

VITA

ALAN J. FRIEDMAN

SPECIAL INTERESTS

Communication of science and technology to the general public, students, and teachers, through museum exhibits, interdisciplinary courses, lectures, and mass media.

Development of exhibitions, programs, staff, and structure for museums.

Research on the cultural influences of science and technology; for example, *Einstein as Myth and Muse*, by Alan J. Friedman and Carol C. Donley, published by the Cambridge University Press.

EDUCATION

Ph. D. in Physics, Florida State University, 1970

B. S. in Physics, Georgia Institute of Technology, 1964

EMPLOYMENT

Consultant in Museum Development and Science Communication, 2006 – present

Assisting museums, government agencies, foundations, and other organizations in developing exhibitions and programs, planning new institutions and expansions, and developing policies for education. Writing and lecturing on science and its relationship to the broader culture.

Director, New York Hall of Science, 1984 – 2006

Responsible for selecting staff, developing exhibition and education programs, fund raising, and renovating the physical plant for New York City's science and technology museum. Planned and directed the growth of the institution from 1984, with a staff of 3 and an operating budget of \$300,000, to 250 full-time and part-time employees and an annual operating budget of \$11 million. Capital projects included a \$13 million renovation/expansion completed in 1996, and a \$92 million expansion completed in 2006.

Conseiller Scientifique et Muséologique, Cité des Sciences et de l'Industrie, Parc de La Villette, Paris, 1982 – 1984

Senior planning consultant on science content, exhibitions, program development, and general museum operations for France's new national science museum. Special responsibilities in the children's area, the astronomy program, and the research group.

Director of Astronomy and Physics, Lawrence Hall of Science, University of California, Berkeley, 1973 - 1984 (on leave, 1982 - 1984)

Responsible for creating and managing a diverse program of research, curriculum development, and implementation of science education projects for children, teachers, adults, and family audiences. Directed five National Science Foundation-funded projects, including "Activity-Based Planetarium Programs," which pioneered the technique of audience participation in public planetarium programs. Directed "Star Games," an exhibition replicated by ten museums in four countries.

Assistant Professor of Physics (Instructor, 1969-70), Hiram College, Ohio, 1969 - 1974

Developed undergraduate physics courses and laboratories. Conducted research with undergraduate students in low-temperature physics. Instituted two interdisciplinary courses, "Science in Twentieth-Century British and American Fiction," and "Stars, Clocks, and Men."

Teaching and Research Assistant (Dissertation Fellow, 1968-69), Department of Physics, Florida State University, Tallahassee, 1964 – 1969

Conducted research in low-temperature solid state physics and magnetic critical phenomena. Dissertation: *Specific Heat of MnBr₂ Near the Critical Point*.

Research Assistant, Diffraction Laboratory, Engineering Experiment Station, Georgia Institute of Technology, 1960 – 1964

Crystallography research using x-ray, neutron, and electron diffraction.

VISITING APPOINTMENTS

Visiting Scholar and Adjunct Professor, Graduate program in museum studies, New York University, 1996 - 2000

Visiting Assistant Professor, American Studies Program and Department of English, Temple University, Philadelphia, Fall 1975

Visiting Lecturer, Department of English (1974) and Center for Innovative and Interdisciplinary Sciences (1975), San Francisco State University

Research Fellow, English Department, University of California, Berkeley, 1972

HONORS

Award for Excellence in Science Education, Lawrence Hall of Science, University of California, Berkeley, 2008

Centennial Honor Roll, American Association of Museums, 2006

Distinguished Informal Science Education Award, National Science Teachers Association, 2006

Andrew Gemant Award, American Institute of Physics, 2004

Fellow Award for Outstanding Contribution, Association of Science-Technology Centers, 2003

Honorary Doctorate of Humane Letters, Pace University, 2000

Fellow, New York Academy of Sciences, 1999

Fellow, American Association for the Advancement of Science, 1997

Special Recognition Award, Mayor's Awards for Excellence in Science and Technology, 1996

American Association for the Advancement of Science Award for Public Understanding of Science and Technology, 1996-7

International Planetarium Society Service Award, 1990

Professional Award of Merit, Astronomical Association of Northern California, 1983

Distinguished Service Award, Mid-Atlantic Planetarium Society, 1982

Younger Humanist Fellowship, National Endowment for the Humanities, 1972-73

Phi Beta Kappa
Sigma Pi Sigma

CONSULTING

Academy of Natural Sciences, Philadelphia: exhibit on dinosaurs
Adler Planetarium, Chicago: exhibit on antique astronomical instruments
American Association for the Advancement of Science: Chautauqua program
American Association of Museums: seminars in the humanities
American Physical Society: planning for an exhibition on the history of the AIP
Association of Science-Technology Centers: exhibit on microprocessors
Association of Science-Technology Centers: climate change project consortium
At-Bristol, England: review of a millennium project museum complex
Bishop Museum, Honolulu: exhibition and planetarium program on Polynesian navigation
Canadian Parks Service, Halifax: planning for Alexander Graham Bell Historic Park
California Academy of Sciences, San Francisco: review institutional strategic plan
California Science Center, aerospace exhibition hall
Edwin Schlossberg, Inc., NY: exhibitions for Discover World, Ohio
Empire State Stem Cell Board: planning for public education on stem cell research
Exploratorium, San Francisco: outdoor exhibits, center for learning and teaching
Franklin Institute, Philadelphia: exhibit on timekeeping; review institutional strategic plan
Golden Gate Bridge Highway Transportation District: outdoor exhibitions
Invention Factory, Trenton NJ: planning for a new science center
Ironbridge Institute, UK: museum management training
Jewish Community Centers of Chicago: designing an outdoor science exhibition
Lawrence Hall of Science: development of an exhibition on Ernest Orlando Lawrence
Lowell Observatory, Flagstaff: exhibit on history of astronomy
Mary Brogan Museum of Art & Science, Tallahassee, FL: strategic planning
Metaform Inc., NY: exhibition design for Expo 1992 in Spain
Metamorphoses Inc., Montreal: planning the Musée des Sciences et de la Technologie
Milwaukee Public Museum: expansion program
Museums Collaborative, NY: museum education institutes
National Council of Science Museums, Calcutta, India: planning for six museums
National Oceanic and Atmospheric Administration: planning for NOAA's extension, education, and outreach activities
National Science Foundation: creation of a framework for evaluating informal science impact
New York State Stem Cell Science Board: planning for public engagement programs
Noyce Leadership Institute: core faculty for museum leadership development program
Oakland Museum: exhibit on art and astronomy
Pacific Science Center, Seattle: planning a planetarium
Parc de La Villette, Paris: museum planning, program and exhibition development strategies
Quest Productions, Seattle: planning a children's television program
Rochester Museum and Science Center: planning an exhibition area
Schenectady Museum: planning for a relocation and expansion
Science Museum of Minnesota: planning for physical science exhibits
Science Museum of Virginia, Richmond: crystallography exhibition
Sciencenter, Ithaca NY: review institutional strategic plan

SciTech, Aurora IL: high energy physics exhibition
 Scholastic Publications: Advisory Board, *SuperScience* and *Magic School Bus* TV series
 Smithsonian Institution, National Museum of American History: exhibit on timekeeping
 Temple University, Philadelphia: arts and technologies curriculum planning
 Joseph Wetzel Associates, Boston: planning a new museum in Kentucky
 University of California President's Office: planning a television series on scientists
 Visitor Studies Association: co-PI for the Center for the Advancement of Informal Science Education
 Wildlife Conservation Society, Brooklyn Aquarium: "Alien Stingers" exhibition planning
 WGBH-TV, Boston: TV series on women in science and a science series for children

ACTIVITIES IN PROFESSIONAL ORGANIZATIONS

American Association for the Advancement of Science, Committee on Public Understanding of Science and Technology (1997-2003)
 American Association of Museums, Senior Accreditation Examiner (1987-90)
 American Institute of Physics, Public Information Committee (1986-1992), Committee on Career Placement (1990-1996); Gemant Award Committee (2006-), chair (2008-)
 Association of Science-Technology Centers, Board of Directors (1989-1997), Legislative Committee Chair (1992-1995)
 Board of Education of the City of New York, Systemic Initiative Advisory Board (1993-1996)
 Center for Informal Learning and Schools, Exploratorium, Center Review Panel (2002- 2007)
 Cornell University Laboratory of Ornithology, Administrative Board Member (2009-)
 Cultural Institutions Group of New York City, Chair (1999-2001), Steering Committee (1989-2006)
 Department of Education, New York City, co-Chair of Task Force on Science Education (2005)
 Department of Education, New York State, co-Chair of University of the State of New York Summit Planning Advisory Committee (2005-2006)
 Eugene Lang College, The New School University, Board of Governors (2000-2004)
 Hebrew Technical Institute, Board Member (2007 -)
 Informal Science Review, Advisory Board (1993-2005)
 International Planetarium Society, President (1985-1986)
 Journal of Modern Literature, Editorial Advisory Board (1988-2002)
 Merck Institute for Science Education, Advisory Board (1999 -)
 Modern Language Association, Division of Literature and Science, Executive Committee (1977-1981), Chair (1980)
 Museum Studies Journal, Advisory Board (1982 - 1988)
 National Academy of Engineering, Committee on Assessing Technological Literacy (2003 - 2006)
 National Assessment Governing Board (2006 -), Vice-Chair, Assessment Development Committee
 National Science Foundation, Advisory Committee, Directorate for Education and Human Resources (1991 - 1996); Visiting Committee Chair, Science and Mathematics Networks Program (1991) and Informal Science Education Program (1992, 1995); CLT Program Blue Ribbon Committee, (2001 - 2007)
 National Science Teachers Association, Informal Science Education Advisory Board (1995-1997)
 New York Academy of Sciences, Advisory Committee, Forum on Structural Reform in Schools (1989-1990), Educational Advisory Committee (1991 - 1999)
 New York State Association of Museums, Councilor (1987-91)
 Noyce Foundation, Board Member (2006 -)

Pacific Planetarium Association, President (1978)
Renewal Fund Advisory Board, Wellcome Trust, London (2003-2005)
Review Panel Member, National Science Foundation, National Endowment for the Humanities,
New York State Council on the Arts, Massachusetts Cultural Council, United States
Department of Energy
Visitor Studies Association, President (2005 - 2007), Board Member (2003-2009)

PUBLICATIONS

- “You learned how to do that *where?*”, *The Informal Learning Review*, No. 94 (2009), 1-4.
- Framework for Evaluating Impacts of Informal Science Education Projects*, editor and co-author, published on-line at http://insci.org/docs/Eval_Framework.pdf (Washington: National Science Foundation, 2008)
- “The Great Sustainability Challenge: How Visitor Studies Can Save Cultural Institutions in the 21st Century,” *Visitor Studies*, Vol. 10, No. 1 (2007) 3–12.
- “The Extraordinary Growth of the Science-Technology Museum,” *Curator*, Vol. 50, No. 1 (January 2007) 63-75.
- Tech Tally: Approaches to Assessing Technological Literacy*, contributing author, National Research Council, 2006.
- “The Serenity of Science,” in *Remedios Varo/Catalogue Raisonné*, ed. Ricardo Ovalle and Walter Gruen (Ediciones Era, Mexico, 3rd Edition 2002) 75-87, in English and Spanish.
- “TryScience: The Potential Synergy of Multiple-Museum Web Sites,” with Eric Marshall, published on-line at www.nobel.se/nobel/nobel-foundation/symposia/interdisciplinary/ns120/lectures/friedman.pdf (July 2002); in a shorter, modified version with Eric Marshall and Paul Horn as “TryScience: Virtual Synergy,” *Museum News* (March/April 2004) 9-11.
- “Technology Literacy: What Informal Education Has to Offer,” published on-line at www.nae.edu/nae/NAETech.nsf/weblinks/KGRG-58FUU4 (February 2002), and in shorter form in *ASTC Dimensions*, September/October 2002, 3-4.
- “The Scientist’s Science Educator: How One Young Physicist’s Life Was Changed by the Example of Robert Karplus,” in *A Love of Discovery: Science Education—Second Career of Robert Karplus*, ed. Robert G. Fuller (New York, NY: Kluwer Academic/Plenum Publishers, 2002) 247-252.
- “Lessons from English Museums, 1970,” *Journal of Museum Education*, Vol. 26, No. 3 (Fall 2001) 10-12.
- “Museums, Communities, and Contemporary Science,” in *Museums of Modern Science*, ed. Svante Lindqvist (Canton, MA: Science History Publications, 2000) pp. 43-51. Reprinted in English and Portuguese in *Implementation of Science Centers and Museums*, ed. Vanessa F. Guimarães and Gilson Antunes da Silva (Rio de Janeiro: Universidade Federal do Rio de Janeiro, 2002) pp. 292-301; reprinted in *Informal Learning Review* (May/June 2003), 12-15.
- “Response to ‘The Meaning of Sensation’,” *Museum News* (July/August 2000), 22-23.
- “Expanding Audiences: The Audio Tour Access Project at the New York Hall of Science,” *ASTC Dimensions* (July/August 2000) 7-8.

“They're Having Fun, But Are They Learning?” *Parents League Review*, Vol. 32 (1998) 164-170. Reprinted in *Forum on Education of The American Physical Society* (Spring 2001) 9-12; in *Merck Institute for Science Education Newsletter*, 2001; and in Sheila Grinell, ed., *A Place for Learning Science*, 2nd edition (Washington: Assoc. of Science- Tech. Centers, 2003) 24-29.

“What is a Science Centre?” and “Review of the Conference,” in *Science Centres for Ireland*, ed. Ian Elliott, et. al. (Dublin: Royal Dublin Society, 1997) pp. 25-31, 101-105.

“Explaining the Universe/Why Arts Education and Science Education Need Each Other,” *American Art*, Vol. 11, No. 3 (Fall 1997) 2-7.

“The Evolution of Science and Technology Museums,” *The Informal Science Review*, No. 17, March/April 1996, pp. 1, 14-17.

“Differentiating Science-Technology Centers from Other Leisure-time Enterprises,” *ASTC Newsletter*, Vol. 24, No. 1 (1996) 7-10. Shorter version reprinted as “Are Science Centers and Theme Parks Merging?” *The Informal Science Review*, No. 25, Jul/Aug 1997, pp. 1, 4.

“Creating an Academic Home for Informal Science Education,” in *Public Institutions for Personal Learning*, ed. John H. Falk and Lynn D. Dierking (Washington: American Association of Museums, 1995) pp. 135-140. Reprinted in *Curator*, Vol. 38, No. 4 (1995) 214-220; in French in *La Révolution de la Muséologie des Sciences*, ed. Bernard Schiele and Emlyn H. Koster (Lyon, France: Presses Universitaires de Lyon and Sainte-Foy, Québec, Canada: Éditions MultiMondes, 1998) pp. 107-118; in *Science Centers for This Century* (Québec, Canada: Editions MultiMondes, 2000) pp. 125-139; and in English and Portuguese in *Implementation of Science Centers and Museums*, ed. Vanessa F. Guimarães and Gilson Antunes da Silva (Rio de Janeiro: Universidade Federal do Rio de Janeiro, 2002) pp. 76-89.

“Exhibits and Expectations,” *Public Understanding of Science*, Vol. 4 (1995) 305-313.

“Why Did the 1991 Code of Ethics Fail?” *Curator*, Vol. 37, No. 1 (1994) 9-11.

“A Rain forest Ecowalk,” *New York Times*, February 27, 1994, Section 5, pp. 18, 36.

“Convincing the Director,” in *Museum Visitor Studies in the 90s*, ed. Sandra Bicknell and Graham Farmelo (London: Science Museum, 1993) pp. 43-46; reprinted in *Visitor Studies: Theory, Research and Practice*, ed. Don Thompson, et. al. (Jacksonville, AL: Visitor Studies Association, 1993) pp. 256-262, and in *Introduction to Museum Evaluation*, ed. Minda Borun, Randi Korn, and Roxana Adams (Washington, DC: Am. Assoc. of Museums, 1999) pp. 1-4.

Planetarium Activities for Student Success, volumes 1 - 12, series editor with Cary Sneider and Alan Gould, co-author volumes 1, 5, 6, and 8, and author, volume 12 (Berkeley: Lawrence Hall of Science; New York: New York Hall of Science, 1990, 1992, 1993).

“Evaluation and Museum Management,” in *Try It! Improving Exhibits through Formative Evaluation*, ed. Sam Taylor and Beverly Serrell (Washington, D.C.: Association of Science Technology Centers; New York: New York Hall of Science, 1991) pp. 76-86. French edition Dijon: OCIM, 1998.

“Mix and Match/Devising an Appropriate Management Scheme for your Museum,” *Museum News*, Vol. 24, No. 4 (July/August 1991) 38-42.

“Planetariums, ± 25 Years,” *Planetarian*, Vol. 20, No. 1 (1991) 8-13. Also printed in *Constellation*, Vol. 24, No. 4 (1990), and in *Planetarium/A Challenge for Educators* (New York: United Nations, 1992; Japanese edition Osaka: Japan Planetarium Society, 1993).

- “Science and Technology Centers,” with Alan Schwartzman, *Encyclopedia of Architecture* (New York: John Wiley and Sons, 1989) pp. 553-558.
- “Participatory Oriented Planetariums Revisited,” with Cary Sneider, *Planetarian*, Vol. 17, No. 3 (1988) 22, 25.
- “Five Starlabs at the New York Hall of Science: a User’s Report,” with Terry Boykie and Susan J. Barnett, *Planetarian*, Vol. 16, No. 4 (1987) 10-11, 20.
- “The Influence of Pseudoscience, Parascience and Science Fiction,” in *Communicating Science to the Public* (Chichester, England: John Wiley and Sons, 1987) pp. 190-204
- “La Rétroaction comme Mode de Travail” (tr. Huguette Guilhaumon), *Musées*, Vol. 9, No. 2 (1986) 32-34.
- Einstein as Myth and Muse*, with Carol Donley (Cambridge University Press, 1985; Japanese edition Tokyo: Chijin Shokan, 1989).
- “Audience Participation Planetarium Programmes” and “the International Planetarium Society,” *Colloque des Planetariums Européens—Comptes Rendus* (1984), pp. 106-111, 145-147.
- “The Clockwork Universe” (exhibit review), *Technology and Culture*, Vol. 25, No. 2 (April 1984) pp. 280-286.
- “Learning to Control Variables with Model Rockets: A Neo-Piagetian Study of Learning in Field Settings,” with Cary Sneider, Kevin Kurlich, and Steve Pulos, *Science Education*, Vol. 68, No. 4 (1984) 463-484.
- “Science and Technology,” in *Approaches to GRAVITY’S RAINBOW*, ed. Charles Clerc (Columbus: Ohio State University Press, 1983) pp. 69-102.
- “The New Technologies and Museum Education,” *Roundtable Reports*, Vol. 8, No. 5 (1983) 12-14.
- “Ulysses and Modern Science,” in *The Seventh of Joyce*, ed. Bernard Benstock (Bloomington: Indiana University Press; Sussex: The Harvester Press, 1982) pp. 198-206.
- “Monochromatic Light for an Audience Participation Special Effect,” with Alan Gould, *Planetarian*, Vol. 11, No. 3 (Third Quarter, 1982).
- “What do Planetariums do to Visitors?” (editor), *Planetarian*, Vol. 10, No. 4 (Fourth Quarter, 1981) pp. 6-13.
- “The Human Context of Objects,” in *Museums, Adults and the Humanities*, edited by Zipporah W. Collins, American Association of Museums: Washington, D.C., 1981, pp. 147-164.
- Sky Challenger* (activity set) with Budd Wentz (Berkeley: Lawrence Hall of Science, 1980).
- Planetarium Educator’s Workshop Guide*, with Lawrence F. Lowery, Steven Pulos, Dennis Schatz, and Cary I. Sneider, illustrated by Budd Wentz, *International Planetarium Society Special Report*, No. 10, 1980.
- “Star Games: A Participatory Astronomy Exhibit,” with Laurie P. Eason and Cary I. Sneider, *Planetarian*, Vol. 8, No. 3 (1979) 3-7.
- “Summative Evaluation of a Participatory Science Exhibit,” with Cary I. Sneider and Laurie P. Eason, *Science Education*, No. 36 (1979) 25-36.
- “Contemporary American Physics Fiction,” *American Journal of Physics*, Vol. 47, No. 5 (1979)

392-395.

“Summative Evaluation of a Participatory Science Exhibit,” with Cary I. Sneider and Laurie P. Eason, *Science Education*, No. 36 (1979) 25-36.

“Teaching Science Fiction: Unique Challenges,” with Gregory Benford, Samuel Delany, Robert Scholes, and John Woodcock, ed., *Science Fiction Studies*, No. 19, Vol. 6, Part 3 (November, 1979) pp. 249-262. [www.depauw.edu/sfs/backissues/19/teaching19forum.htm]

“A Scientist Who Writes,” review of *A Sense of the Future*, by Jacob Bronowski, ed. by Piero E. Ariotti, *San Francisco Review of Books*, Vol. 3, No. 10 (February 1978) pp. 12-13.

Review, *The Stone Circles of the British Isles*, by Aubrey Burl, *San Francisco Review of Books*, Vol. 3, No. 6 (October 1977) pp. 24-25.

“On Being Wrong,” review of Lowell and Mars, by William Graves Hoyt, *San Francisco Review of Books*, Vol. 3, No. 3/4 (Summer 1977) p. 30.

“Audience Participation and the Future of the Small Planetarium,” with Dennis L. Schatz and Cary I. Sneider, *Planetarian*, Vol. 5, No. 4 (1976) 3-8.

“Self-Discovery in Astronomy for the Public,” with Dennis Schatz, *Sky and Telescope*, No. 52 (1976) 254-258.

“Robert Coover's *Universal Baseball Association* and Modern Physics,” *Trema* (University of Paris), No. 1 (1976) pp. 147-155.

“Participatory Planetarium Shows,” *Planetarium Director's Handbook*, No. 28 (1975) 1-4.

“Elevator Exhibit,” with Laurie Eason, *The Physics Teacher*, No. 13 (1975) pp. 492-493.

“Images of the Universe,” with Andrew Fraknoi, *Mercury*, No. 4 (March-April 1975) pp. 14-17.

“The Novelist and Modern Physics: New Metaphors for Traditional Themes,” *Journal of College Science Teaching*, No. 4 (1975) pp. 310-312.

“Interactive Public Planetarium Programs,” *International Society of Planetarium Educators Special Report*, No. 6 (1974) pp. 52-55.

“Science as Metaphor: Thomas Pynchon and Gravity's Rainbow,” with Manfred Puetz, *Contemporary Literature*, No. 15 (1974) pp. 346-359. Reprinted in Richard Pearce, ed., *Critical Essays on Thomas Pynchon* (Boston: G.K. Hall, 1981) pp. 69-81.

“Physics and Literature in this Century: A New Course,” *Physics Education*, No. 8 (1973) pp. 305-308.

“Alternative Approaches to Planetarium Education,” *Mercury*, No. 2 (November-December 1973) p. 12, 18.

“A High Resolution, Four-Terminal, ac Resistance Bridge for Low Temperature Use,” with M.R. Ody, *Review of Scientific Instruments*, No. 43 (1972) pp. 612-613.

“Professional Politics: A Study of Elbert H. Clark,” *The Broadcaster*, (Summer 1972) pp. 5-8.