

## Editorial: Annual Business and News

**T**HIS past year has been a very successful one for the Journal of Guidance, Control, and Dynamics (*JGCD*). The *JGCD* remains number two in the total number of domestic and international subscriptions among the seven AIAA journals. And now, as a bonus, a subscription to the *JGCD* allows on-line access to the entire 27-year *JGCD* archive. Almost 400 new papers were submitted in 2004—more than in any of the past 15 years. The implementation of our Web-based manuscript submission and management system (WriteTrack) continued to be improved, and the system is fully operational. The entire editorial and review process is faster, more accurate, and less labor intensive. From March 2003 through September 2004, the median time from submission to acceptance was reduced to 154 days with author revision time accounting for more than half of the time. The editorial team thanks the AIAA team for their continuing help in designing, implementing, and upgrading the system.

In 2004, we finished the Centennial of Flight series begun in 2003 by publishing several History of Key Technologies papers:

(January)—“Evolution, Revolution, and Challenges of Handling Qualities,” D. G. Mitchell et al.

(March)—“Flight Control Century: Triumphs of the Systems Approach,” D. McRuer and D. Graham

—“A History of Analytical Orbit Modeling in the U.S. Space Surveillance System,” F. R. Hoots, P. W. Schumacher Jr., and R. A. Glover

In total, there were nine papers in the series, and I want to thank all of the authors for their special efforts in writing these interesting contributions. Also, thanks to Associate Editor David Doman for organizing a special section on Reusable Launch Vehicle Guidance and Control in the November–December issue.

In past editorials I have written about the progress made during the year toward meeting the goals that I have as Editor-in-Chief. The goals are to 1) maintain the quality of the *JGCD*, 2) increase the number of engineering-applications-oriented papers, 3) minimize the time from submission to publication, 4) increase the international involvement in the *JGCD*, and 5) listen to and respond to everyone’s concerns. Let me briefly discuss each item.

The *JGCD* continues to attract high-quality papers submitted on a worldwide basis. On any given date, typically 130 papers were in the process of being evaluated. However, the number of applications-oriented papers submitted still needs to be increased and I repeat the call to the community to respond with more relevant papers that can help engineers practice their profession.

The Associate Editors continue to shorten the time from submission of a paper to the time the review comments are returned to the author. Our goal is to return every paper in under three months of receipt. Then it is up to the authors to make revisions as quickly as possible to speed their papers toward publication. Currently, author revision time is the single largest contributor to delays in acceptance. There is currently a fairly large backlog of papers ready to be published because WriteTrack produced many finished papers while papers from the previous manual process were also still being finished. We are publishing the “oldest” papers first as we work off the backlog.

International participation in the *JGCD* has increased from previous levels. More than 50% of new paper submittals were from outside the United States and the acceptance rate for those papers has been about the same as for U.S. papers. Publication tends to be a bit slower, however, as more of these papers need extensive editorial work and revisions of figures. Our International Advisors have been very helpful in soliciting papers. The fact that the *JGCD* archive is on-line should aid our international authors in their research and also increase our international subscription base.

The editorial staff has a concern that there are a few individuals submitting minor variations of the same paper to multiple AIAA journals or to other technical publications. Authors should be aware that WriteTrack provides a history of each author’s submissions to all of the AIAA journals and gives the editorial staff the ability to inspect them. We are maintaining the high standards of all of the AIAA journals and will normally not consider a paper that has been declined by another AIAA journal. Also, authors should realize that they cannot copy, without attribution, parts of any of their previous works (copyrighted or not) and, obviously, any parts of other authors’ works. The latter situation will be treated very seriously by the Publications Ethics Committee.

With this issue, I am announcing several changes to our Editorial staff.

First, retiring Associate Editors are

- Prof. Kurt Anderson, Rensselaer Polytechnic Institute
- Dr. Alain Carrier, Lockheed Martin Advanced Technology Center
- Prof. Jonathan How, Massachusetts Institute of Technology
- Mr. Stephen Osder, Osder Associates

I want to express my personal thanks to our retired Associate Editors for their service. Steve Osder ends 27 years of outstanding volunteer service to the *JGCD* and Steve deserves a special note of appreciation.

Then, renewed with thanks for their continuing service as Associate Editors are

- Prof. Richard Colgren, University of Kansas
- Dr. Hari Hablani, The Boeing Company
- Prof. Ping Lu, Iowa State University
- Dr. Michael McFarland, SAIC
- Prof. Mark L. Psiaki, Cornell University
- Dr. M. Bala Subrahmanyam, Lockheed Martin Advanced Technology Center
- Prof. Panagiotis Tsiotras, Georgia Institute of Technology

I would like to welcome the following new Associate Editors:

- Prof. John Crassidis, University of Buffalo, SUNY
- Prof. Fidelis O. Eke, University of California at Davis
- Dr. Bruce Kothmann, The Boeing Company, Rotorcraft Division
- Mr. James Mitchell, Boeing Commercial Airplanes, The Boeing Company,

The complete list including biographical sketches of current Associate Editors is presented in the following pages.

I express my gratitude to all of the reviewers who perform the peer reviews that are necessary to maintain the quality of the *JGCD*. The list of reviewers contributing between 1 October 2003 and 30 September 2004 follows the list of Associate Editors. I apologize to any reviewers whose names have been inadvertently omitted from the list.

I would like to acknowledge our International Advisors who help us in soliciting high-quality papers that represent the technical efforts in their countries. They also assist authors who may have questions about the review process. For his service, I would like to thank our retired International Advisor, Prof. Mario Innocenti, of the University of Pisa, Italy.

Special acknowledgements go to the individuals who served as liaison between the *JGCD* and an AIAA Technical Committee (TC): Prof. Mark Balas, University of Colorado, with the Guidance, Navigation & Control TC; Dr. Ronald Proulx, Draper Laboratory, with the Astrodynamics TC; Prof. John Valasek, Texas A&M University, with the Atmospheric Flight Mechanics TC; and Dr. Karl

Bilimoria, NASA Ames Research Center, with the Air Transportation Systems TC. Starting this year, Prof. Yaakov Oshman, Technion—Israel Institute of Technology, will serve as liaison with the GNC TC and former Associate Editor Dr. Sanjay Garg, NASA Glenn Research Center, will serve as liaison with the Intelligent Systems TC.

Thanks to all of the editorial staff at AIAA Headquarters and to the production staff at TechBooks. These dedicated individuals work at the highest standards in producing the *JGCD*. Thanks to Ms. Lisa Gorman and Ms. Loretta Mitrano, Draper Laboratory, for making the Editor-in-Chief's office operate smoothly and efficiently all year long and to Draper Laboratory for its support of the *JGCD*.

Finally, I continue to encourage communications between our readers and any member of the Editorial Staff. I also believe we did a good job last year in covering the span of interests of our readers and in responding quickly to communications. We can always do better and we are willing to listen; please contact me directly. My contact information is

Dr. George T. Schmidt  
*Editor-in-Chief, JGCD*  
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George T. Schmidt received his S.B. and S.M. degrees in Aeronautics and Astronautics from the Massachusetts Institute of Technology (MIT) in 1965 and his Sc.D. in Instrumentation from MIT in 1971. Since 1965 he has worked at the Charles Stark Draper Laboratory, Cambridge, Massachusetts, where he is currently Director, Education. Prior to that he was the Leader of the Guidance and Navigation Division and Director of the Guidance Technology Center. His major technical activities have been in GN&C system design for missiles, aircraft, and manned spacecraft; Kalman filtering applications; and integration techniques for high-resolution synthetic aperture radars, satellite navigation systems, and inertial sensors. Starting in 1968 he served the NATO Research and Technology Organization (formerly AGARD) in many positions, including as a U.S. member of the Guidance and Control Panel. He is a Lecturer in Aeronautics and Astronautics at MIT. He is a Fellow of the AIAA, a Fellow of the Institute of Electrical and Electronics Engineers, and an elected member of the Russian Federation, Academy of Navigation and Motion Control. He has received several awards including the AIAA International Cooperation Award in 2001. He is serving on the AIAA Ethics Committee. He is the Editor-in-Chief of *The Draper Technology Digest* and is author or contributing author of more than 80 technical papers and reports, encyclopedia articles, and textbooks. He has been Editor-in-Chief of the *AIAA Journal of Guidance, Control, and Dynamics* since 1996.

## Associate Editors



**S. N. BALAKRISHNAN** is currently a Professor of Aerospace Engineering in the Department of Mechanical and Aerospace Engineering and Engineering Mechanics at the University of Missouri—Rolla (UMR). He received his Ph.D. in aerospace engineering at the University of Texas at Austin. Dr. Balakrishnan's professional roles include Lead Engineer, Lockheed Electronics Company, Houston, Texas, where he worked in the space shuttle program; Scientist and Fellow, Center for Space Research, University of Texas at Austin; and Faculty Research Fellow, Wright Laboratory (Eglin Air Force Base, Florida). He teaches stability and control and advanced control courses at UMR. His research activities focus on neural networks in trajectory optimization, and control, missile guidance, and multiple target-multiple sensor problems and estimation. He has authored/coauthored about 55 journal articles and refereed conference papers in these areas. Dr. Balakrishnan is a Member of the AIAA Guidance, Navigation, and Control Technical Committee, an Associate Fellow of AIAA, and Director, American Automatic Control Council.



**KARL D. BILIMORIA** is an Aerospace Engineer at the NASA Ames Research Center, where he leads a research group on future air traffic control concepts for NASA's Airspace Systems program. Previously, he worked on advanced guidance and control concepts for supersonic civil transport aircraft under NASA's High Speed Research (HSR) program. He received his B. Tech. from the Indian Institute of Technology, Kanpur, graduating at the top of the aeronautical engineering class in 1982; he also received his M.S. and Ph.D. in aerospace engineering from Virginia Polytechnic Institute and State University in 1984 and 1986, respectively. From 1987 to 1994, Dr. Bilimoria was on the aerospace engineering faculty at Arizona State University (ASU), where he held the positions of Assistant Professor and Research Scientist. At ASU, he taught courses on optimal control, flight dynamics/control, aircraft performance, and aircraft conceptual design; he also conducted research on aircraft trajectory optimization, optimal control of spacecraft, and flight dynamics of elastic hypersonic vehicles. He is an Associate Fellow of AIAA; a Member of the AIAA Air Transportation Systems Technical Committee (TC); a past Member of the AIAA Guidance, Navigation, and Control TC; a past Member of the AIAA Atmospheric Flight Mechanics TC; a past Member of the IFAC TC on Air Traffic Control Automation; and a Member of Sigma Gamma Tau (national aerospace honor society). Dr. Bilimoria was a finalist in the 1996 NASA Astronaut selection. He has received several NASA awards for his work, including the Exceptional Technology Achievement Medal.



**RICHARD COLGREN**, Senior Staff Engineer at the Lockheed Martin Aeronautics Company in Palmdale, California, is Lead Engineer for C4ISR and UAV programs for Air Vehicle Sciences and Systems. He earned his B.S. in aeronautics and astronautics at the University of Washington and his M.S. and Ph.D. in electrical engineering systems at the University of Southern California. Previously he was Flight Control Systems Lead for RECEE and Advanced Programs, and before that IPT Lead for Specialist Support on the DarkStar UAV (Tier III-). He was also IPT Lead for the Vehicle Management System on the Uninhabited Combat Air Vehicle, and was Lead Flight Controls Engineer on the U-2S and on the Air Force Multivariable Control Theory project. He has served as Project Engineer/Principal Investigator on independent research and development projects including Technologies for Reliable Autonomous Control, development of the Lockheed flight controls workstation, and the state reduction of structural dynamic models for control systems design. Previous work includes feasibility studies and preliminary/advanced design for flight control system concepts. Work on UAV projects includes Tier IIC, Tier III-, Tier III, X-33, UCAV, micro- UAVs, the Wraith Remotely Piloted Vehicle, and other projects. Dr. Colgren is a past Chair of the Integrated Controls Subcommittee of the Lockheed Corporate Task Force. Dr. Colgren is an aeronautical engineering evaluator for the Accreditation Board for Engineering and Technology, Inc./Aeronautical. He is an Associate Fellow of the AIAA, and is a Member and past Secretary for the National Technical Committee on Guidance, Navigation, and Control.



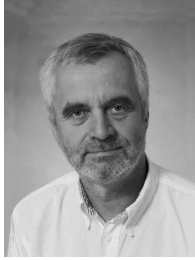
**JOHN L. CRASSIDIS** is an Associate Professor of Mechanical and Aerospace Engineering at the University at Buffalo (UB), State University of New York. He received his B.S., M.S., and Ph.D. in Mechanical Engineering from the State University of New York at Buffalo. Prior to joining UB in 2001, he held academic appointments at Catholic University of America from 1996 to 1998 and Texas A&M University from 1998 to 2001. From 1996 to 1998, he was a NASA Postdoctoral Research Fellow at Goddard Space Flight Center, where he worked on a number of spacecraft projects and research ventures involving attitude control systems. He is the principal author of the textbook *Optimal Estimation of Dynamic Systems* (CRC Press, 2004) and has authored or coauthored more than 80 journal and refereed conference papers. He served as the Technical Program Co-Chair of the AIAA Guidance, Navigation, and Control (GN&C) Conference in 2001 and as the General Chair in 2003. He has received many awards for his achievements including the best paper award for the 2001 and 2003 AIAA GN&C conferences. His current research interests include nonlinear estimation and control theory, spacecraft attitude determination and control, attitude dynamics and kinematics, and robust vibration suppression. Since 1997 he has been a Member of the AIAA Technical Committee on Guidance, Navigation, and Control, where he currently serves as Secretary. He is an Associate Fellow of AIAA.



**DAVID B. DOMAN** is a Senior Aerospace Engineer with the Air Vehicles Directorate of the Air Force Research Laboratory (AFRL) at Wright-Patterson Air Force Base in Dayton, Ohio. He received his B.S. degree in aerospace engineering (magna cum laude) from West Virginia University in 1991, his M.S. in aeronautics and astronautics from Purdue University in 1993, and his Ph.D. in aerospace engineering from Virginia Polytechnic Institute and State University in 1998. From 1993 to 1995 he worked as a Research Aerospace Engineer in the Flying Qualities group at the U.S. Air Force Wright Laboratory, where he focused on control theoretical modeling of human operator dynamics. He is currently the Technical Area Lead for the Space Access and Hypersonic Vehicle Guidance and Control Group in the Control Science Center of Excellence at AFRL, where he is responsible for conducting and directing research in the areas of adaptive guidance and control, on-line trajectory retargeting algorithms, and nonlinear control allocation. He has published more than 50 refereed conference papers, journal articles, and technical reports and currently holds one U.S. patent. He was the corecipient of the 2003 Gen. Benjamin D. Foulois Award as well as the 2000 Dr. Courtland D. Perkins award for his technical contributions at the Air Vehicles Directorate of AFRL. He is a Senior Member of the AIAA, a Member of the Institute of Electrical and Electronics Engineers, an Associate Editor for the IEEE Control Systems Society's Conference Editorial Board, and a member of the AIAA Technical Committee on Guidance, Navigation, and Control.



**FIDELIS O. EKE** holds a diploma in mechanical engineering from Universite Lovanium, Kinshasa, Democratic Republic of the Congo, an M.S. in mechanical engineering from Tuskegee University, and a Ph.D. in mechanical engineering from Stanford University. He worked for six and half years in the Guidance and Control Section of the Jet Propulsion Laboratory in Pasadena. Some of the major tasks he performed include design of attitude control algorithms for the Galileo spacecraft; stability studies of rocket motors; study of various aspects of the dynamics, control, and stability of spin-stabilized spacecraft; evaluation of the impact of flexibility on the design of controllers for large flexible space structures; development of new formalisms for the study of the dynamics of multibody systems. He is currently an Associate Professor in the Department of Mechanical and Aeronautical Engineering at the University of California, Davis, where he teaches courses in the dynamics and controls areas. His research interests are mainly in the application of dynamics and controls to aerospace systems, especially attitude dynamics and control, dynamics of variable mass systems, and multibody dynamics.



**WODEK GAWRONSKI** is a Principal Engineer at the Jet Propulsion Laboratory, California Institute of Technology. He received his M.S. (1968), Ph.D. (1970), and D.Sc. (1975) from the Gdansk University of Technology, Gdansk, Poland. He was a Professor at the Gdansk University of Technology (1970–1983), a Visiting Professor at the University of Hanover, Germany (1983–1986), and Senior NRC Fellow at the NASA Langley Research Center, Hampton, VA (1987–1989). His research interest is in the areas of structural dynamics, structural control, system identification, and antenna and radiotelescope pointing and control. At the Jet Propulsion Laboratory he is responsible for the advanced development of the control systems of NASA Deep Space Network antennas. He was also a consultant on control system design to several radiotelescope projects, including the NRAO 100-meter Green Bank Telescope in West Virginia, and the 50-meter Large Millimeter Wavelength Telescope in Pueblo, Mexico. He is an author of two books: *Balanced Control of Flexible Structures* (Springer 1996), and *Dynamics and Control of Structures* (Springer 1998).



**HARI B. HABLANI** received his B.S. (mechanical engineering) in 1972 from Government College of Engineering and Technology, Raipur, Chhattisgarh, and his M.S. in 1974 and Ph.D. in 1978 (both in aerospace engineering) from the Indian Institute of Science, Bangalore, India. He passed his M.S. with distinction and Ph.D. with P. S. Narayan Gold Medal. From 1978 to 1980, he was a Postdoctoral Fellow in the Department of Aeronautical and Astronautical Engineering, Purdue University, West LaFayette, Indiana. For the following two years, he was a NASA National Research Council Resident Associate at Johnson Space Center, Houston, Texas. Since 1982, he has been with The Boeing Company (formerly Rockwell International), Flight Sciences and Advanced Design Group, Huntington Beach, California, where he currently is a Technical Fellow. For the past three years, he has been involved with the design of guidance, navigation, and control of spacecraft rendezvous. Earlier, he was responsible for detailed design and simulation of spacecraft and interceptor dynamics, control, determination, guidance, and navigation. Dr. Hablani has received numerous awards for his contributions, including the Leonardo de Vinci (the Spirit of the Renaissance) Engineer of the Year 1991 and patent and innovation awards. He has authored numerous publications, both internal and external. For the last two years, he has been presenting Boeing-wide, a course on guidance, navigation, and control of spacecraft and interceptors. He has been an Associate Fellow of AIAA since 1994.



**CHRISTOPHER D. HALL** is a Professor of Aerospace and Ocean Engineering at Virginia Polytechnic Institute and State University. Before joining Virginia Tech in 1997, he taught for five years in the Department of Aeronautics and Astronautics at the Air Force Institute of Technology. He received a B.S. in aerospace engineering from Auburn University (1984), an M.S. in systems engineering at the Air Force Institute of Technology (1988), and a Ph.D. in theoretical and applied mechanics from Cornell University (1992). His research interests include spacecraft dynamics and control, space systems design, and nonlinear oscillations. He is a member of the Phi Kappa Phi, Sigma Gamma Tau, and Tau Beta Pi Honorary Societies, and the recipient of a Tau Beta Pi Outstanding Professor Award in 1993, the Colonel Charles A. Stone Leadership Award in 1996, the Ralph R. Teetor Educational Award in 1997, and the Dean's Award for Excellence in Teaching in 2001. He is an Associate Fellow of AIAA, is a past Associate Editor of this journal, and is currently Chair of the AIAA Astrodynamics Technical Committee.



**BRUCE D. KOTHMANN** received his B.S., with highest distinction, in aerospace engineering from the University of Virginia in 1989, his M.S. in aerospace engineering from Pennsylvania State University in 1992, and his Ph.D. in aerospace engineering from Princeton University in 2000. He is presently a Senior Technical Specialist in the Flying Qualities group with the Boeing Company, Rotorcraft Division, in Philadelphia. He is also on the adjunct faculty of the Mechanical Engineering Departments at Drexel University and the University of Pennsylvania and has given invited lectures on rotorcraft flight dynamics and automatic control. He has published regularly and given papers in Russia, France, Canada, and throughout the United States. His primary research interests are the synthesis of computational and applied aerodynamics methods for flight dynamics applications; the effects of usable agility and envelope protection on both handling qualities and the structural design process; and the implementation and flight testing of advanced control systems in production-representative environments.



**JESSE LEITNER** holds a Ph.D. in aerospace engineering from Georgia Institute of Technology in the area of flight mechanics and control, an M.S. in aerospace engineering from Georgia Institute of Technology, and a B.S. in aerospace engineering from the University of Texas at Austin. He is currently a Guidance, Navigation, and Control (GN&C) Systems Engineer and he serves as NASA Goddard's Lead Engineer for Distributed Space Systems. In this role he is responsible for the end-to-end technology program supporting Goddard's Earth Science and Space Science multiple spacecraft missions. He is also the Lead Analyst for formation flying guidance, navigation, and control work. Dr. Leitner serves as an interface between engineers and scientist principal investigators for distributed spacecraft missions at Goddard and he also acts as an interface in this area to the Department of Defense and other government agencies with interests in distributed space systems. Prior to joining NASA Goddard at the beginning of 2000, he was a Group Leader for Space Flight Dynamics and Control at the Air Force Research Laboratory, Space Vehicles Directorate, in Albuquerque. His research interests are in spacecraft guidance, navigation, and control and formation flying; applications of nonlinear and adaptive control; and dynamics and control of large optical systems. He serves on the AIAA GN&C Technical Committee, he has just finished his term as the AIAA Director on the American Automatic Control Council, and he was the Technical Program Chair for the 2002 AIAA GN&C Conference. He is an Associate Fellow of AIAA.



**PING LU**, Professor of Aerospace Engineering at Iowa State University, received his B.S. from the Beijing Institute of Aeronautics and Astronautics, China, in 1982 and his M.S.E. and Ph.D. in aerospace engineering from the University of Michigan in 1984 and 1988, respectively. He worked as a Postdoctoral Fellow from 1988 to 1989 at the University of Michigan. Since 1990 he has been with Iowa State University. His research interests include aerospace guidance, nonlinear control theory and applications, and trajectory optimization. He is an Associate Fellow of AIAA and was a Member of the AIAA Technical Committee on Guidance, Navigation, and Control (1994–2000).



**MICHAEL B. MCFARLAND**, Senior Systems Engineer with Raytheon Electronic Systems, is involved in a variety of research and development activities related to advanced missile guidance and control algorithms. He received his B.S. in aerospace engineering with high honors from the University of Florida in 1991, and his M.S. and Ph.D. in aerospace engineering from the Georgia Institute of Technology in 1992 and 1997, respectively. From 1991 to 1999, he was a Research Aerospace Engineer with the Air Force Research Laboratory Munitions Directorate at Eglin Air Force Base. Some of his previous research efforts focused on genetic algorithms, hybrid numerical/analytical methods for optimal aeroassisted orbit transfer vehicle guidance, robust nonlinear missile autopilot architectures, missile guidance laws, adaptive nonlinear control using artificial neural networks, and optimal path planning. His current research interests include guidance and control of hypersonic missiles, applications of adaptive and nonlinear control theory, and artificial neural networks. He is a Senior Member of AIAA, Member of the AIAA Missile Systems Technical Committee, Member of the Institute of Electrical and Electronics Engineers, and Life Member of Tau Beta Pi.



**COLIN MCINNES** is Professor of Engineering Science at the Department of Mechanical Engineering, University of Strathclyde. He obtained a B.Sc. (Hons.) in physics and astronomy and a Ph.D. in astrodynamics from the University of Glasgow in 1988 and 1991, respectively. He was then appointed as a lecturer in the Department of Aerospace Engineering in October 1991 and was subsequently Reader (1996) and Professor (1999). He joined the University of Strathclyde in September 2004. His research interests center on highly non-Keplerian orbits for solar sails, solar sail mission analysis and design, autonomous spacecraft control, and space robotics. Recent contributions include studies of high-energy sample return missions using solar sails for the ESA and mission applications of non-Keplerian orbits for NOAA and the Lockheed Martin Corporation. He is a Fellow of the Royal Aeronautical Society, the Institute of Physics, and the Royal Society of Edinburgh and was elected a Fellow of the Royal Academy of Engineering in July 2003.



**ROBERT G. MELTON** is a Professor of Aerospace Engineering at the Pennsylvania State University. He received his B.S. in physics (cum laude) from Wake Forest University in 1976, and his M.S. in physics (1979) and Ph.D. in engineering physics (1982) from the University of Virginia. His research includes work in celestial mechanics, non-Keplerian astrodynamics, trajectory optimization, optimum station-keeping for space-based interferometry, and satellite attitude dynamics and control. An Associate Fellow of AIAA, he has served on its Astrodynamics Technical Committee and on the *Journal of Guidance, Control, and Dynamic's* Applications Advisory Board. He is a member of Sigma Pi Sigma (Physics Honor Society) and a Fellow of the American Astronautical Society, in which he has served as Chair of the Space Flight Mechanics Technical Committee, and Vice President-Technical; and in which he is currently Vice President-Publications.



**JAMES MITCHELL** is a Technical Fellow with the Boeing Company. He has 30 years of experience in aircraft control system design, with the last 20 years being specifically involved in the design of fly-by-wire flight control systems for fixed- and rotary-wing aircraft. He gained his Bachelors degree in aeronautical engineering in 1974 from the Imperial College of Science and Technology in London, England. His early working experience was with Westland Helicopters, where he was a member of a team developing a family of unmanned rotorcraft, which are now to be seen as objects of interest in the British Helicopter Museum at Weston-super-Mare, England. He continued his career with Canadair in Montreal, Canada, where he was involved with the design of the Canadair Challenger business jet. He joined Boeing in Seattle in 1979 as part of the flight controls team for the Boeing 767. His career at Boeing since then has included the Boeing 767 and Boeing 777 commercial transports, the Boeing-Sikorsky RAH-66 Comanche helicopter, and the Bell-Boeing V-22 and Bell-Boeing (now Bell-Agusta) 609 tilt-rotor aircraft. He is now supporting the design of the flight control system for the Boeing 7E7 Dreamliner. A member of the American Helicopter Society, AIAA, and Society of Automotive Engineers, Jim is also a member of the Steering Committee for the Software System Safety Working Group chaired by Professor Nancy Leveson of MIT, which addresses areas of common interest between diverse industries that use software as a means of controlling safety critical functions.



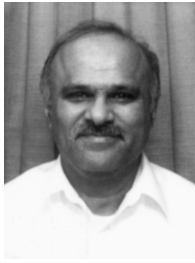
**VIVEK MUKHOPADHYAY** received his S.M. and Sc.D. degrees in aeronautics and astronautics from Massachusetts Institute of Technology in 1970 and 1972. He was awarded the President of India Gold Medal and B.Tech. degree at the Indian Institute of Technology in 1968. He is presently a Senior Research Engineer at NASA Langley Research Center, Aerospace Systems Concepts and Analysis Division. His prior positions include Assistant Professor, Indian Institute of Technology; Research Specialist, Planning Research Corporation; Adjunct Associate Professor, George Washington University, Joint Institute for Advancement of Flight Sciences; and Senior Research Engineer, Aeroelasticity Branch and Systems Analysis Branch at NASA Langley. He is an Associate Fellow of AIAA, and a recipient of the prestigious NASA Floyd Thompson Fellowship. He has 35 years of research and teaching experience in the areas of applied optimal control, aeroservoelasticity, and structural dynamics and has many publications in archival journals. He was a contributing author to the Academic Press series *Advances in controls and Dynamics*, AIAA History of Key Technologies series, and "Benchmark Active Control Technology" special publications. His research interests are in the areas of robust control, active flutter suppression, multidisciplinary analysis, and optimization of advanced aerospace concepts. He has made key contributions to many NASA Langley projects including Drone for Aeroelastic and Structural Testing, Active Flexible Wing Flutter suppression, Benchmark Active Control Technology, Joined Wing Concept, Advanced Vehicle Systems Technology Programs, and Blended Wing Body vehicle design and optimization.



**MARK L. PSIAKI** is an Associate Professor in the Sibley School of Mechanical and Aerospace Engineering at Cornell University in Ithaca, New York. He received a B.A. in physics in 1979 and a M.S. and Ph.D. in mechanical and aerospace engineering in 1984 and 1987, all from Princeton University. He worked at the RCA Space Center in East Windsor, NJ, on the TIROS program from 1979 to 1982. He has worked at Cornell continuously since 1986 except for two sabbaticals, one from 1994 to 1995 and one in 2001. In both instances he was a Lady Davis fellow in the Aerospace Faculty at the Technion in Haifa, Israel. His principal research interests are in the areas of estimation and filtering, GPS receivers and applications, spacecraft attitude and orbit determination, and spacecraft attitude dynamics and control. He received the best paper awards for the 1997 AIAA Guidance, Navigation, and Control conference and for the 1998 and 2002 AIAA/AAS Astrodynamics Specialist conferences. He also has received teaching and advising awards from Cornell. He is an Associate Fellow of the AIAA and served on its Guidance, Navigation, and Control Technical Committee from 1992 to 1995.



**JUREK Z. SASIADEK** is a Professor of aerospace engineering in the Department of Mechanical and Aerospace Engineering at Carleton University, Ottawa, Ontario, Canada. He received his M.S. (1972), Ph.D. (1975), and D.Sc. from the Technical University of Wroclaw, Wroclaw, Poland. His research interests focus in two main areas. The first is robotics, especially space robotics and unmanned autonomous vehicles (UAVs). The second area involves guidance, navigation, and control, especially spacecraft and aircraft control and nonlinear control. In 1989–1991 Dr. Sasiadek was with the Canadian Space Agency in Ottawa, and in 1985–1987 he was a Technical Director for Alberta Research Council, Calgary, Alberta. He has authored or coauthored more than 180 journal and refereed conference papers. Professor Sasiadek is a member of the AIAA Guidance, Navigation, and Control Technical Committee. An Associate Fellow of AIAA, he was a Program Chair of the 1994 AIAA Guidance, Navigation, and Control Conference in Scottsdale, Arizona. In August 2001, he was General Chair of the 2001 AIAA Guidance, Navigation, and Control Conference in Montreal, Quebec. Currently, he is Chair of an IFAC Robotics Technical Committee. Also, he is a Chair of Joint Robotics and Control Systems Societies Chapter in Ottawa.



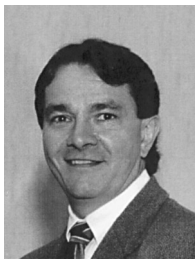
**M. BALA SUBRAHMANYAM** was born in the state of Andhra Pradesh, India, in 1949. He received his B.S. (1970) in electrical engineering from the Regional Engineering College, Warangal, India, and his M.S. (1972) and Ph.D. (1975) in electrical engineering from the University of Iowa, Iowa City, Iowa. Dr. Subrahmanyam has held faculty positions with Texas A&M University, Kingsville, Texas, and the University of Missouri-Columbia, Columbia, Missouri. He was also with the Naval Air Warfare Center, Patuxent River, Maryland, working in the area of research and development of flight control systems of advanced naval aircraft. Currently he is with the Lockheed Martin Advanced Technology Center in Palo Alto, CA, working on the Advanced EHF and Airborne Laser programs. He is also an Adjunct Professor with the Florida Institute of Technology. Dr. Subrahmanyam's research interests include the areas of guidance and control problems of aircraft and missiles, H 1 control, and optimal control. He has published over 30 journal articles in these areas. In addition, he has written the books *Optimal Control with a Worst Case Performance Criterion and Applications* (Springer-Verlag, 1990) and *Finite Horizon H 1 and Related Control Problems* (Birkhauser, 1995). He is an Associate Fellow of the AIAA.



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