

# Green Aviation Papers, Call and Recognition

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**T**HE term *green aviation* is definitely catching on worldwide. In the United States, we note that several government agencies [e.g., NASA, Department of Defense (DOD), Department of Energy, and Federal Aviation Administration], engine and airframe suppliers and maintainers, and several universities are onboard to participate.

NASA states that green aviation is about taking responsibility for the impact of aviation on the environment, which includes carbon footprint, other emissions, and noise.

They define green aviation as involving activities to improve aircraft fuel efficiency, develop the next generation of efficient air traffic control, and develop new technologies and systems engineering processes to reach the future of carbon-neutral air transportation across the globe.

Working with NASA, the DOD is looking for ways to increase fuel efficiency of new systems as well as the legacy fleet.

AIAA President Mark J. Lewis pointed out in the October 2010 issue of *Aerospace America*, page B5, that “energy and efficiency are at the core of what we do.” He noted that “Aeronautical engineers have been extremely responsive to noise concerns and emissions. And both air and space have an important role to play in global climate monitoring.”

Such activity will require research and development using new prediction methods, both in the design of advanced fuel-efficient vehicles and seeking ways to update older systems.

The *Journal of Aircraft* will welcome aircraft technology papers on this subject. I will ask our International Editors Board to prepare country-specific editorials on this topic. Simultaneously, I will ask our Editorial Advisory Board (EAB) to canvass their Technical Committees (TCs) for potential technical sessions to generate key papers on this topic.

The *Journal of Aircraft* will be greatly enhanced this year by the arrival of Dr. John Vassberg, a Technical Fellow at Boeing, bringing 24 years of experience in aerodynamics, including computational fluid dynamics.

Dr. Joseph Lee of International Consulting Services was a Member of our Editorial Advisory Board. Now an Associate Editor, he will work with our Board of International Editors to help identify special sections, special articles, and editorials. He will also work on the continuing problem of achieving good English grammar from foreign authors.

We plan to publish a special section this year on the subject of aircraft systems engineering. Details of the type of papers sought appear in the September 2009 issue of *Aerospace America*, page 46. Abstracts and papers intended for this special section should be sent for initial screening to our Associate Editors: either Dr. John C. Hsu (jc0hsu@gmail.com) or Dr. Satoshi Nagano (Satoshi.nagano@aero.org).

I would like to recognize the continued dedicated service of our fine Associate Editors who appear here as the “2011 Team.” The quality of the published papers attests to their thoroughness and willingness to help authors bring out their best. We are also fortunate

to have, as mentioned above, an Editorial Advisory Board, also listed on the inside front cover. Most EAB members also serve on a TC relevant to the *Journal of Aircraft*. In this way, these TCs have a solid link to the *Journal of Aircraft* for archival publication of their best meetings papers. EAB members help identify reviewers and also stimulate ideas for special sections or survey papers dealing with topics of TC interest.

Our 19-member International Editors Board is also listed on the inside front cover. They continue to represent the *Journal of Aircraft* to the authors in their respective countries. They are each invited to provide an editorial or a short article or to sponsor a special section on current developments in applied aircraft technology. The important role of the International Editorial Board is underscored by the trend over the past few years of an increasing percentage of foreign articles. In 2004 39% of papers had a foreign first author. That number grew to 63% in 2009.

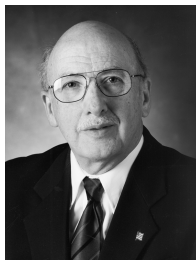
The names of the past year’s Reviewers through the first of October appear in this issue. I am sure you recognize many of these individuals and I certainly wish to thank them for their technical insight and willingness to ensure that our published articles are accurate, timely, and important to readers and will retain lasting value. The *Journal of Aircraft* would not exist without dedicated peer reviewers.

I would like to thank Michael Bragg, Vice President of Publications, for his support of the *Journal of Aircraft* overall. Roger Williams is the Managing Director of Technical Publications and has provided extensive support to the operations of the journals. Amanda Maguire is our Product Manager for the Journals. She ably tracked all the details, including scheduling Editorial Board meetings, year-end actions, etc. Michael Baden-Campbell is our most talented Managing Editor. Every request gets an immediate response. He has been of great help to Associate Editors and authors, demonstrating great patience and thoroughness, especially as we began working with ScholarOne. Michael McGinnes is our Applications Specialist and he ably helps us keep ScholarOne on track. I look forward to continuing my association with this fine professional team.

Over the past year we underwent a transition from WriteTrack to ScholarOne for the processing of manuscripts. Authors now submit their papers to ScholarOne and that starts a sequence of assignment of Associate Editor, who first invites and then selects willing reviewers. It may just be a startup phenomenon, but we are experiencing a problem gaining reviews. We owe the quality of the published articles to the thoroughness of our reviews, and we appeal to the readers of the *Journal of Aircraft* to offer their services to review an occasional paper. We encourage our Editorial Advisory Board to compile and keep current a list of reviewers in their specialty areas.

Thomas M. Weeks  
Editor-in-Chief

## Editor-in-Chief



**THOMAS M. WEEKS** completed his degree work at Syracuse University, Department of Mechanical and Aerospace Engineering, in 1965. He entered active commissioned service that year, assigned to the U.S. Air Force Flight Dynamics Laboratory (now the Air Vehicles Directorate of the U.S. Air Force Research Laboratory) at Wright-Patterson Air Force Base. His initial work was in the field of electrogas dynamics at the nearly completed 50-MW wind-tunnel facility. In 1968, he separated from the U.S. Air Force, but took a civil position at the same location. He worked on a variety of projects, including unsteady hypersonic heating, transonic test techniques, and sonic boom, before becoming the Manager of the External Aerodynamics Group. He served first as the Deputy and then as the Manager of the X-29 Advanced Technology Demonstrator, developed by the Advanced Research Projects Agency, NASA, and the U.S. Air Force. He served as Chief of the Wind Tunnels Branch and the Technology Strategy Branch. He served as Acting Chief Scientist and Acting Deputy Director of the Directorate. He served as Chief of the Integration and Operations Division. He retired from the Air Vehicles Directorate in August of 1998 and is currently with Universal Technology Corporation.

## Associate Editors



**DR. JOÃO LUIZ F. AZEVEDO** received his A.E. degree from Instituto Tecnológico de Aeronáutica, São José dos Campos, Brazil, in 1981. He obtained M.S. and Ph.D. degrees in aeronautical and astronautical engineering from Stanford University in 1984 and 1988, respectively. His professional experience includes the development and application of computational fluid dynamics (CFD) codes for applied aerodynamic and aeroelastic analyses of aerospace vehicles, aeroelastic clearance of launch vehicles and sounding rockets, and aerodynamic CFD analyses of wind-tunnel models before testing. Current areas of research interest include the development of adaptive unstructured grid CFD codes for realistically complex configurations, the implementation of turbulence models for such flow conditions, and the development of cost-effective techniques for coupling CFD solvers with aeroelastic analysis procedures. Teaching activities have been mainly centered at Instituto Tecnológico de Aeronáutica (ITA). He has worked as an Associate Professor at ITA since August 1988, teaching undergraduate- and graduate-level courses in CFD and advising undergraduate students and both M.S. and Ph.D. candidates in the areas of aeroelasticity and CFD. He has more than 40 full articles published in peer-reviewed archival technical journals and over 180 full papers published in the proceedings of technical conferences. He is an Associate Fellow of the AIAA, and he is a member of the AIAA Applied Aerodynamics Technical Committee. He is also a Regional Deputy Director for Central and South America in AIAA's Region VII.



**INDERJIT CHOPRA** is the Alfred Gessow Professor in Aerospace Engineering and Director of Alfred Gessow Rotorcraft Center at the University of Maryland. He received his B.S. in aeroengineering from Punjab Engineering College in 1965, his M.E. from Indian Institute of Science in 1968, and his Sc.D. from Massachusetts Institute of Technology (MIT) in 1977. He worked at the National Aerospace Laboratory from 1966 to 1974. His research there included wind-tunnel testing of scaled aeroelastic models of airplanes and launch vehicles. At MIT, he worked on dynamic analysis of wind turbines. In 1977, he joined the NASA Ames Research Center and Stanford University Joint Institute of Aeronautics and Acoustics, where he worked for four-and-a-half years on the development of aeroelastic analysis of advanced rotor systems. In 1981, he joined the University of Maryland. He has been working on problems associated with aeromechanics of helicopters, smart structures, and micro air vehicles. His graduate advising resulted in 34 Ph.D. and 60 M.S. degrees. An author of over 150 archival papers, Dr. Chopra has been Associate Editor of *Journal of the American Helicopter Society* (1987–1991) and *Journal of Intelligent Materials and Systems* (1977–present). He was the recipient of the 2002 AIAA Structures, Structural Dynamics, and Materials Award; 2002 AHS Grover Bell Award; 2001 ASME Adaptive Structures and Material Systems Prize; 2002 A. J. Clark School of Engineering Faculty Outstanding Research Award; and the 2004 SPIE Smart Structures and Materials Lifetime Achievement Award. He has been a Member of the U.S. Army Science Board (1997–2002). He is a Fellow of the AIAA, American Society of Mechanical Engineers, American Helicopter Society, National Institute of Aerospace, and Aeronautical Society of India.



**ROBERT E. DUFFY** is currently President of RED Associates, a research, development, and consulting firm. A former member of the faculty of the Department of Mechanical Engineering, Aeronautical Engineering, and Mechanics at Rensselaer Polytechnic Institute, he was the Chairman of the aeronautical engineering academic program. He is the author of over 65 published papers and research reports in the areas of applied aerodynamics, flight mechanics, and experimental fluid dynamics. Dr. Duffy has served as a consultant to numerous governmental agencies, industrial concerns, and individuals. He is on the Board of Directors of ENECO, Inc., a wind energy development firm that investigates and evaluates innovative concepts. He is a past Member of the Atmospheric Flight Mechanics Technical Committee and is an Associate Fellow of the AIAA.



**FRANKLIN E. EASTEP** is an Emeritus Professor of aerospace engineering at the University of Dayton. He received a B.S. in aeronautical engineering from The Ohio State University in 1958, an M.S. in aeronautics from the Air Force Institute of Technology in 1963, and a Ph.D. in aeronautics and astronautics from Stanford University in 1968. Dr. Eastep has been teaching and conducting research within the technical areas of structural dynamics, aeroelasticity, and unsteady aerodynamics since 1968. During that period, he has been the principal for 18 Ph.D. candidates and over 45 M.S. students. He served on active duty with the U.S. Air Force for 20 years, retiring in 1978. Dr. Eastep is a Member of the American Academy of Mechanics and is a Fellow of the AIAA. He is presently a National Research Council Senior Research Associate with the U.S. Air Force Research Laboratory at Wright-Patterson Air Force Base.



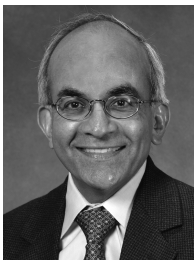
**AHMED A. HASSAN** is currently a Boeing Technical Fellow at the Boeing Company. His area of expertise is computational fluid dynamics (CFD). Dr. Hassan received his B.S. and M.S. from the University of Cairo in 1974 and 1976, respectively. He then received his Ph.D. from the University of Arizona in 1981. He was on the faculty of Arizona State University from 1981 to 1987 as an Assistant Professor. He joined The Boeing Company (then McDonnell Douglas Helicopter Company) in 1987, where he conducted research related to the application/development of CFD design and analysis tools for rotorcraft problems. He is the company representative on the corporate-wide CFD working group, an Associate Fellow of the AIAA (1981 to the present), and a Member of the American Helicopter Society (1987 to the present). He is currently serving as an Associate Editor for the *Journal of Aircraft* in the area of CFD. Dr. Hassan has published more than 30 archival studies and presented more than 60 papers at national and international conferences. He holds six patents and has four additional patents pending with the U.S. Patent and Trademark Office. His work has focused on modeling the aerodynamics of rotor blade-vortex interactions and investigating novel flow control techniques for rotorcraft applications.



**RONALD A. HESS** received B.S., M.S., and Ph.D. degrees in aerospace engineering from the University of Cincinnati. After completing his doctoral degree, he joined the faculty of the Department of Aeronautics at the U.S. Naval Postgraduate School. In 1976, he joined the staff of the Flight Systems Research Division at NASA Ames Research Center. In 1982, he joined the faculty at the University of California, Davis, where he is currently a Professor of mechanical and aeronautical engineering. His research interests lie in the areas of automatic and manual control and in human/machine systems. He is an Associate Fellow of the AIAA and a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE). In 2000, he was a recipient of the AIAA Mechanics and Control of Flight Award. He is also an Associate Editor of the *IEEE Transactions on Systems, Man and Cybernetics, Part A* and of the *British Journal of Aerospace Engineering*.



**KENNETH J. HOLT** retired from McDonnell Douglas Corporation in 1990. He had been involved in flight-test operations and marketing. He received his B.S. from Hampton University and his M.B.A. from the University of Missouri. He served 20 years in the U.S. Air Force and retired as a Lieutenant Colonel and a Command Pilot. His background is in fighters. He has flown the F-86, F-100, F-4, F-15, and F-18, and he spent tours in the Air Training Command and Strategic Air Command. He joined McDonnell Douglas in 1973. There, he flew production test flights and was the company's interface with the military and Federal Aviation Administration for test flights. He developed much of the flight-test operating procedure for the F-18 and AV8B, and he was the McDonnell Douglas flight operations consultant to the Government Aircraft Factory F-18 facility in Avalon, Australia. He retired from active flying in 1984. Mr. Holt served as Chair of the Aircraft Operations Technical Committee from 1985 to 1987. He is a Senior Member of the AIAA.



**MAHENDRA JOSHI** is the Chief Engineer of Noise and Emissions at Boeing Commercial Airplanes. He leads a team that is responsible for developing acoustical and emissions designs that meet the requirements for new and derivative airplanes, developing efficient technologies and tools to enable these designs, achieving noise and emissions certification for these products, providing operational environmental support to customers, and coordinating regulatory development. Mr. Joshi has over 30 years' experience in this field. He has held several positions, all related to environmental performance, during his career at The Boeing Company (including McDonnell Douglas). His prior responsibilities included Research Engineer; Senior Manager/Technical Fellow of Acoustics and Propulsion Technology; Manager of Environmental Performance for the NASA High-Speed Civil Transport; Manager of Single-Aisle Airplane Program Noise Support; Manager of Community Noise; and Manager of 787 Community Noise, Product Development and Emissions. Mr. Joshi received a Ph.D. in mechanical/aerospace engineering from the University of Tennessee Space Institute. He has also performed noise research and design at NASA Langley Research Center and at Bell Helicopter Textron. He is an Associate Fellow of the AIAA and was a Member of the Aeroacoustics Technical Committee.



**DR. JOSEPH W. LEE** is a consultant, professor and founder of [www.icsinnovation.com](http://www.icsinnovation.com). He has 19 years of experience in the consulting industry specializing in technology, management and global business with support from international corporations, business associates and strategic partners. Dr. Lee served on the Georgia Institute of Technology's International Technology Indicators Panel (distinguished panel supported by the U.S. National Science Foundation) during 1993-1995. Dr. Lee's academic credentials include a Doctor of Science in engineering management, Master of Science degree in technology marketing; and a degree in engineering and mathematics. Since 1988, he has been a professor of Technology Management and International Marketing at George Washington University, Johns Hopkins University, and Florida Institute of Technology. He published articles and as speaker on technology transfer, strategic management and technology management. He is an Associate Fellow of AIAA.



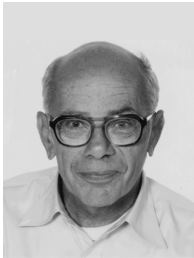
**GARY D. RENIERI**, a Boeing Technical Fellow, has over 30 years of experience in the area of composite analysis, testing, design, and manufacturing technology. He received a B.S. and M.S. in mechanical engineering from Lowell Technological Institute (not the University of Massachusetts at Lowell). He received a Ph.D. in engineering sciences and mechanics from Virginia Polytechnic Institute and State University. His career has spanned assignments from the Space Shuttle Aft Propulsion Subsystem, AV-8B, F-18, F-15 to technical manager on many U.S. Air Force, Navy, and Army technology development programs. He was a Technical Lead on the Air Force Composites Affordability Initiative from 1995 until 2005 in the areas of composite analysis development, analysis validation, and development of associated test articles leading to the certification of integrated composite structure. Dr. Renieri is the Focal in the Boeing Research and Technology group for Reliability-Based Design and Certification activities. Before his recent activities, Dr. Renieri was the Technical Excellence Focal for the Office of the Chief Engineer of the System of Systems Engineering Integration team of the Future Combat Systems program.



**THOMAS WILLIAM STRGANAC** is a Professor of aerospace engineering at Texas A&M University. He received his B.S. in aerospace engineering from North Carolina State University in 1977, his M.S. in aerospace engineering from Texas A&M University in 1980, and his Ph.D. in engineering mechanics from Virginia Polytechnic Institute and State University in 1987. His research interests focus on structural dynamics, nonlinear mechanics, and aeroelastic phenomena. He served as an Engineer at NASA Wallops Flight Center from 1975 to 1982 and at NASA Langley Research Center from 1982 to 1989. He has internationally presented short courses on advanced flight tests and aeroelasticity, and he is the coauthor of the texts *Introduction to Flight Test Engineering* and *A Modern Course in Aeroelasticity*. He has served on the Lighter-Than-Air Systems Technical Committee (Ph.D.), the Balloon Systems and Technology TC, and the Structural Dynamics TC. He served as the General Chairman of the AIAA Structures, Structural Dynamics and Materials Conference in 1999 and served as the General Chairman of the AIAA Dynamics Specialists Conference in 1996. He is an Associate Fellow of the AIAA and a registered Professional Engineer.



**BRIAN E. THOMPSON** holds the Natural Sciences and Engineering Research Council and General Motors of Canada Chair of Engineering Design and Innovation at the University of Western Ontario. He received his B.A.Sc. (mechanical engineering) from the University of Waterloo in 1979 and a Ph.D. from Imperial College of Science and Technology in 1984. He has been at a licensed Professional Engineer since 1986. Dr. Thompson is a seasoned engineering designer with experience in advanced medical, automotive, aircraft, rocket-engine, and instrumentation concepts. He has industrial experience at Bell Northern Research, Scientific Research Associates, and The Boeing Company, and he has held previous academic appointments at Imperial College, the University of Waterloo, and Rensselaer Polytechnic Institute (RPI). His research places emphasis on studio pedagogy, trailing-edge flows, vehicular design, and emerging technologies. He was the Chief Engineer of the Aircraft Studio at RPI, which produced the world's largest student-engineered aircraft. Dr. Thompson has engineering experience in a wide range of applications, including commercial aircraft, high-speed snow plowing, hybrid electric automobiles, axial turbomachinery, centrifugal pumps, heat exchangers, telephony heat transfer, gas and steam turbines, and pulmonary ventilation. He has authored over 160 publications and technical reports, is a patent holder, and has presented invited lectures and short courses on aerodynamics, engineering studios, and aircraft design in the United States, Europe, Canada, and the United Kingdom.



**MURRAY TOBAK** is a Senior Staff Scientist at NASA Ames Research Center. He has degrees from the University of California and Stanford University and has been a Research Scientist at NACA–NASA Ames Research Center since 1948. He has specialized in theoretical studies of fluid and flight dynamics of high-speed aircraft and missiles. His studies have been aimed at identifying problems in nonlinear dynamics, flow stability, 3-D separated flow, and vortex phenomena requiring basic research and new analytical and experimental tools for their solution. He is an Associate Fellow of the AIAA and has received NASA's Exceptional Service Award.



**DR. VASSBERG** is currently the chief aerodynamicist of the Advanced Joint Air Combat System (AJACS) and Speed-Agile Configuration Development (SACD) programs. Dr. Vassberg received his Ph.D from the University of Southern California in 1992, and his M.S. and B.S. from Texas A&M University in 1981 and 1980, respectively, all in aerospace engineering. He joined Boeing (McDonnell Douglas Corp) in 1982, working in the Aerodynamic Technology Programs group, where he developed or co-developed transonic airfoil technologies such as optimum upper-surface pressure recovery paths, divergent trailing edge and trailing-edge wedge concepts, using computational methods and validating these technology advancements with wind tunnel testing. Since then, Dr. Vassberg has developed, matured, transitioned, and applied numerous computational fluid dynamics (CFD) methods and aerodynamic technologies. In order to accomplish this, he has worked about half of his career in aerodynamic research and technology groups and the other half in aircraft program development organizations. He is considered a world authority in the development and application of CFD and aerodynamic shape optimization for aerodynamic design within an aircraft design environment. Dr. Vassberg is chairman and a charter member of the International AIAA CFD Drag Prediction Workshop (DPW) organizing committee; he is also on the Advisory Board for the AIAA High-Lift Prediction Workshop. Dr. Vassberg holds about a dozen patents related to aerodynamic technologies. In addition, Dr. Vassberg has introduced and developed new fields of numerical simulation including: inflight refueling hose-drogue dynamics, towed-decoy dynamics, fast surface-paneling techniques, and globally-elliptic meshing methods. Dr. Vassberg is a Boeing Technical Fellow and an AIAA Fellow.