

CHEMICAL HERITAGE FOUNDATION

JAMES S. MURDAY

Transcript of an Interview
Conducted by

Cyrus Mody

at

Washington, D.C.

on

29 May 2007

(With subsequent corrections and additions)

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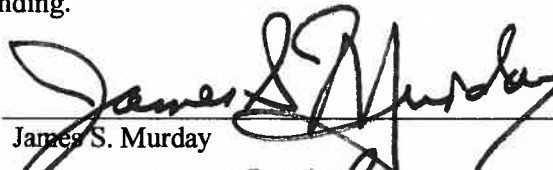
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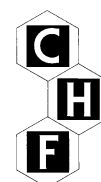
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JAMES S. MURDAY

Education

1964 B.S. , Physics, Magna Cum Laude, Case Inst. of Technology
1969 Ph.D., Physics, Cornell University

Professional Experience

Naval Research Laboratory

1970-1973 Research Physicist, Chemistry Division
1974-1980 Head, Advanced Surface Spectroscopy and Carbon Sections
1974-1987 Part-time Consultant and Program Officer, Office of
Naval Research
1981-1987 Head, Surface Chemistry Division
1988-2006 SES-4 Head, Chemistry Division
1989-1992 Chair, Invention Evaluation Board
1995 Member, InfoVision/2000 (Library) Steering Committee
1995-1998 Chair, Performance Management Committee in NRL Lab
Demonstration Project
1997-2002 Chair, Library Committee
1999-2001 Technical Coordinator, construction project for NRL
Nanoscience Building
2000 Member, Working Group on Defenses Acquisition Workforce
Improvement Act (DAWIA)
2000 Chair, NRL E.O. Hulburt Award Selection Committee
2000-2002 Member, Naval Fuels and Lubricants IPT
2001-2003 Chief Scientist, Office of Naval Research
2001-2006 Chair, Naval Working Group on Nanoscience

American Vacuum Society

1977-1987 Chair, Mid Atlantic Chapter
1982 Chair, National Symposium Local Arrangements Committee
1982-1985 Chair, Trustees
1986 Chair, National Symposium Local Arrangements Committee
1986-1988 Editorial Board, JVST
1987-1988 Board of Directors
1991-1993 President cycle
1996 Chair, Nanometer Structures Division
1998-2001 Chair, Intersociety Interactions Committee
1993-2007 Member, Long Range Planning Committee
1999-2001 Member, Long Range Technical Planning Committee

	American Chemical Society
1983-1985	Executive Committee, Colloid and Surface Chemistry Division
1988	Symposium Co-chairperson 3 rd Chemical Congress of North America
1991	Symposium Co-chairperson 4 th Chemical Congress of North America
	American Institute of Physics
1986-1989	Governing Board
1988-1991	Member, Nominating Committee
1990	Chair, Nominating Committee
1991-1993	Chair, Development Committee
1994-1996	Member, Committee of Committees
1996	Chair, Committee of Committees
	International Union of Vacuum Science, Techniques and Applications
1992-1995	Chair, Steering Committee on Science and Technology of Nanometer Structures
1995-1998	Chair, Nanometer Structures Division
	Institute of Physics, United Kingdom
1994-2001	Editorial Board, Nanotechnology Journal
	Federation of Materials Societies
1995-2003	Trustee
	Department of Defense
1997-1997	Directory of Research (acting), Research and Engineering
1999-2006	Chair/member, Committee on Nanoscience Strategic Research Objective
1999-2006	NSTC Nanoscale Science, Engineering and Technology Subcommittee
	Office of Science and Technology Policy
1999-2006	Executive Secretary, NSTC Nanoscale Science, Engineering and Technology Subcommittee
	National Nanotechnology Coordination Office
2001-2003	Director (half time position)
	University/College (General)
2003-present	Chair, External Advisory Board for University of South Carolina NanoCenter
2004-2006	Chair, External Advisory Board for University of Pennsylvania

2008-present	Nano-Bio Interface Center Member, International Advisory Board, King Abdullah Institute For Nanotechnology
2009-present	Member, External Advisory Board for InterNano at University of Massachusetts, Amherst
2010-present	Member, External Advisory Board for Nanolink at Dakota County Technical College
2006-present	Office of Research Advancement, University of Southern California, Washington, D.C. Associate Director, Physical Sciences

Honors

	Navy Research Lab, Navy, and Department of Defense
1973	Special Achievement Award, NRL
1974	Letter of Commendation from the Chief of Naval Research
1975	Special Achievement Award, NRL
1976	Outstanding Performance Rating
1977	Outstanding Performance Rating
1980	Chemistry Division Publication Award
1981	Certificate of Appreciation, Strategic Systems Project Office
1986	Outstanding Performance Rating
1987	PMRS Performance Awards
1988	PMRS Performance Awards
1990	Outstanding Performance Rating
1990	Technology Transfer Award
1991	SES Bonus Award
1993	Certificate of Commendation, Joint Directors of Laboratories
1995	Leadership Award
1995	Combined Federal Campaign Vice Chairman
1996	SES Bonus Award
1997	Certificate of Appreciation (Dept. of Defense Executive Leadership Development Program)
2000	Meritorious Civilian Service Award, Naval Research Laboratory
2000	Hammer Award
2001	SES Bonus Award
2002	Presidential Rank of Meritorious Executive in the Senior Executive Service
2004	SES Bonus Award
2005	SES Bonus Award

Professional

Fellow, Washington Academy of Sciences

	Fellow, American Vacuum Society
	Fellow, Institute of Physics, United Kingdom
	Honorary Member, American Vacuum Society
1991	Plenary Speaker, Inaugural Meeting of Korean Vacuum Society
1993	Plenary Speaker, Brazilian Vacuum Society Conference
1993	AVS Commendation
1995-2000	Citation of Appreciation from R&D Magazine (R&D100 Award)
2007-2008	Participant, Digitalized Globe Conferences, Allianz SE

ABSTRACT

James S. Murday, at a young age, decided he wanted to be a second Einstein; he wanted to bring important change to the world. In school he always did better in the sciences and math, so he liked them more. He was most interested in the physical sciences, though he liked biology well enough to consider biophysics for a graduate program. He entered Case Institute of Technology, working with Arthur Benade. Case was across the street from Severance Hall, where music offered scope for the practical application of physics, and Murday wrote his senior thesis on the acoustics of flutes. William Gordon, Murday's other major mentor, introduced Murday to nuclear magnetic resonance (NMR).

Fascinated by solid-state physics, Murday entered Cornell University, where he was research assistant for Robert Cotts. Murday's interests expanded to include diffusion. At the time, chemistry's new pulse techniques provided greater impetus for NMR, and Murday exploited the growing interface between chemistry and physics.

When he finished his PhD he was recruited by Henry Resing into the NMR lab at the Naval Research Laboratory (NRL). Resing was working on protective chemistry and needed a diffusion person. Later, Murday became head of the new surface chemistry branch, an event he regards as a turning point in his career, the first step to nanoscience.

Murday discusses his early experiences in the NRL, beginning with the relationship between NRL and the Office of Naval Research, where he was drafted to survey the state of surface science. He describes how he liked being a decision-maker as well as a lab worker, and further describes his experiences as the man who could see the big picture and could find reasons for various agencies and departments to join the American Vacuum Society (AVS).

Murday joined the AVS, which united chemistry, materials science, and electronics. He helped organize AVS's applied division and established the Mid-Atlantic chapter of AVS, thus enhancing his own position there and eventually being elected to the board of directors. When scanning and tunneling microscopes came along, clearly nanostructures were next. AVS officially became the first home of nanoscience. Murday influenced the Defense Advanced Research Projects Agency and the National Science Foundation, both of which had funding in abundance, to get involved in nano. Usefulness of nano for unmanned aircraft drew in the Department of Defense, and all then came up with the Interagency Working Group, which hoped to promote nano to the President and Congress of the United States. It took a couple of years and two presidents, but finally Nanometer Science and Engineering Technology (NSET), a subcommittee of the National Science and Technology Council (NSTC), was born and Murday was named Executive Secretary. Murday was also appointed Director of the National Nanotechnology Coordination Office (NNCO), set up to support NSET. NSET has continued to expand its membership as well as to change its purpose. The character of nano has changed with this expansion and with new technology. Murday felt he was getting stale as Head of the NRL Chemistry Division and that new blood was needed, so he accepted the position of Associate Director for Physical Sciences with University of Southern California's Office of Research Advancement in Washington, D.C.

INTERVIEWER

Cyrus Mody is an assistant professor of history at Rice University. Prior to that position he was the manager of the Nanotechnology and Innovation Studies programs in the Center for Contemporary History and Policy at the Chemical Heritage Foundation. He has a bachelor's degree in mechanical and materials engineering from Harvard University and a Ph.D. in science and technology studies from Cornell. He was the 2004–2005 Gordon Cain Fellow at CHF before becoming a program manager. Mody has published widely on the history and sociology of materials science, instrumentation, and nanotechnology.

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<p>Wanted to be second Einstein. Wanted to do something to cause change in the world. Liked physical sciences best, but also interested in biology. Found sciences and math easiest for him.</p>	
College Years	2
<p>Earned BS degree in physics at Case Institute of Technology. Liked biophysics but stuck to physics. Business manager of Case's magazine. Cross-country team. Senior thesis with Arthur Benade on the acoustics of flutes. William Gordon also major mentor; interested Murday in magnetic resonance.</p>	
Graduate School Years	7
<p>Entered Cornell University. Research assistant for Robert Cotts. Cotts's mentoring, personality, lab work, and management style. Murday's interest in diffusion. Interface between chemistry and physics. New pulse techniques important to nuclear magnetic resonance (NMR). PhD in solid-state physics.</p>	
Beginning Employment Years	15
<p>Recruited by Henry Resing for NMR lab at Naval Research Laboratory (NRL). Protective chemistry. Absorbance research needed diffusion person. Went into surface science to write report for Office of Naval Research (ONR). First step toward nanoscience. Relationship between ONR and NRL. Funding from Defense Advanced Research Projects Agency (DARPA). Becomes head of surface chemistry, then superintendent of chemistry division.</p>	
Moving Up Management Ladder	29
<p>Scanning tunneling microscopy and then atomic force microscopy lead to thinking about nanostructures. Joined American Vacuum Society (AVS), home of surface science. Combined chemistry, materials, electronics; science both basic and applied. IBM and Bell Laboratories dominated surface science. Powerful computers needed. Fusion. Plasma. Department of Energy. Revitalized Mid-Atlantic Chapter of AVS and eventually moved to board of directors.</p>	
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<p>Conferences begin in Europe. American Chemical Society nano meeting disappointing. AVS officially gives nano its first home. ULTRA program. DARPA, National Science Foundation (NSF) involved in nano, have much money. United Kingdom's low energy electron diffraction (LEED) program. A network program (LINK Nanotechnology Programme) was launched in the UK in 1988 with an annual budget of about \$2 million per year. Japan's Aono Atom Craft program. International Union of Vacuum Science Technology and Applications (IUVSTA).</p>	

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<p>Mihail Roco of NSF and Department of Defense join Murday to form Interagency Working Group; President's Council of Advisors on Science and Technology (PCAST) approval; Congressional approval. Selection of name Nanometer Science Engineering and Technology (NSET). Discussion of definition and funding. Murday named director of National Nanotechnology Coordination Office (NNCO), established to support Nanometer Science Engineering and Technology (NSET). Murday named executive secretary of NSET. National Institutes of Health (NIH) becomes involved as nano seems to have therapeutic value. Proteomics. Chemical warfare. Moletronics. Giant magnetoresistance. Spintronics. Economics of research.</p>	
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<p>Murday's two jobs. Director of NSET a full-time job. Murday getting stale. Accepts position as Associate Director for Physical Sciences of the USC Office of Research Advancement in Washington, D.C.</p>	
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