2 above the resonance region”, Phys. Rev. **C101**, (2020) 055503.
7. S. Adhikari et al., (GlueX Collaboration), “Beam asymmetry **Σ** for the photoproduction of η and η’ mesons at E_γ = 8.8 GeV”, Phys. Rev. **C100**, (2019) 052201.
8. A. Ali et al., (GlueX Collaboration), “First measurement of near-threshold J/ψ exclusive photoproduction off the proton”, Phys. Rev. Lett. **123**, (2019) 072001.
9. D. Androic et.al., (Qweak Collaboration), “Precision Measurement of the Weak Charge of the Proton”, **Nature 557**(7704), (2018) 207-211. doi: 10.1038/s41586-018-0096-0.
10. M. Dugger et al., “Design and construction of a high-energy photon polarimeter”, Nucl. Instr. Meth. **A867** (2017) 115–127.
11. J.A. Magee et al., “A novel comparison of Møller and Compton electron-beam polarimeters”, Phys. Lett. **B766** (2017) 339-344.

12. H. Al Ghoul, et al., (GlueX Collaboration), “Measurement of the beam asymmetry **Σ** for π^0 and η photoproduction on the proton at Eγ = 9 GeV”, Phys. Rev. **C95** (2017) 042201.
13. A. Narayan et al., “Precision Electron-Beam Polarimetry at 1 GeV Using Diamond Microstrip Detectors”, Phys. Rev. X **6**, (2016) 011013.
14. T. Allison et al. (Qweak Collaboration), “The Qweak Experimental Apparatus”, Nucl. Instr. Meth. **A781** (2015) 105–133.
15. K. Finkelstein, R.T. Jones, A. Pauling, D.C. Sagan, Z. Brown, and D S. Misra, “High Resolution, Monochromatic X-ray Topography Capability at CHESS”, Proceedings of the 12th International Conference on Synchrotron Radiation Instrumentation (SRI-2015), AIP Conf. Proc. 1741(2016) , 010001.
16. D. Androic et al. (Qweak Collaboration), “First Determination of the Weak Charge of the Proton”, Phys. Rev. Lett. **111** (2013) 141803.
17. G. Yang, R.T. Jones, F. Klein, K. Finkelstein, K. Livingston, “Rocking Curve Imaging for Diamond Radiator Crystal Selection”, Journal of Diamond & Related Materials **19** (2010) 719.
18. F. Adamyan, A. Aganyants, H. Hakobyan, J. Manukyan, R. Oganezov, L. Sargsyan, A. Sirunyan, H. Vartapetian, and R.T. Jones, “Experimental study of photon beam polarimetry based on nuclear e+e- pair production on an amorphous target”, Nucl. Instr. Meth. **A579**, (2007) 973.
19. R.T. Jones, T. Bogue, B.E. Evans, M. Kornicer, A.R. Dzierba, R. Gardner, J.L. Gunter, D. Krop, R. Lindenbusch, D. Rust, E. Scott, P. Smith, C. Steffen, S. Teige, D.S. Armstrong, D.H.E. Clark, L.J. Kaufman, D.J. Steiner, E. Frlez, D. Pocanic, J.J. Kolata, L.O. Lamm, G. Rogachev, C. Campbell, E. Collins, L. McGlinchey, P. Rubin, E. Walker, D.S. Adams, J. Napolitano, D.I. Sober, H. Crannell, R.R. Mammei, E.S. Smith, “Performance of the Radphi detector and trigger in a high rate tagged photon beam”,Nucl. Instr. Meth. **A570**, (2007) 384.
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21. S. Darbinyan, H. Hakobyan, R.T. Jones A. Sirunian, and H. Vartapetian, “Polarimetry of coherent bremsstrahlung by analysis of the photon energy spectrum”, Nucl. Instr. Meth. **A554** (2005) 75.
22. F. Adamyan, H. Hakobyan, R.T. Jones, Zu Manukyan, A. Sirunian, H. Vartapetian, “A Photon Beam Polarimeter based on Nuclear e+e- Pair Production in an Amorphous Target”, Nucl. Instr. Meth. **A546** (2005) 376.
23. J.D. Kellie, P.J.M. Clive, G.L. Yang, R. Beck, C. Gordon, C. Hall, J.W. Harris, R.T. Jones, D. Laundy, K. Livingston, I.J.D. MacGregor, J.C McGeorge, J. Malone, A. Schmidt, P.A. Slaven, R.M. Vrcelj, and D. Watts, “The Selection and Performance of Diamond Radiators used in Coherent Bremsstrahlung Experiments”, Nucl. Instr. Meth. **A545** (2005) 164.
24. F. Adamyan, K. Dallankyan, H. Hakobyan, Zh. Manukyan, A. Sirunian, H. Vartapetian and R.T. Jones, “Calculations of a CB polarimeter based on e+e- pairs photoproduction on nuclei in an amorphous target”, YerPhi preprint 1590, December 2003.
25. GlueX collaboration, A. Dzierba spokesman, “Photoproduction of Gluonic Excitations and Unusual Mesons: The Hall D Project at Jefferson Lab”, Hall D Design Report v4, Jefferson Lab Reports (Nov. 11, 2002) R.T. Jones editor and primary author of chap. 4 “Photon Beam and Tagger” pp. 49-104, and chap. 10, “Monte Carlo Simulations” pp. 237-262.

26. R.T. Jones, “Can the scalar mesons a0/f0(980) be described by a kaon-antikaon state?”, Proceedings of EMI2001 International Symposium on Electromagnetic Interactions in Nuclei, Osaka, 4-7 December 2001, M. Fujiwara and T.Shima eds., published by World Scientific (2002).
27. C. Guo, R.T. Jones, G.N. Gibson, “Influence of spatial symmetry on the dynamics of strong-field ionization”, Phys. Rev. **A62** Rapid Communications (2000) 15402.
28. “PWA results from the Jetset experiment”, R.T. Jones, AIP Conference Proceedings vol.549, eds. Z. Parsa and W. Marciano (2000) 237.
29. R.T. Jones, “Optimal Photon Sources for CEBAF at Higher Energies,” Physics and Instrumentation with 6-12 GeV Photons, eds. S. Dytman, H. Fenker, R. Roos, proceedings published by Jefferson Lab User’s Group (1999) 189.
30. A. Buzzo et al (the JETSET collaboration), “Study of the reaction from $p\bar{p} \rightarrow \Phi\Phi$ from 1.1 to 2.0 GeV/c,” Phys. Rev. **D57** (1998) 5370.
31. R.T. Jones, “The Radphi experiment at Jefferson Lab”, Hadron Spectroscopy Seventh International Conference, AIP Conference Proceedings 432, Eds. S.U. Chung and H.J. Willutzki (1997).
32. A. Buzzo et al (the Jetset collaboration), “Measurement of the Reaction from $p\bar{p} \rightarrow \Phi\Phi$ from 0.6 to 1.9 GeV/c”, Phys. Rev. **D56** (1997) 3803.
33. A. Buzzo et al (the Jetset collaboration), “Search for narrow resonnaces in the reaction ”, Zeitschift für Physik **C76** (1997) 475.
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36. R.T. Jones and E.G. Adelberger, “Quantum Mechanics and Bell's Inequalities,” Phys. Rev. Lett. **72**, (1994) 2675.
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39. R.T. Jones, M. Price, M. Renevey and H. Wirth, “A fast RICH detector for JETSET”, Nucl. Instr. Meth. **A323** (1992) p. 386.
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41. J.E. Knott, P.T. Debevec, P.D. Harty, D.A. Jenkins and R.T. Jones, “An Absolute Measurement of the Differential Cross Section for Deuteron Photodisintegration from 63 to 71 MeV”, Phys. Rev. **C45** (1992) 904.
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44. R.T. Jones, “An Automated Method for Measuring Wire Tensions in Multiwire Chambers”, Nucl. Instr. Meth. **A268** (1988) 550.
45. R.T. Jones and A.L. Ritter, “Analysis of Multiple Scattering for (e,2e) Experiments on Thin Films”, Journal of Electron Spectroscopy and Related Phenomena 40 (1986) 285.
46. D.A. Jenkins and R.T. Jones, “Kinematics of Threshold (γ ,π^0) Reactions”, Phys. Rev. **C31** (1985) 262.
47. A.L. Ritter, J.R. Dennison and R.T. Jones, “The Spectral Momentum Density of Amorphous Carbon from (e, 2e) Spectroscopy”, Phys. Rev. Lett. **53** (1984) 2054.