HOWARD R. REISS
Curriculum Vitae
September 2010

PERSONAL INFORMATION

PERMANENT ADDRESS:

Physics Department
American University
Washington, DC 20016-8058, USA
Telephone: (202) 885-2749
Fax: (202) 885-2723
E-mail: reiss@american.edu

CURRENT ADDRESS:

Max-Born-Institut
Max-Born-Strasse 2a
12489 Berlin, Germany
Telephone: +49 30 6392-1325
Fax: +49 30 6392 1309
E-mail: reiss@mbi-berlin.de

EDUCATION

B. Ae. E., Polytechnic University (summa cum laude), 1950
M. Ae. E., Polytechnic University, 1951
Ph. D., Physics, University of Maryland, 1958

EMPLOYMENT HISTORY

- Research Fellow, Polytechnic University, 1950-1951
- Physicist, Hydromechanics Division, David Taylor Model Basin, 1951-1955
- Physicist, Nuclear Physics Division, U.S. Naval Ordnance Laboratory, 1955-1958
- Lecturer in Physics, University of Maryland, 1959-1963
- Visiting Scientist, Istituto di Fisica dell'Universitá, Turin, Italy, 1963-1964
- Adjunct Professor of Physics, American University, 1967- 1969
- Research Physicist and Chief of the Nuclear Physics Division, Naval Ordnance Laboratory, 1958-1969

- **Visiting Professor, Physics Department, University of Arizona, 1975-1981**
- **Full-Time Consultant, Amoco Research Center, Standard Oil Company (Indiana), 1980-1982**
- **Research Professor, Arizona Research Laboratories, University of Arizona, 1981-1986**
- **Visiting Scientist, Institute for Theoretical Atomic and Molecular Physics, Harvard-Smithsonian Center for Astrophysics, Harvard University, 1993-1994**
- **Professor of Physics, American University, Washington, DC, 1969-**
- **Visiting Professor, Universidad de Salamanca, Salamanca, Spain, 2001-2004**
- **Visiting Scientist, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Berlin, Germany, 2004-**
- **Visiting Professor, Eidgenössische Technische Hochschule Zürich (ETH; Swiss Federal Institute of Technology), Zürich, Switzerland, 2010**

HONORS AND AWARDS

Elected to honorary academic societies in:
- **Engineering (Tau Beta Pi)**
- **Scientific Research (Sigma Xi)**
- **Scholastic Achievement (Phi Kappa Phi)**
- **Physics (Sigma Pi Sigma)**

Undergraduate merit scholarship, Polytechnic University

Institute of Aeronautical Sciences Award, 1949

Research Fellowship, Polytechnic University

Bachelor's degree granted *summa cum laude*

Distinguished Scientist Sabbatical Year Award, 1963-1964

Distinguished Civilian Service Award, Naval Ordnance Laboratory

Invention Award, Naval Ordnance Laboratory

Elected Fellow of the American Physical Society

College of Arts and Sciences Nominee for 1989 University Award for Outstanding Scholarship, Research, and other Professional Contributions

Selected for NSF Visitors Program at the Harvard-Smithsonian Center for Astrophysics, Harvard University, 1993-94

College of Arts and Sciences Nominee for 1996 University Award for Outstanding Scholarship, Research, and other Professional Contributions

Plaque awarded by the Optical Society of America in recognition of my contributions to startup of the all-electronic refereed archival journal Optics Express, Sept. 1998

Medal awarded by the Symposium on Ultrafast Intense Laser Science, Inscribed *"To Howard Reiss for His Contribution to Ultrafast Intense Laser Science"* Big Island, Hawaii, 11 December 2005.

"Festkolloquium" in honor of my 80th birthday. This was a major enterprise organized by the Max Born Institute in Berlin, consisting of a reception, a colloquium program with four speakers, and a banquet. The colloquium program had an Introduction by Professor Wolfgang Sandner, Director of the Max Born Institute and a Professor at the Technische Universität of Berlin; a scientific talk by Professor Joseph H. Eberly of the University of Rochester; a scientific talk by Professor Pierre Agostini, now at Ohio State University, but a senior staff member for many years at the Centre d'Etudes Nucléaires de Saclay near Paris, France; and finally a talk by me that was a mixture of a scientific component and a tribute to the many people who were of importance to my career. The "Fest" was well-attended (by more than 50 people) from many countries: USA, Germany, France, Spain, Italy, Poland, Russia, and the UK. 12 March 2010.

Biography currently appears in:

- ***Who's Who in the World***
- ***Who's Who in the East***
- ***Who's Who in Science and Engineering***
- ***Men and Women of Science***

(Invitations to have my biography appear in several less-widely distributed publications have been declined.)

I have been invited to serve on many Organizing Committees and Advisory Committees for major International Conferences.

PRINCIPAL ACTIVITIES AND ACHIEVEMENTS

My primary career accomplishments are connected with the importance and the properties of the nonperturbatively strong interactions of intense electromagnetic fields with matter in both relativistic and nonrelativistic domains.

Specifically:

- **My 1962 paper on photon multiphoton pair production (see item 14 in the following list of published articles) was the original stimulus for all subsequent work on very-strong-field interactions, as well as on the usefulness of Volkov methods. The Soviet physicists of that era have acknowledged that debt for the extensive contributions of Soviet (and Russian) scientists beginning in 1964.`This same 1962 paper also stimulated the 1964 work of Brown & Kibble in the West. *My 1962 paper started strong-field physics.***
- **In another 1962 paper (relativistic problems) (see article 15) and again in a 1970 paper (nonrelativistic problems) (see article 23) it was demonstrated that field intensity in itself will limit the radius of convergence of perturbation expansions, and that these limits are accessible in the laboratory. This is a major result, previously unremarked.**
- **The *strong-field mass shift*, observed at SLAC in 1997, was first identified and discussed in 1962 (see article 13).**
- **The 1962 paper (see article 13) is the full theoretical background for the first true vacuum-structure effect demonstrated in the historic experiment at SLAC in 1998. That is, this was the theory of the first experiment where particles with mass were created from an initial state with no mass. A 1970 paper (see article 24) calculated conditions under which an actual experiment could be done at SLAC.**
- **In a 1970 paper (article 22), the use of S-matrix methods was introduced for nonperturbative calculations that did not involve scattering, which had previously been thought to be the sole application of S matrices. The S-matrix approach is now the standard technique for the analytical treatment of nonperturbatively strong fields.**
- **The Strong-Field Approximation (SFA), now the standard analytical tool for the calculation of ionization of atoms and molecules by strong laser fields was published in 1980 (article 37). This paper also predicted Above-Threshold Ionization (ATI) in advance of the famous 1979 paper that observed ATI (the disparity in dates was due to referee delays); it predicted intensity-caused channel closings; pronounced effects of the polarization of laser light; the possibility that higher-order effects can compete with, and even dominate lowest-order effects; and so on.**
- **The first detailed agreement between an observed ATI spectrum and a calculated spectrum was reported in 1987 (article 64).**
- **The first completely relativistic analytical treatment of photoioniza-**

tion was given in 1990 (article 71).

- A recent paper (article 112) demonstrated that the popular concept of atomic ionization as a tunneling phenomenon is, in fact, of very limited applicability.
- A theory of the enhancement of forbidden nuclear beta decay by strong, low frequency fields, published in 1983 (articles 41 and 42) was supported by laboratory experiments that were reported recently (article 109).

My work experience has been very varied, ranging from aero- and hydrodynamics in predoctoral work, to quantum electrodynamics and relativistic quantum field theory for the doctorate, and going on to high-energy physics, nuclear physics, solid-state physics, plasma and chaotic phenomena, and atomic and molecular physics.

As a result, my work has appeared in Physical Review A, B, C, D, E, and Letters, as well as in many other professional journals.

CITATIONS

Approximately 2,500 citations of my published works are listed in the ***Science Citations Index***.

Eleven of my single-author papers (i.e., with no multiple-authorship dilution) have received more than 50 citations each. This number is sometimes regarded as the threshold for papers of major significance. Of these, three have over a hundred citations, with one currently at 779.

PUBLICATIONS

BOOKS

- V. P. Krainov, H. R. Reiss, and B. M. Smirnov, ***Radiative Processes in Atomic Physics,*** John Wiley and Sons, New York, 1997 (ISBN 0-471-12533-4).
- B. M. Smirnov, with the editorial collaboration of H. R. Reiss, ***Physics of Ionized Gases,*** John Wiley & Sons, New York, 2001 (ISBN 0-471-17594-3). As of July 2008, this book is available online from the Wiley website.

MONOGRAPH

H. R. Reiss, "Theoretical Methods in Quantum Optics: S-Matrix and Kel-

dysh Techniques for Strong-Field Processes", Progress in Quantum Electronics **16**, Number 1 (1992).

BOOK CHAPTERS

- H. R. Reiss, “Facts and Fallacies in Strong-Field Physics”, in W. Becker and M. V. Fedorov, editors, ***Universality and Diversity in Science***, World Scientific, Singapore, 2004, pp. 151-166.
- H. R. Reiss, "Foundations of the Strong-Field Approximation", in K. Yamanouchi, S. L. Chin, P. Agostini, and G. Ferrante, editors, ***Progress in Ultrafast Laser Science III***, Springer Series in Chemical Physics, Vol. 89, Springer, Berlin, 2008, pp. 1-32.

ARTICLES

1. P. A. Libby and H. R. Reiss, "The Design of Two-Dimensional Contraction Sections", Quarterly of Applied Mathematics **9**, 95 (1951).
2. H. R. Reiss, "A Method for Measuring the Damping of Surface Waves by Wave Absorbers", DTMB Report 896 (1955).
3. H. R. Reiss, "A Procedure to Impart Specified Dynamical Properties to Ship Models", DTMB Report 986 (1956).
4. H. R. Reiss and J. G. Brennan, "The Possibility of a Fragmenting Nuclear Warhead for ICBM Defense", NAVORD Report 4274, 1956.
5. H. R. Reiss, "The Dynamics of a Gravity Towing System", DTMB Report 1040 (1957).
6. H. R. Reiss, "Dynamics of Towing Systems", DTMB Report 1099 (1957).
7. H. R. Reiss, "The Dynamics of a Gravity Towing System", DTMB Report 1040 (1957).
8. H. R. Reiss, "Dynamics of Towing Systems", DTMB Report 1099 (1957).
9. H. R. Reiss, "Electron Effects on Barrier Penetration", NOLTN 3908, 1957.
10. J. G. Brennan, H. R. Reiss, and T. E. Spriggs "Theory of Neutron Yields from Explosively Activated Initiators", NAVORD Report 5697, 1957.
11. H. R. Reiss, "Absorption of Light by Light and Its Application to Convergence of Perturbation Theory", NAVORD Report 6180, 1958.
12. H. R. Reiss, Title Classified, DTMB Report C-760 (1959).
13. H. R. Reiss, "An Experimental Investigation of the Effects of Scale in Wave Tests of Small Ship Models", DTMB Report 1039 (1961).
14. H. R. Reiss, "Absorption of Light by Light", Journal of Mathematical Physics **3**, 59 (1962).
15. H. R. Reiss, "A Convergent Perturbation Expansion in First-Quantized Electrodynamics", Journal of Mathematical Physics **3**, 387 (1962).
16. H. R. Reiss and V. Wataghin, "Test for the Existence of the Neutral Vector Boson of Weak Interactions", Physical Review **136**, B214

(1964).
17. V. Wataghin and H. R. Reiss, "Nonlocal Form Factors for High-Energy Proton-Proton Scattering at Large Momentum Transfer", Nuovo Cimento **35**, 1153 (1965).
18. H. R. Reiss and M. H. Cha, "Photoproduction of W+ Meson", Physical Review Letters **14**, 399 (1965).
19. J. H. Eberly and H. R. Reiss, "Electron Self-Energy in Intense Plane-Wave Field", Physical Review **145**, 1035 (1966).
20. H. R. Reiss and J. H. Eberly, "Green's Function in Intense-Field Electrodynamics", Physical Review **151**, 1058 (1966).
21. H. R. Reiss, "Proposed Experiment to Detect the Mass Shift of an Electron in an Intense Photon Field", Physical Review Letters **17**, 1162 (1966).
22. H. R. Reiss, "Semiclassical Electrodynamics of Bound Systems in Intense Fields", Physical Review A **1**, 803 (1970).
23. H. R. Reiss, "Atomic Transitions in Intense Fields and the Breakdown of Perturbation Calculations", Physical Review Letters **25**, 1149 (1970).
24. H. R. Reiss, "Production of Electron Pairs from a Zero Mass State", Physical Review Letters **26**, 1072 (1971).
25. H. R. Reiss, "Transitions in Electromagnetic Fields of Arbitrary Intensity", Physical Review D **4**, 3533 (1971).
26. H. R. Reiss, "Determination of the Intense-Field Mass Shift of the Electron from Vacuum Polarization on the Mass Shell", Physical Review D **6**, 385 (1972).
27. H. R. Reiss, "Approximate Perturbation Theory for High-Order Electromagnetic Transitions", Physical Review A **6**, 817 (1972).
28. N. K. Rahman and H. R. Reiss, "Multiphoton Transition in Hydrogen between 1S and 2P Levels", Physical Review A **6**, 1252 (1972).
29. H. R. Reiss, "Polarization Effects in High-Order Multiphoton Ionization", Physical Review Letters **29**, 1129 (1972).
30. J. E. Rogerson, R. N. DeWitt, and H. R. Reiss, "Momentum-Translation Approximation outside Its Domain of Applicability", Physical Review A **7**, 21 (1973).
31. H. R. Reiss, "Non-Perturbation Methods in High Intensity Laser-Field Interaction", in B. C. Coboc and M. V. Kurepa, editors, ***Electronic and Atomic Collisions***, Institute of Physics, Beograd, Yugoslavia, 1973.
32. H. R. Reiss, "Nonperturbative Path-Integral Approximations", Physical Review D **11**, 388 (1975).
33. E. M. Gaddy and H. R. Reiss, "Evaluation of the `Mean-Frequency Technique'", Physical Review A **13**, 1801 (1976).
34. H. D. Jones and H. R. Reiss, "Intense-Field Effects in Solids", Physical Review B **16**, 2466 (1977).
35. H. R. Reiss, "Field Intensity and Relativistic Considerations in the Choice of Gauge in Electrodynamics", Physical Review A **19**, 1140 (1979).
36. H. R. Reiss, "Gauges for Intense-Field Electrodynamics", Physical

Review A **22**, 770 (1980).
37. H. R. Reiss, "Effect of an Intense Electromagnetic Field on a Weakly Bound System", Physical Review A **22**, 1786 (1980).
38. H. R. Reiss, "Properties of the Momentum-Translation Approximation", Physical Review A **23**, 3019 (1981).
39. H. R. Reiss, "Laser Enhancement of Nuclear Beta Decay", Physical Review Letters **48**, 652 (1982).
40. H. R. Reiss, "Laser Effects on Nuclear Beta Decay", Applied Physics B **28**, 310 (1982).
41. H. R. Reiss, "Nuclear Beta Decay Induced by Intense Electromagnetic Fields: Basic Theory", Physical Review C **27**, 1199 (1983).
42. H. R. Reiss, "Nuclear Beta Decay Induced by Intense Electromagnetic Fields: Forbidden Transition Examples", Physical Review C **27**, 1229 (1983).
43. H. R. Reiss, "Extensions of the Theory of Electromagnetically Induced Nuclear Beta Decay", Physical Review C **28**, 1402 (1983).
44. H. R. Reiss, "Multipole Expansions and Intense Fields", Physical Review A **29**, 698 (1984).
45. H. R. Reiss, "Multiphoton Polarization Ratio as a Sensitive Indicator of Specific Intensity Effects", in L. Mandel and E. Wolf, editors, ***Coherence and Quantum Optics***, Plenum Press, New York, 1984.
46. H. R. Reiss, "General Consequences of High Field Intensity on a Two-Body Bound System", in L. Mandel and E. Wolf, editors, ***Coherence and Quantum Optics***, Plenum, NY, 1984.
47. H. R. Reiss, "Reply to `Comment on Enhancement of Forbidden Nuclear Beta Decay by High-Intensity Radio-Frequency Fields'", Physical Review C **29**, 1132 (1984).
48. H. R. Reiss, "Keldysh Approximation Revisited", in A. O. Barut, editor, ***Quantum Electrodynamics and Quantum Optics***, Plenum Press, New York, 1984.
49. H. R. Reiss "Consequences of High Field Intensity in Semiclassical Electrodynamics", in A. O. Barut, editor, ***Quantum Electrodynamics and Quantum Optics***, Plenum, NY, 1984.
50. H. R. Reiss, "Effects of Relative Energy Contributions in a Two-Interaction Transition", Physical Review Letters **52**, 1061 (1984).
51. H. R. Reiss, "Electromagnetically Induced Nuclear Beta Decay in Electric-Field Gauge", Physical Review C **29**, 1825 (1984).
52. H. R. Reiss, "Electromagnetically Induced Nuclear Beta Decay Calculated by a Green's Function Method", Physical Review C **29**, 2290 (1984).
53. H. R. Reiss, "Response to `Comment on Effects of Relative Energy Contributions in a Two-Interaction Transition'", Physical Review Letters **52**, 2094 (1984).
54. H. R. Reiss, "On a Theorem Concerning the Enhancement of Nuclear Decays by Intense Radiation Fields", Phys. Letters **103A**, 312 (1984).
55. H. R. Reiss, "Accelerated Beta Decay for Nuclear Waste Disposal", in

R. G. Post, editor, ***Waste Management 84***, University of Arizona Press, Tucson, AZ, 1985.
56. H. R. Reiss, "Enhancement of Forbidden Nuclear Beta Decay by Low Frequency Electromagnetic Fields", Infrared Physics **25**, 525 (1985).
57. H. R. Reiss, "Far-Infrared Intense-Field Phenomena in Active Galactic Nuclei", Infrared Physics **25**, 521 (1985).
58. H. R. Reiss, "Simultaneous Electromagnetic Enhancement of Nuclear Beta Decay and Isomeric Transitions", Physical Review C **31**, 2238 (1985).
59. H. R. Reiss, "Reply to `Comment on Effects of Relative Energy Contributions in a Two-Interaction Transition'", Physical Review Letters **54**, 1330 (1985).
60. H. R. Reiss, "Enhancement of Forbidden Nuclear Beta Decay", in R. Bergere, S. Costa, and C. Schaerf, editors, ***Intermediate Energy Nuclear Physics***, World Scientific, Singapore, 1986.
61. H. R. Reiss, "Field-Enhanced Internal Conversion and Its Application to the Gamma Ray Laser", in W. C. Stwalley and M. Lapp, editors, ***Advances in Laser Science***, American Institute of Physics, New York, 1986.
62. S. A. Wender, G. C. Baldwin, W. L. Talbert and H. R. Reiss, "Predicted Changes in the Internal Conversion Rates in 119Sn Due to Admixtures of Lower Multipole Order", in W. C. Stwalley and M. Lapp, editors, ***Advances in Laser Science***, American Institute of Physics, NY, 1986.
63. H. R. Reiss, "Simultaneous Electromagnetic Enhancement of Nuclear Beta Decay and Internal Conversion", Physical Review C **33**, 739 (1986).
64. H. R. Reiss, "Spectrum of Atomic Electrons Ionized by an Intense Field", Journal of Physics B **20**, L79 (1987).
65. H. R. Reiss, "Electron Spectrum in Intense Field Photoionization", Journal of the Optical Society of America B **4**, 726 (1987).
66. H. R. Reiss, "Non-Perturbative Theory of Above-Threshold Ionization", in N. K. Rahman, C. Guidotti, and M. Allegrini, editors, ***Photons and Continuum States of Atoms and Molecules***, Springer-Verlag, Berlin, 1987.
67. J. L. Friar and H. R. Reiss, "Modification of Nuclear Beta Decay by Intense, Low Frequency Electromagnetic Waves", Physical Review C **36**, 283 (1987).
68. H. R. Reiss, "Phenomena at a Laser Focus", NSWC Tech. Rept. TR 87-184, 1987.
69. H. R. Reiss, "Analytically Simple Dressing of Bound-State Wave Functions", Physical Review A **39**, 2449 (1989).
70. H. R. Reiss, "The Keldysh Theory of Strong-Field Ionization and Its Extensions", in C. A. Nicolaides, C. W. Clark, and M. H. Nayfeh, editors, ***Atoms in Strong Fields***, Plenum Press, New York, 1990.
71. H. R. Reiss, "Relativistic Strong-Field Photoionization", Journal of the Optical Society of America B **7**, 574 (1990).

72. H. R. Reiss, "Keldysh Approximation in One and Three Dimensions", Rapid Communication, Physical Review A **41**, 6530 (1990).
73. H. R. Reiss, "Complete Keldysh Theory and Its Limiting Cases", Physical Review A **42**, 1476 (1990).
74. H. R. Reiss, "Photoionization of Arbitrary S States by Extremely Intense Fields", Acta Physica Polonica A **78**, 199 (1990).
75. H. R. Reiss, "Strong-Field Approximation in Photoionization", Radiation Effects and Defects in Solids **122**, 693 (1991).
76. H. R. Reiss, "Selection of Gauge in Strong-Field Atomic Photoionization", in V. V. Dodonov and V. I. Man'ko, editors, ***Quantum Field Theory, Quantum Mechanics, and Quantum Optics***, Nova Science, New York, 1991.
77. H. R. Reiss, "Reply to Comments on 'Complete Keldysh Theory and Its Limiting Cases'", Physical Review A **45**, 2140 (1992).
78. H. R. Reiss, "Frequency and Polarization Effects in Stabilization", Physical Review A **46**, 391 (1992).
79. H. R. Reiss, "Foundations of the Stabilization Phenomenon in Photoionization" Journal of Soviet Laser Research **13**, 250 (1992).
80. H. R. Reiss, "Non-Gauge Phase Transformations in Quantum Transition Amplitudes", D. Han, Y. S. Kim, and V. I. Man'ko, editors, ***Squeezed States and Uncertainty Relations***, National Aeronautics and Space Administration, Greenbelt, MD, 1992.
81. H. R. Reiss and N. Hatzilambrou, "Atomic State Effects in Stabilization", in B. Piraux, A. L'Huillier, and K. Rzążewski, editors, ***Super-Intense Laser-Atom Physics III***, Plenum, New York, 1993.
82. H. R. Reiss, N. Hatzilambrou and D. P. Crawford, "Atomic Stabilization by Strong Fields of Low or High Frequency and Circular or Linear Polarization", Laser Physics **3**, 285 (1993).
83. N. B. Baranova, H. R. Reiss, and B. Ya. Zel'dovich, "Multiphoton and Tunnel Ionization by an Optical Field with Polar Asymmetry", Physical Review A **48**, 1497 (1993).
84. D. P. Crawford and H. R. Reiss, "Stabilization in Relativistic Ionization with Circularly Polarized Light", Physical Review A **50**, 1844 (1994).
85. H. R. Reiss and V. P. Krainov, "Approximation for a Coulomb-Volkov Solution in Strong Fields", Physical Review A **50**, R910 (1994).
86. J. Bauer, M. Ivanov, K. Rzążewski, and H. R. Reiss, "SFA Applied to the One-Dimensional Two-Electron Model Atom", Journal of Physics B **28**, 4413 (1995).
87. H. R. Reiss, "Frequency Effects and Classical Paths in Strong-Field Ionization", Journal of Nonlinear Optics and Materials **4**, 687 (1995).
88. H. R. Reiss and V. P. Krainov, "Coulomb-Volkov Correction for a Strong-Field Approximation", SPIE Proceedings **2796**, 39 (1996).
89. H. R. Reiss, "High-Frequency, High-Intensity Photoionization", Journal of the Optical Society of America B **13**, 355 (1996).
90. H. R. Reiss, "Energetic Electrons in Strong-Field Ionization", Physical Review A **54**, R1765 (1996).

91. H. R. Reiss, “New Approach to Intense-Field Stabilization in Atoms”, Laser Physics **7**, 84 (1997).
92. H. R. Reiss, “Physical Basis for Strong-Field Stabilization of Atoms”, Laser Physics **7**, 543 (1997).
93. D. P. Crawford and H. R. Reiss, “Relativistic Photoionization”, Optics Express **2**, 289 (1998).
94. H. R. Reiss and D. P. Crawford, “Relativistic Photoionization”, SPIE Proceedings **3735**, 148 (1999).
95. H. R. Reiss, A. Shabaev, and H. Wang, “Alteration of Nuclear Beta Decay by Non-Nuclear Strong Fields”, Laser Physics **9**, 92 (1999).
96. J. San Roman, L. Roso, and H. R. Reiss, “Evolution of a Relativistic Wavepacket Describing a Free Electron in a Very Intense Laser Field”, Journal of Physics B **33**, 1869 (2000).
97. H. R. Reiss, “Dipole-Approximation Magnetic Fields in Strong Laser Beams”, Physical Review A **63**, 013409 (2001).
98. H. R. Reiss, “Dependence on Frequency of Strong-Field Atomic Stabilization”, Optics Express **8**, 99 (2001).
99. H. R. Reiss, “Spectra of Atoms at Nonperturbative Laser Intensities”, Physical Review A **65**, 055405 (2002).
100. H. R. Reiss and V. P. Krainov, “Generalized Bessel Functions in Tunneling Ionization”, Journal of Physics A **36**, 5575 (2003).
101. H. R. Reiss, “Channel Closings in Strong-Field Ionization and Implications for Gauge Invariance”, Laser Physics **13**, 889 (2003).
102. H. R. Reiss and V. P. Krainov, Further Comment on ‘Generalized Bessel Functions in Tunneling Ionization’”, Journal of Physics A **38**, 527 (2005).
103. H. R. Reiss, “Strong-Field Physics Viewed as a Paradigm Shift”, Laser Physics **15**, 1486 (2005).
104. H. R. Reiss and N. Hatzilambrou, "Ionization by a Single-Cycle Pulse", Journal of Modern Optics **53**, 221 (2006).
105. H. R. Reiss and V. P. Krainov, “Erratum: Approximation for a Coulomb-Volkov Solution in Strong Fields”, Physical Review A **74**, 049903(E) (2006).
106. H. R. Reiss, “Mixed Quantum and Classical Processes in Strong Fields”, Physical Review A **75**, 013413 (2007).
107. H. R. Reiss, “Inherent Contradictions in the Tunneling-Multiphoton Dichotomy”, Physical Review A **75**, 031404(R) (2007).
108. H. R. Reiss, “Velocity-Gauge Theory for the Treatment of Strong-Field Photodetachment”, Physical Review A **76**, 033404 (2007).
109. H. R. Reiss, “Observation of the Acceleration by an Electromagnetic Field of Nuclear Beta Decay”, Europhysics Letters **81** (2008) 42001.
110. S. Ter-Avetisyan, M. Schnürer, T. Sokollik, P. V. Nickles, W. Sandner, H. R. Reiss, J. Stein, D. Habs, T. Nakamura, and K. Mima, Physical Review E **77**, 016403 (2008).
111. H. R. Reiss, “Comment on ‘Photodetachment in a Strong Laser Field: An Experimental Test of Keldysh-like Theories’”, Physical Review A **77**,

067401 (2008).
112. H. R. Reiss, “Limits on Tunneling Theories of Strong-Field Ionization”, Physical Review Letters **101**, 043002 (2008); *also referenced in* Virtual Journal of Ultrafast Science, Vol. **7**, Issue 8, August 2008.
113. H. R. Reiss, Erratum to “Limits on Tunneling Theories of Strong-Field Ionization”, Physical Review Letters **101**, 155901(E) (2008).
114. H. R. Reiss, "Special Analytical Properties of Ultrastrong Coherent Fields", European Journal of Physics D **55**, 365-374 (2009) [DOI: 10.1140 (2009)].
115. H. R. Reiss, "Novel Phenomena in Very-Low-Frequency Strong Fields", Physical Review Letters **102**, 143003 (2009).
116. H. R. Reiss, "Dependence of Physical Interpretations on the Choice of Electromagnetic Gauge", Laser Physics **19**, 1626 (2009).
117. H. R. Reiss, “Unsuitability of the Keldysh Parameter for Laser Fields”, Physical Review A **82**, 023418 (2010).

INVITED CONFERENCE LECTURES

1. American Physical Society Invited Paper, Washington, DC Meeting, "Intense-Field Electrodynamics", 25 April 1966.
2. Second Rochester Conference on Coherence and Quantum Optics, "Properties of an Electron in an Intense Electromagnetic Field", 23 June 1966.
3. DC Consortium of Universities, First Physics Conference, "Theory of Intense-Field Electrodynamics", 1 November 1969.
4. Washington-Baltimore Colloquium on Atomic and Molecular Collisions, 17 January 1972.
5. Washington-Baltimore Colloquium on Atomic and Molecular Collisions, "Effects of Polarization in Multiphoton Ionization", College Park, MD, 12 February 1973.
6. Conference on Directions in Atomic Physics, Gordon Research Conference, "Atomic Physics in Intense Electromagnetic Fields", Proctor Academy, Andover, NH, 18 June 1973.
7. Eighth International Conference on the Physics of Electronic and Atomic Collisions (ICPEAC VIII), "Non-Perturbation Methods in High Intensity Laser-Field Interaction", Belgrade, Yugoslavia, 20 July 1973.
8. NATO Advanced Study Institute on Quantum Electrodynamics and Quantum Optics, "Keldysh Approximation Revisited", Boulder, CO, 30 May 1983.
9. NATO Advanced Study Institute on Quantum Electrodynamics and Quantum Optics, "Consequences of High Field Intensity in Semiclassical Electrodynamics", Boulder, CO, 3 June 1983.
10. International Symposium on Atoms in Strong Fields, "Refinement of the Keldysh Theory", Grainau, Federal Republic of Germany, 5 September 1988.

11. NATO Advanced Study Institute on Atoms in Strong Fields, "The Keldysh Theory of Strong Field Ionization and Its Extensions", Kos, Greece, 18 October 1988.
12. International Conference on Super-Intense Laser-Atom Physics (SILAP I), "Relativistic Effects in High-Intensity Photon-Electron Interactions", Rochester, NY, 28 June 1989.
13. International School of Coherent Optics: Quantum Optics II, "Photoionization of Arbitrary S States by Extremely Intense Fields", Ustron, Poland, 21 Sept. 1989.
14. International Vavilov Conference on Nonlinear Optics, "Photoionization in Very Strong Fields", Novosibirsk, USSR, 2 June 1990.
15. International Conference on Group Theoretical Methods in Physics, "Selection of Gauge in Strong-Field Photoionization", Moscow, USSR, 8 June 1990.
16. International Conference on Coherent Processes in Strong Fields, "The Strong-Field Approximation in Photoionization", Washington, DC, 22 June 1990.
17. Big Sky Workshop on Super-Intense Laser-Atom Physics (SILAP II), "Stabilization as a Function of Frequency and Polarization", Big Sky, Montana, 24 June 1991.
18. Workshop on Squeezing, Groups, and Quantum Mechanics, "Foundations of the Stabilization Phenomenon in Photoionization", Baku, Azerbaijan, 17 September 1991.
19. International Conference on Coherence and Quantum Optics, "Stabilization with a Keldysh-Like Method", St. Petersburg, Russia, 26 September 1991.
20. Joint Lebedev-Maryland Workshop on Squeezed States and Uncertainty Relations, "Non-Gauge Phase Transformations in Quantum Transition Amplitudes", Moscow, Russia, 28 May 1992.
21. Adriatico Research Conference on the Hydrogen Atom in Strong Fields, "Strong-Field Ionization, Stabilization, and Atomic-State Effects", Trieste, Italy, 18 August 1992.
22. NATO Advanced Study Institute, Workshop on Super-Intense Laser-Atom Physics (SILAP III), "Atomic State Effects in Stabilization', Han-sur-Lesse, Belgium, 12 January 1993.
23. International Conference on Multiphoton Processes (ICOMP), "Stabilization from the Tunneling Limit to the Kramers-Henneberger Limit", Quebec City, Canada, 27 June 1993.
24. Oak Ridge National Laboratory, Mini-Symposium on Accelerated Nuclear Decay, "Interaction of Strong, Low Frequency Fields with Nuclei", Oak Ridge, TN, 31 August 1994.
25. SPIE International Conference on Fundamentals of Laser-Matter Interaction, “Coulomb-Volkov Corrections for a Strong-Field Approximation”, with V. P. Krainov, St. Petersburg, Russia, 27 June 1995.
26. NATO Advanced Research Workshop, International Conference on Super-Intense Laser-Atom Physics (SILAP IV), "Electrons in Strong-

Field Ionization", Volga River, Russia, 6 August 1995.

27. **International Conference on Laser Physics, "Clear Signature for Atomic Stabilization", Moscow, Russia, July 1996.**
28. **International Conference on Laser Physics, "Strong-Field Approximation: Coulomb Corrections and Physical Interpretation", Prague, Czech Republic, August 1997.**
29. **International Conference on Nonlinear Optics, "Polarization Effects in Relativistic Ionization", Moscow, Russia, July 1998.**
30. **International Conference on Laser Physics, "Alteration of Nuclear Beta Decay by Non-Nuclear Strong Fields", Berlin, Germany, July 1998.**
31. **Super-Intense Laser-Atom Physics International Workshop on Relativistic Effects In Strong Fields (SILAP), American University, "Major Changes in Radioactivity Induced by Low-Frequency Electro-magnetic Fields", Washington, DC, 29 May 1999.**
32. **International Conference on Multiphoton Processes (ICOMP), "Physical Basis for Strong-Field Stabilization of Atoms", Monterey, CA, October 1999.**
33. **Focus Meeting on Relativistic Effects in Atomic Systems in Extreme Fields, "Foundations of Relativistic Photoionization of Atoms", Dresden, Germany, 11 April 2000.**
34. **International Conference on Laser Physics 2000, "New Results on Strong-Field-Accelerated Nuclear Beta Decay", Bordeaux, France, 21 July 2000.**
35. **Symposium on Quantum Control of Atoms and Fields (Eberlyfest), "Dependence on Frequency of Strong-Field Atomic Stabilization", Rochester, NY, 21 October 2000.**
36. **Symposium on Quantum Nucleonics, International Quantum Electronics Conference, "Gamma-Ray Transitions Induced by Low-Frequency Radiation", Moscow, Russia, 25 June 2002.**
37. **Conference on Complex Systems, "Accelerated Nuclear Beta Decay as a Complex System", Centre International des Systemes Complexes, University of Trieste, Trieste, Italy, 25 September 2002.**
38. **International Conference on Laser Physics 2003, "Strong-Field Fundamentals", Hamburg, Germany, 25 August 2003.**
39. **Nonlinear Wave Physics: High-Field Physics and Ultrafast Nonlinear Phenomena, "Strong-Field Approximation in Relativistic Laser-Atom Interactions", Volga River, Russia, 8 September 2003.**
40. **International Symposium on Ultrafast Laser Science, "Ultrafast Intense Laser-Atom Interaction", Québec, Canada, 27 September 2003.**
41. **Deutsche Forschungsgemeinschaft Schwerpunktkolloquium, "Electron Pair Production by Photons", Friedrich-Schiller-Universität Jena, Jena, Germany, 1 April 2004.**
42. **International Conference on Laser Physics 2004, "Photoelectron Momentum Distributions in Strong-Field Ionization", Trieste, Italy, 16 July 2004.**

43. International Workshop on Lasers and Nuclei, “Acceleration of Forbidden Beta Decay”, Karlsruhe, Germany, 13 September 2004.
44. International Symposium on Ultrafast Intense Laser Science 3, “Physical Insights from the Strong-Field Approximation”, Palermo, Sicily, Italy, 17 September 2004.
45. 340th Wilhelm und Else Heraeus-Seminar, High-Field Attosecond Physics, “Ionization by a Single-Cycle Pulse”, Obergurgl, Austria, 13 January 2005.
46. International Conference on Laser Physics 2005, “Wave Function Effects in the Strong-Field Approximation”, Kyoto, Japan, 8 July 2005.
47. International Conference on Laser Physics 2005, “Field-Accelerated Radioactive Decay”, Kyoto, Japan, 8 July 2005.
48. International Symposium on Ultrafast Phenomena of Atoms, Molecules, and Bio-Molecules in Designed Laser Fields, “Structure of the SFA and Limits on Rescattering”, University of Tokyo, Tokyo, Japan, 9 July 2005.
49. Indo - UK Discussion Meeting, "Nuclear Reactions Driven by Intense Electromagnetic Fields", Tata Institute of Fundamental Research, Mumbai, India, 24 April 2006.
50. International Conference on Super-Intense Laser-Atom Physics (SILAP’06), “Gauge Transformations and Strong Fields”, Salamanca, Spain, 20 June 2006.
51. International Conference on Laser Physics 2006, “Gauge Matters in Strong-Field Physics", Lausanne, Switzerland, 25 July 2006.
52. International Conference on Laser Physics 2006, “Overview of Strong-Field Accelerated Nuclear Beta Decay", Lausanne, Switzerland, 26 July 2006.
53. COAST Autumn School, “Foundations of Strong-Field Physics”, University of Tokyo, Tokyo, Japan, 25 November 2006.
54. ICONO (International Conference on Nonlinear Optics), “Inherent Flaws in the Multiphoton-Tunneling Scheme”, Minsk, Belarus, 31 May 2007.
55. International Conference on Laser Physics 2007, “Physical Interpretations and the choice of Electromagnetic Gauge”, León, Mexico, 21 August 2007.
56. W&E Heraeus Seminar on Novel Light Sources and Applications, “Limits on the Keldysh Parameter for Tunneling Ionization by Strong Laser Fields”, Obergurgl, Austria, 7 February 2008.
57. International Conference on Laser Physics 2008, “Novel Phenomena in Ionization by Very-Low-Frequency Strong Fields”, Trondheim, Norway, 3 July 2008.
58. Extreme Light Infrastructure (ELI), Workshop and School on Fundamental Physics with Ultra-High Fields, “Special Analytical Properties of Ultrastrong Coherent Fields”, Frauenwoerth, Germany, 29 September 2008; “Remarks”, 30 September 2008.
59. WE-Heraeus-Seminar (426) on Atomic Theory for Fundamental Inte-

ractions and Simple Systems in Strong Fields, “Novel Phenomena in Low Frequency Intense Fields”, Bad Honnef, Germany, 20 January 2009.

60. International Conference on Laser Physics 2009, "Violation of conservation Rules Following from a Change of Electromagnetic Gauge", Barcelona, Spain, 15 July 2009.
61. International Conference on Super-Intense Laser-Atom Physics (SILAP’09), “Limitations of Gauge Invariance; Consequences for Laser-Induced Processes”, Zion National Park, Utah, USA, 21 September 2009.
62. International Conference on Laser Physics 2010, “Laser-Induced Ionization is Not a Tunneling Process”, Foz do Iguaçu, Brazil, 6 July 2010.

COLLOQUIUM AND SEMINAR TALKS

1. Universitá di Torino, Seminario dell'Istituto di Fisica, "Particle Aspects of Dirac Electrodynamics", 7 February 1964.
2. Catholic University, Elementary Particles Seminar, "Intermediate Boson in Weak Interactions", 8 April 1965.
3. University of Rochester, Quantum Optics Seminar, "Virtual Structure of a Relativistic Electron in a Plane Wave Electromagnetic Field", 5 October 1965.
4. University of Maryland, Seminar on Atomic Physics and Quantum Electronics, "Intense Field Electrodynamics", 11 February 1966.
5. Catholic University, Elementary Particles Seminar, "Exact Wave Functions and Green's Function for a Relativistic Electron in a Plane Wave Electromagnetic Field", 3 March 1966 and 10 March 1966.
6. University of South Carolina, Physics Seminar, "A Method for Solving Problems in Semiclassical Radiation Theory", 8 December 1966.
7. University of Rochester, Atomic Physics and Quantum Optics Seminar, "Atomic Transitions in Intense Fields", 21 May 1968.
8. George Washington University, Physics Seminar, "Atomic Transitions in Intense Fields", 19 March 1969.
9. Louisiana State University, Atomic Physics Seminar, "Atomic Transitions in Intense Fields", 26 March 1969.
10. Naval Research Laboratory, Physics of Solids Colloquium, "Atomic Transitions in Intense Fields", 21 April 1969.
11. American University, Nuclear Seminar, "SU(3), an Introduction", 14 October 1969.
12. DC Consortium of Universities, First Physics Conference, "Theory of Intense-Field Electrodynamics", Washington, DC, 1 November 1969.
13. American University, Nuclear and Particle Physics Seminar, "Regge Poles", 10 March and 24 March 1970.

14. University of Rochester, Atomic Physics and Quantum Optics Seminar, 5 January 1971.
15. American University, Nuclear and Particle Physics Seminar, "Production of Electron Pairs from a Zero-Mass State", 8 February 1971.
16. Catholic University, Nuclear and Particle Seminar, "Electrodynamics beyond Perturbation Theory", 18 February 1971.
17. Naval Research Laboratory, Plasma Physics Seminar, "Electrodynamics beyond Perturbation Theory", 4 March 1971.
18. Naval Research Laboratory, Atomic Physics Lecture Series, "Novel Results and Techniques in Electrodynamics", 27 September 1971, 18 October 1971, 5 November 1971, 15 November 1971, 29 November 1971, 20 December 1971.
19. Washington-Baltimore Colloquium on Atomic and Molecular Collisions, 17 January 1972.
20. American University, Nuclear and Particle Physics Seminar, “Path-Integral Approximation Methods", 29 February 1972.
21. Naval Research Laboratory, Optical Sciences Division Colloquium, "Optical Transitions in Electromagnetic Fields of Arbitrary Intensity", 23 March 1972.
22. American University, Nuclear and Particle Physics Seminar, "Weak Interactions, CVC, and PCAC", 2 May 1972.
23. Washington-Baltimore Colloquium on Atomic and Molecular Collisions, 12 February 1973.
24. Naval Research Laboratory, Interaction Physics Branch Colloquium, "Atomic Phenomena in Very Intense Electromagnetic Fields", 6 April 1973.
25. Centre d'Etudes Nucleaires de Saclay, Seminar of the Service de Physique Atomique, "Momentum Translation vis-a-vis Cohen-Tannoudji Objections", 6 July 1973.
26. American University, Environmental Studies Colloquium, "Civilization's Energy Gamble", 16 October 1973.
27. American University School of International Service, Population Dynamics Seminar, "Economics of Natural Resource Utilization", 19 October 1973.
28. American University School of International Service, World Human Needs and International Planning Seminar, "The Limits to Growth", 22 October 1973.
29. University of Western Ontario, Seminar, "Intense-Field Effects in Atoms", 13 March 1974.
30. University of Waterloo, Seminar, "Intense-Field Effects in Atoms", 14 March 1974.
31. American University, Environmental Colloquium, "The Energy Crises", 17 April 1974.
32. Joint Institute for Laboratory Astrophysics, University of Colorado, Atomic and Radiation Interaction Theory Seminar, "The Momentum Translation Method", 19 June 1974.

33. Joint Institute for Laboratory Astrophysics, University of Colorado, Atomic and Radiation Interaction Theory Seminar, "Path-Integral Approximations", 26 June 1974.
34. American University School of International Service, U.S. in World Affairs Seminar, "Problems of Energy and Energy Production", 10 July 1974.
35. American University School of International Service, World Population Dynamics Seminar", "Economics of World Resource Utilization", 14 October 1974.
36. American University, Physics Department Colloquium, "Re-examination of the Cosmological Redshift", 23 April 1975.
37. Optical Sciences Center, University of Arizona, High Energy Lasers Seminar, "Multiple Photon Effects in Atoms," 30 September and 2 October 1975.
38. University of Arizona, Quantum Optics and Atomic Physics Seminar, "Intensity Effects in Electrodynamics", 2 April and 9 April 1976.
39. TRW Corporation, Special Projects Seminar, "Induced Forbidden Beta Decay," 12 December 1978.
40. General Atomics, Special Seminar, "Induced Forbidden Beta Decay," 13 December 1978.
41. Convair Division of General Dynamics Corporation, Energy Systems Seminar, "Controllable Beta Decay," 5 September 1979.
42. Amoco Research Center, Special Seminar, "Controllable Beta Decay," 21 September 1979.
43. University of Arizona, Optical Sciences Center Special Seminar Series, "Strong-Field Quantum Electrodynamics", 17, 18, 19 December 1979.
44. Office of Naval Research, Special Seminar, "Induced Nuclear Beta Decay", 24 March 1980.
45. Lawrence Livermore National Laboratory, Special Seminar, "Induced Nuclear Beta Decay", 6 June 1980.
46. University of Arizona, Physics Department Colloquium, "Dynamical Redshifts and Blueshifts in Quasars," 29 April 1981.
47. Los Alamos National Laboratory, Theoretical Division Seminar, "Nuclear Beta Decay Induced by Low-Frequency Electromagnetic Fields," 20 October 1983.
48. Joint Colloquium of the Physics Department and the Department of Nuclear and Energy Engineering of the University of Arizona, "Enhanced Beta Radioactivity", 25 January 1984.
49. Oak Ridge National Laboratory, Physics Division Seminar, "Accelerated Beta Radioactivity", 3 February 1984.
50. Lawrence Livermore National Laboratory, Nuclear Chemistry Division Seminar, "Electromagnetically Induced Nuclear Beta Decay", 22 February 1984.
51. Argonne National Laboratory, Nuclear Physics Seminar, "Accelerated Beta Radioactivity", 14 May 1984.

52. Universitá di Pisa, Institute of Quantum Chemistry Seminar, “Gauge Comparisons in Electrodynamics”, 13 September 1984.
53. Universitá di Pisa, Physics Department Seminar, "Electromagnetically Enhanced Beta Decay", 13 September 1984.
54. Los Alamos National Laboratory, Gamma Ray Laser Group Seminar, "Gamma Ray Transitions Induced by Low-Frequency Radiation", 29 November 1984.
55. Los Alamos National Laboratory, Physics Division Seminar, "Experimental Measurements of Electromagnetically Enhanced Beta Decay", 30 November 1984.
56. Université Laval (Quebec), Physics Department Colloquium, "Accelerating Radioactivity with Electromagnetic Fields", 29 April 1985.
57. Chalk River Nuclear Laboratories Colloquium, "The Acceleration of Radioactive Decay by Low Frequency Electromagnetic Fields", 1 May 1985.
58. FOM Instituut voor Atoom en Molecuulfysica Seminar, Amsterdam, "Electromagnetic Dressing of Bound and Free States", 11 June 1985.
59. Los Alamos National Laboratory, Gamma Ray Laser Group Seminar, "Modification of Internal Conversion by an External Field", 10 October 1985.
60. White Oak Laboratory, Naval Surface Weapons Center, Physics Research Colloquium, "Intense Field Electromagnetic Effects in Optical Systems", 2 May 1986.
61. New York University, Physics Department Colloquium, "Intense Field Atomic Photoionization", 10 November 1986.
62. University of Illinois at Chicago, Physics Department Seminar, "Intensity Effects in Multiphoton Ionization", 11 November 1986.
63. AT&T Bell Laboratories, Research, Physics, and Academic Affairs Division Seminar, "Non-Perturbative Effects in Multiphoton Ionization", 11 December 1986.
64. Princeton University, Physics Department Seminar, "Intense Field Phenomena in Multiphoton Ionization", 6 January 1987.
65. Universität Graz (Austria), Institut für Theoretische Physik Seminar, "Atomic Photoionization by Very Intense Fields", 3 June 1987.
66. Oak Ridge National Laboratory, Physics Division Seminar, "External Field Effects on Nuclear Beta Decay", 23 July 1987.
67. Catholic University of America, Physics Colloquium, "Enhancement of Nuclear Beta Decay by Low Frequency Fields", 1 October 1987.
68. City College of the City University of New York, "Intensity Regimes in Multiphoton Ionization", 30 October 1987.
69. College of William and Mary, Atomic Physics Seminar, "Intensity Effects in Low Order Photodetachment", 13 November 1987.
70. College of William and Mary, Physics Colloquium, "Photodetachment and Photoionization in Intense Fields", 13 November 1987.
71. Idaho National Engineering Laboratory and Idaho Research Center, Joint Physics Colloquium, "Accelerated Beta Decay", 5 August 1988.

72. Los Alamos National Laboratory, Theoretical Physics Division Seminar, "Foundations of the Keldysh Theory", 11 August 1988.
73. University of Virginia, Atomic Physics Seminar, "Theory of Microwave Ionization of Rydberg States", 22 Feb. 1989.
74. Polish Academy of Sciences Institute for Theoretical Physics, and University of Warsaw (Poland), Joint Physics Seminar, "Atomic Transitions Aided by a Low Frequency Intense Field", 28 Sept. 1989.
75. Jagiellonian University (Cracow, Poland), Seminar of the Institute for Physics, "Strong-Field Atomic Photoionization", 29 Sept. 1989.
76. University of Helsinki (Finland), Seminar of the Research Institute for Theoretical Physics, "Physics of Atoms in Strong Fields", 22 May 1990.
77. Leningrad State University (USSR), Seminar of the Department of Theoretical Physics, "Physics of Atoms in Strong Fields", 28 May 1990.
78. Institute of General Physics of the USSR Academy of Sciences (Moscow, USSR), All-Moscow Seminar on Multiphoton Processes, "Physics of Atoms in Strong Fields", 6 June 1990.
79. Naval Research Laboratory, Plasma Physics Division Seminar, "Physics of Very Strong Electromagnetic Fields", Washington, DC, 5 September 1990.
80. High Field Science Meeting, Center for Ultrafast Optical Science, University of Michigan, "General Properties of Stabilization and Quantitative Strong-Field Ionization Theory", Ann Arbor, Michigan, 29 June 1991.
81. Imperial College, Seminar of the Blackett Laboratory, "A Strong-Field View of Laser-Atom Interactions", London, England, 22 May 1992.
82. Institute of General Physics of the Russian Academy of Sciences, All-Moscow Seminar on Multiphoton Processes, "Laser-Atom Interactions and Stabilization", Moscow, Russia, 27 May 1992.
83. Universitá degli Studi di Como, Seminar of the Dipartimento di Fisica, "Atoms in Very Strong Fields", Como, Italy, 2 June 1992.
84. FOM Instituut voor Atoom en Molecuulfysica Seminar, "Strong Fields: From Fundamentals to Stabilization", Amsterdam, Netherlands, 10 August 1992.
85. University of Maryland Baltimore County, Physics Seminar, "Strong Field Effects in Atoms", 12 February 1993.
86. Institute for Theoretical Physics of the Polish Academy of Sciences Seminar, "Construction from First Principles of a Strong-Field Theory", Warsaw, Poland, 13 September 1993.
87. Institute for Theoretical Atomic and Molecular Physics, Harvard-Smithsonian Center for Astrophysics, Harvard University, Seminar, "Novel Behavior of Atoms in Very Strong Plane-Wave Fields", Cambridge, MA, 4 October 1993.
88. Institute for Theoretical Physics of the Polish Academy of Sciences Seminar, "Strong-Field Ionization at High Frequencies", Warsaw, Poland, 11 August 1995.
89. Institute for Theoretical Physics of the Polish Academy of Sciences

Seminar, "Comprehensive Strong Field Theory", Warsaw, Poland, 19 July 1996.

90. Laser Atomic, Molecular, and Optical Sciences Group, University of Maryland, "Strong-Field Stabilization of Atoms", College Park, MD, 25 September 1997.

91. Plasma Physics Division Seminar, Naval Research Laboratory, "Strong-Field Stabilization of Atoms", Washington, DC, 24 October 1997.

92. Max-Born Institut für Nichtlineare Optik und Kurzzeitspektroskopie Sonderseminar, "Method to Observe Strong-Field Stabilization of Atoms", Berlin, Germany, 27 November 1997.

93. Max-Born Institut für Nichtlineare Optik und Kurzzeitspektroskopie Sonderseminar, "Acceleration of Forbidden Beta Decay by Strong Electromagnetic Fields", Berlin, Germany, 27 November 1997.

94. Hahn-Meitner-Institut Sonderseminar, "Alteration of Nuclear Processes by Non-Nuclear Strong Fields", Berlin, Germany, 28 November 1997.

95. Lawrence Livermore National Laboratory Special Seminar, "Alteration of Nuclear Beta Decay by Non-Nuclear Strong Fields", Livermore, CA, 7 January 1998.

96. Seminar of the Strong-Field Atomic and Molecular Physics Group, Illinois State University, "Strong-Field Stabilization of Atoms", Normal, IL, 9 April 1998.

97. Atomic, Molecular and Optical Physics Seminar, Illinois State University, "Alteration of Nuclear Beta Decay by Non-Nuclear Strong Fields", Normal, IL, 10 April 1998.

98. Sandia National Laboratories, Advanced Concepts Group Seminar, "Accelerated Nuclear beta Decay", Albuquerque, NM, 1 September 1999.

99. Catholic University of America, Physics Department Seminar, "Accelerated Beta Decay", Washington, DC, 2 March 2000.

100. Max-Planck-Institut für Physik Komplexer Systeme, Atomic Systems in Extreme Fields Seminar, "General Formulation for Nonperturbative Strong Field Interactions", Dresden, Germany, 15 March 2000.

101. Max-Planck-Institut für Physik Komplexer Systeme, Atomic Systems in Extreme Fields Seminar, "Volkov and Kramers-Henneberger Methods for Strong Fields", Dresden, Germany, 4 April 2000.

102. Universidad de Salamanca, Departamento de Fisica Aplicada Round Table on Accelerated Beta Decay, "Enhancement of Inhibited Beta Decay", Salamanca, Spain, 30 November 2001.

103. FORTH (Foundation for Research and Technology-Hellas), IESL (Institute for Electronic Structure and Laser) Seminar, "Channel Closings and Gauge Invariance in Quantum Mechanics", Iraklion, Crete, Greece, 8 May 2003.

104. Max-Born Institut für Nichtlineare Optik und Kurzzeitspektroskopie Sonderseminar, "Three-Dimensional Dirac Relativistic Above-

Threshold Ionization Rates, Spectra, and Angular Distributions by Analytical Means", Berlin, Germany, 28 October 2003.

105. Max-Planck-Institut-Heidelberg für Kernphysik, Bothe-Kolloquium, "Foundations of Strong-Field Physics and Selected Applications", Heidelberg, Germany, 30 October 2003.

106. Tata Institute of Fundamental Research, "Seminars on Strong-Field Physics", series of five daily seminars, Mumbai, India, 2-6 February 2004.

107. Tata Institute of Fundamental Research, Institute-wide General Colloquium, "Strong-Field Physics: Large Effects from Small Causes", Mumbai, India, 4 February 2004.

108. Max-Born-Institut-Berlin, Kolloquium, "Relativistic Strong-Field Phenomena", Berlin, Germany, 19 May 2004.

109. Max-Planck-Institut für Physik Komplexer Systeme, Quantum Dynamics Seminar, "Relativistic Strong-Field Phenomena", Dresden, Germany, 2 June 2004.

110. Universidad de Salamanca, Seminario del Departamento de Fisica Aplicada, "Physical Insights from the Strong-Field Approximation", Salamanca, Spain, 30 September 2004.

111. University of Tokyo, Yamanouchi Laboratory, Department of Chemistry Seminar, "Basics of Strong Field Processes", Tokyo, Japan, 23 November 2004.

112. University of Tokyo, Yamanouchi Laboratory, Department of Chemistry Seminar, "Strong Field Phenomena", Tokyo, Japan, 24 November 2004.

113. University of Tokyo, Yamanouchi Laboratory, Department of Chemistry Seminar, "Active Areas of Research in Strong Fields", Tokyo, Japan, 25 November 2004.

114. University of Tokyo, Yamanouchi Laboratory, Department of Chemistry Seminar, "Strong Field Acceleration of Radioactivity", Tokyo, Japan, 26 November 2004.

115. Universität Ulm, "Is a Failure of Gauge Invariance Possible in Quantum Mechanics?", Ulm, Germany, 17 December 2004.

116. Ludwig Maximilian's Universität, "Strong-Field Acceleration of Forbidden Beta Decay", Munich, Germany, 19 September 2005.

117. Ohio State University, "Strong-Field Induced Nuclear Processes in a Novel Strong-Field Environment", Columbus, Ohio, 9 December 2005.

118. Tata Institute of Fundamental Research, "Seminars on Strong-Field Physics", series of three daily seminars, Mumbai, India, 19-21 April 2006.

119. Bhabha Atomic Research Centre, "Nuclear Reactions Driven by Intense Electromagnetic Fields", Mumbai, India, 26 April 2006.

120. Universidad de Salamanca, Seminario del Departamento de Fisica Aplicada, "Nuclear Reactions Accelerated by Intense Electromagnetic Fields", Salamanca, Spain, 28 June 2006.

121. Max Planck Institut für Kernphysik, Sonderseminar, "Nuclear Reac-

tions Accelerated by Intense Electromagnetic Fields", Heidelberg, Germany, 18 July 2006.

122. Shanghai Institute of Optics and Fine Mechanics (SIOM), "Special Features of Strong-Field Physics", Shanghai, China, 4 December 2006.

123. Zhejiang University, "Nuclear Reactions Accelerated by Intense Electromagnetic Fields", Hangzhou, China, 6 December 2006.

124. Forschungszentrum Dresden (FZD), "Potential New Source of Nuclear Energy", Rossendorf, Dresden, Germany, 2 July 2007.

125. ETH, "Basic Questions in Strong-Field Physics", Zürich, Switzerland, 18 November 2008.

126. JAEA (Japan Atomic Energy Agency), "Accelerated Beta Decay and Implications for Nuclear Energy", Tokai, Japan, 1 December 2008.

127. University of Tokyo Chemistry Department, "Novel Features of Strong Fields at Low Frequencies and the Failure of the Tunneling Concept", Tokyo, Japan, 2 December 2008.

128. Freie Universität, Theoretical Chemistry Seminar, "Failure of the Tunneling Theory of Ionization", Berlin, Germany, 3 February 2009.

129. Fritz Haber Institute, Molecular Physics Seminar, "Novel Phenomena in Low Frequency Intense-Field Ionization and the Failure of the Tunneling Model", Berlin, Germany, 13 February 2009.

130. Humboldt University, Strong Field Seminar, "Basic Principles of Strong-Field Physics and Their Frequent Violation", Berlin, Germany, 30 March 2009.

131. Max Born Institute, Division A Seminar, "Foundations of Strong Field Physics", Berlin, Germany, 7 April 2009.

132. Forschungszentrum Dresden (FZD), "Accelerated Beta Decay and Implications for Nuclear Energy", Rossendorf, Dresden, Germany, 30 April 2009.

133. ETH Zürich, "Angular Momentum Considerations in Ionization by Long-Pulse Circularly Polarized Light", Zürich, Switzerland, 1 March 2010.

134. ETH Zürich Special Laser Seminar, "Relativistically Strong Fields at Very Low Frequencies, and Applications to Basic Energy Problems", Zürich, Switzerland, 12 April 2010.

135. ETH Zürich and University of Zürich Joint Theory Colloquium, "Limitations of Gauge Invariance and Consequences for Laser-Induced Processes", Zürich, Switzerland, 17 May 2010.

136. Physics Department, Georgia Institute of Technology, "Laser-Induced Ionization is not a Tunneling Process", Atlanta, Georgia, 28 July 2010.

137. Paul Scherrer Institute, "Accelerated Beta Decay and Implications for Nuclear Energy", PSI, Switzerland, 14 September 2010.

PAPERS PRESENTED AT PROFESSIONAL MEETINGS

1. W. M. Frank and H. R. Reiss, "Diagrammatic Expansions in Time-Dependent and Time-Independent Perturbation Theories", Bull. Am. Phys. Soc. **7**, 298 (1962).
2. H. R. Reiss and W. M. Frank, "Relevance of Models for Convergence of Field Theory", Bull. Am. Phys. Soc. **8**, 71 (1963).
3. G. K. Riel, H. R. Reiss, and D. G. Simons, "Deep Underwater Nuclear Counting", Proceedings of Seventh Annual Navy Science Symposium, 1963.
4. M. H. Cha and H. R. Reiss, "Photoproduction of Weakly Interacting Vector Bosons", Bull. Am. Phys. Soc. **10**, 18 (1965).
5. R. J. Genolio and H. R. Reiss, "Symmetrized Electron Self-Energy in Quantum Electrodynamics", Bull. Am. Phys. Soc. **10**, 544 (1965).
6. H. R. Reiss, "Production of Pairs by Photon Beams", Bull. Am. Phys. Soc. **10**, 583 (1965).
7. H. R. Reiss, "Virtual Structure of an Electron in an Intense Photon Beam", Bull. Am. Phys. Soc. **10**, 712 (1965).
8. H. R. Reiss, "Electron in a Strong Photon Field of Gaussian Distribution", Bull. Am. Phys. Soc. **11**, 96 (1966).
9. H. R. Reiss, "Electron Green's Function in an Intense Electromagnetic Field of Gaussian Distribution", Bull. Am. Phys. Soc. **11**, 323 (1966).
10. H. R. Reiss, "Properties of an Electron in an Intense Photon Beam", Second Rochester Conference on Coherence and Quantum Optics, June 1966.
11. H. R. Reiss, "Splitting of an Electron Beam by Nonlinear Interaction with an Intense Photon Beam", Bull. Am. Phys. Soc. **11**, 773 (1966).
12. H. R. Reiss, "Method of Solution in Semiclassical Electrodynamics", Bull. Am. Phys. Soc. **12**, 109 (1967).
13. H. R. Reiss, "Interaction of a Wave Packet Electron with a Wave Packet of Intense Electromagnetic Radiation", Bull. Am. Phys. Soc. **12**, 1054 (1967).
14. H. R. Reiss, "Behavior of a Bound Electron in a Radiation Field of Arbitrary Intensity", Bull. Am. Phys. Soc. **13**, 80 (1968).
15. H. R. Reiss, "Multiphoton Transitions in a Hydrogenlike Atom", Bull. Am. Phys. Soc. **14**, 17 (1969).
16. H. R. Reiss, "Corrections to a Non-Perturbative Method in Electrodynamics", Bull. Am. Phys. Soc. **15**, 50 (1970).
17. H. R. Reiss, "Bound-State Intense-Field Method with Relaxed Photon-Energy Constraint", Bull. Am. Phys. Soc. **15**, 584 (1970).
18. H. R. Reiss, "Pair Production in Vacuum by Interaction of Light with Light", Bull. Am. Phys. Soc. **16**, 119 (1971).
19. H. R. Reiss, "Intense-Field Theory of Multiphoton Processes: 1s-2p Transition in Hydrogen", Bull. Am. Phys. Soc. **16**, 506 (1971).
20. J. E. Rogerson and H. R. Reiss, "Comparison of the Momentum Translation Approximation with Perturbation Theory for Resonant Transitions

in Atomic Hydrogen", Bull. Am. Phys. Soc. **17**, 455 (1972).

21. R. N. DeWitt and H. R. Reiss, "Theory of Multiphoton Ionization of Hydrogen by Intense Electromagnetic Fields", Bull. Am. Phys. Soc. **17**, 455 (1972).
22. N. K. Rahman, H. R. Reiss, and F. H. M. Faisal "Multiphoton Ionization of Hydrogen in a Plane-Wave Approximation with Coulomb Corrections", Balatonfüred (Hungary) Conference (ICOMP 0), Sept. 1972.
23. F. H. M. Faisal, N. K. Rahman, and H. R. Reiss, "Electron Detachment of H- by Multiple Photon Absorption", Balatonfüred Conference (ICOMP 0), Sept. 1972.
24. R. N. DeWitt and H. R. Reiss, "Theory of the Multiphoton Ionization of Hydrogen by Intense Electromagnetic Fields", Balatonfüred Conference (ICOMP 0), Sept. 1972.
25. E. T. Dressler and H. R. Reiss, "Multiphoton Photoelectric Effect from Intense Radiation", Balatonfüred Conference (ICOMP 0), Sept. 1972.
26. B. J. Choudhury and H. R. Reiss, "Photodetachment of an Electron Bound in a Screened Coulomb Potential by Multiphoton Absorption", Balatonfüred Conference (ICOMP 0), Sept. 1972.
27. B. J. Choudhury and H. R. Reiss, "Multiphoton Absorption in a U2 Color Center", Balatonfüred Conference (ICOMP 0), Sept. 1972.
28. H. R. Reiss, "Mass-Shell Vacuum Polarization", Balatonfüred Conference (ICOMP 0), Sept. 1972.
29. H. R. Reiss and N. K. Rahman, "Bound-Bound Electromagnetic Atomic Transitions at High Field Intensity", Balantonfüred Conference (ICOMP 0), Sept. 1972.
30. H. R. Reiss and J. E. Rogerson "Simple Approximation to Perturbation Theory for Electromagnetic Transitions in Atoms", Balatonfüred Conference on Multiphoton Processes (ICOMP 0), Sept. 1972.
31. H. R. Reiss, "Laser Effects on Nuclear Beta Decay", XII International Quantum Electronics Conference (IQEC XII), Munich, 25 June 1982.
32. H. R. Reiss, "Multiphoton Polarization Ratios as a Sensitive Indicator of Specific Intensity Effects", Fifth Rochester Conference on Coherence and Quantum Optics, 14 June 1983.
33. H. R. Reiss, "General Consequences of High Field Intensity on a Two-Body Bound System", Fifth Rochester Conference on Coherence and Quantum Optics, 15 June 1983.
34. H. R. Reiss, "Beta Decay Induced by Low Frequency Electromagnetic Fields", Post-Deadline Paper, Nuclear Physics Division of the American Physical Society, Notre Dame University, 13 October 1983.
35. H. R. Reiss, "Electromagnetically Accelerated Nuclear Beta Decay in Fission Products", Annual Meeting of the American Physical Society, San Antonio, TX, 31 Jan. 1984; Bull. Am. Phys. Soc. **29**, 46 (1984).
36. H. R. Reiss, "Accelerated Beta Decay for Nuclear Waste Disposal", Waste Management 84 Symposium, Tucson, AZ, 14 March 1984.
37. H. R. Reiss, "Methods of Calculation of Electromagnetically Enhanced Nuclear Beta Decay", American Physical Society Meeting, Washington,

D.C., 23-26 April 1984; Bull. Am. Phys. Soc. **29**, 678 (1984).

38. H. R. Reiss, "Comparison of Plane Waves and Quasistatic Electric Fields in Induced Nuclear Beta Decay", American Physical Society Meeting, Storrs, CT, 30 May - 1 June 1984; Bull. Am. Phys. Soc. **29**, 818 (1984).
39. H. R. Reiss, "Enhancement of Forbidden Nuclear Beta Decay by Low Frequency Electromagnetic Fields", Third International Conference on Infrared Physics, Zurich, Switzerland, 26 July 1984.
40. H. R. Reiss, "Far-Infrared Intense-Field Phenomena in Active Galactic Nuclei", Third International Conference on Infrared Physics, Zurich, Switzerland, 26 July 1984.
41. H. R. Reiss, "Multiphoton and Intense-Field Effects in Field-Enhanced Nuclear Beta Decay", International Conference on Multiphoton Processes III (ICOMP III), Iraklion, Crete, Greece, 6 Sept. 1984.
42. H. R. Reiss, "Longitudinal Terms in the Interaction of Low-Frequency Electromagnetic Fields with Free Charged Particles", American Physical Society Meeting, Crystal City, VA, 24-27 Apr.1985; Bull. Am. Phys. Soc. **30**, 753 (1985).
43. "Quantum States Dressed by Low-Frequency Electromagnetic Fields", Division of Electronic and Atomic Physics of the American Physical Society, Norman, OK, 29-31 May 1985; Bull. Am. Phys. Soc. **30**, 883 (1985).
44. H. R. Reiss, "Enhancement of Forbidden Beta Decay", International School of Intermediate Energy Nuclear Physics, Verona, Italy, 20-30 June 1985.
45. H. R. Reiss and D. L. Barker, "Experiments on Electromagnetic Enhancement of Beta Decay in 137Cs", Division of Nuclear Physics of the American Physical Society, Asilomar, CA, 28-30 Oct. 1985; Bull. Am. Phys. Soc. **30**, 1272 (1985).
46. S. A. Wender, H. R. Reiss, and G. C. Baldwin, "Predicted Changes in the Internal Conversion Rates in 119Sn due to Admixtures of Lower Multipole Order", International Laser Science Conference, Dallas, TX, 18-22 Nov. 1985.
47. H. R. Reiss, "Field-Enhanced Internal Conversion and its Application to the Gamma Ray Laser", International Laser Science Conference, Dallas, TX, 18-22 Nov. 1985.
48. H. R. Reiss, "Electromagnetically Accelerated Nuclear Beta Decay as a New Energy Source", Seventh Miami International Conference on Alternative Energy Sources, Miami, FL, 9-11 Dec. 1985.
49. H. R. Reiss, "Siegert's Theorem and Free Particles", American Physical Society Meeting, Washington, D.C. 28 April - 1 May 1986; Bull. Am. Phys. Soc. **31**, 789 (1986).
50. H. R. Reiss, "Nonperturbative Theory of Above-Threshold Ionization Applied to Xenon in Circularly Polarized Fields", Workshop on Photons and Continuum States of Atoms and Molecules, Cortona, Italy, 17 June 1986.
51. H. R. Reiss, "The Momentum Translation Approximation in E.r Gauge",

Division of Atomic, Molecular, and Optical Physics of the American Physical Society, Eugene, OR, 18-20 June 1986; Bull. Am. Phys. Soc. **31**, 949 (1986).

52. H. R. Reiss, "Non-Perturbative Theory of Above-Threshold Ionization", Optical Society of America Symposium on Multiple Excitations of Atoms", 20 October 1986, Seattle, Washington.
53. H. R. Reiss, "Polarization Ratios in Multiphoton Ionization of Atoms", International Quantum Electronics Conference (IQEC), Baltimore, Maryland, 1 May 1987.
54. H. R. Reiss, "High Order Multiphoton Ionization without Tunneling", International Conference on Multiphoton Processes (ICOMP IV), Boulder, Colorado, 13 July 1987.
55. H. R. Reiss, "Dressed States from a Rearrangement of Perturbation Theory", International Conference on Multiphoton Interactions (ICOMP IV), Boulder, Colorado, 14 July 1987.
56. H. R. Reiss, "A New Hamiltonian for Electrodynamics", American Physical Society Meeting, Baltimore, Maryland, 20 April 1988; Bull. Am. Phys. Soc. **33**, 1053 (1988).
57. H. R. Reiss, "3D vs. 1D and the Role of A2 in Classical Field-Electron Interaction", International Symposium on Atoms in Strong Fields, Grainau, Federal Republic of Germany, 6 September 1988.
58. H. R. Reiss, "Convergence of Perturbation Theory in Photoionization", NATO Advanced Study Institute on Atoms in Strong Fields, Kos, Greece, 21 October 1988.
59. H. R. Reiss, "Multiphoton Ionization from S States of Hydrogen with Large Principal Quantum Number", American Physical Society Meeting, Baltimore, Maryland, 2 May 1989; Bull. Am. Phys. Soc. **34**, 1193 (1989).
60. R. S. Bardfield and H. R. Reiss, "Initial-State Effects in Strong-Field Photoionization", American Physical Society Meeting, Washington, DC, 18 April 1990; Bull. Am. Phys. Soc. **35**, 1020 (1990).
61. R. S. Bardfield and H. R. Reiss, "Application of the Strong-Field Approximation to Multiphoton Ionization Data", American Physical Society Meeting, Washington, DC, 22 April 1991; Bull. Am. Phys. Soc. **36**, 1249 (1991).
62. H. R. Reiss, "Stabilization of Atoms in Superintense Laser Fields", American Physical Society Meeting, Washington, DC, 22 April 1991; Bull. Am. Phys. Soc. **36**, 1249 (1991).
63. H. R. Reiss and R. S. Bardfield, "Quantitative Theoretical Predictions for Ionization Experiments in Very Strong Fields", Big Sky Workshop on Super-Intense Laser-Atom Physics (SILAP II), Big Sky, Montana, 24 June 1991.
64. H. R. Reiss, "Strong-Field Fundamentals: Contact Transformations and the Golden Rule", Big Sky Workshop on Super-Intense Laser-Atom Physics (SILAP II), Big Sky, Montana, 24 June 1991.
65. H. R. Reiss, "Effects of a Strong, Low-Frequency Field on Nuclear Transitions", Gordon Research Conference on Multiphoton Processes,

New London, New Hampshire, 10 June 1992.

66. D. P. Crawford and H. R. Reiss, "Multiphoton Ionization by Circularly Polarized Light in the Relativistic Regime", Adriatico Research Conference on the Hydrogen Atom in Strong Fields, Trieste, Italy, 20 August 1992.
67. N. Hatzilambrou and H. R. Reiss, "Photoionization Using the Strong-Field Approximation: Calculation of Ion Yield as a Function of Laser Pulse Time Dependence", Adriatico Research Conference on the Hydrogen Atom in Strong Fields, Trieste, Italy, 20 August 1992.
68. R. S. Bardfield and H. R. Reiss, "An Approach to Above-Threshold Ionization in Two Electromagnetic Fields", Adriatico Research Conference on the Hydrogen Atom in Strong Fields, Trieste, Italy, 20 August 1992.
69. R. S. Bardfield and H. R. Reiss, "Laser-Assisted Microwave Above-Threshold Ionization: A Theoretical Approach", American Physical Society Meeting, Washington, DC, 12 April 1993; Bull. Am. Phys. Soc. **38**, 935 (1993).
70. N. B. Baranova, B. Ya. Zel'dovich, and H. R. Reiss, "Multiphoton and Tunnel Ionization by an Optical Field with Polar Asymmetry", International Conference on Multiphoton Processes VI (ICOMP VI), Quebec City, Canada, 26 June 1993.
71. R. S. Bardfield and H. R. Reiss, "An Analysis of Laser-Assisted Above-Threshold Ionization in a Microwave Field", International Conference on Multiphoton Processes VI (ICOMP VI), Quebec City, Canada, 26 June 1993.
72. N. Hatzilambrou and H. R. Reiss, "Analytical Treatment of Atomic Ionization by Intense, Ultrashort Laser Pulses", International Conference on Multiphoton Processes VI (ICOMP VI), Quebec City, Canada, 26 June 1993.
73. D. P. Crawford and H. R. Reiss, "Relativistic Photoionization with Circularly Polarized Light", International Conference on Multiphoton Processes VI (ICOMP VI), Quebec City, Canada, 26 June 1993.
74. H. R. Reiss, "Photoelectron Angular Distributions and Spectra at Very High Orders", International Conference on Quantum Optics III, Szczyrk, Poland, 4 September 1993.
75. H. R. Reiss, "Tunneling and Anti-Tunneling in Atomic Ionization", International Conference on Quantum Optics III, Szczyrk, Poland, 4 September 1993.
76. H. R. Reiss, "Formal Foundations of Strong-Field Theories of Photoionization", International Conference on Quantum Optics III, Szczyrk, Poland, 4 September 1993.
77. H. R. Reiss, "Anti-Tunneling and Its Predictions for Atomic Stabilization", Euroconference on Generation and Application of Ultrashort X-Ray Pulses, Salamanca, Spain, 12 March 1994.
78. H. R. Reiss, "Analytical Prediction of Photoelectron Spectrum at Very High Intensity", Euro-conference on Generation and Application of Ul-

trashort X-Ray Pulses, Salamanca, Spain, 12 March 1994.

79. N. Hatzilambrou and H. R. Reiss, "Short Pulse Atomic Ionization Using the Strong Field Approximation", American Physical Society Meeting, Washington, DC, 18 April 1994; Bull. Am. Phys. Soc. **39**, 1080 (1994).
80. H. R. Reiss and R. S. Bardfield, "Qualitative Analysis of High-Order Multiphoton Processes", American Physical Society Meeting, Washington, DC, 19 April 1994; Bull. Am. Phys. Soc. **39**, 1101 (1994).
81. R. S. Bardfield and H. R. Reiss, "Comparison of Theory and Experiment for Laser-Assisted Microwave ATI of Sodium", American Physical Society Meeting, Washington, DC, 19 April 1994; Bull. Am. Phys. Soc. **39**, 1102 (1994).
82. D. P. Crawford and H. R. Reiss, "Relativistic Spin Effects in Photoionization", American Physical Society Meeting, Washington, DC, 19 April 1994; Bull. Am. Phys. Soc. **39**, 1102 (1994).
83. H. R. Reiss, "Electron Spectrum in Short Pulse Strong Field Ionization", American Physical Society Meeting, Washington, DC, 21 April 1994, postdeadline paper.
84. H. R. Reiss, "Contradictions between Strong-Field Theories", Conference on High-Field Interactions and Short Wavelength Generation, St. Malo, France, 22 August 1994.
85. H. R. Reiss, "Theory and Experiment for Photoelectron Spectra in Short-Pulse High-Intensity Photoionization", Conference on High-Field Interactions and Short Wavelength Generation, St. Malo, France, 22 August 1994.
86. R. S. Bardfield and H. R. Reiss, "Analysis of Ionization Spectra for Microwave ATI of Sodium", American Physical Society Meeting, Washington, DC, 21 April 1995; Bull. Am. Phys. Soc. **40**, 1040 (1995).
87. Shabaev and H. R. Reiss, "Corrections to the Linear Polarization Strong Field Approximation", American Physical Society Meeting, Washington, DC, 21 April 1995; Bull. Am. Phys. Soc. **40**, 1040 (1995).
88. N. Hatzilambrou and H. R. Reiss, "Atomic Ionization by Short, Intense, Laser Pulses", American Physical Society Meeting, Washington, DC, 21 April 1995; Bull. Am. Phys. Soc. **40**, 1040 (1995).
89. H. R. Reiss, "Energy Conditions for Atomic Stabilization at High Frequencies", American Physical Society Meeting, Washington, DC, 21 April 1995; Bull. Am. Phys. Soc. **40**, 1040 (1995).
90. H. R. Reiss, "Energy Conditions in High Frequency Ionization", Conference on Super-Intense Laser-Atom Physics (SILAP IV), Volga River, Russia, 5 August 1995.
91. J. Bauer, M. Ivanov, K. Rzążewski, and H. R. Reiss, "Strong Field Approximation for the Helium Atom", Conference on Super-Intense Laser-Atom Physics (SILAP IV), Volga River, Russia, 7 August 1995.
92. H. R. Reiss, A. Shabaev, and H. Wang, “Momentum Translation Approximation in Accelerated Beta Decay, American Physical Society Meeting, Washington, DC, 18 April 1997; Bull. Am. Phys. Soc. **42**, 939 (1997).

93. H. Wang, A. Shabaev, and H. R. Reiss, "Forbidden Beta Decay Accelerated by Low Frequency Fields", American Physical Society Meeting, Washington, DC, 18 April 1997; Bull. Am. Phys. Soc. **42**, 939 (1997).
94. N. Hatzilambrou and H. R. Reiss, "Bright Light Shines Quickly, Electron, Once Coulomb Bound, Has Light Now Set Free?", American Physical Society Meeting, Washington, DC, 18 April 1997; Bull. Am. Phys. Soc. **42**, 955 (1997).
95. Shabaev and H. R. Reiss, "Coulomb Correction to the Linear Polarization SFA", American Physical Society Meeting, Washington, DC, 18 April 1997; Bull. Am. Phys. Soc. **42**, 956 (1997).
96. H. R. Reiss, "Femtosecond Electron Beam Pulses Produced by Intense Lasers", American Physical Society Meeting, Washington, DC, 18 April 1997; Bull. Am. Phys. Soc. **42**, 956 (1997).
97. H. R. Reiss and D. P. Crawford, "Relativistic Photoionization", International Conference on Multiphoton Processes (ICOMP VII), Monterey, CA, 5 October 1999.
98. H. R. Reiss, "Connection between the Strong Field Approximation and the High Frequency Approximation", Laser Physics 2000 International Conference, Bordeaux, France, 20 July 2000.
99. H. R. Reiss, "Ubiquity of Magnetic Field Effects in Strong Fields", International Conference on Quantum Optics V, Kościelisko, Poland, 22 June 2001.
100. H. R. Reiss, "Strong-Field Stabilization of Atoms in the Relativistic Domain", International Conference on Quantum Electronics, Moscow, Russia, 24 June 2002.
101. H. R. Reiss, "Channel Closings in Strong-Field Photoionization and Implications for Gauge Invariance", Laser Physics 2002 International Conference, Bratislava, Slovak Republic, 4 July 2002.
102. H. R. Reiss, "Strong-Field Channel Closings and Gauge Invariance in Quantum Mechanics", New Directions in Laser-Matter Interactions Conference, Brussels, Belgium, 5-7 September 2002.
103. H. R. Reiss, "Analytical Treatment of Ionization at Relativistic Intensities", Super-Intense Laser-Atom Physics (SILAP), Southfork Ranch, Dallas, TX, 19 November 2003.
104. H. R. Reiss, "Gauge Transformations and Strong Fields", Super-Intense Laser-Atom Physics (SILAP'06), Salamanca, Spain, 20 June 2006.

RESEARCH GRANTS AND PROJECTS

CONTRACTS AND GRANTS AWARDED

- National Science Foundation grant, 1973-1974 (approx. $25,000).
- Standard Oil Company (Indiana) [now called the Amoco Corporation] contract, 1980-1982 (approx. $500,000).

- University Patents, Inc. grant, 1982-1986 (approx. $400,000).
- Naval Surface Warfare Center IPA contract, 1986-1992 (approx. $270,000).
- National Science Foundation, as a subcontractor for the University of Michigan, 1991-1992 ($20,000).
- National Science Foundation grant, 1991-1995 ($160,000).
- Department of Energy grant, 1996-1998 ($220,000 for two years).
- National Institute for Science and Technology contract, 1996 ($7,000).
- Mellon Fund grant, 1999 ($1,000).
- Thomas Jefferson National Accelerator Facility contract, 1999-2000 ($26,000).
- Max-Planck-Gesellschaft, March – April 2000, Forschungsstipendium (Research Grant), for research and participation in the Seminar on Atomic Systems in Extreme Fields at the Max-Planck-Institut für Physik Komplexer Systeme, Dresden, Germany.

TRAVEL AWARDS

- National Science Foundation, 1970, to attend International Quantum Electronics Conference in Kyoto, Japan.
- National Science Foundation, 1972, to attend International Conference on Multiphoton Processes in Balatonfüred, Hungary.
- National Science Foundation, 1973, to attend International Conference on the Physics of Electronic and Atomic Collisions in Belgrade, Yugoslavia.
- Los Alamos National Laboratory, 1985, to spend six weeks at Los Alamos in a research collaboration with their staff.
- Oak Ridge National Laboratory, 1988-89, for participation in the Short-Visit Research Travel Program in connection with activities at Oak Ridge.
- Institute for Theoretical Atomic and Molecular Physics, Harvard-Smithsonian Center for Astrophysics, Harvard University, 1993-94, travel and relocation costs for sabbatical year at Harvard.
- Japanese Ministry of Education, Culture, Sports, Science and Technology, December 2005 to attend International Symposium on Ultrafast Intense Laser Science, where a medal was presented for "Outstanding Contributions to Light Field Science".

CONFERENCE ORGANIZATION

At the request of the sponsors, I organized (with Prof. R. Grobe of Illinois State University) the international conference SILAP V (Fifth International Conference on Super-Intense Laser-Atom Physics). The conference was

held in the workshop format, with attendance by invitation only. The list of invitees was deliberately short, and confined to active leaders in their respective subfields, with the single unifying theme of *"Relativistic Effects in Super-Strong Electromagnetic Fields"*. Only one invitee declined of 28 speakers invited. Approximately 40% of the participants traveled from Europe to American University for the sole purpose of attending the conference, which was held 28 – 30 May 1999 at AU.

Organizing and Program Committee: H. R. Reiss and R. Grobe.
Local Organizing Committee: H. R. Reiss and Y. Shabaev.
Sponsors:

- **Center for Ultrafast Optical Science (CUOS), University of Michigan. Supported by the National Science Foundation.**
- **Rochester Theory Center (RTC), Rochester University. Supported by the National Science Foundation.**
- **Mellon Fund.**

EDITORIAL ACTIVITIES

REFEREEING FOR PROFESSIONAL JOURNALS

Most editorial activities involve service as a referee for professional physics journals. Over three hundred referee reports have been written for the following major journals:

- **Physical Review Letters**
- **Physical Review A**
- **Physical Review C**
- **Journal of Physics A**
- **Journal of Physics B**
- **Physics Letters A**
- **Physics Letters B**
- **Journal of the Optical Society of America B**
- **Canadian Journal of Physics**
- **Journal of Applied Physics**
- **Journal of Chemical Physics**
- **Optics Letters**
- **Optics Communications**
- **Journal of Mathematical Physics**
- **Physics Essays**
- **Optics Express**
- **Beam Interactions with Materials and Atoms**
- **Computers and Graphics**
- **Europhysics Letters**

- Europhysics Journal D
- Open Optics Journal

REFEREEING OF PROPOSALS FOR GRANTING AGENCIES

I served on a panel at the invitation of the National Science Foundation to decide on the disposition of $6 million in grants to HBCUs (Historically Black Colleges and Universities). 20, 21 July 1998.

Major funding agencies request peer reviews in connection with their decisions on awards of research grants. In the last three years, about a dozen referee reports have been written for the following agencies:

- National Science Foundation (6)
- International Science Foundation (4)
- Air Force Office of Scientific Research (1)
- Department of Energy (1)
- Cottrell Science Awards of the Research Corporation (1)

MEDIA APPEARANCES AND INTERVIEWS

Interviewed by Radio Budapest (Hungary) after chairing the ceremonial closing session of the first International Conference on Multiphoton Physics, September 1972.

Interviewed by Univision TV news about the Russian nuclear accident at the Tomsk-7 nuclear weapons plant and its public health implications, 7 April 1993.

Interviewed by Voice of America about the Tomsk-7 nuclear accident and whether nuclear power has a future, based on this and other nuclear accidents, 9 April 1993.

Consulted by an Associated Press correspondent about possible environmental hazards arising from the storage of depleted uranium at Paducah, Kentucky; and about the general physical and radioactive properties of depleted uranium, 7 December 1994.

Interviewed by KPCC National Public Radio station in Los Angeles, CA about the nuclear accident that occurred in Japan. I was the sole interviewee on a half-hour program and took questions afterward. 1 October 1999.

One of two people interviewed by KPCC National Public Radio station in Los Angeles, CA on the subject of disposal of radioactive wastes, and took

questions afterward. 19 October 1999.

Participated in an hour-long discussion with two other participants in a WAMU National Public Radio presentation in Washington, DC on the subject of the possibility of effects on humans of low frequency radiation from devices such as mobile phones and microwave ovens, April 2001.

Interviewed by National Public Radio in Washington, DC through a telephone connection to Salamanca, Spain on the subject of "dirty bombs" as they might be used by terrorists. The interview on 12 June 2002 by WAMU in Washington lasted about a half hour.

Featured in the magazine: "Berlin, das Magazin der Hauptstadt" in issue of December 2004, published by Partner fűr Berlin, Gesellschaft fűr Hauptstadt Marketing, mbH, Fasanenstrasse 85, 10623 Berlin. Lead person in article on American scholars working in Germany. Circulation: 1.2 million. Enclosed as a supplement with: *Frankfurter Allgemeine Zeitung, Der Tagesspiegel, Sűddeutsche Zeitung, Die Welt, Financial Times Deutschland, and Handelsblatt.*

Interviewed by Srinivas Laxman, Special Correspondent for *The Times of India*. Article following from the interview published on Tuesday, 25 April 2006 in *The Times of India* on page 13.

Interviewed on 28 April 2006 by Dr. Lalitha Vaidyanathan, Science Correspondent for *The Press Trust of India Limited*. Interview available as a wire service article.

Interviewed by Christine Vollgraf for the *Verbundjournal (Das Magazin des Forschungsverbundes Berlin e.V.)*. Article entitled "Der Herausforderer" appeared in the issue of September 2008, p.18 as a full-page article with photo.

COURSES TAUGHT

UNDERGRADUATE COURSES

College Physics (two-semester, sophomore level)
University Physics (two-semester, sophomore level with calculus)
Astronomy
Resources, Population, and Environment (for non-science majors)
How the Universe Works (for non-science majors)

LOWER-LEVEL GRADUATE COURSES

Environmental Science (two-semester, team-taught with chemist)

Classical Mechanics
Electricity and Magnetism
Statistical Physics
Quantum Mechanics

ADVANCED GRADUATE COURSES

Classical Mechanics
Nonlinear Dynamics (Chaos Theory)
Electromagnetic Theory (two-semester)
Quantum Theory (two-semester)
Quantum Optics
Relativistic Quantum Mechanics
Relativistic Quantum Field Theory
Elementary Particle Physics

SUPERVISION OF DISSERTATIONS AND THESES

In addition to the Ph.D. candidates whose research I supervised, I also directed the research for two M.S. theses. The Ph.D. recipients are:

Robert N. DeWitt, Ph.D. awarded 1973.
Dissertation title: "Multiphoton Ionization of Hydrogen in the Momentum Translation Approximation".

Naseem K. Rahman, Ph.D. awarded 1973.
Dissertation title: "Path Integrals in Intense Field Electrodynamics and Photodetachment of H- in Intense Electromagnetic Fields".

John E. Rogerson, Ph.D. awarded 1974.
Dissertation title: "The Momentum Translation Approximation in Certain Limiting Cases".

Hermenzo Jones, Ph.D. awarded 1974.
Dissertation title: "Intense Field Effects in Materials".

Douglas P. Crawford, Ph.D. awarded January 1994.
Dissertation title: "Relativistic Ionization with Intense Linearly Polarized Light".

Niki Hatzilambrou, Ph.D. awarded January 1997.
Dissertation title: "Atomic Photoionization by Intense, Short Laser Pulses".

Rina S. Bardfield, Ph.D. awarded May 1997.
Dissertation title: "Above-Threshold Ionization in Two Electromagnetic Fields".

Crystal Cooper, Ph.D. awarded January 1998.
Dissertation title: "A Simulation and Time Series Analysis of Reaction-Diffusion Equations in Biological Pattern Formation".

Demetra Papadopoulou, Ph.D. awarded May 1998.
Dissertation title: "Quasi-Two-Body Scaling in Inclusive Nuclear Reactions".

Andrew Shabaev, Ph.D. awarded January 2000.
Dissertation title: "Transition Amplitude Methods for Quantum Processes in Low Frequency Fields".

Hongan Wang, Ph.D. awarded August 2000.
Dissertation title: "Forbidden Beta Decay Affected by an Intense, Low Frequency, Linearly Polarized Electromagnetic Field".

CONSULTANT ACTIVITIES

(Only those activities for which fees were paid are listed.)

Naval Ordnance Laboratory, 1969-1973.
Naval Research Laboratory, 1973-1974.
University of Delhi, India (Thesis Examiner) 1973-1974.
International Research Group, 1974.
Standard Oil Company (Indiana), 1980-1982.
University Patents, Inc., 1982-1986.
Los Alamos National Laboratory, 1985-1987.
Elsevier Scientific Publishing Company, 1986.
Naval Surface Warfare Center, 1986-1992.

INVENTIONS

PATENT DISCLOSURES

- **1968. Two disclosures on *Antineutrino Detection*, with G. K. Riel, F. J. Kelly, and C. L. Cowan.**
- **1971. Disclosure on *Multiphoton Processes*.**
- **1971. Disclosure on *Nonlinear Processes*, with R. B. Kay.**
- **1977. Disclosure on *New Energy Sources*.**
- **2000. Provisional Patent Application for *Accelerating Radioactivity*.**

PATENTS GRANTED

- **Classified patent issued 1970 on *Clandestine Nuclear Explosion Anti-neutrino Detector* by U. S. Patent Office. Co-inventors: F. J. Kelly, G. K. Riel, C. L. Cowan.**
- **Patent No. 0099946 granted October 1986 by European Patent Office for *Induced Nuclear Beta Decay*. Patent valid in Belgium, Federal Republic of Germany, France, Switzerland, and United Kingdom.**
- **Patent No. 1,209,282 granted March 1987 by Canadian Patent Office for *Induced Nuclear Beta Decay*.**