

# Curriculum Vitae

## Richard W. Robinett

**Personal:** 303J Osmond Lab Born October 2, 1953  
Department of Physics Married, two children  
(814) 863-0965 (office)  
(814) 865-3604 (FAX) rick@phys.psu.edu  
[www.phys.psu.edu/~rick/ROBINETT/robinett.html](http://www.phys.psu.edu/~rick/ROBINETT/robinett.html)

**Education:** 1975-1981, Ph. D., University of Minnesota  
Thesis title: *Mass Scales in Grand Unified Theories*  
Thesis Advisor: Prof. Jonathan L. Rosner  
  
1971-1975, B. A. (Magna cum laude), University of Minnesota,  
College of Liberal Arts, Honors Division,  
(Double major in mathematics and physics)

### Academic Experience:

2000-present Professor, Penn State University  
1994-1995 Faculty Research Visitor, Argonne National Laboratory  
(sabbatical leave)  
1990-2000 Associate Professor, Penn State University  
1986-1990 Assistant Professor, Penn State University  
1983-1986 Research Associate-Lecturer, University of Massachusetts, Amherst  
1981-1983 Research Associate, University of Wisconsin, Madison  
1975-1981 Research Assistant-Teaching Associate, University of Minnesota

### Administrative Experience:

2003-present Associate Department Head, Physics Department (PSU)  
2003-present Director of Graduate Studies, Physics Department (PSU)  
1998-2003 Assistant Department Head, Physics Department (PSU)  
1996-present Director of Undergraduate Studies, Physics Department (PSU)

### Other Professional Experience:

2000-2002 Associate Editor, American Journal of Physics (three year term)  
2001-2003 General Member-at-Large of the Executive Committee,  
American Physical Society (APS) Forum on Education

## Teaching/Advising/Administrative Awards and Honors:

- 2005 Undergraduate Program Leadership Award, Penn State University
- 2003 Excellence in Advising Award, Penn State University,  
(Undergraduate Student Government award for faculty advising)
- 2002 C. I. Noll Award for Excellence in Teaching, Penn State University  
(Eberly College of Science Alumni Society)
- 1999 Atherton Award for Excellence in Teaching, Penn State University  
(University system wide award for "...*outstanding teaching at the undergraduate level.*" )
- 1994 Provost's Award for Collaborative Instruction and Curricular Innovation  
(with J. Annett, S. Heppelmann, and P. Sokol), Penn State University
- 1992 Penn State Society of Physics Students (SPS) Teaching Award
- 1980 "TA of the Year", School of Physics and Astronomy teaching award,  
University of Minnesota

## Research Awards and Honors:

- 2003 Fellow of the American Physical Society (APS) (Forum on Education)  
cited "*For his contributions to undergraduate education in quantum mechanics, especially in visualization, and for demonstrated excellence in the training and advising of undergraduate physics majors.*"
- 2003 Inclusion in *Who's Who in Science Higher Education*
- 1990-1991 SSC (Superconducting SuperCollider) Junior Faculty Fellowship  
Texas National Research Laboratory Commission (TNRLC)
- 1984 Fourth Award, Gravity Research Foundation, 1984 Awards  
(for "The Principle of Equivalence at Finite Temperature",  
with J. F. Donoghue and B. R. Holstein)
- 1977-1978 Institute of Technology Corporate Associates (ITCA) Fellowship

## Professional Memberships:

- Phi Beta Kappa, 1975 - present
- Sigma Xi, 1982 - present
- American Physical Society (Division of Particles and Fields), 1990 - present
- American Association of Physics Teachers (AAPT), 1996 - present
- American Physical Society (Education Forum), 1999 - present

# Publications

## Articles Published in Refereed Journals

1. R. W. Robinett and J. L. Rosner, "Prospects for a second neutral boson at low mass in  $SO(10)$ ", Phys. Rev. **D25**, 3036-3064 (1982); **D27**, 679 (E) (1983).
2. R. W. Robinett, "Mass bounds in the Fritzsche-Mandelbaum composite model", Phys. Lett. **116B**, 144-146 (1982).
3. R. W. Robinett, "Neutral currents in  $E_6$ ", Phys. Rev. **D26**, 2388-2395 (1982).
4. R. W. Robinett, "Neutral current interactions in grand unified theories", Phys. Rev. **D26**, 2526-2528 (1982).
5. R. W. Robinett and J. L. Rosner, "Mass scales in grand unified theories", Phys. Rev. **D26**, 2396-2419 (1982).
6. R. W. Robinett, " $W$  magnetic moment in electroweak mixing and composite models and radiation zeros in  $q_i \bar{q}_j \rightarrow W \gamma$ ", Phys. Rev. **D28**, 1185-1191 (1983).
7. R. W. Robinett, " $W$  weak multipole moments in electroweak mixing and composite models", Phys. Rev. **D28**, 1192-1197 (1983).
8. V. Barger, R. W. Robinett, W. -Y. Keung, and R. J. N. Phillips, "Supersymmetric decay widths of weak bosons", Phys. Rev. **D28** (Rapid Communications) 2912-2914 (1983).
9. R. W. Robinett, "Homemade rainbows: a backyard experiment", Phys. Teacher **21**, 388-390 (1983).
10. V. Barger, R. W. Robinett, W. -Y. Keung, R. J. N. Phillips, "Production of gauge fermions at colliders", Phys. Lett. **131B**, 372-376 (1983).
11. R. W. Robinett, "A class of supersymmetric radiation zeros", Phys. Rev. **D30**, 688-689 (1984).
12. P. Langacker, R. W. Robinett, and J. L. Rosner, "New heavy gauge bosons in  $pp$  and  $p\bar{p}$  collisions", Phys. Rev. **D30**, 1470-1487 (1984).
13. J. F. Donoghue, B. R. Holstein, and R. W. Robinett, "Renormalization of the energy-momentum tensor and the validity of the equivalence principle at finite temperature", Phys. Rev. **D30**, 2561-2572 (1984).
14. R. W. Robinett, "Supersymmetric QED at finite temperature and the principle of equivalence", Phys. Rev. **D31**, 336-340 (1985).
15. R. W. Robinett, "Supersymmetric electromagnetic moments and radiation zeros", Phys. Rev. **D31**, 1657-1660 (1985).
16. J. F. Donoghue, B. R. Holstein, and R. W. Robinett, "The principle of equivalence at finite temperature", Gen. Rel. and Grav. **17**, 207-214 (1985).

17. R. W. Robinett, "Production of scalar quarkonium in  $t$ -quarkonium radiative decays", Phys. Rev. **D31**, 3008-3009 (1985).
18. P. Moxhay and R. W. Robinett, "Searching for scalar quarkonium at proton-antiproton colliders", Phys. Rev. **D32**, 300-302 (1985).
19. R. W. Robinett, "Supersymmetry and ultra-high energy cosmic rays", Phys. Rev. Lett. **55**, 469-472 (1985).
20. R. W. Robinett, "Extended strongly interacting Higgs theories", Phys. Rev. **D32**, 1780-1785 (1985).
21. R. W. Robinett, "Light gluinos and quark-gluon plasma formation in relativistic heavy-ion collisions", Phys. Rev. **D32**, 2449-2451 (1985).
22. J. F. Donoghue, B. R. Holstein, and R. W. Robinett, "Quantum electrodynamics at finite temperature", Ann. Phys. **164**, 233-253 (1985); (E) **172**, 172 (1986).
23. R. W. Robinett, "Two Higgs doublets and heavy quarkonium decays", Phys. Rev. **D33**, 736-739 (1986).
24. R. W. Robinett, "Searching for supersymmetry in high-energy cosmic ray interactions", Phys. Rev. **D33**, 1239-1246 (1986).
25. R. W. Robinett, "On the mixing and production of exotic fermions in  $E_6$ ", Phys. Rev. **D33**, 1908-1911 (1986).
26. R. W. Robinett, "The phenomenology of isosinglet Higgs bosons in extended electroweak models", Phys. Rev. **D34**, 182-185 (1986).
27. E. Golowich and R. W. Robinett, "Probing the three-Higgs boson coupling in heavy quarkonium decays", Phys. Rev. **D34**, 888-891 (1986).
28. J. F. Donoghue, B. R. Holstein, and R. W. Robinett, "On the gravitational coupling at finite temperature", Phys. Rev. **D34**, 1208-1209 (1986).
29. E. Golowich and R. W. Robinett, "Limits on millicharged matter from beam dump experiments", Phys. Rev. **D35**, 291-292 (1987).
30. R. W. Robinett, " $t$ -quarkonium decays into  $b\bar{b}$  decays and charged Higgs bosons", Phys. Rev. **D35**, 2897-2899 (1987).
31. R. W. Robinett, "Extra  $Z$ 's from  $E_6$  and other exotic physics in heavy-quarkonium decays", Phys. Rev. **D36**, 719-723 (1987).
32. H. Grotch and R. W. Robinett, "New limits from single-photon searches at  $e^+e^-$  colliders", Phys. Rev. **D36**, 2153-2156 (1987).
33. R. W. Robinett, "Exotic quarks from the superstring and toponium decays", Phys. Lett. **B197**, 531-535 (1987).
34. R. W. Robinett, "The production of leptoquark bosons in ultra-high energy neutrino interactions", Phys. Rev. **D37**, 84-88 (1988).

35. R. W. Robinett, “New production mechanisms for exotic quarks of superstring-inspired  $E_6$  models at  $ep$  colliders”, Phys. Rev. **D37**, 1321-1324 (1988).
36. M. A. Doncheski, H. Grotch, and R. W. Robinett, “Axigluons and heavy quarkonia”, Phys. Lett. **206B**, 137-140 (1988).
37. M. A. Doncheski, H. Grotch, and R. W. Robinett, “Axigluons in the  $\Upsilon$  system”, Phys. Rev. **D38** (Rapid communications) 412-413 (1988).
38. H. Grotch and R. W. Robinett, “Limits on the  $\tau$  neutrino electromagnetic properties from single photon searches at  $e^+e^-$  colliders”, Z. Phys. **C39**, 553-556 (1988).
39. R. W. Robinett, “Production prospects for Higgs bosons in chiral-color models”, Phys. Rev. **D38** (Rapid communications), 2301-2304 (1988).
40. M. A. Doncheski, H. Grotch, R. W. Robinett, and K. Schilcher, “Higgs boson radiative corrections to the decay  ${}^3S_1(Q\bar{Q}) \rightarrow H\gamma$ ”, Phys. Rev. **D38**, 3511-3515 (1988).
41. R. W. Robinett and T. G. Rizzo, “Axigluon production at  $ep$  colliders”, Phys. Lett. **B215**, 777-782 (1988).
42. R. W. Robinett, “Partial-wave unitarity constraints on the axigluon mass”, Phys. Rev. **D39**, 834-837 (1989).
43. R. W. Robinett, “Flavor-changing decays of toponium”, Phys. Lett. **B218**, 476-480 (1989).
44. R. Fletcher, F. Halzen, and R. W. Robinett, “Probing the gluon structure of the photon with HERA”, Phys. Lett. **B225**, 176-180 (1989).
45. T. G. Rizzo and R. W. Robinett, “Triple gauge boson decay of new neutral gauge bosons”, Phys. Lett. **B226**, 117-121 (1989).
46. M. A. Doncheski, H. Grotch, R. W. Robinett, K. Schilcher, G. Belanger, and P. Moxhay, “Flavor-changing decays of the  $Z^0$  and leptoquarks”, Phys. Rev. **D40**, 2301-2304 (1989).
47. R. W. Robinett, “ $\psi\psi$  production and multiple parton interactions at supercollider energies”, Phys. Lett. **B230**, 153-158 (1989).
48. S. Heppelmann, R. W. Robinett, and P. Moxhay, “ $\psi\Upsilon$  production in hadronic collisions”, Phys. Lett. **B233**, 245-250 (1989).
49. L. Bergström and R. W. Robinett, “ $Z$  and vector meson production in hadronic collisions at large transverse momentum”, Phys. Lett. **B238**, 112-116 (1990).
50. L. Bergström and R. W. Robinett, “On the rare decays  $Z \rightarrow VV$  and  $Z \rightarrow VP$ ”, Phys. Rev. **D41**, 3513-3514 (1990).
51. L. Bergström and R. W. Robinett, “ $Z$  decay into a vector meson and a lepton pair”, Phys. Lett. **B245**, 249-250 (1990).
52. L. Bergström, R. W. Robinett, and L. Weinkauff, “Aspects of  $\psi$  and  $\Upsilon$  production at supercollider energies”, Phys. Rev. **D42**, 825-834 (1990).

53. M. A. Doncheski and R. W. Robinett, "Low transverse momentum  $\psi$  and  $\Upsilon$  production in polarized proton-proton collisions", Phys. Lett. **B248**, 188-192 (1990).
54. R. W. Robinett, "Charmonium production at large transverse momentum in polarized proton-proton collisions", Phys. Rev. **D43**, 113-118 (1991).
55. L. Bergström, H. Grotch, and R. W. Robinett, " $D$ -wave quarkonium production and annihilation decays: Formalism and applications", Phys. Rev. **D43**, 2157-2160 (1991).
56. R. W. Robinett and L. Weinkauff, "Charged Higgs boson decay  $H^\pm \rightarrow \Upsilon W^\pm$ : the effects of  $P$ - and  $D$ - states", Mod. Phys. Lett. **A17**, 1575-1579 (1991).
57. R. W. Robinett, "Final state gluon polarization in large transverse momentum quarkonium production", Z. Phys. **C51**, 89-91 (1991).
58. M. A. Doncheski, R. W. Robinett, and L. Weinkauff, "Spin dependence of three-jet and two-jet plus photon events in polarized proton-proton collisions", Phys. Rev. **D44**, 2717-2726 (1991).
59. R. W. Robinett and L. Weinkauff, "Exclusive QCD predictions for proton-antiproton decay rates of  $^3D_1$  charmonium states", Phys. Lett. **B271**, 231-236 (1991).
60. L. Bergström, P. Ernstöm, and R. W. Robinett, "Large  $p_T$  production of  $D$ -wave quarkonium states at hadron colliders", Phys. Rev. **D45**, 116-123 (1992).
61. R. W. Robinett, "Transverse spin asymmetries for three-jet production in hadronic collisions", Phys. Rev. **D45**, 2563-2565 (1992).
62. G. Bunce, J. Collins, S. Heppelmann, R. Jaffe, S. Y. Lee, Y. Makdisi, R. W. Robinett, J. Soffer, M. Tannenbaum, D. Underwood, and A. Yokosawa, "Polarized protons at RHIC", Particle World **3**, 1-12 (1992).
63. M. A. Doncheski and R. W. Robinett, "Double photon production in polarized proton-proton collisions", Phys. Rev. **D46**, 2011 (1992).
64. R. W. Robinett and L. Weinkauff, "Covariant formalism for  $F$ -wave quarkonium production and annihilation: application to  $^3F_J \rightarrow gg$  decays", Phys. Rev. **D46**, 3832-3840 (1992).
65. M. A. Doncheski, R. W. Robinett, and L. Weinkauff, "Spin-spin asymmetries in large transverse momentum Higgs boson production", Phys. Rev. **D47**, 1243-1246 (1993), hep-ph/9208250.
66. R. W. Robinett, "Probing the three-gluon coupling of QCD using heavy quark and quarkonium production in hadronic collisions", Phys. Lett. **B318**, 189-196 (1993).
67. M. Karliner and R. W. Robinett, "Aspects of heavy quark production in polarized proton-proton collisions", Phys. Lett. **B324**, 209-216 (1994), hep-ph/9310346.
68. J. Goldstein, C. Lebedziek, and R. W. Robinett, "Supersymmetric quantum mechanics: examples with Dirac  $\delta$  functions", Am. J. Phys. **62**, 612-618 (1994).
69. M. A. Doncheski and R. W. Robinett, "Aspects of  $\psi$  and  $\chi$  production in polarized proton-proton collisions", Z. Phys. **C63**, 611-618 (1994), hep-ph/940124.

70. S. P. Fraser, S. T. Fraser, and R. W. Robinett, "Aspects of four-jet production in polarized proton-proton collisions", *Phys. Rev.* **D51**, 6580-6583 (1995), [hep-ph/9411359](#).
71. R. W. Robinett, "Quantum and classical probability distributions for position and momentum", *Am. J. Phys.* **63**, 823-832 (1995)
72. R. W. Robinett, "Visualizing the solutions of the circular infinite well in classical and quantum mechanics", *Am. J. Phys.* **64**, 440-446 (1996)
73. R. W. Robinett, "Quantum mechanical time-development operator for the uniformly accelerated particle", *Am. J. Phys.* **64**, 803-808 (1996).
74. R. W. Robinett and P. E. Sokol, "Investigating physical pendula with K'NEX<sup>TM</sup> ", *Phys. Teacher* **34**, 427-429 (1996).
75. R. W. Robinett, "Average value of position for the anharmonic oscillator: classical versus quantum results", *Am. J. Phys.* **65**, 190-194 (1997).
76. R. W. Robinett, "WKB energy quantization and first-order perturbation theory", *Am. J. Phys.* **65**, 320-328 (1997).
77. M. A. Doncheski and R. W. Robinett, "Third-generation leptoquark decays and collider searches", *Phys. Lett.* **B411**, 107-111 (1997), [hep-ph/9707486](#).
78. M. A. Doncheski and R. W. Robinett, "Closing the window on the axigluon mass using top quark production data", *Phys. Lett.* **B412**, 91-94 (1997), [hep-ph/9706490](#).
79. M. A. Doncheski and R. W. Robinett, "Leptoquark production in ultrahigh-energy neutrino interactions reexamined", *Phys. Rev.* **D56**, 7412-7415 (1997), [hep-ph/9707328](#).
80. R. W. Robinett, "Visualizing classical periodic orbits from the quantum energy spectrum via the Fourier transform: Simple infinite well examples", *Am. J. Phys.* **65**, 1167-1175 (1997).
81. R. W. Robinett, "Periodic orbit theory of a continuous family of quasi-circular billiards", *J. Math. Phys.* **39**, 278-298 (1998).
82. R. W. Robinett, "The polarizability of a particle in power law potentials: a WKB analysis", *Eur. J. Phys.* **19**, 31-39 (1998).
83. R. W. Robinett, "Energy eigenvalues and periodic orbits for the circular disk or annular infinite well", *Surf. Rev. and Lett.* **5**, 519-526 (1998).
84. M. A. Doncheski and R. W. Robinett, "Radiation zeros and scalar particles beyond the standard model", [hep-ph/9805328](#), *Phys. Lett.* **B435**, 364-372 (1998).
85. M. A. Doncheski and R. W. Robinett, "Eliminating the low-mass axigluon window", [hep-ph/9804226](#), *Phys. Rev.* **D58**, 097702 (3 pages) (1998)
86. R. W. Robinett, C. Mulfinger, and J. Passaneau, "Optical realization of a circular billiard", *Phys. Teacher* **36**, 547-552 (1998).

87. R. W. Robinett, "Isolated versus non-isolated periodic orbits in variants of the two-dimensional square and circular wells", *J. Math. Phys.* **40**, 101-122 (1999).
88. R. W. Robinett, "Periodic orbit theory analysis of the circular disk or annular billiard: non-classical effects and the distribution of energy eigenvalues", *Am. J. Phys.* **67**, 67-78 (1999).
89. M. A. Doncheski and R. W. Robinett, "Anatomy of a quantum 'bounce'", *Eur. J. Phys.* **20**, 29-37 (1999).
90. R. W. Robinett, "Visualizing the collapse and revival of wavepackets in the infinite square well using expectation values", *Am. J. Phys.* **68**, 410-420 (2000), [quant-ph/0307041](#).
91. R. W. Robinett, Invited comparative review of undergraduate and graduate textbooks on classical mechanics, *Am. J. Phys.* **68**, 390-393 (2000).
92. R. W. Robinett, "Wave packet revivals and quasi-revivals in one-dimensional power law potentials", *J. Math. Phys.* **41**, 1801-1813 (2000).
93. M. A. Doncheski and R. W. Robinett, "Extra dimensional gravity and dijet production at  $\gamma\gamma$  colliders, *Phys. Rev.* **D61**, 117701 (4 pages) (2000), [hep-ph/9910346](#).
94. M. A. Doncheski and R. W. Robinett, "Comparing classical and quantum probability distributions for an asymmetric infinite well", *Eur. J. Phys.* **21**, 217-228 (2000), [quant-ph/0307014](#).
95. R. W. Robinett, "Periodic orbit theory analysis of a family of deformed hemispherical billiards", *Surf. Rev. and Lett.* **7**, 151-160 (2000).
96. M. A. Doncheski and R. W. Robinett, "Expectation value analysis of wave packet solutions for the quantum bouncer: short-term classical and long-term revival behavior", *Am. J. Phys.* **69**, 1084-1090 (2001), [quant-ph/0307046](#).
97. R. W. Robinett, "Spacecraft artifacts as physics teaching resources", *Phys. Teach.* **39**, 476-479 (2001)
98. E. Cataloglu and R. W. Robinett, "Testing the development of student conceptual and visualization skills in quantum mechanics through the undergraduate career", *Am. J. Phys.* **70**, 238-251 (2002).
99. R. W. Robinett, "Visualizing classical and quantum probability densities for momentum using variations on familiar one-dimensional potentials", *Eur. J. Phys.* **23**, 165-174 (2002), [quant-ph/0307056](#).
100. R. W. Robinett and S. Heppelmann, "Quantum wave packet revivals in circular billiards", *Phys. Rev. A* **65**, 062103-1 – 62103-10 (2002) [quant-ph/0307020](#).
101. M. A. Doncheski and R. W. Robinett, "Quantum mechanical analysis of the equilateral triangle billiard: periodic orbit theory and wave packet revivals", *Ann. Phys.* **299**, 208-227 (2002), [quant-ph/0307063](#).
102. R. W. Robinett, "It's, like, relative motion at the mall", *Phys. Teach.* **41**, 140-142 (2003).

103. R. W. Robinett, "Quantum mechanics of the two-dimensional circular billiard plus baffle system and half-integral angular momentum", *Eur. J. Phys.* **24**, 231-243 (2003), [quant-ph/0307035](#).
104. M. A. Doncheski, S. Heppelmann, R. W. Robinett, and D. C. Tussey, "Wave packet construction in two-dimensional quantum billiards: Blueprints for the square, equilateral triangle, and circular cases", *Am. J. Phys.* **71**, 541-557 (2003), [quant-ph/0307070](#).
105. M. A. Doncheski and R. W. Robinett, "Wave packet revivals and the energy eigenvalue spectrum of the quantum pendulum", *Ann. Phys.* **308**, 578-598 (2003), [quant-ph/0307079](#).
106. R. W. Robinett, "Quantum wave packet revivals", *Phys. Rep.* **392**, 1-119 (2004), [quant-ph/0401031](#).
107. M. A. Belloni, M. A. Doncheski, and R. W. Robinett, "Wigner quasi-probability distribution for the infinite square well: Energy eigenstates and time-dependent wave packets", *Am. J. Phys.* **72**, 1183-1192 (2004), [quant-ph/0312086](#).
108. R. W. Robinett and L. C. Bassett, "Analytic results for Gaussian wave packets in four model systems: I. Visualization of the kinetic energy", *Found. Phys. Lett.* **17**, 607-625 (2004), [quant-ph/0408049](#)
109. R. W. Robinett and L. C. Bassett, "Analytic results for Gaussian wave packets in four model systems: II. Autocorrelation functions", *Found. Phys. Lett.* **17**, 645-661 (2004), [quant-ph/0408050](#)
110. M. Belloni, M. A. Doncheski, and R. W. Robinett, "Exact results for 'bouncing' Gaussian wave packets", *Phys. Scripta* **71**, 136-140 (2005), [quant-ph/0408182](#)
111. M. Belloni, M. A. Doncheski, and R. W. Robinett, "Zero-curvature solutions of the one-dimensional Schrödinger equation", *Phys. Scripta.* **72**, 122-126 (2005) [quant-ph/0410104](#).
112. R. W. Robinett, M. A. Doncheski, and L. Bassett, "Simple examples of position-momentum correlated Gaussian free-particle wave packets in one-dimension with the general form of the time-dependent spread in position", *Found. Phys. Lett.* **18**, 645-661 (2005) [quant-ph/0502097](#).
113. L. P. Gilbert, M. Belloni, M. A. Doncheski, and R. W. Robinett, "More on the asymmetric infinite well: energy eigenstates with zero curvature", *Eur. J. Phys.* **26**, 815-825 (2005) [quant-ph/0512156](#).
114. R. W. Robinett, "Image method solutions for free-particle wave packets in wedge geometries", *Eur. J. Phys.* **27**, 281-289 (2006) [quant-ph/0512108](#).
115. R. W. Robinett "Self-interference of single Bose-Einstein condensates due to boundary effects", *Phys. Scr.* **73**, 681-684 (2006) [quant-ph/0511075](#).
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117. L. P. Gilbert, M. Belloni, M. A. Doncheski, and R. W. Robinett, "Playing quantum physics Jeopardy with zero-energy eigenstates", *Am. J. Phys.* **74**, 1035-1036 (2006).

## Books

1. **Proceedings of the Polarized Collider Workshop**, Penn State University, University Park, PA, 1990, edited by J. Collins, S. Heppelmann, and R. W. Robinett, AIP Conference Proceedings, No. 223, Particles and Fields 42 (American Institute of Physics, New York, 1991).
2. **Quantum Mechanics: Classical Results, Modern Systems, and Visualized Examples**, Oxford University Press, 1996.
  - Selected as the Main Selection for Winter 1996-1997 by Newbridge Library of Science Book Club.
3. **Quantum Mechanics: Classical Results, Modern Systems, and Visualized Examples**, Second Edition, Oxford University Press, 2006
  - Includes on-line resources such as
    - **Guide to the Pedagogical Literature on Quantum Mechanics** (90 pages)
    - **Solutions Manual** (340 pages)
    - **Supplementary Chapters** (50 pages)
    - **Worksheets** (additional extended homework problems, 60 pages)

Available at <http://robinett.phys.psu.edu/qm> – Userid and password required for some components; contact author.

## Articles Published in Non-refereed Journals and Conference Proceedings

1. R. W. Robinett and J. L. Rosner, "Proton stability", Proc. of the 1981 Int. Conf. on Neutrino Physics and Astrophysics, ed. by R. J. Cence and A. Roberts (Univ. of Hawaii, Honolulu, 1981), p. 193-204 (presented by J. L. Rosner).
2. R. W. Robinett and J. L. Rosner, "Second  $Z$  in  $SO(10)$ ", Proc. of the XVII Rencontre de Moriond, ed. by J. Tran Thanh Van, v. 1, p. 603-613 (presented by J. L. Rosner).
3. R. W. Robinett and J. L. Rosner, "Minimally extended electroweak gauge theories in  $SO(10)$  and  $E_6$ ", in Proc. of the Neutrino Mass and Gauge Structure of the Weak Interactions Mini-Conference (AIP Conference Proceedings No. 99, New York 1983), ed. by V. Barger and D. Cline, p. 193-201 (presented by R. W. Robinett).
4. C. N. Leung, R. W. Robinett and J. L. Rosner, "Second-order fermion masses", in Proc. of the Neutrino Mass and Gauge Structure of the Weak Interactions Mini-Conference (AIP Conference Proceedings No. 99, New York 1983), ed. by V. Barger and D. Cline, p. 292-296 (presented by J. L. Rosner).
5. R. W. Robinett and J. L. Rosner, "Electroweak gauge theories with extra  $U(1)$ 's in  $S(10)$  and  $E_6$ ", in Electroweak Interactions at High Energies, Proceedings of the 1982 DESY workshop, ed. by R. Kogerler and D. Schildknecht (World Scientific Publishing Co., Singapore, 1983), p. 273-277 (presented by R. W. Robinett).
6. P. Langacker, R. W. Robinett, and J. L. Rosner, "The production and decay of heavy gauge bosons in  $pp$  and  $p\bar{p}$  collisions", in Proceedings of the Workshop on Electroweak Symmetry Breaking, (LBL-18571), ed. by I. Hinchliffe, p. 54-57, Lawrence Berkeley Labs (presented by J. L. Rosner).
7. J. L. Rosner, P. Langacker, and R. W. Robinett, "Forward-backward asymmetries in  $W$  and  $Z$  decays", DPF Workshop on  $pp$  options for the Supercollider", (Univ. of Chicago, 1984), ed. by J. A. Polcher and A. R. White, p. 202-206 (presented by J. L. Rosner).
8. R. W. Robinett, "Axiguons and quarkonia", in the Proceedings of the 1988 Meeting of the Division of Particles and Fields of the APS (Storrs, CT, 1988), (World Scientific, Singapore, 1990), ed. by K. Haller, p. 749-751.
9. R. W. Robinett, "Flavor-changing decays of toponium and single  $b'$  production", Proceedings of the 2nd International Symposium on the 4th Family of Quarks and Leptons" (UCLA, 1989), New York Academy of Sciences (Vol. 578), ed. by A. Soni and D. Cline, p. 438-444.
10. R. W. Robinett, "Spin and polarized proton-proton collisions at RHIC", in Proceedings of Particles and Fields '91, joint meeting of the DPF/APS and the DP/CAP, Vancouver, Canada, 1991, (World Scientific, Singapore, 1992), ed. by D. Axen, D. Bergman, and M. Comyn, p. 647-651.
11. M. A. Doncheski and R. W. Robinett, "Double photon production in polarized proton-proton collisions", in Proceedings of Particles and Fields '92, 7th meeting of the Division of Particles and Fields of the APS (DPF 92), Batavia, IL, Nov. 1992, p. 1039-1041.

12. R. W. Robinett, "Prospects for spin physics at RHIC", to appear in Proceedings of the International Symposium on Particle Theory and Phenomenology, Ames, Iowa, May 1995, ed. by J. -W. Qiu and G. Valencia, p. 103-108, hep-ph/9506230.

### **Other Research Contributions**

1. Co-organizer, *Polarized Collider Workshop*, Penn State University, November 1990.
2. Founding member of RHIC Spin Collaboration (RSC) November 1990.
3. Co-author, RHIC Spin Collaboration (RSC) letter of intent, May 1991, RHIC-SPIN-LOI-1991.
4. Co-author, Joint RSC-PHENIX-STAR proposal to BNL, August, 1992.
5. Co-author, Update to joint RSC-PHENIX-STAR proposal to BNL, August, 1993.

# Invited Talks

## Seminars, Colloquia, and Talks at Workshops

1. “*Gutsier Guts*”, Department of Physics, University of Wisconsin-Madison, January 1980.
2. “*Grand unified models based on  $SO(10)$  and  $E_6$* ”, Department of Physics, University of Chicago, September 1981.
3. “*Neutral currents and extra  $Z$ 's in non-minimal grand unified models*”, Theoretical Physics group, Fermilab National Laboratory, October 1981.
4. “*Electroweak interactions with extra  $U(1)$ 's in  $SO(10)$  and  $E_6$* ”, DESY Workshop on Electroweak Interactions at High Energies, Hamburg, West Germany, October 1982.
5. “*Minimally extended electroweak gauge theories in  $SO(10)$  and  $E_6$* ”, at Neutrino Mass and Gauge Structure of the Weak Interactions Mini-Conference, Telemark Wisconsin, November 1982.
6. “*W boson weak and electromagnetic moments and composite models*”, Department of Physics, Purdue University, November 1982.
7. “*W boson electromagnetic moments, radiation zeros and composite models*”, Department of Physics, University of Pennsylvania, January 1983.
8. “*The principle of equivalence at finite temperature*”, Department of Physics, Northeastern University, August 1984.
9. “*The principle of equivalence at finite temperature*”, Department of Physics, Indiana University, November 1984.
10. “*The principle of equivalence at finite temperature*”, Department of Physics, Wisconsin-Madison, February 1984.
11. “*The principle of equivalence at finite temperature*”, Theoretical Physics Group, Argonne National Laboratory, February 1984.
12. “*Aristotle was right: heavier things do fall faster (if they're hot) or The principle of Equivalence at finite temperature*”, Department of Physics, Vanderbilt University, February 1985.
13. “*Supersymmetric particle physics*”, Department of Physics, State University of New York at Buffalo, October 1985.
14. “*Supersymmetry and cosmic ray physics*”, Department of Physics, Penn State University, November 1985.
15. “*Supersymmetry and cosmic ray physics*”, Department of Physics, University of Miami, November 1985.
16. “*Why the universe might be supersymmetric*”, Department of Physics, Notre Dame University, February 1986.

17. “*Why the universe might be supersymmetric*”, Department of Physics, University of Massachusetts, Amherst, May 1986.
18. “*Searching for exotic physics in toponium decays*”, CERN, Geneva, Switzerland, February 1987.
19. “*Exotic quarks in  $E_6$  theories*”, 11th International Workshop on Weak Interactions, St. Johns College, Santa Fe, June 1987.
20. “*Phenomenology of superstring-inspired  $E_6$  models*”, Department of Physics, University of Montreal, March 1988.
21. “*Axigluons and all that*”, Department of Physics, University of Toronto, April 1988.
22. “*Axigluons and all that*”, Department of Physics, University of Guelph, April 1988.
23. “*Axigluons and quarkonia*”, 1988 Meeting of the Division of Particles and Fields of the American Physical Society, University of Connecticut, Storrs, August 1988.
24. “*New physics from toponium (and related topics)*”, Department of Physics, University of Wisconsin-Madison, February 1989.
25. “*Flavor-changing decays of toponium and single  $b'$  production*”, 2nd International Symposium on the 4th Family of Quarks and Leptons, UCLA, 1989.
26. “*Heavy quarkonium production at colliders as a test of the gluon content of the proton and photon*”, Department of Physics, Drexel University, March 1990.
27. “*Spin physics at RHIC*”, Department of Physics, Stockholm University, November 1990.
28. “*Spin physics at RHIC*”, Department of Physics, Uppsala University, November 1990.
29. “*Spin physics at RHIC*”, HEP Theory Group, Brookhaven National Laboratory, November 1990.
30. “*Spin and polarized proton-proton collisions at RHIC*”, invited talk at PF91, joint meeting of the Division of Particles and Fields of the American Physical Society and the Division of Particles of the Canadian Association of Physics, Vancouver, British Columbia, Canada, August 1991.
31. “*Towards a program of polarized proton-proton collisions at RHIC*”, HEP Division, Argonne National Laboratory, November 1991.
32. “*Towards a program of polarized proton-proton collisions at RHIC*”, Department of Physics, University of Wisconsin-Madison, November 1991.
33. “*Towards a program of polarized proton-proton collisions at RHIC*”, Department of Physics, Carnegie-Mellon University, February 1992.
34. “*Towards a program of polarized proton-proton collisions at RHIC*”, Department of Physics, McGill University, November 1992.
35. “*Prospects for spin physics at RHIC*”, HEP experimental group, University of Chicago, October 1994.

36. "*Prospects for spin physics at RHIC*", Department of Physics, University of Illinois at Chicago, November 1994.
37. "*Prospects for spin physics at RHIC*", invited talk at XVII International Kazimierz Meeting on Particle Physics, Iowa State University, May 1995.
38. "*Prospects for spin physics at RHIC*", HEP Division, Argonne National Laboratory, June 1995.
39. "*Visualizing the solutions to problems in quantum mechanics*", Department of Physics, Villanova University, October 1996.
40. "*Closing the low-mass axigluon window with top quark production data*", 1998 Madison Pheno-CTEQ meeting, University of Wisconsin Madison, April 1998.
41. "*Validation of the Quantum Mechanics Visualization Instrument*", AAPT (American Association of Physics Teachers) meeting, January 2000 (presented by E. Cataloglu).
42. "*Augmentation of students' visual understanding of selected topics in quantum mechanics*", AAPT (American Association of Physics Teachers) meeting, January 2000 (presented by F. Tasar).
43. "*Comparing classical and quantum probability distributions for an asymmetric infinite well*", AAPT (American Association of Physics Teachers) meeting, August 2000.
44. "*Development and tests of a quantum mechanics assessment instrument*", AAPT (American Association of Physics Teachers) meeting, August 2000.
45. "*Development of the Quantum Mechanics Visualization Instrument (QMVI)*", Summer 2001 Gordon Conference on Scientific Visualization, August 2001, Mount Holyoke College.
46. "*Periodic orbit theory analysis of simple variants of familiar two dimensional billiard systems*", invited talk at the meeting of the American Mathematical Society, Irvine, CA, November 2001.
47. "*Development and validation of an achievement test for quantum mechanics: The Quantum Mechanics Visualization Instrument (QMVI)*", by E. Cataloglu, R. W. Robinett, and V. Lunetta, 2002 Annual International Conference of the National Association for Research in Science Teaching (NARST) New Orleans , LA April 7-10, 2002. (Presented by E. Cataloglu.)
48. "*Testing the development of student conceptual and visualization understanding in quantum mechanics through the undergraduate career*", invited plenary talk at the Summer 2002 Gordon Conference on Physics Research and Education: Quantum Mechanics, June 2002, Mount Holyoke College.
49. "*Testing the development of student conceptual and visualization understanding in quantum mechanics through the undergraduate career*", invited talk at the April 2003 meeting of the American Physical Society, Philadelphia, PA.
50. "*Quantum wave packet revivals*", Winter 2004 AAPT meeting, Miami, FL.

51. “*Assessment of student understanding in quantum mechanics informing the development of novel problems and visualization methods*”, Seminar, Ohio State University, November 2004.
52. “*Time-dependent phenomena in quantum mechanics: Pedagogical examples modeling modern experimental realizations*”, seminar at Indiana University of Pennsylvania, April 2006.
53. “*Time-dependent phenomena in quantum mechanics: Pedagogical examples modeling modern experimental realizations*”, seminar at Davidson University, April 2006.
54. “*Quantum wave packet revivals*”, Institute Laue Langevin Grenoble, France (May 2006).

## Membership on Graduate Degree Candidates' Committees

### Graduate Student Committees:

1987-1990	--	Steven Alexander	Physics
1989-1991	--	Robert Brott	Physics
1988-1990	Ph. D.	Michael Doncheski	Physics
1989-1991	Ph. D.	Simon Durrant	Physics
1989-1991	Ph. D.	Seungjoon Hyun	Physics
1989-1992	Ph. D.	Sangpyo Kim	Physics
1990-1993	Ph. D.	Anna Majewska	Physics
1990-1993	Ph. D.	John Reid	Physics
1991-1994	Ph. D.	Randall Scalise	Physics
1990-1993	Ph. D.	Laura Weinkauff (Advisor)	Physics
1991-1993	Ph. D.	J. Wu	Physics
1991-1993	Ph. D.	Bin Chen	Physics
1994-1996	Ph. D.	John Josef	Physics
1997-1998	Ph. D.	Andreas Freund	Physics
1997-1999	Ph. D.	Vadim Guzey	Physics
2000-2001	Ph. D.	Nadiya Tkachuk	Physics
2001-2001	Ph. D.	Daniel Zhalov	Physics
2001-2002	Ph. D.	Seiji Takemae	Physics
2001-2002	M. Ed.	Douglas Tussey (Advisor)	Physics
2002-2004	Ph. D.	Fernando Sudarshan	Physics
2002-2005	Ph. D.	Chris van der Broeck	Physics
2003-2005	Ph. D.	Sasha Pavlyk	Physics
2003-2005	Ph. D.	Sean McReynolds	Physics
2002-	Ph. D.	Isaac Mognet	Physics
2003-2006	Ph. D.	Theodore Rogers	Physics
2001-	Ph. D.	Buddhika Atulugama	Physics
1989-1991	Ph. D.	M. Walker	Astronomy
1991-1994	M. A.	G. Saulnier	Astronomy
1987-1989	Ph. D.	P. Stine	Astronomy
1990-1992	Ph. D.	A. Antunes	Astronomy
1994-1997	Ph. D.	J. Macmillan	Astronomy
1995-1998	--	H. Papathanassiou	Astronomy
2001-2005	Ph. D.	Michele Stark	Astronomy
2003-	Ph. D.	Lijun Gou	Astronomy
2005-	Ph. D.	Brendan Miller	Astronomy
1999-2002	Ph. D.	E. Cataloglu (Co-Advisor)	Education
2006	M. S.	Jacob Smith	EE

# Teaching Duties

<u>Semester</u>	<u>Course</u>	<u>Credits</u>	<u>Enrollment</u>
Fall 1986	Phys. 406 (Nuclear and Particle Physics)	3	25
Spring 1987	Phys. 201H (Introductory Physics/Mechanics)	4	15
Fall 1987	Phys. 410 (Quantum Mechanics)	3	32
Spring 1988	Phys. 221 (Introductory Physics/Mechanics)	4	38
Fall 1988	Phys. 222 (Introductory Physics/E&M)	4	41
	Phys. 406 (Nuclear and Particle Physics)	3	33
Spring 1989	Phys. 410 (Quantum Mechanics)	3	37
Fall 1989	Phys. 406 (Nuclear and Particle Physics)	3	28
Spring 1990	Phys. 410 (Quantum Mechanics)	3	20
Fall 1990	SSC Fellow	–	No teaching
Spring 1991	SSC Fellow	–	No teaching
Fall 1991	Phys. 201 (Introductory Physics/Mechanics) (2 recitation sections)	4	70
Spring 1992	Phys. 410 (Quantum Mechanics)	3	25
Fall 1992	Phys. 419 (Classical Mechanics)	3	25
Spring 1993	Phys. 410 (Quantum Mechanics)	3	25
Fall 1994	-----	–	No teaching
Spring 1994	Phys. 201 (Introductory Physics/Mechanics) (course admin)	4	600
Fall 1994	On Sabbatical Leave	–	No teaching
Spring 1995	On Sabbatical Leave	–	No teaching
Fall 1995	Phys. 215 (Introductory Physics/Mechanics)	4	450
Spring 1996	Phys. 400 (Electricity and Magnetism)	3	15
Fall 1996	Phys. 215 (Introductory Physics/Mechanics)	4	450
Spring 1997	Phys. 202 (Introductory Physics/E&M)	4	540
	Phys. 297B (Freshman Seminar)	1	15
Fall 1997	Phys. 215 (Introductory Physics/Mechanics)	4	450
Spring 1998	Phys. 297A (Freshman Seminar)	1	18
Fall 1998	Administrative Duties (Asst. Dept. Head)	–	No teaching
Spring 1999	Phys. 215 (Introductory Physics/Mechanics)	4	300
	Phys. 187 (Freshman Seminar)	1	15
Fall 1999	Administrative Duties (Asst. Dept. Head)	–	No teaching
Spring 2000	Phys. 215 (Introductory Physics/Mechanics)	4	300
	PSU 016 (First Year Seminar)	1	20
	Phys. 496 (Independent Studies)	2	1

<u>Semester</u>	<u>Course</u>	<u>Credits</u>	<u>Enrollment</u>
Fall 2000	Administrative Duties (Asst. Dept. Head)	–	No teaching
Spring 2001	Phys. 215 (Introductory Physics/Mechanics)	4	250
	PSU 016 (First Year Seminar)	1	20
Fall 2001	Administrative Duties (Asst. Dept. Head)	–	No teaching
Spring 2002	Sabbatical Leave/Administrative Duties	–	No teaching
Fall 2002	Administrative Duties (Asst. Dept. Head)	–	No teaching
Spring 2003	Administrative Duties (Asst. Dept. Head)	–	No teaching
Fall 2003	Administrative Duties (Assoc. Dept. Head)	–	No teaching
Spring 2004	PSU 016 (First Year Seminar)	1	30
Fall 2004	Administrative Duties (Assoc. Dept. Head)	–	No teaching
Spring 2005	PSU 016 (First Year Seminar)	1	30
Fall 2005	Administrative Duties (Assoc. Dept. Head)	–	No teaching
Spring 2006	PSU 016 (First Year Seminar)	1	30
Fall 2006	Administrative Duties (Assoc. Dept. Head)	–	No teaching
Spring 2007	PSU 016 (First Year Seminar)	1	30
	PHYS 497C (Mathematica in Physics)	1	25

# Undergraduate Advising Responsibilities

<u>Year</u>	<u>No. of advisees</u>
1986-1987	1 (Physics/Honors)
1987-1988	2 (Physics) 2 (Physics/Honors) 2 (Science)
1988-1989	4 (Physics) 4 (Science)
1989-1990	8 (Physics) 1 (Physics/Honors)
1991-1992	6 (Physics)
1992-1993	5 (Physics)
1993-1994	3 (Physics)
1994-1995	None (on sabbatical leave)
1995-1995	2 (Physics)
1996-1997	14 (Physics/Honors/double majors/minors)
1998-1999	24 (Physics/Honors/double majors/minors)
1999-2000	20 (Physics/Honors/double majors/minors)
2000-2001	20 (Physics/Honors/double majors/minors)
2001-2002	56 (Physics/Honors/double majors/minors)
2002-2003	83 (Physics/Honors/double majors/minors)
2003-2004	115 (Physics/Honors/double majors/minors)
2004-2005	140 (Physics/Honors/double majors/minors)
2005-2006	150 (Physics/Honors/double majors/minors)
2006-2007	150 (Physics/Honors/double majors/minors)

## Service to the University

### Department:

Associate Department Head	2003 -
Director of Graduate Studies	2003 -
Assistant Department Head	1998 - 2003
Director of Undergraduate Studies	1998 -
Undergraduate Program Committee (chair)	1995 -
Society of Physics Students (SPS) advisor	2002 -
Physics Department COOP liaison	1998 -
Departmental Evaluation Committee (ex officio member)	2001 -
Departmental P&T committee	2001
EPF Seminar organizer	1987 - 1990
Osmond Lab classroom renovation committee	1998 - 2000
Policy Committee	1987 - 1988
Awards Committee	1987 - 1988
Recruitment Committee	1988 - 1990
Graduate Admissions Committee	1989 - 1990
Teaching Committee (chair)	1991 - 1994
CES Promotion and Tenure Committee	1992 - 1993

## College:

Undergraduate Education Advisory Committee (UEAC, Advisory Committee to ECoS Dean)	1996 -
COOP Student of the Year Selection Committee	1999, 2001, 2003 - 2006
ECoS Enrollment Planning Team	2000 - 2003, 2005 -
ECoS Committee on Instructional and Research Faculty	2000 - 2002
ECoS <i>ad hoc</i> committee on fixed-term faculty awards	2002

## University:

University Faculty Senate	1996 - 1998
Teaching and Learning Consortium (Faculty Team)	1999 - 2001
Faculty Advisory Committee (FAC) for the Schreyer Honors College	2001 - 2003, 2003 -
University Advising Council	2000 - 2004
Search Committee for Schreyer Honors College Assistant/Associate Dean	2002
AD-14 Review Committee for SHC Dean	2004
FELT (Fund for Excellence in Learning and and Teaching) Selection committee	2000
Placement Enterprise Committee	1999
Facilitator for Teaching Colloquy	2001
Application reader for Schreyer Honors College	2001, 2002, 2004 - 2006
Undergraduate Fellowship Office (UFO) steering committee	2004 -

# Service to the Public

## Journal Editorships

- Associate Editor of *American Journal of Physics*, 2000-2002.

## Consulting

- Member of *The Governors Commission for College and Career Success – Science Benchmarks committee*
  - Committee charged by the Governor of the Commonwealth of Pennsylvania to develop rigorous science benchmark standards for graduating high school seniors in Chemistry, Physics, Life Sciences, and Technology.
- Paid consultant for the Louisiana Board of Regents (1999, 2002, 2005).
  - Member of multi-disciplinary panel to read and evaluate educational proposals for Louisiana colleges and universities and recommend funding from LaCEPT (State of Louisiana supplementary funds) budget.
- Member of APS-sponsored SPIN-UP team to Rutgers to assess undergraduate education (2001).
  - American Physical Society (APS) program to assess the status of physics undergraduate education and visit 'model' departments
  - Followup visit to George Washington University.
- Consultant (paid) for McGraw-Hill textbook development project (2000 - 2004).
- Consultant (unpaid) for the TV program *The Weakest Link* (2001).