

DR. JAY PAUL BORIS

Present Position:

NRL Chair of Science in Computational Physics (U. S. Senior Executive Service)
Chief Scientist and Director of the Laboratory for Computational Physics & Fluid Dynamics
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An internationally known expert in developing and applying high-performance computer technology to solve large-scale scientific and engineering problems, Dr. Boris has conceived and led computational and theoretical studies in fluid dynamics for a wide range of applications. He is widely known for his studies of urban contaminant transport but his expertise also includes reactive flow, many-body dynamics, solar physics and plasma physics. He has developed a number of the fluid dynamic, chemical kinetic, and plasma simulation algorithms now in common use for detailed simulation of physical phenomena in these scientific disciplines. Dr. Boris is responsible for developing, supervising, and leading the theoretical and numerical research of the Laboratory for Computational Physics and Fluid Dynamics, an interdisciplinary group of engineers, numericists, fluid dynamicists, and reactive flow physicists. Current projects in the LCP&FD include applications of parallel computing to CFD and reactive flows, development of parallel near-neighbor algorithms for molecular dynamics, Direct Simulation Monte Carlo, and materials science, research for fire safety, studies of atmospheric contaminant transport for force protection and homeland security, hydrodynamics for naval applications, and other priority DoD science and technology programs. For the past seven years Dr. Boris has been the DoD Computational technology Area Leader for CFD, participating centrally in the initiation and execution of the CHSSI scalable software development program on behalf of the DoD High Performance Computer Users. Dr. Boris is a U. S. citizen born May 25, 1942 in Buffalo, New York.

Professional Interests:

Transport of contaminants and civil defense in complex-geometry urban settings
Fluid dynamics and turbulence in reactive and nonreactive flow
Computational physics and numerical analysis
Parallel processing algorithms and high performance computing technology
Nonlinear plasma dynamics and inertial confinement fusion
manybody dynamics applied to materials, physical, and biological systems

Education:

Ph.D. Astrophysical Sciences, 1968, Princeton University
M.A. Astrophysical Sciences, 1966, Princeton University
B.A. Physics, 1964, Princeton University

Previous Positions:

Head, Plasma Dynamics Branch, NRL Plasma Physics Division, 1976–1978
Division Consultant, Computational Physics, NRL Plasma Physics Division, 1970–1976
Research Physicist, Princeton Plasma Physics Laboratory, 1968–1970

Professional Awards and Recognition:

Fellow, American Institute for Aeronautics and Astronautics, 1993
U.S. Navy Captain Robert Dexter Conrad Award for Scientific Achievement, 1990
Presidential Rank of Meritorious Executive in the Senior Executive Service, 1988
Senior Executive Service Outstanding Performance Ratings, 1983–1986, 1988, 1989, 1991–2000
U.S. Navy Award for Distinguished Achievement in Science, 1980
Washington Academy of Sciences Award in Mathematics and Computer Sciences, 1979
Naval Research Laboratory Chair of Science in Computational Physics, 1978
Arthur S. Fleming Award as One of the Top 10 Civil Servants in Science, 1976

Fellow, American Physical Society, Plasma Physics, 1976
U.S. Navy Superior Civilian Service Award, 1975
U.S. Civil Service Outstanding Performance Ratings, 1973–1978
NRL Publication Awards, 1972, 1973, 1977, 1979–1982, 1987, 1990
Princeton University Graduate Fellowship, 1964 – 1968
National Science Foundation Fellowship in Astrophysics, 1965 – 1967
Princeton University Kusaka Memorial Physics Prize, 1964
Graduated Magna Cum Laude from Princeton University, 1964
First Princeton University Scholar, 1961 – 1964
Phi Beta Kappa, Princeton University, 1963
Princeton University Scholarship, 1960 – 1964

Publications: Dr. Boris has published more than 300 papers and articles including three books and a dozen book chapters and invited review articles. He has given over 80 invited or keynote presentations at professional society meetings and conferences. He has also authored or co-authored over 120 technical reports and over 300 conference presentations. He co-authored *Numerical Simulation of Reactive Flow*, the first book on the applications of numerical methods to reactive flows, first edition published by Elsevier, 1987. Russian translation, 1991, published by Mir in former Soviet Union. Second edition published by Cambridge University Press, 2001.

Professional Committees and Panels:

Department of Defense Computational Technology Area Leader for Computational Fluid Dynamics, DoD HPC Modernization Program, 1993–2000
New Technologies Subcommittee and Internet Working Group, AIAA, 1997–1999
Chair, APS Computational Physics Division Rahman Prize Committee, 1992 – 1994
Program Subcommittee, 25th International Symposium on Combustion, 1993 – 1994
Member of Dissertation Committees and Adjunct Faculty Advisor at Princeton University, University of Maryland, and Duke University, 1972 – present
NRL E.O. Hulburt Prize Committee, 1992–present, Chair 1993
AIAA Fluid Dynamics Technical Committee, 1990–1993
Panel to Review NASA Ames CFD Program, 1993
Executive Committee, APS Computational Physics Division, 1987–1992 (Chair 1990–1991)
External Advisory Panel, DARPA Fluid Dynamics URI Programs, 1986–1992
Executive Committee, APS Plasma Physics Division, 1981–1983
Steering Committee, International Conferences on Computational Physics, 1990–1991
Panel for NBS Computing, National Research Council, 1986–1989
NAS/NRC Panel to Assess Current Capabilities & Future Directions in Computational Fluid Dynamics, 1986–1987
ONR Committee to Review the DTNSRDC General Hydrodynamics Research Program and the Applied Hydrodynamics Program, 1987–1988
NAS/NRC Panel to Review the NASA Numerical Aerodynamic Simulator, 1985–1986
Program Subcommittee, 22nd International Symposium on Combustion, 1986–1987
Panel to Review the NASA Numerical Aerodynamic Simulator, 1985–1986

Professional Associations:

American Physical Society, Plasma Physics, Fluid Dynamics and Computational Physics Divisions
American Institute of Aeronautics and Astronautics
American Astronomical Society, Solar Physics Division
International Combustion Institute
Society for Computer Simulation, 1982 – 1988
Sigma Xi, Naval Research Laboratory Chapter
Washington Academy of Sciences