Jearl Walker

May 2014
Physics Department, Cleveland State University
2121 Euclid Ave, Cleveland OH 44115 USA
phone/fax 216.687.2424

Education
Arlington Heights High School, Fort Worth, Texas, graduated 1963
B.S. in physics from Massachusetts Institute of Technology, 1967
Ph.D. in physics from University of Maryland, 1973

Academic positions
Teaching Assistant at Massachusetts Institute of Technology, as a senior, 1966-1967
Teaching Assistant at University of Maryland, 1968-1969
Junior Instructor, as graduate student at University of Maryland, 1969-1971
Assistant Professor, Cleveland State University, 1973-1977
Associate Professor, Cleveland State University, 1977-1981
Chair of the Physics Department, June 1985 - June 1989
Acting Chair of the Physics Department, fall semester, 2007
Professor, Cleveland State University, 1981-present

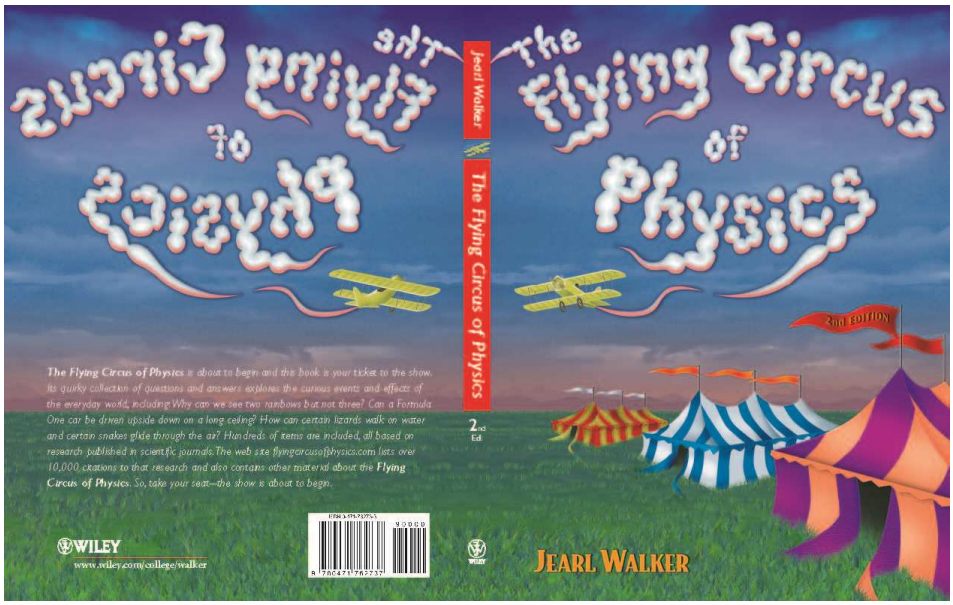
Research interests
Physics education and physics of the everyday world

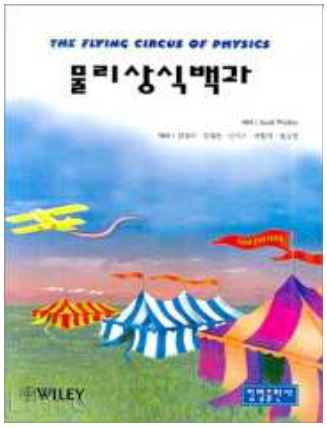
Publications

Books published

The Flying Circus of Physics, 2nd edition

Jearl Walker, 2006, John Wiley & Sons.
The web site www.flyingcircusofphysics.com is an extension of the book, contains the bibliography of the book (over 11,000 citations to scientific literature), over 2,000 links to web videos, and over 150 new stories (more added every month). In its first 2.5 years of operation, the web site has had over 280,000 visits and over 440,000 page views from over 170 countries.
Translations published: Korean (2007), German (2008), French (2008), Italian (2008), Portuguese (2008), Serbian (2010), Persian (2012), Chinese (2012)
Translations underway: Greek, Estonian, Japanese





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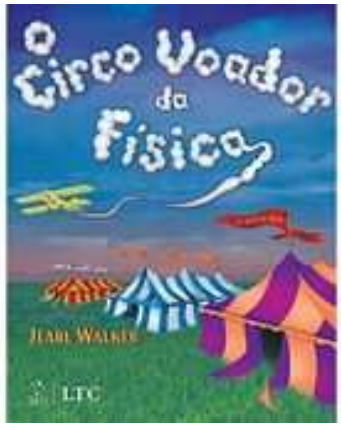

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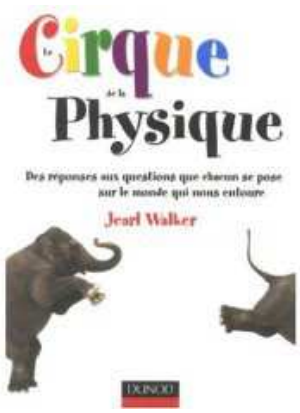

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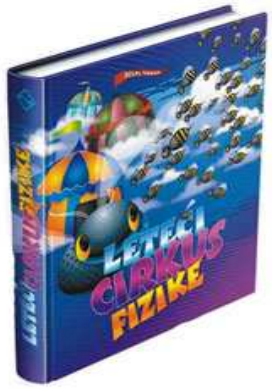
Italian, part 1

Italian, part 2



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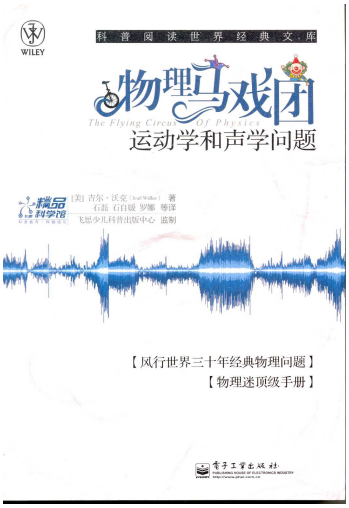

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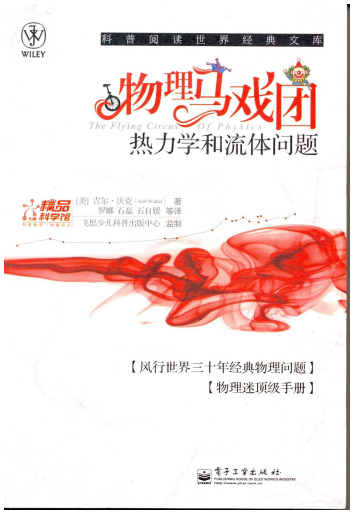
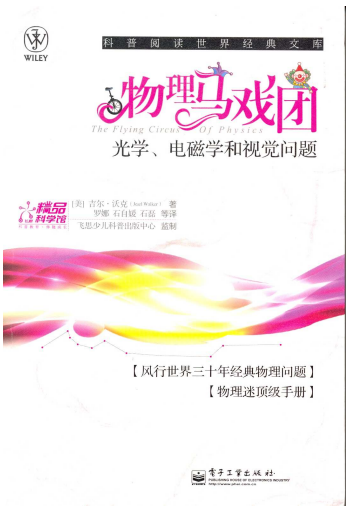


Chinese, part 2

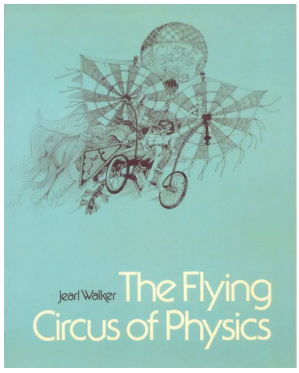


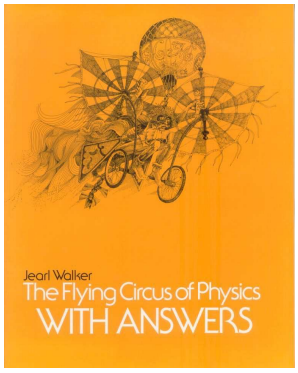
Chinese, part 3

Greek

Persian (Iran, bootleg translation)

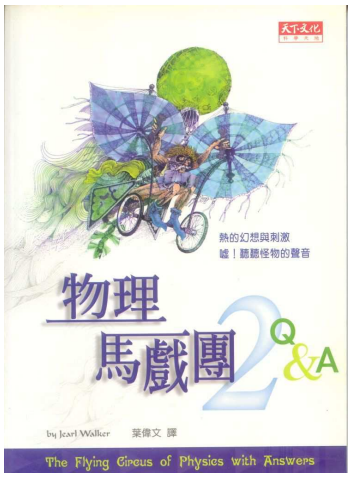
The Flying Circus of Physics. First Edition. Jearl Walker. John Wiley & Sons

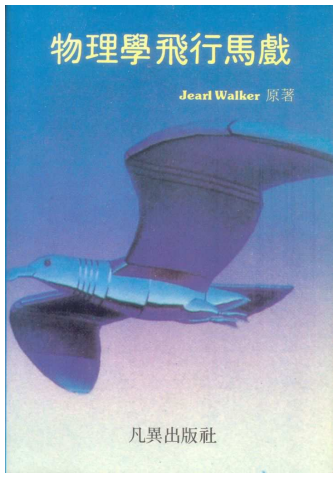
original 1975 

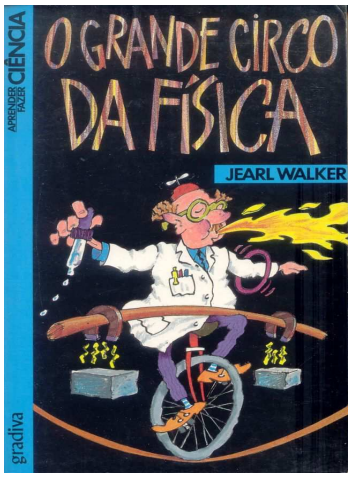
revised 1977 

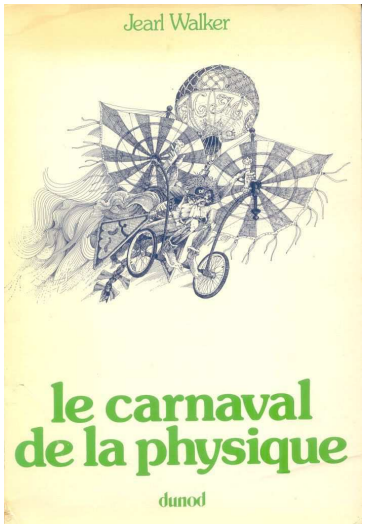
Translations

German, 1977, 1983 Spanish, 1979 Russian, 1980 Japanese, 1979
French, 1980, 1984 Italian, 1981 Arabic, 1981 Greek, 1985
Bulgarian, 1985 Portuguese, 1990, 2001
Chinese (Taiwan, bootleg copy) Chinese (Republic of China), 2000





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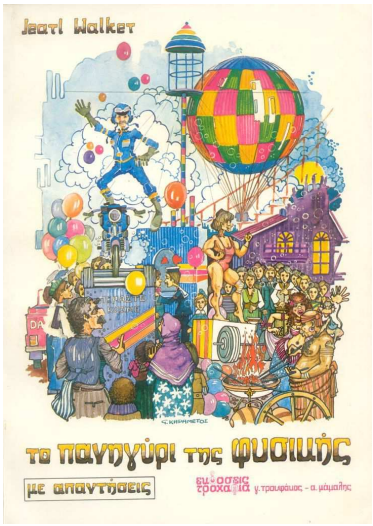
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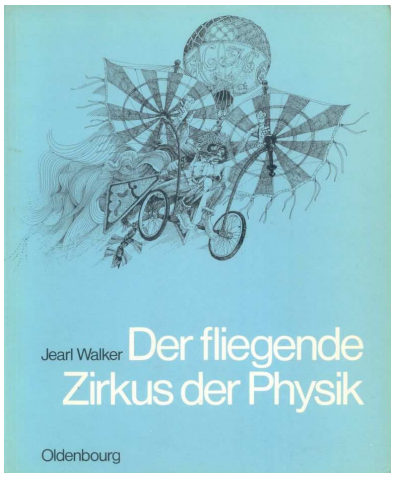
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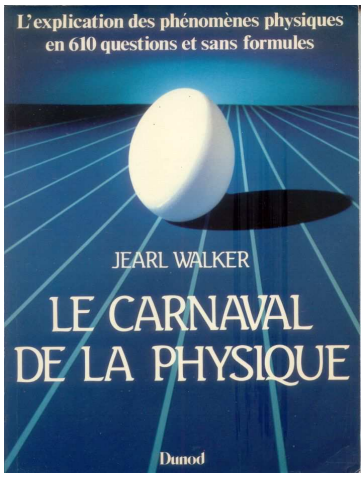
Oldenbourg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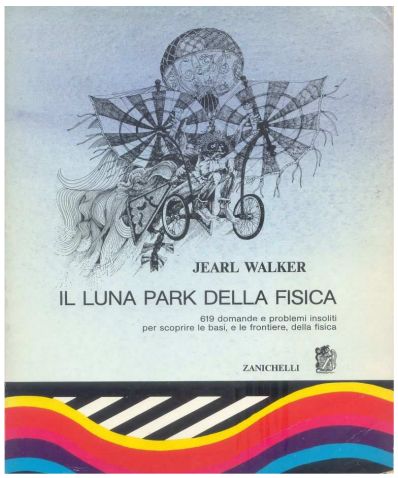
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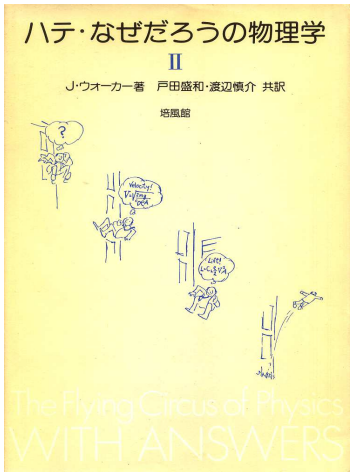
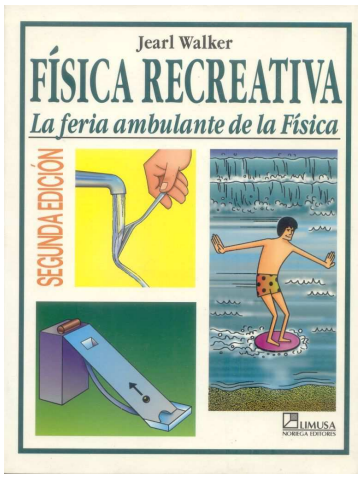




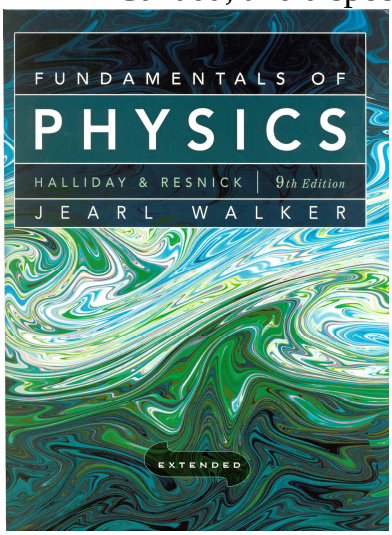
Chinese, part 1

Chinese, part 2

Chinese, part 3

Halliday, Resnick, and Walker, *Fundamentals of Physics*
4/e: 1993 5/e: 1996 6/e: 2002 7/e: 2004 8/e: 2008
9/e: 2010 10/e: 2013 International Student Version 10e: 2014

Translations: Czech, Italian, Portuguese (Brazil), Bahasa-Indonesian, Chinese (two versions of the language), Korean, Japanese, Spanish (Mexico), German, Polish, Philippines, Greek, Turkish, Estonian, French edition for Canada, and a special reprint for India, Bangladesh



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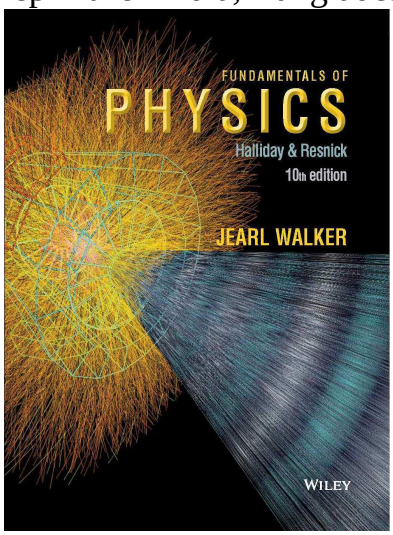

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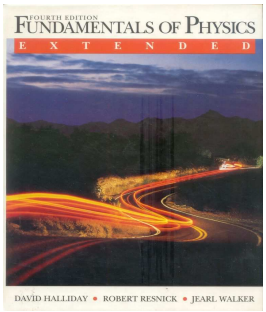

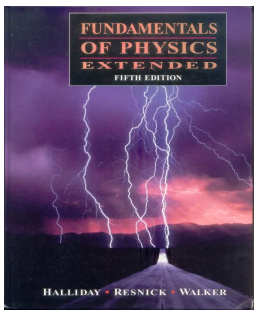

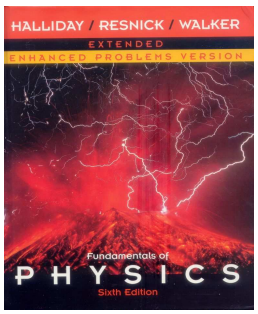

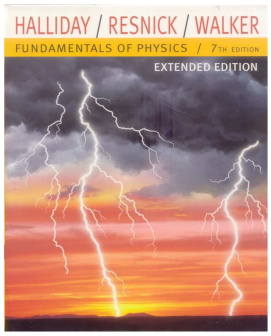

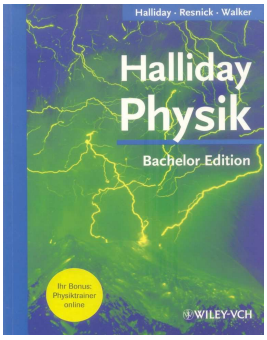
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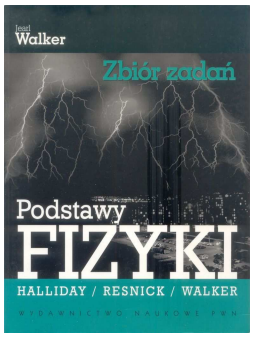
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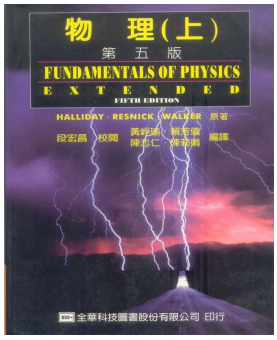
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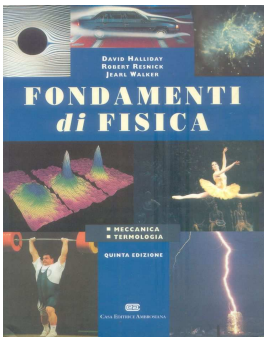
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ROBERT RESNICK
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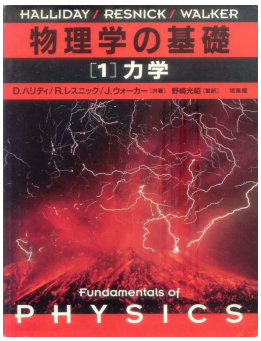
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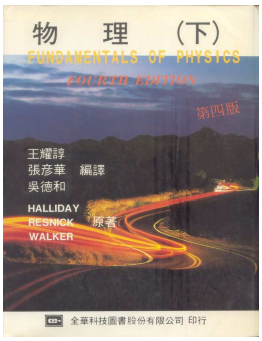
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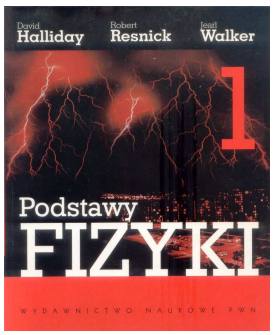
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1
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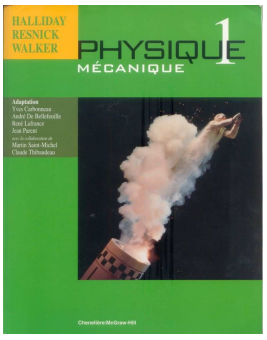
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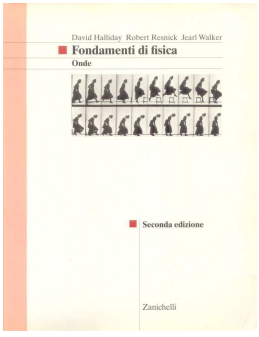
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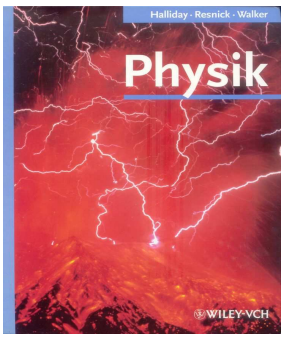
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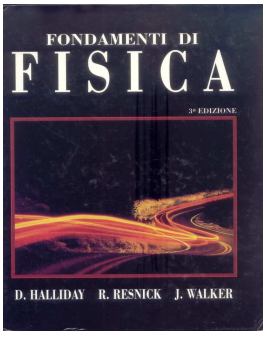
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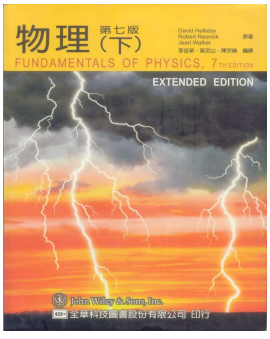
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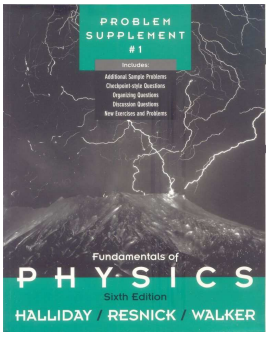
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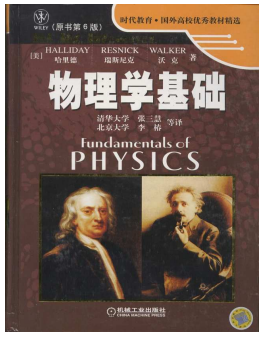
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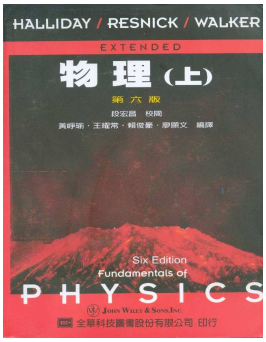
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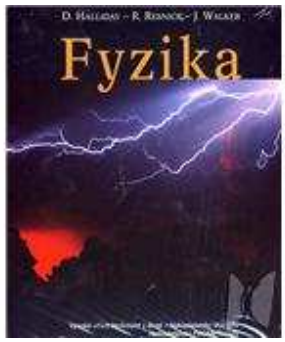
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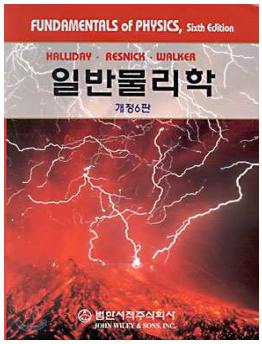
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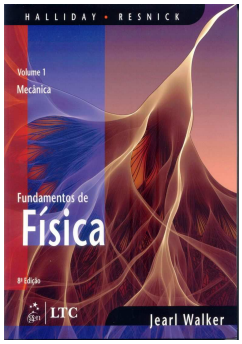
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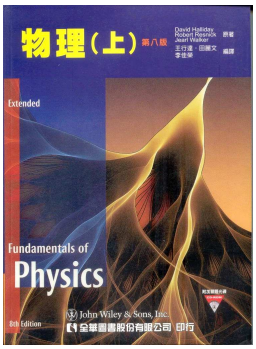
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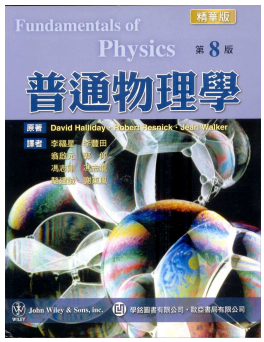
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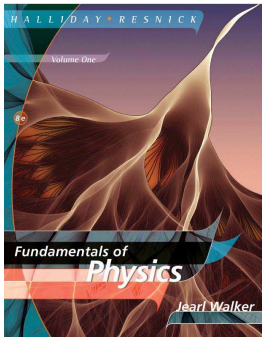
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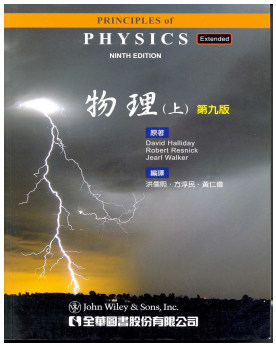
Jearl Walker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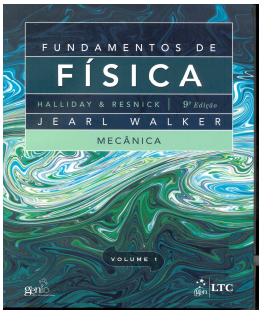
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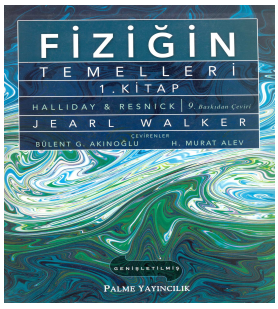
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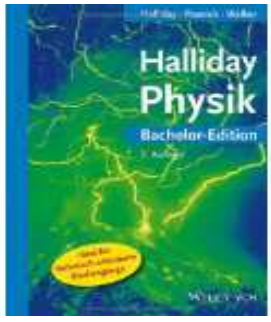
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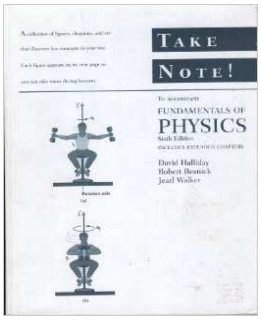
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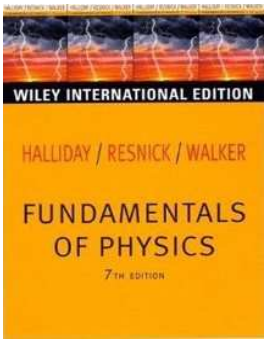
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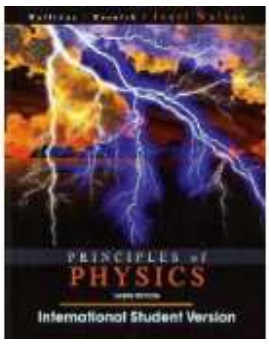
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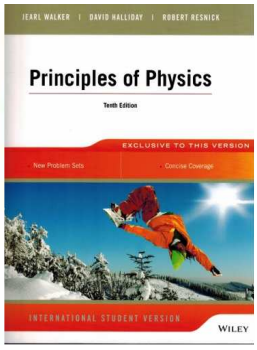
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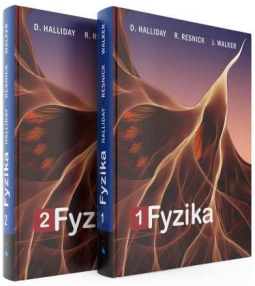
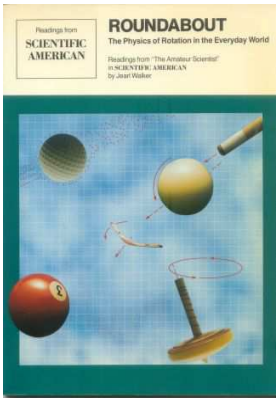
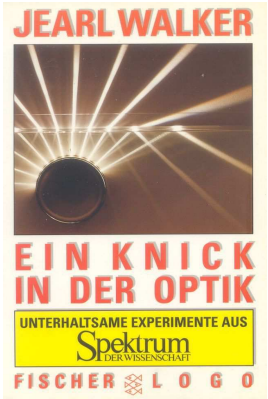
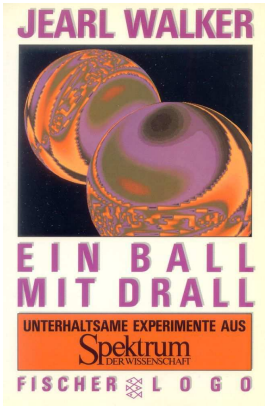


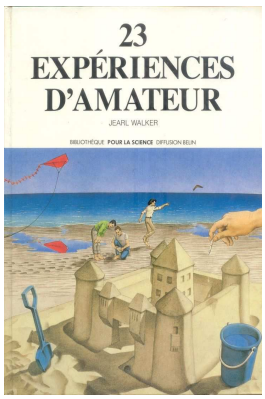
Collections of my articles in Scientific American:

Roundabout: The Physics of Rotation in the Everyday World. Jearl Walker. W. H. Freeman and Company, 1985.







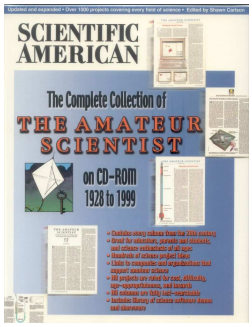


Ein Ball mit Drall: Unterhaltsame Experimente aus "Spektrum der Wissenschaft. Jearl Walker. Fischer Logo, Germany, 1990.

Ein Knick in der Optik: Unterhaltsame Experimente aus "Spektrum der Wissenschaft. Jearl Walker. Fischer Logo, Germany, 1992.

23 Experiences d'Amateur Les Meileures Experiences de Jearl Walker. Bibiotheque Pour la Science, France, 1982.

The Amateur Scientist: 20th Century Collection. CD-ROM that includes all my 152 articles in Scientific American, 2000.



Books edited

1. *Physics of Everyday Phenomena*. Introduction by Jearl Walker. W. H. Freeman and Company, 1979

2. *Light from the Sky*. Introduction by Jearl Walker. W. H. Freeman and Company, 1980

3. *Light and Its Uses: Building and Using Lasers, Holograms, Interferometers and Spectroscopes*. Introduction and editing by Jearl Walker. W. H. Freeman and Company, 1980

Articles not in Scientific American

1. "Physics for Teachers: An Experimental Course." Phil Dilavore and Jearl Walker in The Physics Teacher, Vol. 9, pages 370-377; 1971.

2. "Double Rainbow and Dark Band in Searchlight Beam." John Harsch and Jearl Walker in American Journal of Physics, Vol. 43, pages 453-455; 1975.

3. "Karate Strikes." Jearl Walker in American Journal of Physics, Vol. 43, pages 845-849; 1975 (refereed). Reprinted in Physics 1405: Lecture-Demonstration Notes, edited by Robert Packard. Ginn Press, 1988, and in The Physics of Sports, edited by Angelo Armenti, Jr., American Institute of Physics, 1992.

4. "Behavior of the Sodium and Hydroxyl Nighttime Emissions during a Stratospheric Warming." Jearl Walker and Edith Reed in Journal of the Atmospheric Sciences, Vol. 33, pages 118-130; 1976.

5. "Multiple Rainbows from Single Drops of Water and Other Liquids." Jearl Walker in American Journal of Physics, Vol. 44, pages 421-433; 1976.

6. "Textbook Integrated Problem Sets." Jearl Walker, Virginia F. Walters and Karl J. Casper in American Journal of Physics, Vol. 45, pages 518-521; 1977.

7. "Ideas for the Amateur Scientist." Jearl Walker in The Physics Teacher, Vol. 16, pages 544-549; 1978.

8. "Where's the Fun in Physics?" Jearl Walker in The Science Teacher, Vol. 46, pages 30-32; March 1979.

9. "Physics at the International Science and Engineering Fair." Jearl Walker in The Physics Teacher, Vol. 17, pages 462-463; 1979.

10. "Energy and Work." Jearl Walker in Encyclopedia of Physics, edited by R. G. Lerner and G. L. Trigg. Addison-Wesley Publishing Company, Inc., pages 287-289; 1981.

11. "Stability of a Spinning Book." Jearl Walker in The Physics Teacher, Vol. 19, page 57; January 1981.

12. "Crystals: Cornerstone of Tomorrow's Technology." Jearl Walker in Museum Magazine, Vol. 2, No. 5, pages 53-56; November/December 1981.

13. "Optical Instruments." A. E. E. McKenzie, N. C. McKenzie and Jearl Walker in The Encyclopedia of Physics, third edition, edited by Robert Besancon, Van Nostrand Reinhold Company, Inc., 1985.

14. "Hanging a Spoon from the Nose." Jearl Walker in The Physics Teacher, Vol. 25, No. 4, pages 216-217; April 1987.

15. "Generating Problem Sets with Word Processing Software." Jearl Walker in American Journal of Physics, Vol. 55, No. 12, pages 1141-1142; December 1987.

16. "'The Lonesome Trolley' and other Physics Games." Jearl Walker in The Physics Teacher, Vol. 25, No. 9, pages 574-576; December 1987.

17. Essays in *Fundamentals of Physics*, 3rd ed., by David Halliday and Robert Resnick, John Wiley & Sons, 1988:

"Rush-hour traffic flow," pp. E1-1 through 1-4

"Fear and trembling at the amusement park" (with John Roeder), pp. E2-1 through 2-8

"Boiling and the Leidenfrost effect," pp. E10-1 through 10-6

"Kaleidoscopes," pp. E16-1 through 16-7

18. "Using Refraction Caustics to Monitor Evaporation of Liquid Drop Lenses," James A. Lock, Jearl D. Walker, and James H. Andrews in Applied Optics, Vol. 29, No. 31, pages 4599-4607; June 1990.

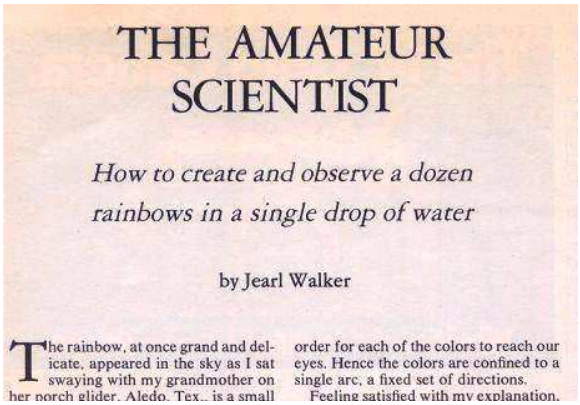
19. Nine of my articles from Scientific American are included in *Teaching Light and Color*, edited by C. J. Chiaverina and T. D. Rossing, published by the American Association of Physics Teachers 2001:
    1. "The Distorted Images Seen in Christmas Tree Ornaments and Other Reflecting Balls," Vol. 259, pp. 112-115, Dec. 1988
    2. "What is a Fish's View of a Fisherman and the Fly He Has Cast on the Water?" Vol. 250, pp. 138-143, March 1984
    3. "Studying Polarized Light with Quarter-Wave and Half-Wave Plate's of One's Own Making," Vol. 237, pp. 172-180, Dec. 1977
    4. "More About Polarizers and How to Use Them, Particularly for Studying Polarized Sky Light," Vol. 238, pp. 132-136, Jan. 1978
    5. "The Colors Seen in the Sky Offer Lessons in Optical Scattering," Vol. 260, pp. 102-105, Jan. 1989
    6. "Some Entertaining Lessons in Optics that may Make Air Travel Easier to Endure," Vol. 259, pp. 100-103, Aug. 1988
    7. "Moire Effects, the Kaleidoscope and Other Victorian Diversions," Vol. 239, pp. 182-188, Dec. 1978
    8. "What Explains Subjective-Contour Illusions, Those Bright Spots That Are Not Really There?" Vol. 258, pp. 96-99, Jan. 1988
    9. "Simple Optical Experiments in Which Spatial Filtering Removes the 'Noise' From Pictures," Vol. 247, pp. 194-205, Nov. 1982

"The Amateur Scientist," monthly in Scientific American

While I wrote for the magazine from 1977 to 1990, my monthly articles were read, on average, by two million people in the United States. They were also translated into Chinese, Italian, French, Japanese, German, Spanish, Arabic, Hungarian, and Russian for publication in the corresponding countries. "The Amateur Scientist" articles were each from 3,000 to 5,000 words long. To date,

these articles have been cited over 300 times in over 150 research journals in a great many different fields.

The entire collection of articles is included in the CD-Rom book *The Amateur Scientist: 20th Century Collection*, published 2000.



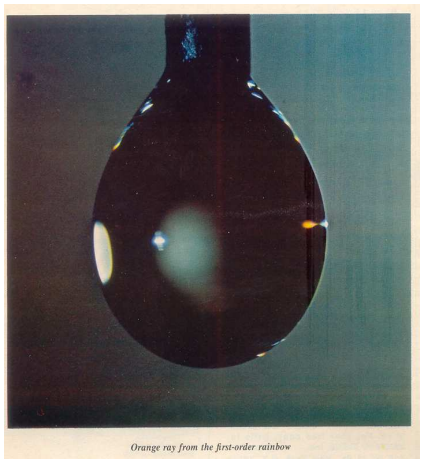
THE AMATEUR SCIENTIST

How to create and observe a dozen rainbows in a single drop of water

by Jearl Walker

The rainbow, at once grand and delicate, appeared in the sky as I sat swaying with my grandmother on her porch glider, Aledo, Tex., is a small

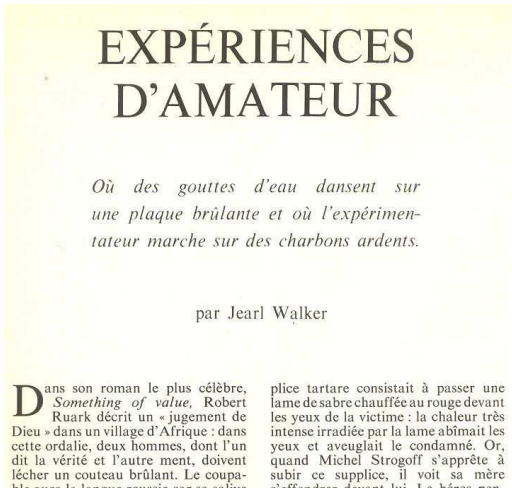
order for each of the colors to reach our eyes. Hence the colors are confined to a single arc, a fixed set of directions. Feeling satisfied with my explanation,



Orange ray from the first-order rainbow

1. "How to create and observe a dozen rainbows in a single drop of water." Multiple order rainbows in various transparent fluids. Vol. 237, No. 1, pages 138-144 + 154; July 1977.

2. "Drops of water dance on a hot skillet and the experimenter walks on hot coals." Leidenfrost phenomena. Vol. 237, No. 2, pages 126-131; August 1977.



EXPÉRIENCES D'AMATEUR

Où des gouttes d'eau dansent sur une plaque brûlante et où l'expérimentateur marche sur des charbons ardents.

par Jearl Walker

Dans son roman le plus célèbre, *Something of value*, Robert Ruark décrit un « jugement de Dieu » dans un village d'Afrique : dans cette ordalie, deux hommes, dont l'un dit la vérité et l'autre ment, doivent lécher un couteau brûlant. Le coupa-

plice tartare consistait à passer une lame de sabre chauffée au rouge devant les yeux de la victime : la chaleur très intense irradiée par la lame abîmait les yeux et aveuglait le condamné. Or, quand Michel Strogoff s'apprête à subir ce supplice, il voit sa mère

3. "How hot water freezes faster than cold water. Why does it do so?" Freezing and cooling rates for water at different initial temperatures. Vol. 237, No. 3, pages 246-257; September 1977.

4. "The salt fountain and other curiosities based on the different density of fluids." Salt fingers, salt oscillators, Rayleigh-Taylor instability. Vol. 237, No. 4, pages 142-150; October 1977.

5. "Wonders of physics that can be found in a cup of coffee or tea." Benard circulation cells, secondary flow, vortexes, cooling rates. Vol. 237, No. 5, pages 152-160; November 1977.

6. "Studying polarized light with quarter-wave and half-wave plates of one's own making." Vol. 237, No. 6, pages 172-180 + 190; December 1977.

7. "More about polarizers and how to use them, particularly for studying polarized sky light." Sky polarization, circularly polarized light. Vol. 238, No. 1, pages 132-136 + 140; January 1978.

8. "Introducing the Musha, the double lozenge and a number of other kites to build and fly." Kite aerodynamics and design. Vol. 238, No. 2, pages 156-161; February 1978.

9. "Visual illusions that can be achieved by putting a dark filter over one eye." Pulfrich pendulum illusion of three dimensional motion. Vol. 238, No. 3, pages 142-153; March 1978.

10. "The physics and chemistry underlying the infinite charm of a candle flame." Vol. 238, No. 4, pages 154-162; April 1978.

11. "What plumes of smoke tell about the structure of the atmosphere." Buoyancy in a stratified atmosphere. Vol. 238, No. 5, pages 162-171; May 1978.

12. "Drops of liquid can be made to float on the liquid. What enables them to do so?" Vol. 238, No. 6, pages 151-158; June 1978.

13. "Chemical systems that oscillate between one color and another." Vol. 239, No. 1, pages 152-160; July 1978. This article reprinted in ChemTech, May 1980.

14. "Observations on grinding glass by hand and on making the most of a fireplace." Scratching in free abrasive grinding; heat radiated by a fireplace; short follow up on the perception of Haidinger's brushes. Vol. 239, No. 2, pages 140-146; August 1978.

15. "The bright colors in a soap film are a lesson in wave interference." Vol. 239, No. 3, pages 232-240 + 242; September 1978.

16. "Some whispering galleries are simply sound reflectors, but others are more mysterious." Acoustical Rayleigh waves and the whispering gallery effect; follow up on multiple order rainbows; short description of selected projects at International Science and Engineering Fair. Vol. 239, No. 4, pages 179-187; October 1978.

17. "Serious fun with Polyox, Silly Putty, Slime and other non-newtonian fluids." Vol. 239, No. 5, pages 186-196; November 1978.

18. "Moire effects, the kaleidoscope and other Victorian diversions." Visual toys. Short pieces: dynamics of a vortex formed from a chimney, and oscillating chemical reactions. Vol. 239, No. 6, pages 182-189 + 198; December 1978.

19. "How to make dazzling photomicrographs with simple and inexpensive equipment." Follow up on cooling rates of water starting from different initial temperatures. Vol. 240, No. 1, pages 152-160; January 1979.

20. "Strange to relate, smokestacks and pencil points break in the same way." Building a telescope timer with an inexpensive hand calculator; why pencil points break; why falling chimneys crack in two. Vol. 240, No. 2, pages 158-166; February 1979.

21. "Boomerangs. How to make them and also how they fly." Vol. 240, No. 3, pages 162-172; March 1979.

22. "More on boomerangs, including their connection with the dimpled golf ball." Vol. 240, No. 4, pages 180-189; April 1979.

23. "How to measure the size of the earth with only a foot rule or a stopwatch." Vol. 240, No. 5, pages 172-182; May 1979.

24. "Experiments with Edwin Land's method of getting color out of black and white." Plus, stereoscopic pairs and thin, colored films on metal. Vol. 240, No. 6, pages 189-200; June 1979.

25. "How to build a simple seismograph to record earthquake waves at home."

Experiment des Monats

Wellen in der Ionosphäre

Von Jearl Walker

Nicht nur in der Troposphäre, sondern auch in den höheren Schichten der Atmosphäre ist die Luft ständig in Bewegung. In der unteren Stratosphäre toben gewaltige Strahlströme (jet streams) mit Geschwindigkeiten von über sechshundert Kilometern pro Stunde, und in der

A. Kohl aus Osseo, Minnesota (USA), angegebenen Apparatur, die ich im folgenden beschreiben werde.

Das Nachweisgerät registriert Veränderungen in der Reflexion von Radiowellen an der Ionosphäre, so daß man aus charakteristischen periodischen

Vol. 241, No. 1, pages 152-161; July 1979.

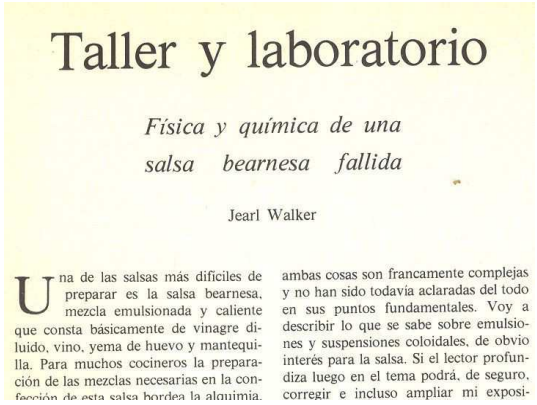
26. "Delights of forming water into sheets and bells with knives, spoons and other objects." Dynamics of water bells and sheets; instability of thin falling streams. Vol. 241, No. 2, pages 188-196; August 1979.

27. "A radiation detector made out of aluminum foil and a tin can." Vol. 241, No. 3, pages 234-246; September 1979.

28. "The mysterious 'rattleback': a stone that spins in one direction and then reverses." Coupling of vibrational and rotational modes in an asymmetric stone. The inversion of a "tippe top." Description of selected projects at the International Science and Engineering Fair. Vol. 241, No. 4, pages 172-184; October 1979.

29. "Flames in which air is introduced into a flammable gas rather than vice versa." Also, a follow up on the cracking of tall structures as they fall. Vol. 241, No. 5, pages 192-204; November 1979.

30. "The physics and chemistry of a failed sauce bearnaise." Colloid suspensions, diffuse double layer of charges, flocculation. Vol. 241, No. 6, pages 178-199; December 1979.



Taller y laboratorio

Física y química de una salsa bearnesa fallida

Jearl Walker

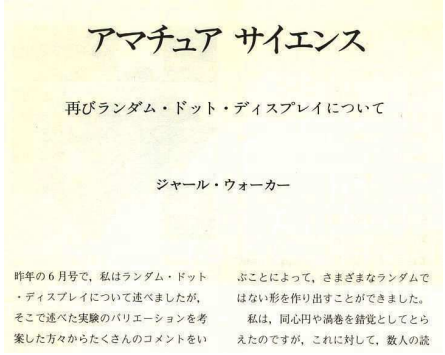
Una de las salsas más difíciles de preparar es la salsa bearnesa, mezcla emulsionada y caliente que consta básicamente de vinagre diluido, vino, yema de huevo y mantequilla. Para muchos cocineros la preparación de las mezclas necesarias en la confección de esta salsa bordea la alquimia. ambas cosas son francamente complejas y no han sido todavía aclaradas del todo en sus puntos fundamentales. Voy a describir lo que se sabe sobre emulsiones y suspensiones coloidales, de obvio interés para la salsa. Si el lector profundiza luego en el tema podrá, de seguro, corregir e incluso ampliar mi exposi-

31. "A homemade spectrophotometer scans the spectrum in a thirtieth of a second." Vol. 242, No. 1, pages 150-160; January 1980.

32. "Easy ways to make holograms and view fluid flow, and more about funny fluids." Vortex visualization with shadows; simple procedure for hologram production; short follow up on non-newtonian fluids. Vol. 242, No. 2, pages 158-170; February 1980.

33. "Stalking the fossil trilobite, crinoid and seed fern in Ohio." Vol. 242, No. 3, pages 184-192; March 1980.

34. "Visual illusions in random-dot patterns and television 'snow'." Pattern perception in



アマチュア サイエンス

再びランダム・ドット・ディスプレイについて

ジャール・ウォーカー

昨年の6月号で，私はランダム・ドット・ディスプレイについて述べましたが，そこで述べた実験のバリエーションを考案した方々からたくさんのコメントをいぶことによって，さまざまなランダムではない形を作り出すことができました。

私は，同心円や渦巻を錯覚としてとらえたのですが，これに対して，数人の読

random-dot Moire patterns. Vol. 242, No. 4, pages 172-176; April 1980.

35. "Illusions in the snow: more fun with random dots on the television screen." Perception of depth in a random noise display. Vol. 242, No. 5, pages 176-184; May 1980.

36. "Mysteries of rainbows, notably their rare supernumerary arcs." Vol. 242, No. 6, pages 174-184; June 1980.

37. "In judo and aikido application of the physics of forces makes the weak equal to the strong." Forces, torques and angular momentum in judo and aikido. Vol. 243, No. 1, pages 150-161; July 1980.

38. "Dazzling laser displays that shed light on light." Techniques for a laser light show. Vol. 243, No. 2, pages 158-168; August 1980.

39. "Billows in the ionosphere are tracked with transistor radios." Simple apparatus with which to detect atmospheric gravity waves. Vol. 243, No. 3, pages 232-243; September 1980.

40. "A homemade mercury-vapor ion laser that emits both green and red-orange." Vol. 243, No. 4, pages 204-209; October 1980.

41. "More about random-dot displays, plus computer programs to generate them." Practical uses for perception organizations in random-dot displays. Also, visual illusion due to line sweep on television screen. Vol. 243, No. 4, pages 198-208; November 1980.

42. "The physics of the patterns of frost on a window, plus an easy-to-read sundial." Vol. 243, No. 5, pages 230-238; December 1980.

43. "More about edifying visual spectacles produced by laser." More techniques for a laser light show. Plus, short follow up on bearnaise sauce. Vol. 244, No. 1, pages 164-170; January 1981.

44. "How can the amateur detect metals in air, liquids or solids? Sam Epstein discourses." Detection of toxic metals by chemical spot testing. Vol. 244, No. 2, pages 168-175; February 1981.

45. "The physics of spinning tops, including some far-out ones." Vol. 244, No. 3, pages 182-192; March 1981.

46. "The charm of hydraulic jumps, starting with those observed in the kitchen sink." Shock wave transitions in water. Vol. 244, No. 4, pages 176-184; April 1981.

47. "About phosphenes: luminous patterns that appear when the eyes are closed." Also, an expansion of computer program for sundial of December 1980. Vol. 244, No. 5, pages 174-184; May 1981.

48. "The physics and chemistry of the lemon meringue pie." Protein chemistry of beaten egg whites. Vol. 244, No. 6, pages 194-200; June 1981.

49. "Anamorphic pictures: distorted views from which distortion can be removed." Plus, depth perception in a CRT monitor. Vol. 245, No. 1, pages 176-187; July 1981.

50. "Interference patterns made by motes on dusty mirrors." Whewell-Quetelet pattern and the Fraunhofer pattern (corona). Vol. 245, No. 2, pages 146-152 + 154; August 1981.

51. "Why do honey and syrup form a coil when they are poured?" Stresses in viscous streams. Short follow up on hydraulic jumps. Vol. 245, No. 3, pages 216-224; September 1981.

52. "The aerodynamics of the samara: winged seed of the maple, the ash and other trees." Vol. 245, No. 4, pages 226-236; October 1981.

53. "The pleasures of the pinhole camera and its relative the pinspeck camera." Vol. 245, No. 5, pages 192-200 + 202; November 1981.

54. "Reflections on the rising bubbles in a bottle of beer." Science in a glass of beer: mist, bubbles and foam; follow up on phosphenes. Vol. 245, No. 6, pages 172-178; December 1981.

55. "Why do particles of sand and mud stick together when they are wet?" Sandcastles and mudpies --- the cohesiveness of powders. Vol. 246, No. 1, pages 174-179; January 1982.

56. "The 'speckle' on a surface lit by laser light can be seen with other kinds of illumination." Speckle interference patterns in coherent light from a laser and the sun. Vol. 246, No. 2, pages 162-169 + 170; February 1982.

57. "Motors in which magnets attract other magnets in apparent perpetual motion." Vol. 246, No. 3, pages 142-150; March 1982.

58. "'Floaters: visual artifacts resulting from blood cells in front of the fovea." Various entoptic phenomena, plus short pieces on reverse stereoscopic viewing and the pinspeck camera. Vol. 246, No. 4, pages 150-162; April 1982.

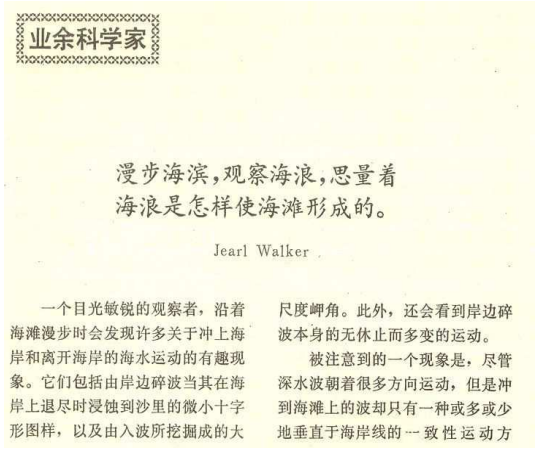
59. "What makes you sound so good when you sing in the shower?" Vol. 246, No. 5, pages 170-177; May 1982.

60. "The essence of ballet maneuvers is physics." Vol. 246, No. 6, pages 118-125; June 1982.

61. "In which a Lifesaver lights up in the mouth and light takes funny bounces through a lens." Triboluminescence; gradient-index devices. Vol. 247. No. 1, pages 146-154; July 1982.

62. "Walking on the shore, watching the waves and thinking on how they shape the beach." Vol. 247. No. 2, pages 144-148; August 1982.

63. "When different powders are shaken, they seem to have lives of their own." Plus, short note on the entoptic phenomenon of "floaters." Vol. 247, No. 3, pages 206-216; September 1982.


业余科学家

漫步海滨，观察海浪，思量着
海浪是怎样使海滩形成的。

Jearl Walker

一个目光敏锐的观察者，沿着海滩漫步时会发现许多关于冲上海岸和离开海岸的海水运动的有趣现象。它们包括由岸边碎波当其在海岸上退尽时浸蚀到沙里的微小十字形图样，以及由入波所挖掘成的大尺度岬角。此外，还会看到岸边碎波本身的无休止而多变的运动。

被注意到的一个现象是，尽管深水波朝着很多方向运动，但是冲到海滩上的波却只有一种或多或少地垂直于海岸线的一致性运动方

64. "Delights of the 'wobbler', a coin or a cylinder that precesses as it spins." Also, short pieces on the "rattleback" spinning toys and how bubbles are created in beer. Vol. 247, No. 4, pages 184-192; October 1982.


Наука вокруг нас

Почему слипаются влажные частицы песка и глины?

ДЖИРЛ УОЛКЕР

«ЗАМКИ» из песка и «пироги» из глины лепят для забавы, но они наводят на интересные размышления. Хотя песок и грязь состоят из частиц в основном одинакового состава, их свойства сильно различаются. Действием каких сил объясняется прочность замков из песка и пирогов из глины? И почему замки из песка рассыпаются после высыхания, а пироги из глины остаются целыми? Чем объясняется

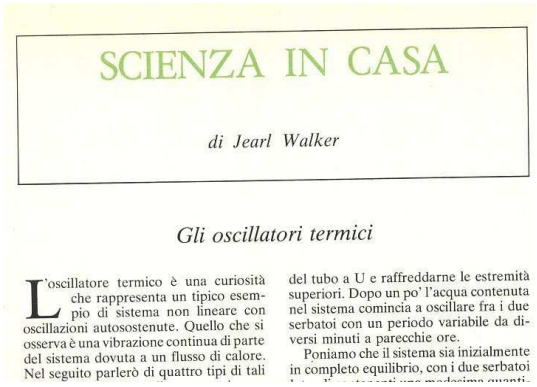
Прочность влажного песка объясняется электрическим взаимодействием между этими положительными ионами и молекулами воды, находящимися между песчинками. Согласно несколько устаревшей модели такого взаимодействия, вода является поставщиком отрицательных ионов (OH^-), которые притягиваются к песчинкам и электрически экранируют места, где

65. "Simple optical experiments in which spatial filtering removes the 'noise' from pictures." Vol. 247, No. 5, pages 194-205; November 1982.

66. "What happens when water boils is a lot more complicated than you might think." Vol. 247. No. 6, pages 162-171; December 1982.

67. "Simple and vivid demonstrations of advanced concepts in physics." Using minimal equipment to measure optical Doppler shift, the gravitational constant and Planck's constant. Vol. 248, No. 1, pages 130-137; January 1983.

68. "Thermal oscillators: systems that seesaw, buzz or howl under the influence of heat." Vol. 248. No. 2, pages 146-153; February 1983.



SCIENZA IN CASA

di Jearl Walker

Gli oscillatori termici

L'oscillatore termico è una curiosità che rappresenta un tipico esempio di sistema non lineare con oscillazioni autosostenute. Quello che si osserva è una vibrazione continua di parte del sistema dovuta a un flusso di calore. Nel seguito parlerò di quattro tipi di tali

del tubo a U e raffreddarne le estremità superiori. Dopo un po' l'acqua contenuta nel sistema comincia a oscillare fra i due serbatoi con un periodo variabile da diversi minuti a parecchie ore.

Poniamo che il sistema sia inizialmente in completo equilibrio, con i due serbatoi

69. "How to analyze a city traffic-light system from the outside looking in." The physics behind platoon formations in traffic. Vol. 248, No. 3, pages 138-145; March 1983.

70. "How lenses can be made out of ice, and what happens when coffee is brewing in the ibrik." Vol. 248, No. 4, pages 132-138; April 1983.

71. "What causes the 'tears' that form on the inside of a glass of wine?" Maragoni effects, and patterns in thin layers of evaporating fluids. Vol. 248, No. 5, pages 162-169; May 1983.

72. "What causes the color in plastic objects stressed between two polarizing filters?" Vol. 248, No. 6, pages 146-152 + 154; June 1983.

73. "The physics of the follow, the draw and the masse (in billiards and pool)." Vol. 249, No. 1, pages 124-129; July 1983.

74. "In which simple equations show whether a knot will hold or slip." The physics of the clove hitch and other knots. Vol. 249, No. 2, pages 120-127; August 1983.

75. "Caustics: mathematical curves generated by light shined through rippled plastic." Catastrophe theory applied to optics. Vol. 249, No. 3, pages 190-202; September 1983.

76. "Thinking about physics while scared to death (on a falling roller coaster)." Physics at the amusement park. Vol. 249, No. 4, pages 162-169; October 1983.

77. "Looking into the ways of water striders, the insects that walk (and run) on water." Vol. 249, No. 5, pages 188-197; November 1983.

78. "Funny things when drops of oil or other substances are placed on water." Thin films of organic liquids in contact with water. Vol. 249, No. 6, pages 164-170; December 1983.

79. "The spectra of street lights illuminate simple principles of quantum mechanics." Vol. 250, No. 1, pages 138-142; January 1984.

80. "How to stop a spinning object by humming and perceive curious blue arcs around a light." Humming at the proper frequency forces a stroboscopic freezing of a spinning object. Purkinje's perceptional blue arcs are investigated. Vol. 250, No. 2, pages 136-145; February 1984.

81. "What is a fish's view of a fisherman and the fly he has cast on the water?" Optics involving sighting through the air-water boundary. Vol. 250, No. 3, pages 138-144; March 1984.

82. "The physics of Grandmother's peerless homemade ice cream." Freezing point depression by salt; ice formation in the ice cream. Vol. 250, No. 4, pages 150-153; April 1984.

83. "In which heating a wire tells a lot about shifts in the crystal structure of steel." Vol. 250, No. 5, pages 148-153; May 1984.

84. "Gismos that apply non-obvious physical principles to the enjoyment of cooking." Vol. 250, No. 6, pages 146-153 + 154; June 1984.

85. "People listening to a bell can perceive sounds the bell does not really make." Vol. 251, No. 1, pages 132-137; July 1984.

86. "Deep think on dominoes falling in a row and leaning out from the edge of a table." Vol. 251, No. 2, pages 122-129; August 1984.

87. "Success in racquetball is enhanced by knowing the physics of the collision of ball with wall." Vol. 251, No. 3, pages 215-227; September 1984.

88. "The troublesome teapot effect, or why a poured liquid clings to the container." Vol. 251, No. 4, pages 144-152; October 1984.

89. "A ball bearing aids in the study of light and also serves as a lens." Vol. 251, No. 5, pages 186-193 + 194; November 1984.

90. "Edge waves form a spokelike pattern when vibrations are set up in a liquid." Vol. 251, No. 6, pages 130-139; December 1984.

91. "Searching for patterns of rainfall in a storm." Vol. 252, No. 1, pages 112-119; January 1985.

92. "Bidwell's ghost and other phenomena associated with the positive afterimage." Vol. 252, No. 2, pages 122-127; February 1985.

93. "A field formula for calculating the speed and flight efficiency of a soaring bird." Plus, more about the positive afterimage of last month's article, and more on racquetball techniques. Vol. 252, No. 3, pages 122-127; March 1985.

94. "Experiments with the external-combustion fluidyne engine, which has liquid pistons." Vol. 252, No. 4, pages 140-144; April 1985.

95. "Cat's cradles and other topologies formed with a two-meter loop of flexible string." Vol. 252, No. 5, pages 138-143; May 1985.

96. "How the sun's reflection from water offers a means of calculating the slopes of waves." Also, notes on the stacking strategies for dominoes. Vol. 252, No. 6, pages 130-134; June 1985.

97. "Fly casting illuminates the physics of fishing." Vol. 253, No. 1, pages 122-126; July 1985.

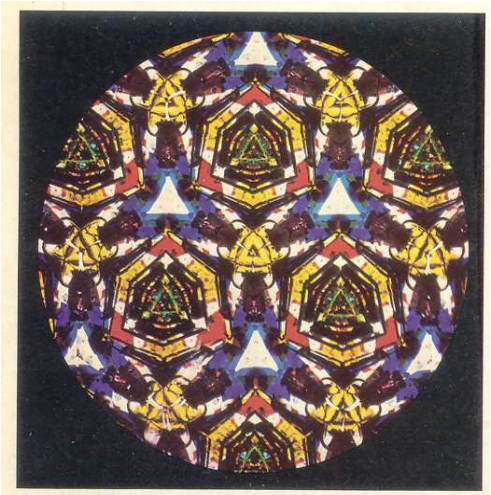
98. "Cooking outdoors with simple equipment demonstrates aspects of thermal physics." Vol. 253, No. 2, pages 114-118; August 1985.

99. "What forces shape the behavior of water as a drop meanders down a windowpane?" Vol. 253, No. 3, pages 138-143; September 1985.

100. "Strange things happen when two pendulums interact through a variety of interconnections." Vol. 253, No. 4, pages 176-180; October 1985.

101. "How best to see Halley's comet while it is in view during the next few months." Vol. 253, No. 5, pages 170-177; November 1985.

102. "The kaleidoscope now comes equipped with flashing diodes and focusing lenses." Vol. 253, No. 6, pages 134-145 + 150 + front cover; December 1985.



Kaleidoscope objects in clear oil

103. "An inexpensive homemade polarimeter can analyze optically active compounds." Plus, a short piece on kaleidoscope symmetries. Vol. 254, No. 1, pages 120-125; January 1986.

104. "A homemade device for testing particle scattering; experiments in zero gravity." Vol. 254, No. 2, pages 114-118; February 1986. Homemade Rutherford scattering.

105. "Methods and optics of perceiving color in a black-and-white grating." Vol. 254, No. 3, pages 112-118; March 1986. McCollough effect.

106. "Wonders with the retroreflector, a mirror that removes distortion from a light beam." Vol. 254, No. 4, pages 118-124; April 1986. Optical phase conjugation.

107. "Wire that 'remembers' its shape is put to work running an engine." Vol. 254, No. 5, pages 124-127; May 1986. The shape-memory alloy Nitinol.

108. "Mirrors make a maze so bewildering that the explorer must rely on a map." Vol. 254, No. 6, pages 120-126 + 128 + front cover; June 1986.

109. "Exotic patterns appear in water when it is freezing or melting." Vol. 255, No. 1, pages 114-119; July 1986.

110. "Retracing the steps by which aluminum metal was initially purified back in 1886." Vol. 255, No. 2, pages 116-119; August 1986.

111. "Rainbow holograms, unlike conventional ones, can be observed in ordinary light," Vol. 255, No. 3, pages 114-119; September 1986.

112. "Cracks in a surface look intricately random but actually develop rather systematically," Vol. 255, No. 4, pages 204-209; October 1986.

113. "The hyperscope and the pseudoscope aid experiments on three-dimensional vision," Vol. 255, No. 5, pages 134-138; November 1986.

114. "Methods for going through a maze without becoming lost or confused," Vol. 255, No. 6, pages 140-147; December 1986.

115. "Reflections from a water surface display some curious properties," Vol. 256, No. 1, pages 120-126; January 1987.

116. "The secret of a microwave oven's rapid cooking action is disclosed," Vol. 256, No. 2, pages 134-138; February 1987.

117. "Calculating the distance to the sun by observing the trail of a meteor," Vol. 256, No. 3, pages 122-126; March 1987.

118. "Making a barometer that works with water in place of mercury," Vol. 256, No. 4, pages 122-127; April 1987.

119. "Concerning disappearances, including the Cheshire cat's odd vanishing act," Vol. 256, No. 5, pages 122-126; May 1987; visual effects --- the "Cheshire-cat" effect and the rhino-optical effect.

120. "Puzzles in two and three dimensions and ways to simplify their solution," Vol. 256, No. 6, pages 122-126; June 1987.

121. "Why a fluid flows faster when the tube is pinched," Vol. 257, No. 1, pages 104-107; July 1987.

122. "Music and ammonia vapor excite the color pattern of a soap film," Vol. 257, No. 2, pages 104-107; August 1987.

123. "Sticky threadlike substances that tend to draw themselves out into bead arrays," Vol. 257, No. 3, pages 108-111; September 1987.

124. "Now there is Rubik's Magic, a new puzzle that provides a study in permutation operators," Vol. 257, No. 4, pages 170-173; October 1987.

125. "Fluid interfaces, including fractal flows, can be studied in a Hele-Shaw cell," Vol. 257, No. 5, pages 134-138; November 1987.

126. "How to capture on film the faint glow emitted when sticky tape is peeled off a surface," Vol. 257, No. 6, pages 138-141; December 1987.

127. "What explains subjective-contour illusions, those bright spots that are not really there?" Vol. 258, No. 1, pages 96-99; January 1988.

128. "The feathery wake of a moving boat is a complex interference pattern," Vol. 258, No. 2, pages 124-127; February 1988.

129. "Why sidespin helps the bowler --- and how to keep scoring strikes," Vol. 258, No. 3, pages 110-113; March 1988.

130. "How to map electrically charged patches with parsley, sage, rosemary and thyme," Vol. 258, No. 4, pages 114-117; April 1988.

131. "Icicles ensheathe a number of puzzles: just how does the water freeze?" Vol. 258, No. 5, pages 114-117; May 1988.

132. "Does convection or the Bernoulli principle make the shower curtain flutter inward?" Vol. 258, No. 6, pages 116-119; June 1988.

133. "Shadows cast on the bottom of a pool are not like other shadows. Why?" Vol., 259, No. 1, pages 116-119; July 1988.

134. "Some entertaining lessons in optics that may make air travel easier to endure," Vol. 259, No. 2, pages 100-103; August 1988.

135. "Shock front phenomena and other oddities to entertain a bored airline passenger," Vol. 259, No. 3, pages 132-135; September 1988.

136. "Drop two stacked balls from waist height; the top ball may bounce up to the ceiling," Vol. 259, No. 4, pages 140-143; October 1988.

137. "The cafe-wall illusion, in which rows of tiles tilt that should not tilt at all," Vol. 259, No. 5, pages 138-141; November 1988.

138. "The distorted images seen in Christmas-tree ornaments and other reflecting balls," Vol. 259, No. 6, pages 112-115; December 1988.

139. "The colors of the sky offer lessons in optical scattering," Vol. 260, No. 1, pages 102-105; January 1989.

140. "In an emergency stop, should a car's wheels be locked or should the braking be controlled?" Vol. 260, No. 2, pages 104-107; February 1989.

141. "How to get the playground swing going: a first lesson in the mechanics of rotation," Vol. 260, No. 3, pages 106-109; March 1989.

142. "How to stop worrying about vibration and make holograms viewable in white light," Vol. 260, No. 5, pages 134-137; May 1989.

143. "The mechanics of rock climbing, or surviving the ultimate physics exam," Vol. 260, No. 6, pages 118-121; June 1989.

144. "What do phonograph records have in common with windshield wipers?" Vol. 261, No. 1, pages 106-109; July 1989.

145. "How to analyze the shock waves that sweep through expressway traffic," Vol. 261, No. 2, pages 98-101; August 1989.

146. "A drop of water becomes a gateway into the world of catastrophe optics," Vol. 261, No. 3, pages 176-179; September 1989.

147. "How to build a Hele-Shaw cell and watch bubbles playing tag in a viscous fluid," Vol. 261, No. 4, pages 116-119; October 1989.

148. "Colored segments of a grid can shed a diffuse glow like the light from a neon tube," Vol. 261, No. 5; pages 94-97; November 1989.

149. "Why are the first few puffs the hardest when you blow up a balloon?" Vol. 261, No. 6, pages 136-139; December 1989.

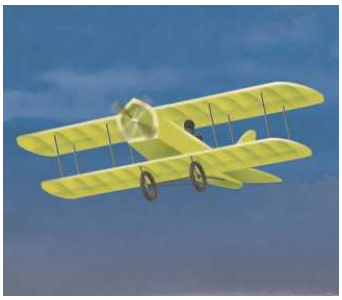
150. "A backyard version of a Stirling engine can be built with common materials," Vol. 262, No. 1, pages 140-144; January 1990.

151. "When a polymer sheet is stretched, it may 'neck' long before it snaps," Vol. 262, No. 2, pages 100-105; February 1990. Includes the optical scattering properties of stretched and unstretched polymer sheets --- the "nude-in-the-shower effect."

152. "A homemade copper chloride laser emits powerful bursts of green and yellow light," Vol. 262, No. 4, pages 114-117; April 1990.

Publications in progress

Continuous work for the web-based learning site for *Fundamentals of Physics*, 10th edition, primarily over 1500 videos (Camtasia format) for minilectures, math aids, and problem solutions. Another 3000 videos in progress.



Continuous work for www.flyingcircusofphysics.com , the web site for *The Flying Circus of Physics*, 2nd edition. The site contains over 200 new stories, over 2000 video links, and over 11,000 citations to research papers. The site began in June 2006. In its first 2.5 years of operation, it had over 280,000 visits and over 440,000 page views from over 170 countries, with downloads totaling more than 82 GB in bandwidth. Every month four new stories are posted.

Papers contributed to meetings

1. "Radiation-Induced Electron Trapping in M.I.S. Transistors." V. Danchenko, S. Brashears and Jearl Walker. International Conference on the Properties and Uses of M.I.S. Structures, Grenoble, France, 1969.

2. "Correlation of a Stratospheric Warming with OGO-4 Measured Nightglows." Jearl Walker and Edith Reed. Conference on the Upper Atmosphere, American Meteorological Society, Atlanta, 1974.

3. "Machine Grading and Grade Updating for Large Classes." Karl Casper, Jearl Walker and Virginia F. Walters. Summer Meeting of the American Association of Physics Teachers, Rolla, Missouri, 1976.

Invited presentations

1. **"Rainbows,"** evening talk at the American Physical Society, Ohio Section, at the University of Akron, October 1976.

2. **"Night Flashes,"** multiple-image slide shows, given at the following:

(1) Annual Meeting of Association for Advancement of Science (AAAS), Washington, DC, February 1978, attendance was about 3,000.
(2) Northeastern Ohio Teachers Association (NEOTA), Baldwin-Wallace College, October 1976.
(3) National Convention, National Science Teachers Association, Boston, December 1977.
(4) Joint Summer meeting, Canadian Association of Physics (CAP) and the American Association of Physics Teachers, London, Ontario, June 1978.
(5) Chemical Education Conference, Philadelphia, August 1978.
(6) Eastern Area Convention, National Science Teachers Association, Hartford, Conn., October 1979.
(7) Cleveland Section, American Chemical Society, February 1981.

3. "What's Wrong with Physics Education?"

(1) Science Teachers Association of New York State (STANYS), New York, November 1978.
(2) Regional Meeting, American Association of Physics Teachers, Texas, November 1978.

4. In service programs, presented to elementary and secondary school teachers as part of their continued education.

(1) Cuyahoga Heights Public Schools, Ohio, April 1980.
(2) Hurst-Euless-Bedford Independent School District, Texas, August 1981.
(3) Jennings Summer Workshop for Science Teachers, Cleveland, four day workshop for physical science teachers from Ohio, sponsored by the Martha Holden Jennings Foundation, every June, from 1983 through 1991.
(4) Jennings Foundation, program for teachers (K through 9) from the general Cleveland area, January 1984 and February 1985.
(5) Workshop for physical science teachers, Cleveland Public School System, 16 May 1987 -- part of Carnegie grant, see below.

5. **"Using Theater Techniques in Physics Classes."** Presented at the conference, "Theater Techniques for Science Communications," New Orleans, February 1979, sponsored by the Association of Science-Technology Centers.

6. **"The Amateur Scientist"**
(1) Northeast Ohio Junior Science and Humanities Symposium, Kent, January 1980.
(2) Spring Science Symposium, Akron Public Schools, Akron, Ohio, March 1981.

7. "Using Amateur Science in Physics Education"
(1) Alberta's Science Council Conference, Alberta, September 1980.
(2) Physics Department, University of Manitoba, Winnipeg, October 1980.
(3) Science Teachers Association of Texas, El Paso, November 1980.
(4) Physics Department, Rutgers University, April 1981.
(5) Ontario Section, American Association of Physics Teachers, Toronto, June 1981.
(6) Physics Department, Indiana State University, September 1981.
(7) Physics Department, University of North Carolina, Raleigh-Durham, September 1981.
(8) Tenth Quincy Conference, Quincy, Illinois, October 1981.
(9) Physics Department, Dickinson College, Carlisle, Pennsylvania, November 1981.
(10) Joint Meeting, Texas Sections of the American Association of Physics Teachers and the Society of Physics Students, Texas Christian University, Fort Worth, November 1981.
(11) Philadelphia Section, American Chemical Society, December 1981.

8. "The Flying Circus of Physics"

(1) (twice) Annual Meeting, American Association for the Advancement of Science (AAAS), San Francisco, February 1974 and Boston, February 1976.
(2) Goddard Space Flight Center, NASA, Greenbelt, Maryland, October 1976.
(3) Northeastern Ohio Teachers Association (NEOTA), at Baldwin-Wallace College, October 1976.
(4) Physics Department, Miami University of Ohio, November 1976.
(5) National Convention, National Science Teachers Association (NSTA), Cincinnati, March 1977.
(6) Physics Department, Ohio University, April 1977.
(7) Eastern Regional Meeting, National Science Teachers Association, Boston, December 1977.
(8) Annual Meeting, American Association of Physics Teachers (AAPT), San Francisco, January 1978.
(9) Annual New Hampshire Spring Science Conference, May 1978.
(10) Joint Summer Meeting, Canadian Association of Physics (CAP) and the American Association of Physics Teachers, London, Ontario, June 1978.
(11) International Commission on Physics Education, Oxford, England, July 1978.
(12) Chemical Education Conference, Pennsylvania, August 1978.
(13) Illinois Section, American Association of Physics Teachers, October 1978.
(14) Cleveland Regional Council of Science Teachers, October 1978.
(15) Science Teachers Association of Ontario Conference (STAO), Toronto, November 1978.
(16) Science Teachers Association of New York State (STANYS), New York, November 1978.
(17) Regional Meeting, American Association of Physics Teachers, Texas, November 1978.
(18) Regional Meeting, National Science Teachers Association, New Orleans, November 1978.
(19) Ohio Junior Science and Humanities Symposium, at Ohio University, March 1979.
(20) New Jersey Section, American Association of Physics Teachers, March 1979.
(21) New England Society of Physics Students, New England Sections of the APS and AAPT, Lowell, Massachusetts, April 1979.
(22) Physics Department, University of Texas at Arlington, May 1979.
(23) "Professional Study Day" for the Baltimore County Public Schools, August 1979.

(24) Physics Department, Simon Freaser University, Vancouver, B. C., September 1979.
(25) Physics Department, University of British Columbia, Vancouver, B. C., September 1979.
(26) Physics Department, University of New Brunswick, Canada, October 1979.
(27) Eastern Area Convention, National Science Teachers Association, Hartford, Conn., October 1979.
(28) Science Teachers' Society, Saskatoon, Saskatchewan, November 1979.
(29) Physics Department, University of Maryland, College Park, November 1979.
(30) Physics Department, Sam Houston State University, Huntsville, Texas, February 1980.
(31) Science Bowl, sponsored by the Physics Department, Western Illinois University, March 1980.
(32) Physics Club, Akron, Ohio, April 1980.
(33) Alberta's Science Council Conference, Alberta, September 1980.
(34) Science Teachers of Manitoba Conference, Winnipeg, October 1980.
(35) Science Teachers Association of Texas, El Paso, November 1980.
(36) Youth Symposium, American Association for the Advancement of Science, Toronto, January 1981.
(37) East Central Ohio Junior Science and Humanities Symposium, Millersburg, Ohio, February 1981.
(38) Science Education Council of Ohio Convention, Columbus, March 1981.
(39) State Science Day, The Ohio Junior Academy of Science, Ohio Wesleyn University, May 1981.
(40) International Mathematical Olympiad, held at Georgetown University, July 1981.
(41) North Carolina School of Science and Mathematics, Raleigh, September 1981.
(42) Tenth Quincy Conference, Quincy, Illinois, October 1981.
(43) The 1981 Glover Memorial Lecture, Dickinson College, Carlisle, Pennsylvania, November 1981.
(44) Joint Meeting, Texas Sections of American Association of Physics Teachers and the Society of Physics Students, TCU, Fort Worth, November 1981.
(45) Philadelphia Section, American Chemical Society, December 1981.
(46) Christmas Lecture, York University, Toronto, December 1981.
(47) Physics Conference, New Jersey Institute of Technology, Newark, March 1982.
(48) The Citadel, South Carolina, March 1982.
(49) College of Charleston, Science Series, April 1982

(50) Governor's Summer Institute for Gifted and Talented High School Students, CSU, July 1986, July 1987
(51) Joint meeting of Akron and Cleveland Sections of the American Chemical Society, February 1989
(52) Joint Conference OSAPS/AAPT/SPS, Cleveland State University, October 2005
(53) Physics and Astronomy Club, Case Western Reserve University, October 2006
(54) Kent State University, talk sponsored by Liquid Crystal Institute, Physics, Chemistry, Biology, Mathematical Sciences and Computer Sciences, November 2006
(55) Ohio Wesleyan University, Department of Physics and Astronomy, January 2007
(56) MEHA conference, Cleveland March 2007
(57) Military Academy at West Point, August 2007
(58) University of Waterloo, Physics Department faculty retreat, December 2007
(59) South Dakota State University, Physics Department colloquium and also a public lecture, February 2008
(60) Joint Professional Development Conference of the South Dakota Science Teachers Association and the South Dakota Council of Teachers of Mathematics, session talk and also the banquet talk, February 2008
(61) 2009 Margaret B. Hayes Lecture at Oberlin College, February 2009
(62) Northeast Ohio Section of the AAPT, Baldwin Wallace College, March 2009

The Flying Circus of Physics talk was given as presentations or classes to promote the Halliday-Resnick-Walker textbook:
2007: University of Florida (Gainesville), University of Central Florida, San Diego State University, University of San Diego, University of California at Los Angeles, University of California at San Diego, University of Southern California

9. Commencement address, "The Event Horizon," Cleveland State University, 12 June 1988

10. Shows for IBM conventions, 1988: 7 shows Miami Beach, 2 shows Montreal, 2 shows Bermuda, 2 shows Puerto Rico, 1 show West Palm Beach. 1990: 2 shows, Australia. 1991: 1 show, New Jersey.
Production agent: Decomas, New York.

11. Faculty seminars and colloquia, “Presentation of Energy and Work in Introductory Physics Textbooks”
    University of Florida, 28 September 2000
    Louisiana State University, 24 October 2000
    Lehigh University, 3 May 2001

Funded grants

1. CSU Research Initiation Grant ($2,000), "Mie Scattering from Individual Drops," 1974.
2. Center for Effective Learning, CSU, Instructional Assistance Grant ($1,000 + $300), "Real World Physics," 1974.
3. Vice Presidential Instructional Development Grant ($2,000), "Audio-Tutorial Physics Courses for Students Unable to Attend Regular Classes," with Karl Casper, 1975.
4. Center for Effective Learning, CSU, Instructional Assistance Grant ($1,000), "Game Playing," 1975.
5. National Science Foundation ($38,000) "Pre-College Teacher Development in Science Program," co-investigator, 1978.
6. CSU Development Foundation ($3,300), "Laser Light Shows for Recruitment of High School Students," 1979.
7. Carnegie Corporation ($9,700), workshops for 24 physical science teachers, part of proposal submitted by the Cleveland Education Fund, 1986/87; CSU's part proposed and enacted by Jearl Walker and Frank Johns (education).
8. National Science Foundation ($835,597), "The Video Encyclopedia of Physics Demonstrations," principal investigators: Bennett Glotzer (The Education Group, Inc.), Richard Berg (Univ. Maryland), and Jearl Walker. Funded 1991. Video-disk series finished 1992. Now available on DDV and on Ohio Link Web service.

Department and University assignments

Department: Lab Committee and Curriculum Committee, 1974-1985.
University: CORE committee for the Center for Effective Learning to review grant proposals, 1977-1978.
Ad-hoc committee on patents and inventions, 1981.
University Recruitment Committee, 1986
Distinguished Faculty Award Committee, 1994
Advisor to physics majors and minors, 1990-present

summer 2005, chairman of department search committee for lab manager
fall 2005 – spring 2006, chairman of department search committee for assistant professor
fall 2005 – present, department PRC
fall 2005 - spr 2007, College of Science PRC
spr 2007, search committee for Dean of College of Science
spr 2010 Selection Committee, 2010 Distinguished Faculty Teaching, Research and Service Awards
fall 2010 College of Science and Health Professionals PRC
fall 2009-spr 2011, PRC, BGES
fall 2010-present, PRC, Math

Professional organizations
American Association of Physics Teachers (AAPT)

Service and media
Over 100 pieces about me and my work, in television, radio, newspapers and magazines. Of note:

New Scientist, 1981 People Magazine, 1981
PM Magazine (a TV show, the piece was aired both locally and on the national syndication, 1981)
National News of CBC television in Canada, 1981
Cleveland Magazine, 1981 WCLQ, channel 61, 1983
CBS Evening News, 1984
Smithsonian magazine, Oct. 1986, pp. 112-121
Monitor Radio, National Public Radio Network, 4 Nov 86
The Christian Science Monitor newspaper, 17 Nov 86
NBC Evening News, 3 Dec 86 (repeated on the morning news show)
Johnny Carson, "The Tonight Show," 22 July 87
"Celebrating Cleveland," channel 5, 4 Dec and 17 Dec 89
The 25th Anniversary Show of WVIZ, Feb 90

Other professional work

1. Associate Editor, American Journal of Physics, 1977-1980.

2. Editorial Board, SciQuest Magazine, American Chemical Society, 1980-1982.

3. Editorial Adviser, Contact Magazine, published by Children's Television Workshop for the age group of 9 to 12, 1980-1990.

4. Judge for the finals of the International Science and Engineering Fair:
   Cleveland, 1977 Orange County, CA, 1978 San Antonio, 1979
   St. Paul, 1980 Milwaukee, 1981 Houston, 1982
   Albuquerque, 1983 Columbus, 1984 Shreveport, 1985
   Fort Worth, 1986 San Juan, Puerto Rico, 1987 Pittsburgh, 1989

5. Approximately weekly contributions to "Quirks and Quarks," a nationwide radio program about science, on the Canadian Broadcasting Corporation, from 1978 through 1990 (with the exception of the first half of 1989); CBC Radio estimated that the show had about 400,000 listeners. Here are two examples:
   http://archives.cbc.ca/IDC-1-41-1723-11853/sports/golfing/clip3
   http://archives.cbc.ca/IDCC-1-41-550-2826/sports/curling/

6. Six-show series for WVIZ-TV (PBS), titled "The Kinetic Karnival of Jearl Walker," 1981. Videotapes are sold nationally to teachers.
   Awards for the series:
   (1) 1983 Ohio State Award, an international award
   (2) 1982 Ohio Educational Broadcasting Network Commission award
   Award for me:
   An Emmy, Cleveland Chapter of the National Academy of Television Arts and Sciences, 14th Annual Awards (June 1983), for "Individual Achievement -- Non-News -- Talent"
   The shows are:
   (1) Forces in collisions
   (2) Rotation
   (3) Fluid flow and friction
   (4) Viscosity: Newtonian and non-Newtonian
   (5) The Leidenfrost effect
   (6) The science of cooking

7. Writer for the pilot of a science series for television, National Film Board of Canada, 1982.

8. One contribution to "The Nature of Things," a nationwide television show about science, on the Canadian Broadcasting Corporation, 1979.

9. Piece on soap bubbles, part of videotape prepared by WVIZ-TV (PBS) under contract with The Exploratorium of San Francisco, intended for science classes at sixth grade level, 1983.

10. Design and production of videotapes distributed by the Physics Department to local high school teachers:
    (1) "The Leidenfrost Effects," 1978.
    (2) "A Day at the Physics Olympics," 1980; also had limited national distribution.

11. Host to Northeast Ohio Physics Olympics for area high school teachers and students, yearly, 1980 to 1995.

12. Book reviews:
    American Journal of Physics
    SciQuest, 1980: "The Physicists" by Daniel J. Kevles.
        1982: "Polywater" by F. Franks, "The Comet Is Coming" by N. Calder and "The Search for Gravity Waves" by P. C. W. Davies.
    Physics Today, 1985: "Biophysical Aerodynamics and the Natural Environment" by A. J. Ward-Smith.

13. Referee for American Journal of Physics (yearly), Science (12 times over many years), Nature (1986) and Canadian Journal of Physics (1987).

14. Design and production of three multiple-image slide shows shown yearly, one show for each quarter of introductory physics. Attendance per show ran about 2,000 persons. Shows created in 1974 and 1975, redesigned in 1976 and shown until 1981.

15. Consultant on the editing of science textbooks by D. C. Heath and Company for grade levels K through 6, 1983 and 1987, and for the junior high school levels, 1986 - 1989 (Physical Science: The Challenge of Discovery by Mark A. Carle, Mickey Sarquis and Louise Mary Nolan, 1991).

16. "Popular Science," a column for Cleveland Edition newspaper, about 800 words each, 1984-1985
    (1) "Smoke gets in your eyes: beating your barbecue's vicious cycle," 30 Aug.
    (2) "The complete angler: this is now the ball bounces," 13 Sep.

(3) "Toilet roll mystery solved: professor dispenses with an old problem," 27 Sep.
(4) "Timed release: coping with rush hour traffic frustration," 11 Oct.
(5) "When drinks cry: why those little tears form in your booze," 25 Oct.
(6) "Potato voodoo: spiking your spud for speed," 8 Nov.
(7) "Hot foot: how to walk over coals, if you want to," 29 Nov.
(8) "Star search: one wise man's guide to the galaxy," 6 Dec.
(9) "Shake, rattle and roll: inner workings of a kaleidoscope," 10 Jan.

17. Courtroom expert witness: October 1984 (a fall), January 1985 (traffic accident), February 1986 (traffic accident).

18. Articles for the World Book Encyclopedia, 1985, 1986.

19. Member of the Science Advisory Board (Cleveland Science Collaborative) for the Cleveland Education Fund, part of the Cleveland Foundation, 1986-1987.

20. Consultant for television advertising, DMB&B Agency, New York, for Proctor and Gamble, Paper Division (Pampers) account, 1986-1987.

21. Member of the Physics Advisory Committee for Cuyahoga Community College, 1986-1989.

22. Guest appearances on "Newton's Apple" a nationally televised show on PBS:
1989, physics of quicksand 1990, physics of judo

23. "Jearl's World," a column in Science World, a magazine published by Scholastic, Inc., for the junior high school market, about 700,000 readers, 1989:

hanging a spoon, 24 Feb	microwave cooking, 24 Mar
roller coasters, 7 Apr	surfing, 5 May
toilet paper and torques, 8 Sep	liquid-thread instability, 22 Sep
karate physics, 6 Oct	surviving a falling elevator, 20 Oct
football spin, 17 Nov	

24. Videotape about physics education, prepared because of a request that was relayed by the United States Information Agency (U. S. State Department), played at a conference of high school teachers in Swaziland, telephone interview followed; summer 1988.

25. Books for which I have written the foreword:
Clouds in a Glass of Beer: Simple Experiments in Atmospheric Physics, Craig F. Bohren, John Wiley & Sons, 1987.

Turning the World Inside Out, and 174 Other Simple Physics Demonstrations, by Robert Ehrlich, Princeton University Press, 1990.

26. About 20 articles published in various newspapers around the country, co-authored with Bill Sones.

27. Guest appearances on "The Daily Planet, a science show on the Discovery Channel Canada
1996: 3 times 2000: 5 times 2007: 1 time 2008: 10 times
2010: 15th Anniversary Show

Awards

1. "Junior Distinguished Faculty Award," Cleveland State University, 1977.
2. "Distinguished Service Citation," American Association of Physics Teachers, 1981.
3. "The Glover Award," The 1981 Glover Memorial Lecture, Dickinson College, Carlisle, Pennsylvania.
4. Emmy Award, Cleveland Chapter of the National Academy of Television Arts and Sciences, 14th Annual Awards, June 1983.
5. Honorary Member of the Golden Key National Honor Society, May 1988.
6. "The 1988 Shurter Distinguished Educators Award," The Martha Holden Jennings Foundation, May 1988.
7. Outstanding teaching award from the College of Science, CSU, April 2005
8. Outstanding teaching award from Cleveland State University, January 2010
9. Osher Fellowship, Exploratorium, San Francisco, May16-June 3 2011
10. Fellow, American Association of Physics Teachers, 2014

See other awards under "Kinetic Karnival," listed above.