

Norman Witriol

President, Building Science Innovators, LLC

Highly knowledgeable and creative physicist, a retired professor of physics (Louisiana Tech University), specializing in, building science, renewable energy, and engineering physics with professional journal publications and presentations to physics and technical societies; experience being principle investigator, and managing over \$500K in grants/projects on energy conservation; and being co-principal investigator or a team member, on other several millions of dollars of other projects/grants. Several years of experience as President of Building Science Innovators, LLC, an entrepreneurial small company specializing in building science, renewable energy technologies, analyzing energy production and utilization, and energy conservation.

◆ Education

- ◆ B. S. (Physics) Polytechnic Institute of New York University
- ◆ M. A. (Physics) Brandeis University
- ◆ Ph. D. (Physics) Brandeis University

◆ Grants

- ◆ “Energy Cost Due to Duct Leakage; Return Duct Leakage vs. Supply Duct Leakage; and Sealing Ductwork thereby Reducing Energy Usage in Existing Residential Buildings,” Norman M. Witriol, State of Louisiana Department of Natural Resources, 2003-04-03, \$158,233.
- ◆ “Testing and Sealing Ductwork, and Reducing Energy Usage in Existing Residential and Industrial Buildings,” Norman M. Witriol and Robert McKim, State of Louisiana Department of Natural Resources, Contract PVE29-01-12, \$385,030.

Adviser on Energy Issues:

- ◆ NOEEP: team picked by the New Orleans City Council's Energy Policy sub-committee.
- ◆ New Energy Policy Task Force: co-author Energy Hawk.
- ◆ Building Science Center in New Orleans: coauthor of report “Why we Need a Building Science center in New Orleans” for Shelley Midura, Chair of the Utility Committee, New Orleans City Council.

◆ Recent Award

- ◆ Service to the City of New Orleans, Utility Committee, New Orleans City Council, Energy Advising (2009).

◆ Employment History

- ◆ President, Building Science Innovators, LLC, May 2004 to Present.
- ◆ Professor, Associate Professor, Assistant Professor, Louisiana Tech University, November 1977 to August, 2006.
- ◆ Consultant/Fellow to nine governmental and industrial organizations.
- ◆ Two appointments as a Senior Research Associate at the National Research Council
- ◆ U.S. Government research physicist at five federal research laboratories.

◆ **Other Professional Information:**

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| ◆ Awards | 8 |
| ◆ Publications (in peer reviewed professional journals): | 37 |
| ◆ Patents: | 5 |
| ◆ Invention Disclosures: | 19 |
| ◆ Lectures, Papers Presented, Reports: | 61 |

Vitae

Education:

B. S. (Physics) Polytechnic Institute of Brooklyn.

M. A. (Physics) Brandeis University.

Ph. D. (Physics) Brandeis University.

Professional Record:

President, Viewpoint Design, LLC, July 2009 - Present

President, Building Science Innovators, LLC, May 2004 to 2017

Develop and Facilitate the concept of the Center for Excellence in the Built Environment (CEBE), an organization recommended by the New Orleans Energy policy Task Force) to reality, October 2007 - present

Member, Renewable Energy Committee, New Orleans Energy Policy Task Force, New Orleans Regional Planning Commission, Regional Planning Commission, June 2007 – October, 2007

Member, Outcomes Committee, New Orleans Energy Policy Task Force, New Orleans Regional Planning Commission, Regional Planning Commission, June 2007 – October, 2007

Professor of Physics, Louisiana Tech University, September 1984 to August 2006.

Associate, Institute for Micromanufacturing, Louisiana Tech University, May 1996 - 2004.

Consultant, U.S. Army Chemical Research, Development, and Engineering Test Center, January 1993 to January 1994.

National Research Council Senior Research Associate, U.S. Army Chemical Research, Development and Engineering Center, June 1991 - September 1992.

Consultant, U.S. Army Chemical Research, Development, and Engineering Test Center, January 1991 to June 1991

National Research Council Senior Research Associate, U.S. Army Ballistic Research Laboratory, September 1989 - September 1990.

Fellow, U.S. Army Chemical Research, Development, and Engineering Center, June 1989 - August 1989.

Consultant, U.S. Naval Research Laboratory, September 1985 to August, 1989.

Consulting Research Physicist, Sachs/Freeman Associates, Inc., June 1988.

Fellow, U.S. Naval Research Laboratory, August 1985 - September 1985.

Associate Professor of Physics, Louisiana Tech University, September 1979 - August 1984.

Consultant, Louisiana Tech University Department of Chemical Engineering (Louisiana Board of Regents Research and Development Grant), October 1980 - September 1981.

Consultant, U.S. Army Missile Research and Development Command, September 1979 - October 1980

Assistant Professor Physics, Louisiana Tech University, December 1977 - August 1979.

Lecturer in Physics, University of Alabama in Huntsville, April 1970 - November 1977.

Research Physicist, Physical Sciences Laboratory, Redstone Arsenal, Alabama, July 1968 - November 1977.

Fellow, Research Assistant, Teaching Assistant, Brandeis University, September 1961 - June 1968.

Physicist, U.S. Army Electronic Proving Ground, Fort Huachuca, Arizona, Summer 1963.

Physicist, U.S. Naval Air Test Center, Patuxent River, Maryland, Summer 1962.

Research Grants:

“Energy Cost Due to Duct Leakage; Return Duct Leakage vs. Supply Duct Leakage; and Sealing Ductwork thereby Reducing Energy Usage in Existing Residential Buildings,” Norman M. Witriol, State of Louisiana Department of Natural Resources, Contract No. 2030-04-03, \$158,233.

“Instrumentation for Fiber Optics Laboratory,” Norman M. Witriol and Mike McShane, Board of Regents, Contract No. LEQSF(2002-03)-ENH-TR-42, 2002 - 2003. \$47,048.

“Testing and Sealing Ductwork, and Reducing Energy Usage in Existing Residential and Industrial Buildings,” Norman M. Witriol and Robert McKim, State of Louisiana Department of Natural Resources, Contract PVE29-01-12, \$385,030.

"The Development of a Center for Advanced Mold/Mask Processes and Applications for the Miniaturization Technologies," R. Warrington, C. R. Friedrich, R. Nassar, W. Dai, F. Jones, B. Ellmore, C. Shepard, G. Callens, B. Jordan, D. Hall, N. Witriol, G. Lin, M. Vasile, D. Beebe, R. Keynton, T. Ameal, H. Hegab, J. Fang, L. Roemer, and D. Cowling, Department of Defense, Contract No. DAAH04-96-1-0200, 1996 - 2001. \$1,994,500.

"Fundamental Studies of Laser-Ignition and Kinetics in Reactive Gases," A. W. Miziolek, B. E. Forch, N. M. Witriol and R. J. Locke, Air Force Office of Scientific Research, Contract No. 89-0017, January - December, 1990. \$120,000.

"Theoretical Molecular Reactive Scattering," U.S. Naval Research Laboratory, IPA, July 1988 - September 1989. \$16,996.

"Theoretical Molecular Reactive Scattering," U.S. Naval Research Laboratory, IPA, October 1986 - September 1987. \$26,040.

"Theoretical Molecular Reactive Scattering," U.S. Naval Research Laboratory, IPA, October 1985 - September 1986. \$21,064.

"Three-Dimensional Quantum Reaction Coordinates and the $F+H_2 \rightarrow HF+H$ System," Louisiana Tech University Seed Grant September 1984 - August 1985. \$1,000.

Principle Investigator on several research projects for the U.S. Army Missile RD&E Laboratory, July 1968 - November 1977.

Project Grants:

NOEEP: In association (as one of the two technical personnel) with Honeywell, the Energy Committee of the New Orleans City Council chose our response to its RFP for the Third Party Administrator for the "New Orleans Energy Efficiency Programs" (NOEEP). (Unfortunately, funds were not allocated due to the devastation caused by Hurricane Katrina.)

Programs (total ~\$7 million/yr x 5 yrs) funded with 1 mill/kWh non-by passable wires charge paid by all customers) would have included:

- Energy Education and Awareness Program
- Residential Energy Efficiency Program
- Low Income Weatherization Energy Efficiency Program
- Small Commercial Energy Efficiency Program
- Large Commercial & Industrial Energy Efficiency Program
- Emergency Energy Price Assistance Energy Efficiency Program

See:

http://www.raponline.org/docs/ARPSC_NOEPPre-KatrinaStatus_Docket06-004-R_2006_10_09.pdf

<http://www.ergconsulting.com/noeep/rfp/docs/tparfp.pdf#search=%22noeep%2>

Awards:

Service to the City of New Orleans, Utility Committee, New Orleans City Council, Energy Advising (2009).

Inventors Award, Patent Number 4,853,771, Louisiana Tech University (2001).

National Research Council, Senior Research Associate, at the U.S. Army Chemical Research, Development and, Engineering Center. Research on The Inverse Scattering Problem, (1990-1991).

National Research Council, Senior Research Associate, at the U.S. Army Ballistic Research Laboratory. Research on Computational Modeling of Laser-Induced Ignition Processes in Combustible Gases, (1989-1990).

American Society for Engineering Education, 1989 Summer Faculty Research Fellow at the U. S. Army Chemical Research, Development, and Engineering Center. Research on Theoretical Investigations of Chemical Reaction Mechanisms, (1989).

American Society for Engineering Education, 1985 Summer Faculty Research Fellow at the U.S. Naval Research Laboratory. Research on Molecular Reaction Dynamics, (1985).

"Outstanding Research Award," College of Arts and Sciences, Louisiana Tech University, (1980).

"Sigma Xi Outstanding Research Award," Louisiana Tech University, (1980).

"Leadership in Patent Disclosures Award," U.S. Army Missile RD&E Laboratory, (1976).

Areas of Expertise:

- Environmental Physics – Energy Conservation
- Utility Regulation
- Building Science
- Energy Efficiency
- Air, Humidity, Heat Transport in Buildings
- Thermodynamics
- Statistical Mechanics
- Bio Robotics – Modeling and Simulation
- Quantum Statistical Mechanics
- Biophysics
- Micro Optical, Electronic, and Mechanical Systems and Sensors – Design, Model and Simulate
- Optics
- Quantum Optics
- Fiber Optics
- Laser Optics
- Laser – Matter Interaction
- Chemical Physics
- Molecular Reaction Dynamics
- Molecular Energy Transfer Processes
- Photoacoustic Spectroscopy
- Quantum Mechanics
- Quantum Measurement Theory
- Computational Physics - Computer Modeling and Simulation
- General Relativity
- Condensed Matter Physics
- Robotic Vision

Publications:

1. Notes for "Fluctuation and Coherence Phenomena in Classical and Quantum Physics," M. Lax in Statistical Physics, Phase Transitions and Superfluidity, Brandeis University Summer Institute in Theoretical Physics, 1966, Volume 2, M. Chretien, E. P. Gross and S. Deser, editors (Gordon and Breach Science Publishers, New York, 1968) pp. 269-478.
2. "Many-Body Point Transforms," Norman M. Witriol, J. Math Phys. 11, 669-680 (1970).
3. "Point Transforms and the Hard-Core Fermi System," Norman M. Witriol, Phys. Rev. A1, 1775-1782 (1970).
4. "Boundary Conditions in the Pairwise Point Transformation Method," Norman M. Witriol, J. Math Phys. 12, 177-179 (1971).
5. "Many-Body Transforms. II. An Exact Noncluster Approach to the Hard-Core Many-Body Problem," Norman M. Witriol, J. Math. Phys. 12, 2467-2480 (1971).

6. "Linear Canonical Transformations in the Theory of Vibrational-Rotational Interactions in Molecules. A Practical Closed Form N-Dimensional Procedure," Norman M. Witriol, *J. Chem. Phys.* 55, 5149-5153 (1971).
7. "Lattice Dynamics of Hard-Core, Highly Anharmonic Crystals," S. B. Trickey, N. M. Witriol, and G. L. Morley, *Solid State Commun.* 11, 139-143 (1972).
8. "Canonical Transformations and Molecular Structure Calculations," Norman M. Witriol, *Intern. J. Quantum Chem. VIS*, 145-152 (1972).
9. "Point Transformation Theory and Quantum Crystals. Zero-Temperature Self-Consistent Phonons Assuming, Two-Body Additivity," S. B. Trickey, N. M. Witriol, and G. L. Morley, *Phys. Rev. A* 7, 1662-1673 (1973).
10. "Vibration-to-Vibration Energy Transfer via Short Range Forces," J. D. Stettler and N. M. Witriol, *Chem. Phys. Letters* 23, 95-98 (1973).
11. "CNDO Calculation of Intermolecular V-T and V-V Potentials - The CO₂-N₂ System," N. M. Witriol, J. D. Stettler, J. R. Sabin, and S. B. Trickey, *Chem. Phys. Letters* 27, 540-543 (1974).
12. "Investigation of the Computation of V-T and V-V Intermolecular Potentials," N. M. Witriol, J. D. Stettler, J. R. Sabin, and S. B. Trickey, *IEEE J. Quantum Electron.* QE-11, 717 (1975).
13. "CO₂-N₂ Intermolecular V-T and V-V Potentials via CNDO," N. M. Witriol, J. D. Stettler, J. R. Sabin, and S. B. Trickey, *J. Chem. Phys.* 63, 3263-3271 (1975).
14. "General Quantum Mechanical Canonical Point Transformation," Norman M. Witriol, *Foundations of Physics* 5, 591-605 (1975).
15. "Ground State Properties of bcc ³He-Test of the Point Transformation Method," S. B. Trickey, N. M. Witriol, and T. R. Koehler, Proceedings Fourteenth International Conference on Low Temperature Physics, M. Krusius and M. Vuorio, editors (North Holland, Amsterdam, 1975) Vol. 1, pp. 491-494.
16. "Near-Resonant V-V Processes and Short-Range Forces," John D. Stettler, and Norman M. Witriol, *Chem. Phys. Letters* 41 242-243 (1976).
17. "A Systematic Treatment of Quantum Mechanical Reaction Coordinates," N. M. Witriol, J. D. Stettler, M. A. Ratner, J. R. Sabin, and S. B. Trickey, *J. Chem. Phys.* 66, 1141-1159 (1977).
18. "Energy Transfer Mechanisms," J. D. Stettler and N. M. Witriol, in Photoacoustic Spectroscopy and Detection, Y. H. Pao, editor (Academic Press, New York, 1977), pp. 27-45.
19. "An Excitation Model for Laser-induced Photochemical Reactions," Charles M. Bowden, John D. Stettler, and Norman M. Witriol, *J. Phys. B: Atom. Molec. Phys.* 10, 1789-1799 (1977).
20. "Effect of Chemical Reactions in Laser Induced Molecular Excitation," Charles M. Bowden, Norman M. Witriol, and C. Alton Coulter, *Optics Comm.* 23, 389-392 (1977).
21. "Distorted-Wave Born Calculations of V-V Energy Transfer," W. D. Eberhardt, J. D. Stettler, N. M. Witriol, and C. C. Sung, *J. Chem. Phys.* 69, 3112-3118 (1978).

22. "Synthesis of Solid Propellant Burning Rate Modifiers by Infrared Augmented Laser Chemistry," J. A. Merritt, C. M. Bowden, R. I. Greenberg, H. C. Meyer, R. A. Shatas, G. A. Tanton, N. M. Witriol, and L. C. Robertson, Proceed. AIAA 16th Aerospace Sciences Meeting, 1-6 (1978).
23. "Population Trapping in Laser Induced Molecular Excitation and Dissociation," J. H. Eberly, N. M. Witriol, J. D. Stettler, and C. M. Bowden, Phys. Letters 73A, 171-174 (1979).
24. "Criteria for the Reduction of the Effective Manifold of States in Models of Laser-Induced Dissociation and Chemistry," N. M. Witriol, A. J. Galli, W. H. Brumage, and C. M. Bowden, Opt. Lett. 5, 24-26 (1980).
25. "Bound Klein-Gordon States in a Reissner-Nordstrom Spacetime," S. Strom, N. M. Witriol, R. L. Gibbs, and L. L. Smalley, Proceed. Ninth International Conference on General Relativity and Gravitation (1980).
26. "Reduction of the Effective Manifold of States in Models of Multi-Photon Laser-Induced Dissociation and Chemistry," Norman M. Witriol, and William H. Brumage, Phys. Rev. A 27, 1564-1574 (1983).
27. "Including the Continuum in the N-level Molecule Model," Norman M. Witriol, Chem. Phys. Lett. 98, 77-80, (1983).
28. "A Simplified Method of Providing a Robot Vision System," David H. Cowling, Norman M. Witriol, and William H. Brumage, Proceedings National Conference on Robotics and Automated Systems. R. Michael Harnett, editor (Louisiana Tech University Press, Ruston, Louisiana) pp. 81-91 (1985).
29. "A Simplified Method of Providing a Robotic Vision System," David H. Cowling, W. Thomas Smith, and Norman M. Witriol, Proceedings IEEE 1986, Region 5 Conference, pp. 178-182 (1986).
30. "An Emergency Illumination System for Emergency Night Landing by Aircraft," D. H. Cowling, N. M. Witriol, and D. A. Lombardo, J. of the Illum. Eng. Soc. of NA 16, 76-81 (1987).
31. "Illuminescent Industrial Robotic Vision System," Norman M. Witriol and David H. Cowling, 1989 Tech. Digest on the Conf. on Lasers and Electro-Optics 11, TuQ3 (1989).
32. "A Systematic Treatment of Quantum Mechanical Reaction Coordinates," Norman M. Witriol and Gary H. Herling, Theor. Chim. Acta 76, 353-371 (1989).
33. "Modeling Laser-Induced Ignition of Combustible Gases," Norman M. Witriol. Brad E. Forch, and Andrzej W. Miziolek, Proceed. 27th JANNAF Combustion Meeting, (1990).
34. "A Simplified Vision System with Robotic Assembly and Manufacturing Applications," D. H. Cowling and N. M. Witriol, Proceed. of the SME Vision 90 Conference, (1990).
35. "Forward Scattering and Size Parameter in Layered Spherical Aerosol Particles," Norman M. Witriol and Orazio I. Sindoni, J. Aerosol Sci. 23, S349-S352 (1992).
36. "Nitric Oxide Mediates the Pulmonary Vasodilator Response to Nociceptin in the Intact Rat," B. Lin, S. Patton, K. Kirschbaum, N. Witriol, M. Franklin, F. Ji, and H. Lippert, The FASEB Journal 16, A73 (2002).

37. "Vascular Studies in the Rat Reveal a Structurally-Novel Selective Histamine I Receptor Agonist," K. Kirschbaum, B. Lin, N. Witriol, F. Ji, S. Patton, M. Franklin, and H. Lipton, *The FASEB Journal* 16, A97 (2002).
38. "Nitric Oxide Mediates the Systematic Vasodilator Response (SV) to Rat Urotensin II (RUT) in vivo," M. Franklin, B. Lin, N. Witriol, S. Patton, F. Ji, K. Kirschbaum, and H. Lipton, *The FASEB Journal* 16, A851 (2002).
39. "Generalized Subtraction Correction Algorithm for Measuring Duct Leakage Using a Blower Door," M. Katz, N. Witriol, and J. Erinjeri, *ASTM International Journal of Testing and Evaluation* 32, 11723-1-8 (2004),
40. "Intermedin/adrenomedullin-2 dilates the rat pulmonary vascular bed: dependence on CGRP receptors and nitric oxide release," Burak Kandilci H, Gumusel B, Wasserman A, Witriol N, Lipton, H, *Peptides* 2006 June;27(6):1390-6.
41. "Hemopressin, a hemoglobin fragment, dilates the rat systemic vascular bed through release of nitric oxide," Lipton, H, Lin, B, Witriol, N, Wasserman, A, Knight, M, *Peptides* 2006 Sep;27(9):2284-8.
42. "A system for measurement and calibration of nonorthogonal joints and limbs in humans," Christopher M. Storey, Anne M Hollister, Charles J. Robinson, Norman M. Witriol, Dale O. Anderson, John C. London, and William L. Buford, *IEEE 2006 International Conference of the Engineering in Medicine and Biology Society - Engineering Revolution In BioMedicine*, paper and presentation (2006).
43. "A representation for multilinked systems with arbitrary revolute joints in human and arthropod limbs," Christopher M Storey, , Anne M. Hollister, Charles J. Robinson, Norman M. Witriol, Dale O. Anderson, *IEEE Special Issue on Bio-Robotics* (submitted)

Patents and Disclosures:

1. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,250; Patent Number: 3,961,272.
2. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,250; Patent Number: 4,027,143.
3. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,250; Patent Number: 4,047,001.
4. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,621; Patent Number: 3,961,272.
5. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure; AMPC 3,621; Patent Number: 4,027,143.
6. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,621; Patent Number: 4,047,001.
7. "Encoding Altimeter" Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,622; Patent Number: 3,961,272.
8. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,622; Patent Number: 4,027,143.
9. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,622; Patent Number: 4,047,001.
10. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,623; Patent Number: 3,961,272.
11. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,623; Patent Number: 4,027,143.
12. "Encoding Altimeter," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,623; Patent Number: 4,047,001.
13. "Stolen Vehicle Recovery System," Norman M. Witriol; Invention Disclosure: AMPC 3,444.
14. "Self-Aerating Container," T. G. Roberts, N. M. Witriol, and C. M. Rust; Invention Disclosure: AMPC 3,446; Patent Number: 4,129,095.
15. "Low Resistance Path Type Rectifier," Norman M. Witriol; Invention Disclosure: AMPC 3,458.
16. "Magnetic Field Dependent Rectifier," Norman M. Witriol; Invention Disclosure: AMPC 3,459.
17. "Catalyst Rejuvenator," Norman M. Witriol; Invention Disclosure: AMPC 3,720.
18. "Multiple Photon Dissociation Laser," Norman M. Witriol, and Charles M. Bowden; Invention Disclosure: AMPC 3,748.

19. "Non-Directional Beacon Radial Selector," Norman M. Witriol and Carlton L. Frederick; Invention Disclosure: AMPC 3,789.
20. "An Aircraft Emergency Illumination System," Norman M. Witriol, David A. Lombardo, and David H. Cowling; Invention Disclosure, U.S. Naval Research Laboratory, 1986.
21. "Robotic Vision System," Norman M. Witriol, William H. Brumage, and David H. Cowling; Invention Disclosure, Navy Case No. 69,440 (1986).
22. "Aircraft Accelerometer," Norman M. Witriol; Invention Disclosure, U.S. Naval Research Laboratory (1988).
23. "Robotic Vision System," Norman M. Witriol, William H. Brumage, and David H. Cowling; Invention Disclosure, Navy Case No. 71,166; Patent Number: 4,853,771 (1989).

Lectures, Papers Presented, Reports, Web Publications:

1. "Many-Body Point Transforms," Norman M. Witriol and Eugene P. Gross, Bull. Am. Phys. Soc. 14, 111 (1969).
2. "Many-Body Point Transforms and the Hard-Core Many-Body Problem," National Bureau of standards (invited lecture, 1969).
3. "Hard-Core Fermi Systems via Point Transforms," Norman M. Witriol, Bull. Am. Phys. Soc. 15, 189 (1970).
4. "The Point Transformation Method," Norman M. Witriol, J. Ala. Acad. Sci. 41, 164 (1970).
5. (i) "The Pairwise Point Transformation Method Applied to Hard-Core Bose and Fermi Systems," (ii) "The Point Transformation Method and the Hard-Core Problem," (iii) "Many-Body Point Transforms," Instituto Politecnico Nacional, Mexico (invited lectures, 1970).
6. "Point Transformations and Boundary Conditions," Norman M. Witriol, Bull. Am. Phys. Soc. 15, 1377 (1970).
7. "Many-Body Point Transforms in the Hard-Core Many-Body Problem," Norman M. Witriol, Bull. Am. Phys. Soc. 16, 108 (1971).
8. "Lattice Dynamics of Hard-Core Highly Anharmonic Crystals," S. B. Trickey, N. M. Witriol, and G. L. Morley, Conference on Quantum Crystals, Banff, Canada (1971).
9. "Intermolecular Hard-Core Potentials - Point Transformations with Boundary Conditions," Norman M. Witriol, Trans. 17th Conf. Army Math., ARO-D Rpt 72-1, 127 (1972).
10. "Lattice Dynamics of Hard-Core Quantum Crystals via Point Transformation Theory," N. M. Witriol, S. B. Trickey, and G. L. Morley, Bull. Am. Phys. Soc. 18, 23 (1973).
11. "General Quantum Mechanical Point Transformations and the Associated Canonical Transformed Momenta," Norman M. Witriol, Bull. Am. Phys. Soc. 18, 267 (1973).

12. "Molecular Vibration Energy Exchange," John D. Stettler and Norman M. Witriol, Bull. Am. Phys. Soc. 18, 268 (1973).
13. "Some Concepts in Reaction Dynamics," University of Alabama in Huntsville (invited lecture, 1973).
14. "Theory of Intermolecular Vibrational Energy Exchange," N. M. Witriol and J. D. Stettler, J. Ala. Acad. Sci., 44, 209 (1973).
15. "Quantized Natural Collision Coordinates Method -Quantum Mechanical Canonical Point Transformations," Norman M. Witriol, Trans. 19th Conf. Army Math., ARO-D Rpt 73-3, 133 (1973).
16. "Origin of the Temperature Dependence of Resonant V-V Transitions," J. D. Stettler and N. M. Witriol, Bull. Am. Phys. Soc. 18, 1526 (1973).
17. "Calculation of Vibrationally Inelastic Intermolecular Forces via CNDO," N. M. Witriol, J. D. Stettler, S. B. Trickey, and J. R. Sabin, 51st Annual Meeting of Alabama Academy of Science (1974).
18. "A Quantized Reaction Coordinate Method," University in Huntsville (invited lecture, 1974).
19. "CO₂ - N₂ Inelastic Intermolecular Potentials via CNDO," Norman M. Witriol, Fifth Southeastern Theoretical Chemistry Association (SETCA) Conference (1974).
20. "Vibrational Energy Transfer in Hydrogen Halide Lasers," John D. Stettler, and Norman M. Witriol, Proc. 1974 Army Science Conf. 3 187 (1974).
21. "V-V Rates for D₂, DF and HCl Based on Short Range Forces," J. D. Stettler, and N. M. Witriol, Bull. Am. Phys. Soc. 19, 1089 (1974).
22. "Computation of Inelastic Intermolecular Potentials for CO₂ - N₂ via CNDO," N. M. Witriol, J. D. Stettler, J. R. Sabin and S. B. Trickey, Bull. Am. Phys. Soc. 19, 1089 (1974).
23. "Quantized Reaction Coordinate Method," Norman M. Witriol, Trans. 20th Conf. Army Math. ARO-D Rpt 75-1, 163 (1975).
24. "Comments on Black Hole Geometrodynamics," Bruce W. Fowler, Norman M. Witriol, and Larry L. Smalley, U.S. Army Missile Command Tech. Rpt. RF-76-3 (1975).
25. "Reaction Coordinates - Concepts and Methods," Seventh Southeastern Theoretical Chemistry Association (SETCA) Conference, (invited lecture, 1976).
26. "A Time-Dependent Quantized Natural Collision Coordinates Method," Norman M. Witriol, Trans. 21st Conf. Army Math., ARO-D Rpt 76-1, 397 (1976).
27. "Theory of Laser Induced Chemical Reaction Rates," N. M. Witriol, C. M. Bowden, and C. A. Coulter, Bull. Am. Phys. Soc., 22, 450 (1977).
28. "An Excitation Model for Laser Photochemical Reactions," C. M. Bowden, J. D. Stettler and N. M. Witriol, Bull. Am. Phys. Soc. 22, 497 (1977).
29. "Effect of Chemical Reactions in Laser-Induced Excitations," C. M. Bowden, N. M. Witriol, and C. Alton Coulter, International Conference on Multiphoton Processes, Rochester, New York (1977).

30. "Reduction of Levels in Laser-Induced Chemistry/Dissociation" A. J. Galli, W. H. Brumage, and N. M. Witriol, Louisiana Tech Univ., College of Arts and Sciences Research Symposium (1978).
31. "Laser Excitation of a Four Level System," N. M. Witriol, Louisiana Tech Univ., College of Arts and Sciences Research Symposium (1978).
32. "Reduction of the Effective Number of Levels in Laser-Induced Dissociation/Chemistry" N. M. Witriol, A. J. Galli, W. H. Brumage, and C. M. Bowden, Bull. Am. Phys. Soc. 24, 66 (1979).
33. "Laser-Induced Inversion in Few Level Systems," C. W. Beason, and N. M. Witriol, Bull. Am. Phys. Soc. 24, 66 (1979).
34. "The Effect of Rotational Levels in Laser Induced Vibrational Excitation Processes: L. B. Godwin, C. W. Beason, W. H. Brumage, and N. M. Witriol, Louisiana Academy of Sciences (1979).
35. "A Method of Simplifying Multi-Level Laser-Induced Chemistry/Dissociation Computations," N. M. Witriol, and W. H. Brumage, Louisiana Tech Univ., College of Arts and Sciences Research Symposium (1979).
36. "Motion of a Particle Near a Black Hole," R. L. Gibbs, and N. M. Witriol, Louisiana Academy of Sciences (1980).
37. "Criteria for the Reduction of Levels in Laser Induced Dissociation/Chemistry Calculations," N. M. Witriol, and W. H. Brumage, Louisiana Tech Univ. Research Symposium (1980).
38. "Quantum Treatment of a Charged Particle Near a Charged Black Hole, R. L. Gibbs, S. Strom, and N. M. Witriol, Louisiana Academy of Sciences (1981).
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40. "Modeling the Continuum in Laser-Induced Chemistry/Dissociation," N. M. Witriol, and W. H. Brumage, Louisiana Tech University, College of Arts and Sciences Research Symposium (1981).
41. "Methods of Including the Continuum in Laser-Induced Chemistry/Dissociation Computations," N. M. Witriol, and W. H. Brumage, Louisiana Tech University, College of Arts and Sciences Research Symposium (1982).
42. "Theory of Continuum Photoexcitations," N. M. Witriol, and W. H. Brumage, Louisiana Tech University, College of Arts and Sciences Research Symposium (1983).
43. "Three-Dimensional Quantum Mechanical Reaction Coordinates," Norman M. Witriol, and Robert E. Wyatt, International Symposium on Atomic Molecular and Solid State Theory, Many-Body Phenomena and Computational Methods (1984).
44. "A Simple Industrial Robotic Vision System," Norman M. Witriol, William H. Brumage, and David H. Cowling, Louisiana Tech University, College of Arts and Sciences Research Symposium (1984).
45. "Three-Dimensional Quantum Reaction Coordinates: A Progress Report, " Norman M. Witriol, Second Southwest Theoretical Chemistry Conference (1985).

46. "Numerical Analysis of a Laser Pumped N-level Molecule Model Including a Continuum," C. L. Rambin, W. H. Brumage, and N. M. Witriol, Louisiana Academy of Sciences (1985).
47. "The B. S. in Physics with a Laser Optics Option Program at Louisiana Tech University," N. M. Witriol, and W. H. Brumage, Louisiana Academy of Sciences (1985).
48. "Modeling Three-Dimensional Quantum Reaction Kinetics Via Reaction Coordinates," U.S. Naval Research Laboratory, Condensed Matter and Radiation Sciences Division (two invited lectures, 1985).
49. "Three-Dimensional Quantum Reaction Coordinates," Norman M. Witriol, Louisiana Tech University, College of Arts and Sciences Research Symposium (1985).
50. "Three-Dimensional Quantum Mechanical Reaction Coordinates: Infinite Mass, Norman M. Witriol, and G. H. Herling, Ninth Canadian Symposium in Theoretical Chemistry, Toronto, Canada (1986).
51. "Theoretical Molecular Reactive Scattering," Norman M. Witriol, Louisiana Tech University, College of Arts and Sciences Research Symposium (1986).
52. "The Laser-Excited N-level Molecular Model with Initial Population Phase Difference," N. M. Witriol, W. H. Brumage, and C. R. Rambin, Bull. Am. Phys. Soc. 34, 1572 (1989).
53. "A Theoretical Investigation of Reactions Involving Perfluoroisobutene (PFIB)," Norman M. Witriol and George R. Famine, U. S. Army Research Office Contract No. DAAL03-86-0001/1558 (1990).
54. "Modeling Laser-Induced Ignition of Combustible Gases," Norman M. Witriol, Brad E. Forch, and Andrzej W. Miziolek, Proceedings of the Twenty-Third International Symposium on Combustion, (referred).
55. "Fundamental Studies of Laser-Ignition and Kinetics in Reactive Gases," Andrzej W. Miziolek, Brad E. Forch, Norman M. Witriol, and Randy J. Locke, AFOSR Contractors Meeting (1990).
56. "New Approaches to the Inverse Scattering Problem," Norman M. Witriol, U.S. Army Chemical Research, Development, and Engineering Center (invited lecture, 1992).
57. "Determination of Layered Aerosol Particle Properties from Scattering Data," D. Calhoon, N. M. Witriol, and O. I. Sindoni, Scientific Conference on Aerosol Research, (1992).
58. "Mueller Matrix Elements for Layered Spheres," N. M. Witriol and O. I. Sindoni, Scientific Conference on Aerosol Research, (1992).
59. "Investigation of the Extraction of Layered Particle Properties from Scattering Data," N. M. Witriol and O. I. Sindoni, Scientific Conference on Aerosol Research, (1992).
60. "A More Realistic Determination of Layered Aerosol Particle Properties from Scattering Data; Noise Introduction," N. M. Witriol, D. K. Calhoon, and O. I. Sindoni, 1993 Edgewood RDEC Scientific Conference on Obscuration and Aerosol Research (1993).

61. "Forward Scattering and the Inversion Problem in Layered Spherical Aerosol Particles," Norman M. Witriol, The School of Science and The College of Engineering Interdisciplinary Seminar, Louisiana Tech University (1994).
62. "Computer Simulation of Ultra-Precision Machining Processes," Norman M. Witriol and Gang Lin, Mardi Gras Conference on "Experimental and Simulation Challenges in Nanostructured Materials," (refereed abstract) (1996).
63. "Spin Deceleration And Heat Production Within The Earth: A Possible Source Of The Driving Energy For Plate Tectonics," Norman M. Witriol, Paul A. Washington, and Larry D. Johnson, Bull. Am. Phys. Soc. 44(3), 24 (1999).
64. "Testing and Sealing Ductwork, and Reducing Energy Usage in Existing Residential and Industrial Buildings," N.Witriol, J. Erinjeri, A. Saber, M.Katz, and R. McKim, TTC Industry Advisory Board Meeting, (2002)
65. "Rehabilitation of HVAC Ductwork for A/C Energy Conservation," N.Witriol, J. Erinjeri, M.Katz, R. Nassar and R. McKim, TTC Industry Advisory Board Meeting, (2003).
66. "Testing HVAC Duct Leakage in Existing Residential Buildings in North Louisiana," Norman M. Witriol, Jinson J. Erinjeri, Myron Katz, Robert McKim, Raja Nassar, DNR Research Report Project No. PVE 29-01-12, 1–195 (2003).
67. "Cathedralized Attics Effect HVAC, Roofing, & Insulation Performance & Specifications," Myron Katz, Norman M. Witriol, and Jinson J. Erinjeri, Louisiana Engineering Society (2006) (invited lecture).
68. "Cathedralized Attics Effect HVAC, Roofing & Insulation Performance & Specification," Myron Katz, Norman M. Witriol, and Jinson J. Erinjeri, <http://www.energyrater.com/CathedralizedAttic/LongDescription.htm>, Sixty One Page Detailed Report on the material presented in Reference 67.
69. "Energy Loss in Residential Buildings in North Louisiana," Norman M. Witriol, Jinson J. Erinjeri, Myron Katz, Robert McKim, Raja Nassar, Trenchless Technology Center, Louisiana Tech University (2006).
70. "A system for measurement and calibration of nonorthogonal joints and limbs in humans," Christopher M. Storey, Anne M Hollister, Charles J. Robinson, Norman M. Witriol, Dale O. Anderson, John C. London, and William L. Buford, IEEE 2006 International Conference of the Engineering in Medicine and Biology Society - Engineering Revolution in BioMedicine, paper and presentation (2006).
71. "Applications of Physics to Measuring and Improving the Performance of Buildings in Hot, Humid, Hurricane-Prone Climates," Norman M. Witriol, Myron Katz, Christopher Faust, and Jinson Erinjeri, Bull. Am. Phys. Soc.
72. "Lectures to Louisiana Energy Raters"

73. Katz, Myron, Christophor Faust & Norman Witriol, Energy Independence via Conservation and Renewables: the New Orleans Example Washington Times, Nov, 2008
74. Katz, Myron, Christophor Faust & Norman Witriol, The Demand-Side Utility, New Orleans City Council, Feb 2008.
75. Katz, Myron, Norman Witriol, Daniel Weiner, Wade Byrd, Philip Farey, Pres Kabakoff, A Center for Excellence in the Built Environment, New Orleans City Council, Jan 2008.
76. Katz, Myron, Norman Witriol, Pres Kabakoff, Christophor Faust et.al., Report of the New Orleans Energy Policy Task Force, New Orleans City Council, Oct 2007.
77. Katz, Myron, Christophor Faust & Norman Witriol, Designing The Standard of Sustainability for Homes, Louisiana Joint Engineering Society Conference, Jan 2007.

Energy and Building Science Certifications

- Heat and Moisture Flow Analyst: WUFI 3.3,; Heat and Moisture Flow Analysis software for the scientific analysis of Building Envelopes; Oak Ridge National Laboratories (2005)
- Infrared Thermographer
- Certificate of Knowledge from NACEP regarding Solar Installations

Adviser on Energy Issues:

- NOEEP: I was a member of the team picked by the New Orleans City Council's Energy Policy sub-committee. See:
<http://www.broadmoorimprovement.com/forum/viewtopic.php?t=290&sid=2a5b269ca8fa9392a19439771f7ac17d>
- New Energy Policy Task Force: I was a co-author Energy Hawk. See:
<http://www.theregengroup.com/images/EnergyHawk.doc>
- Building Science Center in New Orleans: I was a coauthor of the report "Why we Need a Building Science center in New Orleans" for Shelley Midura, Chair of the Utility Committee, New Orleans City Council. See:
<http://www.theregengroup.com/images/KatzRpt2MiduraOnCEBE.doc>

Teaching Record:**Louisiana Tech University:**

| Course Number | Title (semester hours) |
|-----------------------|-------------------------------------|
| Physics 201 | General Physics (3) (Calculus) |
| Physics 202 | General Physics (3) (Calculus) |
| Physics 205 | Descriptive Physics (3) |
| Physics 206 | Descriptive Physics (3) |
| Physics 207 | Astronomy (3) |
| Physics 209 | Elementary Physics (3) (Algebra) |
| Physics 210 | Elementary Physics (3) (Algebra) |
| Physics 220 | Astronomy - The Solar System (3) |
| Physics 230 | Astronomy - The Stars & Galaxies(3) |
| Physics 221 | Intro. to Astrophysics (3) |
| Physics 261 | General Physics Laboratory (1) |
| Physics 262 | General Physics Laboratory (1) |
| Physics 303 | Geometrical Optics (3) |
| Physics 440 | Fourier Optics (3) |
| Physics 521 | Theoretical Mechanics (3) |
| Physics 522 | Quantum Mechanics (3) |
| Physics 532 | Theories of Physics (3) |
| Physics 533 | Statistical Mechanics (3) |
| Physics 450/BIEN 557 | Fiber Optic Sensors (3) |
| Independent Study 498 | Readings & Research - Physics (3) |
| Independent Study 499 | Readings & Research - Physics (3) |
| Arts & Sciences 435 | Undergraduate Research (1-3) |
| Arts & Sciences 551 | Research and Thesis (3) |

University of Alabama in Huntsville:

| Course Number | Title (semester hours) |
|----------------------|--|
| Physics 241 | Waves and Oscillations (3) |
| Physics 301 | Quantum Physics (3) |
| Physics 431 | Intermediate Electricity and Magnetism (3) |
| Physics 601 | Classical Dynamics (3) |
| Physics 622 | Kinetic Theory and Statistical Mechanics (3) |
| Physics 641 | Optics II (3) |