

## **WESLEY L. HARRIS**

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### **RESUME SUMMARY**

Currently, Charles Stark Draper Professor of Aeronautics and Astronautics and Housemaster – New House Residence Hall, Massachusetts Institute of Technology, Cambridge, Massachusetts; former Associate Provost for Faculty Equity, MIT, 2008-2013.

Served as Head of the Department of Aeronautics and Astronautics, MIT, 2003-2008.

Served as Associate Administrator for Aeronautics responsible for all programs, facilities, and personnel in Aeronautics at NASA, 1993-1995.

Performed, from 1990 to 1993, as Vice President and Chief Administrative Officer of the University of Tennessee Space Institute (UTSI), Tullahoma, Tennessee. From 1985 to 1990 served as Dean of the School of Engineering and Professor of Mechanical Engineering at the University of Connecticut, Storrs, Connecticut. And from 1972 to 1985, held several faculty and administrative positions at the Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, including Professor of Aeronautics and Astronautics. Academic research associated with unsteady aerodynamics, aeroacoustics, rarefied gas dynamics, sustainment of capital assets, and chaos in sickle cell disease having made seminal contributions in each of these research fields. In academe, worked with industry and governments to design and build joint industry – government – university research and development programs, centers, and institutes; transferred technology effectively. Credited with more than 130 technical papers and presentations.

Developed an outstanding record in advancing cultural diversity in academe and in government.

Served as chair and member of various boards and committees of the National Research Council (NRC), the National Science Foundation (NSF), the U.S. Army Science Board, and several state governments. Served on committees of the American Institute of Aeronautics and Astronautics (AIAA), the American Helicopter Society (AHS), and the National Technical Association (NTA). Served as advisor to colleges, universities, and institutes.

Earned a Bachelor of Science degree (with Honors) in Aerospace Engineering from the University of Virginia in 1964; a Masters of Arts and a Doctor of Philosophy degree in Aerospace and Mechanical Sciences from Princeton University in 1966 and 1968 respectively. Elected Fellow of the AIAA and of the AHS for personal engineering achievements, engineering education, management, and advancing cultural diversity. Recognized by election to membership in the National Academy of Engineering (NAE) the Cosmos Club, and the Confrerie des Chavaliers du Tastevin.

## RECENT PUBLICATIONS

\*Apori, A. and W. L. Harris, "Chaos in an Eulerian Based Model of Sickle Cell Blood Flow", Paper EC 8, American Physical Society, 54<sup>th</sup> Annual Meeting of the Division of Fluid Dynamics, APS Bulletin, Vol. 46, No.10, page 100. San Diego, CA, November 18-20, 2001.

\*Lewis, S. L. and W. L. Harris, "Sustainment Measures for Fighter Jet Engines", SAE 2001 Transactions, Vol. 110, Journal of Aerospace, Section I, 551-564, [Paper 2001-01-2975], 2002.

\*Apori, A., R. Coral-Pinto and W. L. Harris, "Chaos in the Onset of Sickle Cell Crises". Advances in Fluid Mechanics V, edited by C. A. Brebbia, A. C. Mendes and M. Rahman, WIT Press, Southampton, UK, pages 363-376, 2004.

\*Le Floch, F. and W. L. Harris, "Assessing Chaos in Sickle Cell Anemia", Paper HA 1, American Physical Society, 59<sup>th</sup> Annual Meeting of the Division of Fluid Dynamics, APS Bulletin, Vol. 51, No.9, page 162-163. Tampa, FL, November 19-21, 2006.

\*Le Floch, F. and W. L. Harris. "A Comprehensive Fluid Dynamic-Diffusion Model of Blood Flow Microcirculation with Focus on Sickle Cell Disease", American Physical Society, 62<sup>nd</sup> Annual Meeting of the Division of Fluid Dynamics, APS Bulletin, Vol. 54, No. 19. Minneapolis, MN, November 22-24, 2009.  
<http://meetings.aps.org/link/BAPS.2009.DFD.EE.6>

Tekleab, Y. and W. L. Harris. "2-D Model for Normal and Sickle Cell Blood Microcirculation", American Physical Society, 64<sup>th</sup> Annual Meeting of the Division of Fluid Dynamics, APS Bulletin, Vol. 56, No. 18. Baltimore, MD. November 20-21, 2011.  
<http://meetings.aps.org/link/BAPS.2011.DFD.A14.10>

\*Tekleab, Y. and W. L. Harris, "A Two-Dimensional Model of Blood Plasma Flow with Oxygen Transport and Blood Cell Membrane Deformation". ICCFD7-3205.  
<http://iccf7.org/iccf7/proceedings.html>, 2012.

Atsaves, L. and W. L. Harris, "Chaotic Sickle Cell Blood Flow", SIAM Conference on Application of Dynamical Systems, Snowbird, UT,  
[http://www.siam.org/meetings/ds13/ds13\\_abstracts.pdf](http://www.siam.org/meetings/ds13/ds13_abstracts.pdf), May 19-23, 2013.

## **EXPERIENCE AND ACCOMPLISHMENTS**

### **Associate Administrator for Aeronautics, NASA Headquarters**

1993 - 1995

Responsible for strategy, planning, advocacy, and direction of NASA's Aeronautics research programs and for institutional management of NASA's Ames, Langley, and Lewis Research Centers, and Dryden Flight Research Center including an annual budget in excess of \$2B, over 7400 employees, and over 2000 Aeronautics contracts and grants. Chairs the Aeronautics Management Council which monthly reviews and acts on the top Aeronautics programs. Member of the NASA Program Management Council which monthly reviews and acts on the top NASA programs. Testifies before the U.S. Congress on major Aeronautics programs and facilities. Spokesperson for NASA in public forums on matters of Aeronautics.

Major accomplishments included significantly strengthening research programs and resource management capability through the implementation of program plans, technical/schedule/resource management metrics, regular program status reports, and semi-annual budget reviews.

Dramatically improved communications and working relationships with the U.S. Congress, the Office of Management and Budget (OMB), the Office of Science and Technology Policy (OSTP), the National Economic Council (NEC), and the Office of the U.S. Trade Representative through effective executive level budget advocacy packages, innovative program metrics, and a high level of audit integrity.

Led the development of the Administration policy in Aeronautics science and technology, working with OSTP, NEC, the Federal Aviation Administration (FAA), and the Department of Defense (DoD) culminating in the publication of the Administration document "Goals for a National Partnership in Aeronautics Research and Technology". Led the development of a NASA Aeronautics Strategic Enterprise Plan resulting in the publication of the first-ever NASA Aeronautics strategic plan.

Led in the establishment of the first NASA-Russian cooperation in fundamental aeronautical research. Restructured the University Research Program, the Computational Aerosciences Program, and led the development and execution of joint NASA Aeronautics - industry - university consortia in general aviation aircraft, unpiloted vehicles, and rotorcraft with the formation of the National Rotorcraft Technology Center (NRTC). Led in revamping the four NASA Aeronautics Centers to increase cost-effective technology transfer.

### **Vice President and Chief Administrative Officer, UTSI**

1990 - 1992

Key accomplishments were focusing UTSI's research activities on five selected areas: large scale mathematical computations; environmental concerns; laser applications; space propulsion; and energy conversion. Led in identifying and selecting an internationally recognized scholar to be the Boling Professor (endowed chair).

### **Dean of the School of Engineering, The University of Connecticut**

1985 - 1990

Led in the establishment of the first center for grinding research at a U.S. university as the capstone achievement in directing the School's program to better serve Connecticut's industry. Led in the establishment of the Environmental Research

Institute. Stimulated faculty to significantly increase externally supported research, journal publications, and cultural diversity in student enrollment.

**Faculty and Administrative Positions, MIT**

1972 - 1985

From 1981 to 1985 performed as Professor of Aeronautics and Astronautics. Served, from 1980 to 1981 as Associate Professor of Aeronautics and Astronautics. From 1973 to 1979 held the dual positions of Associate Professor of Aeronautics and Astronautics and of Ocean Engineering. Performed as Visiting Associate Professor of Aeronautics and Astronautics from 1972 to 1973.

Founder and director of the MIT Rotor Acoustics Group. Performed original and definitive research and development in helicopter rotor noise; made major contributions to unsteady, nonlinear transonic external flows; directed approximately 35 Ph.D. and MS dissertations and theses.

First director of MIT's Office of Minority Education from 1975 to 1978; led in the development of an extensive database on the academic performance of minority undergraduate students.

**Program Manager, NASA Headquarters**

1979 - 1980 (on leave from MIT)

As Program Manager of Computational Methods in NASA's Office of Aeronautical and Space Technology pioneered development of computational fluid dynamics techniques and planned NASA's later acquisition of supercomputers.

**Faculty Positions, The University of Virginia**

1968 - 1972

Assistant Professor (1968 - 1970) and Associate Professor (1971 - 1972) in the Department of Aerospace Engineering. Taught undergraduate courses in fluid dynamics and graduate courses in fluid dynamics and hypersonics. Designed and supervised the construction of a blowdown supersonic windtunnel which is still in use at the University of Virginia. Made major contributions to kinetic theory modeling of shock waves in rarefied gas flows.

**Associate Professor of Physics, Southern University**

1970 - 1971 (on leave from the University of Virginia)

Taught undergraduate courses in general physics and advanced thermodynamics.

**OTHER PROFESSIONAL EXPERIENCE**

**President and Owner**, Harris Analytics and Planning, Inc., Newton, MA, 1980 - 1985

**Chairman**, American Society for Engineering Education, New England Section, 1988 - 1989

**Advisory Boards [incomplete]**

U.S. Army Science Board, 1979 - 1986; 1988 - 1993

NSF Engineering Advisory Committee, 1989 - 1993

NRC, Committee on Strategic Technologies for the Army, 1989 - 1993

NRC, Committee on Aeronautical Technologies, 1990 - 1992

NRC, Board on Engineering Education, 1991 - 1993

NRC, Air Force Studies Board, 1991 - 1993

Connecticut Task Force on Manufacturing, Connecticut State General Assembly, 1987 - 1990

Board of Trustees, Science Museum of Connecticut, West Hartford, Connecticut, 1985 - 1990

Hampton University, Department of Engineering, National Advisory Committee, 1989 - 1996

MIT, Department of Aeronautics and Astronautics, Visiting Committee, 1988 - 1992

Alabama A&M University, Executive Research Advisory Council, 1994 - 1996

California Polytechnic State University, College of Engineering Dean's Industrial Advisory Council, 1994 - 1996

Georgia Institute of Technology, School of Aerospace Engineering Advisory Council, 1994 - 2000

North Carolina A&T State University, School of Engineering, Industry Advisory Group, 1994 - 1996

Princeton University, School of Engineering and Applied Science, Leadership Council, 1994 - Present

Princeton University, The Graduate School Leadership Council, 2006 - present

University of California, San Diego, Institute for Mechanics and Materials, Board of Governors, 1994 - 1998

Iowa State University, Department of Aerospace Engineering, Industry Advisory Board, 2005 - 2009

The European Institute, Board of Directors, 1994 - 1998

The American Helicopter Society, Board of Directors, 1996 - 1998

The Federal Aviation Administration (FAA), Research, Engineering and Development Advisory Committee, 1996 - 2001

Trustee, Princeton University, 2001 - 2005

Trustee, Universities Space Research Association, Inc, 2009 - present

## **AWARDS AND HONORS [incomplete]**

The Barry Goldwater Chair of American Institutions, Arizona State University,  
Tempe, AZ, 2000 - 2001

Member, National Academy of Engineering (NAE), 1995

Fellow, AIAA, 1994

Fellow, AHS, 1994

Recipient, Honorary Doctorate of Humane Letter, Lane College, 1994

Recipient, Doctor of Engineering, Honoris Causa, Milwaukee School of  
Engineering, 1994

Recipient, Doctor of Science, Honoris Causa, Old Dominion University, 1995

Recipient, Doctor of Philosophy, Honoris Causa, University of Pretoria, SA, 2006

Recipient, NASA Outstanding Leadership Medal, 1994

Recipient, The University of Virginia Engineering Foundation's Engineering  
Achievement Award, 1994

Member, Confrerie des Chevaliers du Tastevin, 1993

The Herbert S and Jane Gregory Distinguished Lecturer, College of Engineering,  
University of Florida, 1992

Milton Pikarsky Memorial Lecturer, City College School of Engineering The City  
University of New York, 1990

Member, American Academy of Mechanics, 1988

Member, Connecticut Academy of Science and Engineering, 1986

Visiting Lecturer, Society for Industrial and Applied Mathematics, 1971 - 73

Scholar-in-Residence, Millersville, State College, 1982

Eminent Scholar, Norfolk University, 1981 - 82

Recipient, The Irwin Sizer Award, MIT, 1979

Recipient, First Award–Undergraduate Division, Middle Atlantic Student  
Conference, Minta Martin Student Competition, AIAA, 1964

Member, Sigma XI, 1966

Member, Tau Beta Pi, 1963

Member, The Jefferson Society, University of Virginia, 1963

**EDUCATION**

Princeton University, Princeton, New Jersey  
Ph.D. and M.A., Aerospace and Mechanical Sciences, 1968

University of Virginia, Charlottesville, Virginia  
B.S. Aerospace Engineering, 1964

**PERSONAL**

Hobbies: weightlifting, and squash

Excellent health