Biographical Sketch: Dr. Gerard P. Gilfoyle

Professional Preparation:

Franklin and Marshall College, Physics, A.B., 1979.
University of Pennsylvania, Experimental nuclear physics, Ph..D., 1985.
SUNY, Stony Brook, Postdoctoral Fellow in Experimental Heavy-Ion Physics, 1985-1987.

Appointments:

2006-present - Chair, Nuclear Physics Working Group of the CLAS Collaboration.
2004-present - Professor of Physics, University of Richmond.
2002-2003 - Scientific Consultant, Jefferson Laboratory.
2000-2006 - Chair, Department of Physics, University of Richmond.
1999-2000 - AAAS Defense Policy Fellow.
1994-1995 - Scientific Consultant, Jefferson Laboratory.
1993-2004 - Associate Professor of Physics, University of Richmond.
Summer, 1988 - Visiting Research Professor, University of Pennsylvania.
1987-1993 - Assistant Professor, University of Richmond.

Awards and Honors:

1990-present - US Department of Energy ($1,421,000).
2004 - Who's Who Among America's Teachers.
2003 - University of Richmond Distinguished Educator Award.
2002-2003 - SURA Sabbatical Support ($10,000).
2001-2002 - National Science Foundation Major Research Instrumentation Program ($175,000).
1999-2000 - AAAS Defense Policy Fellow ($48,000).
1995-1997 - National Science Foundation, Instrumentation and Laboratory Improvement Program ($14,986).
1994-1995 - CEBAF Sabbatical Support ($24,200).
1992-1995 - National Science Foundation, Instrumentation and Laboratory Improvement Program ($49,813).
1989-1991 - Research Corporation($26,000).

Selected Publications Related to the Proposed Research:

See Reference [20] in 'References Cited' for a list of the members of the CLAS Collaborations.

1. G.P. Gilfoyle for the CLAS Collaboration, 'Measuring Form-Factors and Structure Functions with CLAS', HEP-MAD-2007-216, JLAB-PHY-07-760, Oct 2007.
2. K.Sh. Egiyan, G.A. Asryan, N.B. Dashyan, N.G. Gevorgyan, J.-M. Laget, K. Griffioen, S. Kuhn, *et al.* (The CLAS Collaboration), 'Study of Exclusive d(e,e'p)n Reaction Mechanism at High Q2', Phys. Rev. Lett. **98**, 262502 (2007).
3. K. Egiyan *et al.* (The CLAS Collaboration), 'Measurement of 2- and 3-nucleon short range correlation probabilities in nuclei,' Phys. Rev. Lett. **96**, 082501 (2006).
4. D. Protopopescu, *et al.* (The CLAS Collaboration), 'Survey of A'_{LT} asymmetries in semi-exclusive electron scattering on ^{4}He and ^{12}C,' Nuclear Physics, **A748**, 357 (2005).
5. K. Joo, *et al.* (The CLAS Collaboration), 'Measurement of Polarized Structure Function σ'_{LT}) for $p(\vec{e}, e'p)\pi^0$ from single π^0 electroproduction in the Delta resonance region,' Physical Review C, Rapid Communications, **68**, 032201 (2003).

Selected Other Publications:

See Reference [20] in 'References Cited' for a list of the members of the CLAS Collaborations.

1. B. Mecking *et al.*, (The CLAS Collaboration), 'The CEBAF Large Acceptance Spectrometer,' Nucl. Instr. and Meth., **503**/3, 513 (2003).

2. G.P.Gilfoyle and J.A.Parmentola, 'Using Nuclear Materials to Prevent Nuclear Proliferation,' Science and Global Security **9**, 81 (2001).
3. G.P.Gilfoyle, 'A New Teaching Approach to Quantum Mechanical Tunneling,' Comp. Phys. Comm., **121-122**, 573 (1999).
4. G.P.Gilfoyle, 'Alpha Decay Lab,' Mathematica in Education and Research, Vol. 4, No. 1, p. 24, Winter, 1995.
5. E.Bunn, M.Fetea, G.P.Gilfoyle, H. Nebel, P.D.Rubin, and M.F.Vineyard, 'Investigative Physics Student Guide,' Inquiry-based laboratory manual for general physics at the University of Richmond.

Synergistic Activities:

We have made broader impacts beyond the scope of this proposal. Gilfoyle now serves as chair of the Nuclear Physics Working Group of the CLAS Collaborations and manages a portion of the Collaboration's physics program. He served in government (1999-2000) as a scientific consultant on weapons of mass destruction for the US Department of Defense applying his physics skills to a range of policy issues. Our teaching has been illuminated by our scientific work and we have added computational methods to the upper-level physics curriculum at Richmond and incorporated more computer-based data acquisition and analysis in the introductory physics sequence with the aid of teaching grants from NSF. Finally, we have been able to attract a significant number of women and African-American students to our group in nuclear physics. One of our former female students is now a staff scientist at the Jet Propulsion Lab in California and in the last year two women and two African-American men have worked in our laboratory at Richmond. One of our current students (Greenholt) is headed for a career combining nuclear physics and public policy (she is a double major in Physics and Political Science).

List of Recent Collaborators:

See Reference [20] in 'References Cited' for a list of the members of the CLAS Collaborations. Below we list any current Collaboration members not on Reference 13 and additional collaborators.

A. Afanasev	Hampton University	J. Arrington	Argonne National Lab
E. Bunn	University of Richmond	L. El Fassi	Argonne National Lab
A. Freyberger	Jefferson Lab	M. Fetea	University of Richmond
D. F. Geesaman	Argonne National Lab	K. Hafidi	Argonne National Lab
R. J. Holt	Argonne National Lab	S. Jeschonnek	Ohio State University
P. Kroll	Universität Wuppertal	B. Mustapha	Argonne National Lab
H. Nebel	University of Richmond	D. H. Potterveld	Argonne National Lab
P. E. Reimer	Argonne National Lab	P. Rubin	George Mason University
P. Solvignon	Argonne National Lab	J.W. Van Orden	Old Dominion University
H. Arenhoevel	Institut für Kernphysik, Mainz		

Graduate and Postdoctoral Advisors

Graduate Advisor - Dr. H..T. Fortune, University of Pennsylvania.
Postdoctoral Advisor - Dr. R.W. McGrath, SUNY, Stony Brook.

Thesis Advisor and Post-Graduate Advisor

None. The University of Richmond is a primarily undergraduate institution.

Biographical Sketch: Emory F. Bunn

Professional Preparation: Princeton University, Physics, A.B., 1989.

U.C. Berkeley, Physics, M.A., 1993.

U.C. Berkeley, Physics, Ph.D., 1995.

U.C. Berkeley, Postdoctoral Fellow in Physics, 1995-1996.

Appointments: 2002-present - Assistant Professor of Physics, University of Richmond.

1999-2002 - Assistant Professor of Physics and Astronomy, St. Cloud State University.

1996-1999 - Assistant Professor of Physics and Astronomy, Bates College.

Selected Publications Related to the Proposed Research:

- E.F. Bunn, "Systematic Errors in Cosmic Microwave Background Interferometry," Phys. Rev. D, 75, 083517 (2007).
- E.F. Bunn and M. White, "Mosaicking with Cosmic Microwave Background Interferometers," Astrophys. J.,655, 21 (2007).
- A.L. Korotkov, J. Kim, G.S. Tucker, A. Gault, P. Hyland, S. Malu, P.T. Timbie, E.F. Bunn, E. Bierman, B. Keating, A. Murphy, C. O'Sullivan, P.A.R. Ade, C. Calderon, and L. Piccirillo, "The Millimeter-wave Bolometric Interferometer," Millimeter and Submillimeter Detectors and Instrumentation for Astronomy III (J. Zmuidzinas *et al.*, eds.), Proc. SPIE, 6272, 62750X (2006).
- E.F. Bunn, M. Zaldarriaga, M. Tegmark, and A. de Oliveira-Costa, "E/B Decomposition of Finite Pixelized CMB Maps," Phys. Rev. D, 67, 023501 (2003).
- E.F. Bunn, "Detectability of Microwave Background Polarization," Phys. Rev. D, 65, 043003 (2002).

Selected Other Publications:

- D. Hanson, D. Scott, and E.F. Bunn, "Directionality in the *WMAP* Polarization Data," Mon. Not. Royal Astron. Soc., 381, 2 (2007).
- T. Faulkner, M. Tegmark, E.F. Bunn, and Y. Mao, "Constraining $f(R)$ Gravity as a Scalar-Tensor Theory," Phys. Rev. D, 76, 063505 (2007).
- E.F. Bunn, "Probing the Universe on Gigaparsec Scales with Remote Cosmic Microwave Background Quadrupole Measurements," Phys. Rev. D, 73, 123517 (2006).
- J.C. Baez and E.F. Bunn, "The Meaning of Einstein's Equation," Am. J. Phys., 73, 653 (2005).

- M.E. Abroe, A. Balbi, J. Borrill, E.F. Bunn, S. Hanany, A.H. Jaffe, A.T. Lee, K.A. Olive, B. Rabii, P.L. Richards, G.F. Smoot, R. Stompor, C.D. Winant, and J.H.P. Wu, "Frequentist Estimation of Cosmological Parameters from the MAXIMA-1 Data Cosmic Microwave Background Anisotropy Data," M.N.R.A.S., 334, 11 (2002).

Synergistic Activities:

I am active in physics education in a variety of formal and informal ways beyond simply teaching courses. Examples include the following:

- I wrote the widely-read web document "Frequently Asked Questions About Black Holes," at http://cosmology.berkeley.edu/Education/BHfaq.html, and I continue to field questions from the public on black holes as a result.
- I served as co-moderator of Usenet newsgroup sci.physics.research (1995-2004). Although I no longer serve as moderator, I assist the current moderators and participate regularly in the newsgroup.
- I wrote the "Ask the Wizard" column for the December 2000 issue of *Discover* magazine.
- I am consulted by members of the local and national media (*Richmond Times-Dispatch*, *Discover*, *National Geographic News*) on news stories related to astronomy and astrophysics.
- I developed a new major in Interdisciplinary Physics at the University of Richmond.
- I wrote a new lab manual for an introductory astrophysics course at the University of Richmond.
- I appeared on a Richmond-area news broadast discussion of educational holiday gifts.

List of Recent Collaborators:

P. Ade (Cardiff), J. Baez (U.C. Riverside), E. Bierman (U.C.S.D.), C. Calderon (Cardiff), A. de Oliveira-Costa (U. Penn.), A. Gault (Wisconsin), P. Hyland (Wisconsin), B. Keating (U.C.S.D.), J. Kim (Brown), A. Korotkov (Brown), S. Malu (Wisconsin), A. Murphy (N.U.I. Maynooth), C. O'Sullivan (N.U.I. Maynooth), L. Piccirillo (Manchester), D. Scott (U.B.C.), M. Tegmark (M.I.T.), P. Timbie (Wisconsin), G. Tucker (Brown), B. Wandelt (U.I.U.C.), M. White (Berkeley), M. Zaldarriaga (Harvard).

Graduate and Postdoctoral Advisor:

Joseph Silk (currently at Oxford).

Biographical Sketch: Barry G. Lawson

Professional Preparation:

University of Virginia's College at Wise	Mathematics/CIS	BS	1993
College of William and Mary	Computer Science	MS	1996
College of William and Mary	Computer Science	PhD	2002

Appointments:

Assistant Professor of Computer Science, University of Richmond, 2002 – present
Instructor of Computer Science, College of William and Mary, 2001 – 2002
Programmer, Unisys Corporation, NASA Langley Research Center, 1997 – 1998
Programmer, VA Department of Mines, Minerals, and Energy, 1991 – 1994

Awards and Honors:

NSF #0524239, Cyber Trust, Division of Information & Intelligent Systems, $401,193. "CT-ISG/RUI: Ensuring Computation Integrity in Distributed Volunteer Computing Platforms", co-PI with Doug Szajda and Jason Owen, September 2005 – August 2008.

Selected Publications Related to the Proposed Research:

- J. Owen, B. Lawson, and D. Szajda. *A Nonparametric Analysis for Smith-Waterman Alignment Scores*, Proceedings of the American Statistical Association 2006 Joint Statistical Meetings, Biometrics Section, pp. 315-320. August 2006.
- D. Szajda, M. Pohl, J. Owen, and B. Lawson. Toward a Practical Data Privacy Scheme for a Distributed Implementation of the Smith-Waterman Genome Sequence Comparison Algorithm. In *Proceedings of the Network and Distributed System Security Symposium (NDSS 2006)*, San Diego, CA, February 2006.
- D. Szajda, B. Lawson, and J. Owen. Toward An Optimal Redundancy Strategy for Distributed Computations. In *Proceedings of the 2005 IEEE International Conference on Cluster Computing (Cluster 2005)*, Boston, MA, September 2005.
- D. Szajda, W. Owen, B. Lawson, A. Charlesworth, and E. Kenney. An Alternate Multiplicity-2 Task Assignment Scheme for Distributed Computations. In *Scheduling and Resource Management for Parallel and Distributed Systems (SRMPDS)* with *International Conference on Parallel and Distributed Processing Techniques and Applications*, Las Vegas, NV, June 2005.
- D. Szajda, B. Lawson, and J. Owen. Hardening Functions for Large Scale Distributed Computations. In *Proceedings of the 2003 IEEE Symposium on Security and Privacy*, pages 216-224, Berkeley, CA, May 2003.

Selected Other Publications:

- B. Lawson and E. Smirni. Power-aware Resource Allocation in High-end Systems via Online Simulation. In *Proceedings of the ACM International Conference on Supercomputing (ICS05)*, Cambridge, MA, June 2005.

- B. Lawson and E. Smirni. Self-Adaptive Scheduler Parameterization Via Online Simulation. In *Proc. of the 19th International Parallel and Distributed Processing Symposium (IPDPS 2005)*, Denver, CO, April 2005.
- B. Lawson, E. Smirni, and D. Puiu. Self-adapting Backfilling Scheduling for Parallel Systems. In *Proceedings of the International Conference on Parallel Processing (ICPP 2002)*, Vancouver, B.C., August 2002.
- B. Lawson and E. Smirni. Multiple-queue Backfilling Scheduling with Priorities and Reservations for Parallel Systems. In *8th Annual Workshop on Job Scheduling Strategies for Parallel Processing*, pages 72-83, Edinburgh, Scotland, July 2002.

Synergistic Activities:

- In five years at University of Richmond, directed or co-directed fifteen undergraduate students, including two women, in summer research on topics specifically related to this proposal.
- Developed a general-education Elementary Programming course and an upper-level Simulation course at University of Richmond. Also directed four full-course-credit independent study courses and two internships.
- Developed and presented, with Larry Leemis (William and Mary), a day-long workshop for first-time attendees at the 2006 and 2007 Winter Simulation Conferences.
- Member of conference panel: "Approaches to Undergraduate Research: What Works", with K. Anewalt, J. Polack-Wahl, R. Necaise. Consortium for Computing Sciences in Colleges (CCSC) 2006 Eastern Conference, October 2006.
- Research Talks to Undergraduates:
  - In Faculty and Student Talk (FAST) Series, Denison University Department of Mathematics and Computer Science, Granville, OH, 19 April 2006.
  - To Elon University Department of Computer Science, Elon, NC, 13 April 2006.
  - ACM Spring 2006 Invited Speaker, Bucknell University, Lewisburg, PA, 6 April 2006.
- Affiliated Faculty for Undergraduate Modeling, Simulation, and Analysis (UMSA): an interdisciplinary upper-level undergraduate research course developed and offered at William and Mary in 1998, 2000, and 2002 under NSF award CDA-9712718.

List of Recent Collaborators:

Arthur Charlesworth	University of Richmond
Larry Leemis	William and Mary
Dimitris Nikolopoulos	VA Tech
W. Jason Owen	University of Richmond
Steve Park	William and Mary
Mike Pohl	Google
Evgenia Smirni	College of William and Mary
Doug Szajda	University of Richmond

Graduate and Postdoctoral Advisor:

David Nicol	Professor of Computer Science	UIUC
Steve Park	Professor of Computer Science	College of William and Mary

Biographical Sketch: Douglas C. Szajda

Professional Preparation:

Lafayette College	Mathematics	BS	1984
University of Virginia	Mathematics	MS	1988
University of Virginia	Mathematics	PhD	1992
University of Virginia	Computer Science	MCS	1999
University of Maryland	Computer Science	PostDoc	6/1999-6/2001

Appointments:

Associate Professor of Computer Science, University of Richmond, 08/2001 – present.
Postdoctoral Research Associate, University of Maryland Institute for Advanced Computer Studies (UMIACS), 1999-2001.
Consulting Member of the High-Performance Computing Laboratory, Parabon Computation, Inc., 6/2000 - 12/2000 (concurrent with postdoctoral position at University of Maryland).
Assistant Professor of Mathematics, Washington and Lee University, 1992-1993, 1994-1997.
Visiting Assistant Professor of Mathematics, St. Olaf College, 1993-1994.

Awards and Honors

NSF #0524239, Cyber Trust, Division of Information & Intelligent Systems, $401,193. "CT-ISG/RUI: Ensuring Computation Integrity in Distributed Volunteer Computing Platforms", co-PI with Barry Lawson and Jason Owen, September 2005 – August 2008.

Selected Publications Related to the Proposed Research:

- J. Owen, B. Lawson, and D. Szajda. *A Nonparametric Analysis for Smith-Waterman Alignment Scores*, Proceedings of the American Statistical Association 2006 Joint Statistical Meetings, Biometrics Section, pp. 315-320. August 2006.
- D. Szajda, M. Pohl, J. Owen, and B. Lawson. Toward a Practical Data Privacy Scheme for a Distributed Implementation of the Smith-Waterman Genome Sequence Comparison Algorithm. In *Proceedings of the Network and Distributed System Security Symposium (NDSS 2006)*, San Diego, CA, February 2006.
- D. Szajda, B. Lawson, and J. Owen. Toward An Optimal Redundancy Strategy for Distributed Computations. In *Proceedings of the 2005 IEEE International Conference on Cluster Computing (Cluster 2005)*, Boston, MA, September 2005.
- D. Szajda, W. Owen, B. Lawson, A. Charlesworth, and E. Kenney. An Alternate Multiplicity-2 Task Assignment Scheme for Distributed Computations. In *Scheduling and Resource Management for Parallel and Distributed Systems (SRMPDS)* with *International Conference on Parallel and Distributed Processing Techniques and Applications*, Las Vegas, NV, June 2005.
- D. Szajda, B. Lawson, and J. Owen. Hardening Functions for Large Scale Distributed Computations. In *Proceedings of the 2003 IEEE Symposium on Security and Privacy*, pages 216-224, Berkeley, CA, May 2003.

Selected Other Publications and Patents

- A. Agrawala, U. Shankar, D. Szajda, R. Larsen, *Method, System, and Computer Program Product for Positioning and Synchronizing Mobile Wireless Nodes*, United States Patent No. 7,224,984, issued May 29, 2007. D. Szajda. Absolute Continuity of a class of Unitary Pseudodifferential Operators, *Houston Journal of Mathematics*, Vol. 27, No. 1, 2001, p. 189-202. Available online at http://oncampus.richmond.edu/ dszajda/research/papers/abcon_houston.pdf.

Synergistic Activities:

- Tutorial Chair — 2004 ISOC Network and Distributed System Security Symposium (NDSS)
- Publications Chair — 2005, 2006 ISOC Network and Distributed System Security Symposium
- General Chair — 2008 ISOC Network and Distributed System Security Symposium
- Various computer security related organizing committees and program committees
- In five years at University of Richmond, directed or co-directed fifteen undergraduate students, including two women, in summer research on topics specifically related to this proposal.
- Developed and taught (multiple times) the computer security course at the University of Richmond. Have also designed an introductory level computer security course intended for business majors. The latter course will be offered for the first time this fall. Approximately half of the students who have taken the senior level computer security course have been women.
- Developed and taught a two credit seminar on wireless networks.
- Organizer and coordinator of the ongoing computer science department systems research seminar. The seminar has met weekly since my arrival at the University of Richmond (Fall 2001). Participants include both faculty and students. Topics of discussion include current faculty research as well as publications from recent conferences in related fields.

List of Recent Collaborators:

W. Jason Owen	University of Richmond
Barry Lawson	University of Richmond
Ashok Agrawala	University of Maryland
Udaya Shankar	University of Maryland
Ronald Larsen	University of Pittsburgh

Graduate and Postdoctoral Advisor:

Thomas Kriete	Professor of Mathematics	University of Virginia
Paul Reynolds	Professor of Computer Science	University of Virginia
Ashok Agrawala	Professor of Computer Science	University of Maryland