Curriculum Vitae of David Peak

Academic Degrees

1969	Ph.D. in Physics, State University of New York at Albany (SUNYA) (Dissertation: *Foundations of Gauge Theory*)
1965	B.S. in Physics, State University College at New Paltz, NY

Professional Experience

Academic Positions

1996-present	Professor of Physics, Utah State University (USU), Logan, UT
1994-96	Visiting Professor of Physics, USU
1992-93	E. Clairborne Robins Distinguished University Professor of Science, University of Richmond, Richmond, VA
1987-96	Frank and Marie Louise Bailey Professor of Physics, Union College, Schenectady, NY
1985-87	Professor, Union College
1978-85	Associate Professor, Union College
1975-78	Assistant Professor, Union College
1971-75	Instructor, SUNYA

Research Positions

1988-92	Senior Scientist, Dudley Observatory, Schenectady, NY
1986-88	Faculty Research Fellow, NASA Goddard, Greenbelt, MD
1983-84	Visiting Scientist, Argonne National Laboratory, Argonne, IL
1978-79	Visiting Fellow, Physics Department, Princeton University, Princeton, NJ
1975-94	Senior Fellow, Institute for the Study of Defects in Solids, Albany, NY
1969-71	Postdoctoral Research Associate, SUNYA

Administrative, Board, and Service Positions

1996-2005	Assistant Head, Department of Physics, USU
1994	Member, Board of Trustees, Schenectady Museum
1992-94	Member, Board of Trustees, Dudley Observatory
1989-96	Member, Sigma Xi National Committee on Science, Mathematics, and Engineering Education
1989	Member, National Advisory Group on Undergraduate Education in Science, Mathematics, and Engineering, National Science Foundation
1989-91	Member, Executive Committee, New York State Section of the American Physical Society
1988-98	Member, Governing Board, National Conferences on Undergraduate Research (Chair of Board, 1992-94; chair of development, 1994-98)
1985-88	Member, Board of Trustees, Union College
1985-90	Councilor, Council on Undergraduate Research - Physics/Astronomy branch (Founding member, Secretary, 1985-87)
1984-90	Chairman, Physics Department, Union College
1979-80	Acting Chairman, Physics Department, Union College

Educational Honors and Fellowships

1997	Elected to Phi Kappa Phi, USU
1969	Brandeis Summer Institute Predoctoral Fellow
1967-69	University Research Fellow, SUNYA
1965-67	New York State Regents' College Teaching Fellow

Professional Honors, Awards, and Recognition

2009	Carnegie Foundation for the Advancement of Teaching Utah Professor of the Year
2008	Last Lecturer, USU (April 2, 2008)
2008	University Faculty Adviser of the Year, Robins Award, USU
2008	Faculty Adviser of the Year, College of Science, USU
2005	Undergraduate Research Mentor of the Year, College of Science, USU
2003	Teacher of the Year, College of Science, USU
1996	Prize for Research by a Faculty Member at an Undergraduate Institution, awarded by the American Physical Society
1990	Faculty Meritorious Service Award, presented by the Alumni Council of Union College
1973	University Outstanding Teacher, awarded by the Faculty Senate of SUNYA
1972-74	Outstanding Teacher of the Year, Physics Department, SUNYA

Research Recognition

2008	Micron Professor, Micron Research Center, USU
2006	Research featured in the January entry of *The Mathematics Calendar 2006*, by Theoni Pappas (Wide World, San Carlos, CA, 2005)
2004	Invited plenary speaker, American Physical Society, Albuquerque, NM (October)
2004	Research on possible computation in plants featured in *Science News* magazine (*Computation's New Leaf,* February 21 issue)
1999	Invited keynote speaker, American Association of Physics Teachers, Idaho-Utah Section, Logan, UT (March)
1996	Invited speaker, American Physical Society, Indianapolis, IN (May)
1996	Invited editor, Fractals, Chaos, and Solitons, special issue on iterated function systems
1995	Invited plenary speaker, Wildlife Society Annual Meeting, Portland, OR (September)
1994	Keynote speaker, Ideafest, South Dakota Celebration of Undergraduate Research, Vermilion, SD (April)
1992	Keynote speaker, 23rd Annual New Horizons in Physics Lecture Series, New Paltz, NY (October)
1992	Research on the formation of the first solid bodies in the solar system featured in *Discover* magazine (*Dust Demon*, March issue)
1991	Invited speaker, Astronomical Society of New York, Schenectady, NY (November)
1991	Invited speaker, Fifth National Conference on Undergraduate Research, CalTech, Pasadena (March)
1990	Invited speaker, Council on Undergraduate Research National Meeting, Trinity University, San Antonio (July)
1989	Invited speaker, NYS Section, American Association of Physics Teachers, Saratoga Springs, NY (October)
1989	Invited speaker, Texas Section, American Physical Society, San Antonio (October)
1989	Invited speaker, International Symposium on Defects in Solids, Festschrift for James W. Corbett, Albany (July)

Competitive Grants

Research

2008-	*Biomimetic cellular computing and validation on FPGAs*, Micron Research Center (with Aravind Dasu) ($90,000)
2005-07	*Stomatal Interactions and Emergent Behavior*, National Science Foundation (with K.A. Mott) ($200,000)
2002-03	*Complexity in Stomatal Dynamics: Are Leaves Computational Automata?*, National Science Foundation (with K.A. Mott) ($100,000)
2000-03	*Complex Systems Theory Analysis*, INEEL ($101,204)
1997-98	*Studies of Time-Resolved Impacts in Granular Targets*, USU New Faculty Research Program ($18,000)
1990	Dudley Observatory, to support acquisition of imaging hardware and software used in astronomical research ($8,000)
1986-89	*Formation and Processing of Interstellar Dust*, NASA ($58,800)
1983-84	*Problems in Surface Physics*, Faculty Research Award, U.S. Department of Energy ($35,000)
1978-79	*Problems in Biophysics*, Science Faculty Professional Development Award, National Science Foundation ($24,300)
1976-79	*Theory of Diffusion-Controlled Multistate Kinetics*, Research Corporation ($7,100)
1973-75	*Theory of Reaction Kinetics*, U.S. Atomic Energy Commission (with J.W. Corbett) ($40,000)

Competitive Grants

Education

2009-10	*Mazes and Lasers: LaserFest on the Road Outreach Program*, American Physical Society ($4,600)
2009-10	*Stomatal Structure and Function*, VISION Project, Science Approach (with K.A. Mott) ($13,000)
2000-03	*Redefining the Teaching of Applied Quantum Mechanics Through the Dissemination of a Proven Reform*, FIPSE (via CCNY) ($19,000)
1999-01	*Components for a Comprehensive Computer-Assisted Physics Program*, National Science Foundation (with D.M. Riffe and J.R. Dennison) ($58,269 [+$61,884 match])
1997-99	*Principles and Applications of Nonlinear Dynamics*, National Science Foundation (REU site at USU) (with E. Stone) ($120,000 [+$24,000 match])
1996-97	*Multimedia Instruction Modules for General Physics Laboratories*, Higher Education Technology Initiative of the State of Utah (with J.R. Dennison) ($10,000)
1996-98	*An Investigative Laboratory Program in Physics with Electronic Media Modules*, National Science Foundation (with J.A. Marshall) ($30,336 [+$30,337 match])
1994-96	*Experiments on the Physics of Living Systems*, National Science Foundation (with J. Newman) ($31,250 [+$31,250 match from various external sources])
1991	Pew Foundation, to support course development in nonlinear science for undergraduate science majors ($10,000)
1991-93	*Multiple Thematic Calculus Based Introductory Physics Courses*, National Science Foundation ($150,000)
1990-91	Sloan Foundation New Liberal Arts Program Special Leave Award, to support text preparation for courses in space technology and fractals and chaos ($25,000)
1990	Apple Corporation, to support development of Macintosh-based educational software ($20,000)
1989-91	*Accelerator Physics for Undergraduates in Science and Engineering*, National Science Foundation (with C.C. Jones) ($100,000 [+$240,000 overmatch from Keck Foundation])
1989-91	*Undergraduate Laboratory for the Study of Nonlinear Dynamics*, National Science Foundation (with M. Frame) ($29,570 [+$29,570 match from various external sources])
1980-82	*Condensed Matter Component of a Modern Physics Laboratory*, National Science Foundation (with C.C. Jones and J.E. Newman) ($15,100)

Summary of Teaching and Institutional Service Activities

USU (1994-present)

Existing courses taught:

- General Physics – Science; Introductory Modern Physics; Intermediate Classical Mechanics; Thermal Physics; Advanced Classical Mechanics; Fundamentals of Wave Phenomena.

New courses introduced:

- Liberal Arts and Sciences: Pathways to Knowledge (Order and Chaos); Physics of Complexity; Chaos Under Control; The Physics of Living Systems I and II, and associated laboratories; Science, Art, and Music; Qualitative Methods in Physics; Profession of Physics (freshman seminar); Intermediate Modern Physics.

Major service activities:

- *Department:* Ad hoc curriculum committees: mathematical methods, space science; developed material for and participated in Physics Day at Lagoon (1995-); Assistant Head of Physics (1996-2005); curriculum committee (1996-, chair 1996-99); graduate tracking committee (2000-); chair of surface physics faculty search (1998); chair of physics education research faculty search (2009); chair of Department goals committee (2000-2005); tenure & promotion committees: (J.R. Dennison (chair), C. Torre, T.C. Shen (chair), H. Yang, V. Wickwar (post)). Adviser to SPS (designated Outstanding Chapter by national SPS, 2006, 2007, 2008) and Sigma Pi Sigma. Teaching "coach" for Shane Larson (2008-9).

- *College of Science*: integrated science committee (1996-97); Curriculum committee (1996-2000); Eccles Fellowship Committee (1996-2000); Awards committee (1996-2000); COS representative on USU Microelectronics Education Committee. T&P committees: (S. Yeung, H. de Garis, H-D. Cheng (post), A. Boldyrev, K. Mott (post), D. Farrelly (post))

- *University:* University science general education committee (1997); co-organized University-wide interdisciplinary Nonlinear Dynamics Seminar (1994-2002). Chair of Integrated Science Course Development Committee (1995-97); alternate to University Senate (1996-98); University representative on Utah semester conversion task force (physics, 1997-98); University representative on statewide committee of general education (1998); University Sculpture Committee (2000-); Academic Freedom and Tenure Committee (2007-); Scholarly Teaching Advisory Committee (2008-). Helped establish Student Showcase at USU (1998).

Teaching and Institutional Service Activities, continued

USU (1994-present)

Student research:

- Collaboration with undergraduates on design of Get Away Special (G-200) experiments on sound propagation in granular materials, shuttle mission STS-77 (May, 1996); collaboration on student experiment on thin liquid films aboard ESA parabolic flight (Nov. 1995); directed 6 student-terms of undergraduate research on controlling chaos (1994-95); faculty mentor for student experiment on granular materials aboard KC-135 (Apr. 1997, Apr. 1998, Mar. 1999); directed eight REU students (1997-99);
- Ph.D. thesis mentor for C. Tolle (EE) (1994-97), P. Van Wirt (EE) (1995-97), B. Pyper (2001-03);
- Member of Ph.D. committee for J. Emmert, S. Parker, L. Zhou, N. Nickles, Z. Zhang, T. Doyle, C. Tinney, B. Menon, J-Y. Ji, D. Cripps (ECE), A. Alexandrovna (Chem), J. Brunson, D. Simkhada, R. Datwyler; member of M.S. committee for X. Tan (chair), S. Song, Y-S. Hor, C. Baldwin (CEE), J. Sanders, H. Kim, A. Jabhouri (chair), N. Richter (CS), J. West (Bio), S. Messinger (Bio), S. Chandrasekaran (ECE);
- Directed undergraduate research for C. Hoyt (1997-98), J. James (1999-2000), S. Copeland-Baker (2000-01), F. Hamblin, P. Simonson, R. Datwyler (all 2001-02) (Simonson and Datwyler were selected to present their work at the CUR National Posters-on-the-Hill, April 18, 2002), S. Miller (2002-03), T. Batty (2002-05), C. Lewis (2003-04), F. Zhang (2004-05), K. DuHadway (2004-06), D. Arnfield (2005-07), B.J. Myers (2007-).

Other:

- Department colloquia (Oct. 1994, Oct. 1995, Oct. 1996, Sept. 1998, Sept. 2000, Sept. 2002, Oct. 2003, April 2005, Oct. 2006, Feb. 2007, Sept 2007, Sept. 2008);
- Nonlinear Dynamics Seminars (Feb. 1995, May 1996, Dec. 1996, Jan. 1998, Nov. 1998); Department theory group seminar; Department condensed matter seminars (6); Natural Resources seminar (Dec. 1996); Chemistry seminar (Apr. 1997), Sociology seminar (Dec. 2006). Guest lecturer in thirteen different courses (1994-2005).
- Taught Chautauqua short course on using fractals and chaos in the classroom, Philadelphia, May 4-6, 1995.
- Chair of fund raising for the National Conferences on Undergraduate Research—grants totaling over $1,000,000; initiated and developed agreement between NCUR and Lancy Foundation to establish an annual NCUR/Lancy grant program to fund interdisciplinary research by undergraduates (1998).
- Consulting editor for textbook series in physics with Springer-Verlag (1996-).
- Member American Physical Society selection committee for Prize for Research Done by a Faculty Member at an Undergraduate Institution (1997); Four Corners APS nomination committee (2006).

Teaching and Institutional Service Activities, continued

Union College (1975-96)

Existing courses taught:

- Both algebra- and calculus-based introductory physics and associated laboratories (5 different courses); Classical Mechanics; Electromagnetism (2 courses); Statistical Physics; Quantum Mechanics (2 courses).

New courses introduced:

- Methods of Theoretical Physics; Relativity, Gravitation and Cosmology; The Science in Science Fiction; The Logic of Inquiry (Steinmetz Honors Seminar); Advanced Modern Physics and Lab; Space Technology; Solid State Physics and Lab; Order and Chaos: Art and Magic and Lab; Life on the Edge: Roots of Organization and Lab.

Major service activities:

- Research Committee (1977-78), Faculty Review Board (1980-83; chairman 1981-83), Alumni Council speaker (1982), lecturer in the first Alumni College (1982), discussion leader in the Faculty Seminar on Sociobiology (1981-82), Expanded Horizons Committee (1982-85), Curricular Alternative Committee (1987);
- Faculty Trustee (1985-88); Department chair (1979-80, 1984-90);
- Bicentennial Committee (1987-94), Search Committee for the 17th President of Union College (1989-90); Campus Planning Committee (chairman 1988-90); NCUR-90 Planning Committee (chairman 1988-90); NCUR-95 Planning Committee;
- Organizing committee, Pew Symposium on Ethics in Science (May, 1992); Engineering Curriculum Revision Committee (1994); Electronic Classroom Committee (chair, 1994); numerous ad hoc tenure committees. Served on four Ph.D. committees (SUNY Albany); mentor for two M.A.T. recipients (Union); Graduate Record Examination reviewer (1991, 1994).

Student research:

- Directed about three undergraduate research projects per year; thirteen of my students authored presentations at the National Conferences on Undergraduate Research (one—D. Greenlaw—received outstanding paper in theoretical physics award, 1987, a second—E. Fullar—was invited to present his work at the 1990 national meeting of Sigma Xi), many have given talks at other meetings.

Teaching and Institutional Service Activities, continued

University of Richmond (1993)

New courses introduced:

- Order and Chaos and Lab

Major service activities:

- Public lectures (April and October, 1993); organized and directed faculty study group on fractals, chaos, and complexity (spring 1993, fall 1993); consulted with numerous faculty and administrators on questions of pedagogy, research, and fund raising.

SUNYA (1971-75)

Existing courses taught:

- Calculus-based introductory physics (4 different courses); Intermediate Mechanics; Thermal and Statistical Physics.

New course introduced:

- Urban and Environmental Physics Problems.

Major service activities:

- Graduate Examination Committee (1971-75, chairman 1974-75).

Student research:

- Directed five undergraduates and one doctoral student.

Conference Organization

2006	Organizing committee, Four Corners Sections of the American Physical Society, USU
1992-94	Organizing committee, Ninth National Conference on Undergraduate Research, Union College (April, 1995)
1991	Chair, organizing committee, *Elements of Research: Increasing Student Engagement in the Entry Level Science Course*, national conference at Union College (December)
1988-90	Chair, organizing committee, Fourth National Conference on Undergraduate Research, Union College (April, 1990)
1988	Organized session on the funding of undergraduate research in physics, CUR'88, Carleton College, Northfield, MN (July)
1988	Chair, local organizing committee, Fiftieth Anniversary Meeting of the New York State Section of the American Physical Society, Union College (April)

Physics Department External Reviewer

Minnesota State University, Mankato (2004)
University of Wisconsin Oshkosh (2002)
University of North Carolina at Asheville (November, 1997)
SUNY Brockport (April, 1991)
Iona College (October, 1991)
Colby College (October, 1991)
Manhattan College (April, 1989)
Consultant for Physics Departments at Trinity University (October, 1989), Gustavus Adolphus (July, 1990);

Professional Society Membership

American Physical Society
- Group on Nonlinear & Statistical Physics
- Forum on Physics and Society
- Division of Education

Phi Kappa Phi
Sigma Xi

American Association of Physics Teachers
Council on Undergraduate Research
- Physics/ Astronomy (Founding Member)

Sigma Pi Sigma

Books in Print

Komplexität: das gezähmte Chaos (Birkaüser Verlag, Basel, Switzerland, 1995) (with Michael Frame and Anita Ehlers, translator) ISBN 3-7643-5132-2

Chaos Under Control: The Art and Science of Complexity (W.H. Freeman and Co., New York, 1994) (with Michael Frame) ISBN 0-7167-2492-4

Refereed Publications (*-undergraduate, $^{+}$-graduate student co-author)

K.A. Mott and D. Peak, "Stomatal responses to humidity and temperature in darkness," Plant, Cell, & Environment (submitted, 2009)

J.C. Shope, D. Peak, and K.A. Mott, "Stomatal responses to humidity in isolated epidermes," Plant, Cell & Environment, doi: 10.1111/j.1365-3040.2008.01844.x, 1-9 (2008).

S.M. Messinger^{+}, K.A. Mott, and D. Peak, "Task-performing dynamics in irregular, biomimetic networks," Complexity **12**, 14-21 (2007) **[cover article]**.

K.A. Mott and D. Peak, "Stomatal patchiness and task-performing networks," Annals of Botany, doi: 10.1093/aob/mcl234, 1-8 (2006) **[invited review]**.

J.D. West^{+}, D. Peak, J.Q. Peterson, and K.A. Mott, "Dynamics of stomatal patches for a single surface of *Xanthium strumarium* L. leaves observed with fluorescence and thermal images," Plant, Cell & Environment **28**, 633-641(2005).

R.A. LaViolette, R.J. Glass, D. Peak, and D.L. Stoner, "Self organized network of chemical reactions: application to contaminated converging and diverging flows in fractured media," Journal of Physical Chemistry B **108**, 19657-19662 (2004).

D. Peak, J.D. West^{+}, S.M. Messinger^{+}, and K.A. Mott, "Evidence for complex, collective dynamics and emergent, distributed computation in plants," Proceedings of the National Academy of Sciences **101**, 918-922 (2004).

J.N. Richter^{+} and D. Peak, "Fuzzy evolutionary cellular automata," *Proceedings of International Conference on Artificial Neural Networks In Engineering (ANNIE 2002)* **12**, 185-191 (2002).

D. Peak and M. Frame, "Order and Chaos: Art and Magic -- A First College Course in Quantitative Reasoning Based on Fractals and Chaos," in *Fractals, Graphics, & Mathematics Education*, M.L. Frame and B.B. Mandelbrot, eds. (Mathematical Association of America, 2002) pp 157-169 **[invited chapter]**.

J.-Y. Ji^{+} and D. Peak, "The vacuum excitation and squeezing properties of two quantum oscillators with delta-kicked interactions," Journal of Physics A: Math. Gen. **34**, 3429 (2001).

D. Peak, "Taming Chaos in the Wild: Model-free Techniques for Wildlife Population Control," in *Landscape Ecology Primer*, J. Bissonnette, ed. (Springer-Verlag, New York, 1997) **[invited chapter]**.

H. Hurwitz, M. Frame, and D. Peak, "Scaling symmetries in nonlinear dynamics: A View from Parameter Space," Physica D **81**, 23 (1995).

M. Frame and D. Peak, "Metric universality of order in one-dimensional dynamics," Journal of Bifurcation and Chaos **3**, 567 (1993).

J.B. Davis[+], R.E. Benenson, and D. Peak, "Analysis of experiments in helium microbeam mixing," Materials Research Society Symposium Proceedings **235**, 503 (1992).

D. Peak, D.C. Greenlaw*, and L.A. Schick*, "Pair correlation kinetics," Physical Review A **41**, 5362 (1990).

D. Peak, "Spatial correlations in condensed phase reactions," Radiation Effects **111&112**, 309 (1989).

J.L. Klatt, R.S. Averback, and D. Peak, "Ion beam mixing in Ag-Pd alloys," Applied Physics Letters **55**, 1295 (1989).

S.-J. Kim*, M-A. Nicolet, R.S. Averback, and D. Peak, "Low-temperature ion beam mixing in metals," Physical Review B **37**, 38 (1988).

S.-J. Kim*, B.M. Paine, M-A. Nicolet, R.S. Averback , and D. Peak, "Ion Beam Mixing at Low Temperatures Studied with Marker Atoms Using .3-1 MeV Kr," in *Ion Mixing and Surface Alloying II*, ed. by M-A. Nicolet, D. Follstaedt, and R.S. Averback (Sandia, Albuquerque, NM, 1986), pp. 20-31. **[invited]**

D. Peak, "Thermal Spike and Defect Effects in Ion Mixing," in *Ion Mixing and Surface Alloying II*, ed. by M-A. Nicolet, D. Follstaedt, and R.S. Averback (Sandia, Albuquerque, NM, 1986), pp. 12-19. **[invited]**

J.T. Borenstein[+], J.W. Corbett, and D. Peak, "On the kinetics of thermal donor formation in silicon," Journal of Materials Research **1**, 527 (1986).

J.T. Borenstein[+], J.W. Corbett, and D. Peak, "Formation kinetics of thermal donors in silicon," Materials Research Society Symposium Proceedings **59**, 173 (1986).

J.W. Corbett, S.J. Pearton, A.G. Sganga[+], and D. Peak, "Hydrogen on Semiconductor Surfaces," in *Hydrogen in Disordered and Amorphous Solids*, ed. by G. Bambakidis and R.C. Bowman(Plenum Press, New York, 1986), pp. 61-79.

R.S. Averback, D. Peak, and L.J. Thompson "Ion beam mixing in pure and in immiscible copper bilayer systems," Applied Physics A **39**, 59 (1986).

R.S. Averback and D. Peak, "Effect of projectile energy, specimen temperature and fast thermal diffusing atoms on ion beam mixing," Applied Physics A **38**, 139 (1985).

T.C. Werner, D. Peak, and J.L. Danziger,* "An evaluation of charge effects on the quenching of tryptophan fluorescence in small peptides by iodide ion," Photochemistry Photobiology **42**, 25 (1985).

D. Peak and R.S. Averback, "Influences of thermal spikes in ion beam mixing," Nuclear Instruments and Methods in Physics Research B **7/8**, 561 (1985).

D. Peak, T.C. Werner, R.M. Dennin, Jr.*, and J.K. Baird, "Fluorescence quenching at high quencher concentrations," Journal of Chemical Physics **79**, 3328 (1983).

D. Peak, "The role of diffusion in the binding of carbon monoxide to protoheme in high-viscosity solvents," Journal of Chemical Physics **76**, 3792 (1982).

D. Peak and J.W. Corbett, "The effect of spatial correlations on the steady state nucleation of voids," Radiation Effects **36**, 197 (1978).

D. Peak, "Time lag in diffusion-controlled nucleation," Journal of Chemical Physics **68**, 821 (1978).

D. Peak and J.W. Corbett, "The effects of spatial correlations on steady state nucleation kinetics in dense fluid systems," Journal of Statistical Physics **17**, 97 (1977).

D. Peak, K. Pearlman* and P.J. Wantuck*, "Competitive effect on the rate of the diffusion-controlled reaction A+B→C," Journal of Chemical Physics **65**, 5538 (1976).

D. Peak, J.W. Corbett and J. Bourgoin "Ionization enhanced diffusion," Journal of Chemical Physics **65**, 1206 (1976).

J. Kowall*, D. Peak, and J.W. Corbett "Impurity-concentration profile for an exponentially decaying diffusion coefficient in irradiation enhanced diffusion," Physical Review B **13**, 477 (1976).

M.A. St. Peters^{+}, D. Peak, and J.W. Corbett "Impurity concentration profile in irradiation enhanced diffusion experiments," Physics Letters A**49**, 159 (1974).

D. Peak and J.W. Corbett, "The principle of reactive independence in radiation- and photo-experiments," Radiation Effects **22**, 225 (1974).

C. Weigel^{+}, D. Peak, J.W. Corbett, and R.P. Messmer "LCAO Calculations for the boron and nitrogen interstitial in diamond," Physica Status Solidi (b) **63**, 131 (1974).

C. Weigel^{+}, D. Peak, J.W. Corbett, R.P. Messmer, and G.D. Watkins "Carbon interstitial in the diamond lattice," Physical Review B **8**, 2906 (1973) (with).

J. Bourgoin, D. Peak, and J.W. Corbett, "Ionization enhanced diffusion: ion implantation in semiconductors," Journal of Applied Physics **44**, 3022 (1973).

J.W. Corbett, H.L. Frisch, D. Peak, and M. St. Peters^{+} "Molecular Theory of Nucleation," in *Computational Methods for Large Molecules and Localized States in Solids*, ed. by F. Herman, A.D. McLean, and R.K. Nesbit (Plenum, New York, 1973), pp. 67-78.

D. Peak, "Strong gravity and the Yukawa potential," Lettere Nuovo Cimento **4**, 817 (1972).

K.F. Ratcliff and D. Peak, "The momentum of the photon," American Journal of Physics **40**, 1044 (1972).

D. Peak, P. Brosious^{+}, Y.H. Lee^{+}, M. St. Peters^{+}, H.L. Frisch, and J.W. Corbett, "Correlated recovery kinetics," Radiation Effects **15**, 61 (1972).

D. Peak and J.W. Corbett, "Diffusion-controlled reaction kinetics," Physical Review B **5**, 1226 (1972).

G.D. Watkins, R.P. Messmer, C. Weigel^{+}, D. Peak, and J.W. Corbett "Properties of the interstitial in the diamond-type lattice," Physical Review Letters **27**, 1573 (1971).

D. Peak, H.L. Frisch and J.W. Corbett, "Correlated diffusion-controlled reaction kinetics," Radiation Effects **11**, 149 (1971).

D. Peak and A. Inomata, "Interpretation of a unified theory of gravitation and symmetry breaking," Physical Review **187**, 2276 (1969).

D. Peak and A. Inomata, "On the SO(4,1) model for hadrons," Progress in Theoretical Physics **42**, 143 (1969).

A. Inomata and D. Peak, "Gravitational coupling of negative matter," Nuovo Cimento **63B**, 132 (1969) (with A. Inomata).

D. Peak and A. Inomata, "Summation over Feynman histories in polar coordinates," Journal of Mathematical Physics **10**, 1422 (1969).

Other Publications

E. Stone and D. Peak, "Chaos and Order in an Interdisciplinary REU Site," CUR Quarterly, pp 152-157, June 1999.

D. Peak, "History of Physics" in *The Union College Historical Dictionary*, W. Somers, ed. (Union College Press, 1995) **[invited chapter]**

D. Peak, "Vladimir Rojansky" in *The Union College Historical Dictionary*, W. Somers, ed. (Union College Press, 1995) **[invited chapter]**

D. Peak, "Physics at Union College from 1895 to 1995" in *Early Science and the First Century of Physics at Union College* (V. Ennis Pilcher, 1994) **[invited chapter]**

D. Peak, "Order and Chaos: Art and Magic," in *Proceedings of the National Science Foundation Workshop on the Role of Faculty from the Scientific Disciplines in the Undergraduate Education of Future Science Teachers* (National Science Foundation, 1993) **[invited essay]**

D. Peak, "The Smyth Report," in *Thirty-Eight Ways to Take a Rare Book Seriously* (Friends of the Union College Library, 1982) **[invited essay]**

Papers Presented at Meetings

"Stomatal Responses to Humidity in Isolated Epidermes," J.C. Shope, K.A. Mott, and D. Peak, American Society of Plant Biologists, Plant Biology 2008, Merida, Mexico, June 28, 2008.

"Error-correction in distributed computational networks using self-organized collective dynamics," B.J. Myers* and D. Peak, American Physical Society, Four Corners Section, Flagstaff, October 19, 2007.

"Does size matter? Searching for rhyme and reason in term-end student questionnaire responses in the USU Department of Physics," American Association of Physics Teachers, ID-UT Section, Logan, UT, March 24, 2007.

"Does size matter? Searching for rhyme or reason in term-end student surveys in a large, eclectic physics department," American Physical Society, Four Corners Section, Logan UT, October 6, 2006.

"Nano-computing in noisy and imperfect cellular networks," K. DuHadway* and D. Peak, American Physical Society, Four Corners Section, Boulder CO, October 4, 2005.

"FPGA-based Modeling of Spatio-temporal Interactive Systems," J. Phillips^{+}, V. Hariharan^{+}, A. Dasu and D. Peak, 8th Military and Aerospace Conference on Programmable Logic Devices (MAPLD 05), Washington D.C., September 2005.

"Sophisticated Information Processing in Plants," J.D. West^{+}, D. Peak, and K.A. Mott, First Symposium on Plant Neurobiology, Florence, Italy, May 17-20, 2005.

"Noise Enhanced Emergent, Distributed Computation in Plants," S.M. Messinger^{+}, D. Peak, and K.A. Mott, First Symposium on Plant Neurobiology, Florence, Italy, May 17-20, 2005.

"Complex, collective space-time dynamics in leaves: Do plants compute?" American Physical Society, Four Corners Section, Albuquerque, NM, October 16, 2005 **[invited]**

"Comparing the dynamics of stomatal networks to the problem-solving dynamics of cellular computers," J.D. West^{+}, S.M. Messinger^{+}, D. Peak, and K.A. Mott, International Conference on Complex Systems (ICCS2004), Boston, May 16-21, 2004.

"The Role of Technology in Teaching Physics: Spreadsheets to Enhance Engagement and Enjoyment in the Introductory Physics Lab," Brian Pyper^{+} and David Peak, Meeting: 127th AAPT National Meeting: Madison, WI, August 2003.

"The Game of Leaf: Evidence that Stomatal Networks are Cellular Computers," J.D. West[+], S.M. Messinger*, D. Peak, and K.A. Mott, 23rd Annual Conference on Networks: Structure, Dynamics and Function, May 12-16, 2003, Santa Fe, NM.

"Evaluating the Effect of Spreadsheets in the Introductory Physics Lab on Students' Attitudes and Understanding," Brian A. Pyper[+] and David Peak, 126th AAPT National Meeting: Austin, TX, January 2003.

"Spreadsheets for Enhanced Engagement in the Introductory Physics Lab," Brian A. Pyper[+] and David Peak, 125th AAPT National Meeting: Boise, ID, August 2002.

"Giant Fluctuations in Flow Through Fractured Media: A Stochastic, Self-Organized Dynamics Model," D. Peak, R. Datwyler*, N. Rasmussen*, P. Simonson*, T.R. Wood, and T.M. Stoop, International Conference on Chaos and Nonlinear Dynamics: Dynamics Days 2002, 4-7 January 2002, Baltimore.

"The Role of Complexity in the Prediction of Contaminant Transport in a Fractured Rock Vadose Zone," D.L. Stoner, T.R. Wood, D. Peak, R.J. Glass, and R.A. LaViolette, American Geophysical Union 2001 Fall Meeting, December 10-14, 2001, San Francisco.

"Can a Fractured Basalt Vadose Zone be Characterized as a Complex System?" T.R. Wood, D. Stoner, C. Tolle, J. James*, D. Peak, B. Faybishenko, and J. Crepeau, Geological Society of America, Annual Meeting and Exposition, November 9-18, 2000, Reno, Nevada.

"Time-Based Clustering and its Relationship with Mutual Information," C.R. Tolle[+], D. Peak, and R.W. Gunderson 4th SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 1997.

"Use of Parametric Excitation for Unstable Fixed Point Detection and Capture," P.M. Van Wirt[+], D. Peak, and R.W. Gunderson 4th SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 1997.

"Reduction of Complexity and Control of Spatio-Temporal Chaos through Archetypes," D. Peak, E. Stone, and A. Cutler 4th SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 1997.

"Planets, Powders, and Piledrivers," Bulletin of the American Physical Society**41**, 921 (1996) **[invited]**

"Taming Chaos," Annual Meeting of the Wildlife Society, Portland, OR, September 1995 **[invited]**

"Metric Universality of Order in One-Dimensional Dynamics," M. Frame and D. Peak, Measures of Complexity and Chaos II, Bryn Mawr, PA, August 1992.

"Some Fractal Footprints of Chaos," M. Frame and D. Peak, Mathematical Association of America, San Francisco, January 1995 **[invited]**

"Fractal Catalysis of the Formation of Large Bodies in the Early Solar Nebula: What can We Learn in the Laboratory?" Gordon Research Conference on Fractals, Plymouth, NH, June 1992.

"Laboratory Study of Analogs of Early Solar Nebula Condensed Objects," D. Peak, S.J. Kusiak*, and B. Donn, Lunar and Planetary Sciences Symposium, Houston, TX, March 1992.

"An Experimental Program to Study Impacts on Compressible Aggregates," D. Peak, B. Donn, S.-Y. Lee*, E. Fullar*, and L. Dankelman Lunar and Planetary Sciences Symposium, Houston, TX, March 1990.

"Resolution of the Thermal Donor Dilemma?," International Symposium on Defects in Solids, Albany, NY, July 1989 **[invited]**

"The Council on Undergraduate Research - Physics: A Progress Report," Bulletin of the American Physical Society **32**, 68 (1987).

"Influence of Thermal Spikes in Ion Beam Mixing," IBMM'84, D. Peak and R.S. Averback, Cornell University, Ithaca, NY, July 1984.

"Calculations of the Energy of Interstitial Boron in Various Sites in the Diamond Lattice," C. Weigel[+], D. Peak, J.W. Corbett, G.D. Watkins, and R.P. Messmer, Bulletin of the American Physical Society **16**, 501 (1971).

"Geometrical Description of Gauge Fields," D. Peak and A. Inomata, Bulletin of the American Physical Society **14**, 578 (1969).

"Gravitational Coupling of Negative Matter," D. Peak and A. Inomata, Bulletin of the American Physical Society **13**, 662 (1968).