H. Thomas Williams Resume

Short Biographical Sketch:

Professor Williams joined the faculty at Washington and Lee in 1974, and retired from full-time teaching in the summer of 2011. He attended the University of Virginia, receiving a B. S. in Physics in 1963 and a Ph.D. in Physics (under the direction of M. E. Rose) in 1967.

Upon completion of the Ph.D. he was awarded a National Research Council / National Science Foundation Postdoctoral Research Fellowship which funded two years of theoretical research (with M. Danos) at the National Bureau of Standards, in Washington, DC. He then spend three semesters as Gastdozent at the Universitaet Erlangen-Nuernberg in Germany, followed by a one term teaching appointment at the Virginia Military Institute in Lexington, Virginia.

From the fall of 1971 through the end of 1973, he served as a staff scientist at Kaman Sciences, Colorado Springs, Colorado, studying electromagnetic shielding, field propagation, transmission and reception.

In January 1974, Dr. Williams was appointed Assistant Professor of Physics at Washington and Lee. He was promoted to Associate Professor in 1979, and to Professor in 1984. For the three academic years spanning 1986-89 he served as Associate Dean of the College of Arts and Sciences, and served as Head of Physics and Engineering from 1989 until June, 2000. During the academic year 2002-03, he served as Acting Dean of the College. From 2003-07 he was University Provost. In the fall of 2007 he returned to the Department of Physics and Engineering and served as Department Head in 2010 and 2011.

Professor Williams has provided consulting services to the National Bureau of Standards and the Los Alamos National Laboratory. He has received research support from the National Bureau of Standards, Los Alamos National Laboratory, the Research Corporation and the National Science Foundation.

Research Interests

Professor Williams currently pursues research in the areas of quantum information theory, and non-equilibrium statistical mechanics involving both analytical approaches and computer simulations to address system behavior in one and more dimensions.

Curriculum Vitae

Education:

B. S. in Physics, University of Virginia, June 1963.

Ph. D. in Physics, University of Virginia, August 1967
National Defense Education Act Fellowship
Dissertation: Internal Compton Coefficients (M. E. Rose, director)

Postdoctoral:

National Research Council -- National Science Foundation Postdoctoral Research Fellow at National Bureau of Standards. Work on nuclear theory with Michael Danos. (1967-1969)

Gastdozent, Institute for Theoretical Physics, Universitaet Erlangen-Nuernberg, Germany. (1970)

Employment:

Guest professor, Virginia Military Institute, Lexington, VA (1971).

Staff scientist, Kaman Sciences Corporation, Colorado Springs, CO (1971-1973). Theoretical studies of electromagnetic shielding, classical field transmission and reception.

Faculty, Washington and Lee University, Lexington, VA
Assistant Professor (1974)
Associate Professor (1979)
Professor (1984)
Associate Dean of College of Arts and Sciences, (1986-1989)
Head, Department of Physics and Engineering (1989 - 2000)
Acting Dean of the College (2002-2003)
Provost (2003-2007)
Head, Department of Physics and Engineering (2009-2011)
Retired June 30, 2011

Grants and professional appointments:

Consultant, National Bureau of Standards, 1974 - 1986.

Consultant, Los Alamos Scientific Laboratory, 1987 - 2002.

Research grant from Research Corporation for theoretical study of nuclear Compton scattering at intermediate energies 1981-82. (Grant includes stipend for an undergraduate student assistant each of two summers).

Member of Editorial Committee of Southeastern Universities Research Association (SURA) - purpose of committee was to write the scientific

justification section of a proposal to N.S.F. for the construction of a major particle accelerator research facility in Virginia (CEBAF).

National Science Foundation Research Opportunity Award (ROA) (in collaboration with theory group at University of Virginia): summer 1988, and a second award for research in summers of 1989 and 1990.

Manuscript reviewer, Physical Review C, American Journal of Physics.

Member of Physics Council, Council on Undergraduate Research, 1988 - 1991.

Organizer and director, 2000 Associated Colleges of the South workshop on Computer Based Introductory Physics Laboratories.

Co-organizer, 2010 joint W&L/Va Tech Symposium on Applications of Statistical Techniques to Far-from-Equilibrium and Biological Systems.

Publications (since 1990, most recent first):

Exact analytical solutions of charged monomer and dimer deposition models in one and two dimensions, D. Mazilu, I. Mazilu, H.T. Williams, accepted for publication in *Journal of Physics: conference series.(2012)*

Stochastic epidemic-type model with enhanced connectivity: exact solution, H. T. Williams, I. Mazilu, D. A. Mazilu, Journal of Statistical Physics **2012**, 01017,(January 2012.)

Applications of tridiagonal matrices in nonlinear statistical physics, I Mazilu, D. A. Mazilu, H. Thomas Williams, Journal of Statistical Mechanics (Electronic), **24**, 7-17, 2012.

Entanglement enhancement of a noisy classical communication channel, H. Thomas Williams, Paul Bourdon, arXiv:quant-ph 1109.1029, November 2011.

Exact energy spectrum of a two-temperature kinetic Ising Model, I. Mazilu and H. T. Williams, Physical Review E **80**, 061109 (2009).

Nonequilibrium statistical mechanics: a solvable model, I. Mazilu and H. T. Williams, American Journal of Physics 77, 458-467 (2009.)

Augmented message-matrix approach to deterministic dense-coding theory, E. Gerjuoy, H. T. Williams, P. Bourdon, Physical Review A**79,** 042315 (2009.)

Deterministic Dense Coding and Entanglement Entropy, P. S. Bourdon, E. Gerjuoy (Univ. Pittsburg), J. P. McDonald (W&L undergraduate student) and H. T. Williams., Physical Review **A 77**, 022305 (2008).

Sharp probability estimates for Shor's order-finding algorithm, P. S. Bourdon and H. T. Williams, Quantum Information and Computation 7, 522-550, (2007)

Unital quantum operations on the Bloch ball and Bloch region, P. S. Bourdon and H. T. Williams, Physical Review A 69, 022314 (2004)

Superposition solutions to the Schroedinger equation, H. Thomas Williams, American Journal of Physics 70, pp 532-536, 2002.

Semantics in Teaching Introductory Physics, H. Thomas Williams, American Journal of Physics, 67, pp670-680, 1999.

Two-dimensional growth models, H. Thomas Williams, Laura Goodwin, Steven G. Desjardins, Frederic T Billings, Physics Letters A 250, pp105-110, 1998.

Program for generating tables of SU3 coupling coefficients, Thomas A. Kaeding and H. T. Williams, Computer Physics Communications 98, pp398- 414, 1996.

SU3 isoscalar factors, H. T. Williams, Journal of Mathematical Physics 37 (8), pp4187-4198, 1996.

Symmetry properties of matrix elements of canonical SU(3) tensor operators, L. C. Biedenharn, M. A. Lohe, H. T. Williams, Journal of Mathematical Physics 35, 6672, 1994.

A new algorithm for computation of SU3 Clebsch Gordan coefficients, H. T. Williams, Computers in Physics 8 355, 1994.

Symbolic Solutions: Angular Momentum on a PC, R. R. Silbar and H. T. Williams, Computers in Physics 8, 52, 1994.

Automated Angular Momentum Recoupling Algebra, R. R. Silbar and H. T. Williams, Journal of Computational Physics 99, 299, 1992.

Gauge Invariance and Threshold Photon Scattering on a Composite Target, H. T. Williams, American Journal of Physics 59, 437, 1991.