A Publication of Wide Scope: *Journal of Propulsion and Power*

IT is with a great deal of excitement and hopeful anticipation that I introduce the *Journal of Propulsion and Power* to the AIAA family of journals. The concept of a journal intended to provide, in a single source, original contributions to the broad field of propulsion and power began to evolve several years ago. With the dedicated efforts of many representatives of Technical Committees, members of the Publications Committee, AIAA professional staff members, as well as individual AIAA members, that concept has come to fruition with this premier issue. It is hoped and expected that this new journal will once again appeal to our members who have interests in airbreathing propulsion, liquid propulsion, electrical propulsion, solid rockets, propellant and combustion technology, and power conversion, as used to be the case with the *ARS Journal* at the time of the founding of the AIAA.

It will be apparent from the scope on the inside front cover that the breadth of subject matter to be considered is extensive indeed. Successful attainment of our editorial goals would see the emergence of a first-class journal that would provide the readership of practicing professionals with up-to-date and original contributions to the literature of high-technology propulsion and power, spanning the range from fundamental research through development to applications of propulsion and power generation systems.

The scope of the *Journal of Propulsion and Power* was determined after thorough discussions, both among the Editors-in-Chief of all of the AIAA journals and with the entire AIAA Publications Committee. It is felt that the JPP, as presently constituted, fits well within the overall publications offerings of the Institute, and hopefully little confusion regarding overlap of the journal scopes will occur. In this respect, it should be noted that author preferences will be honored in all cases unless the Editors-in-Chief of all journals involved specify publication in a journal other than that first requested by the author.

The large breadth of material to be considered within the scope of the JPP places a considerable burden upon the many capable professionals who have volunteered their time to serve as Associate Editors. Inevitably, when such a broad scope is considered, contributions are submitted which do not fit within the immediate field of expertise of any of the Associate Editors. In such cases, the Associate Editors seek the assistance of established professionals in the field, and it is in this respect that those Associate Editors identified with the major companies and major research centers provide a particularly valuable service. It is planned to add a few more Associate Editors, and of course replacements will arise from time to time. In this respect, as Editor-in-Chief, I would greatly appreciate communications from the readership regarding the appropriate balance of editorial expertise, and, of course, future appointments will reflect both such readership-identified needs and needs identified with the distribution of submitted papers.

With regard to the editorial structure of the journal, it should be noted that the Associate Editors are responsible for the technical evaluation of the submissions, and in this task they are aided by the many reviewers who contribute their time to this valuable service. All Editors are acutely aware of possible conflict-of-interest situations arising in the review process and do their best to prevent such occurrences. Finally, I am fortunate indeed to have the help of four Editors-at-Large, who are available for guidance in policy matters and also to provide such special services as editing a special edition of the journal. The Editors-at-Large do not participate in the review of individual papers.

I end this first editorial with a request for your support, and sincerely solicit your suggestions and advice. It is with pride that I present below brief resumés and photographs of the editorial staff.

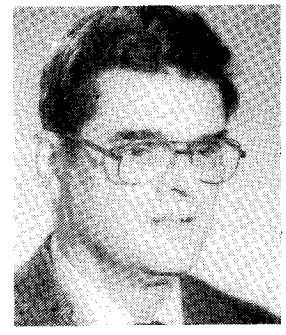
Gordon C. Oates
Editor-in-Chief

Editor-in-Chief

Dr. Gordon C. Oates, Professor of Aeronautics and Astronautics at the University of Washington, received his B.A.Sc. from the University of British Columbia in 1954, his M.Sc. from the University of Birmingham, England, in 1956, and his Ph.D. from Cal Tech in 1959. He has served on the faculty at the University of Washington since 1967, prior to which he was at MIT from 1959-67; he also has served on a visiting status at the U.S. Air Force Academy (1975-1976), the Royal Institute of Technology, Stockholm (1970), and recently the Air Force Office of Scientific Research (1983). His research interests center in the fields of propulsion and energy conversion. He brings to the position of Editor-in-Chief eight years of experience as Associate Editor and Editor-in-Chief for the Journal of Energy.

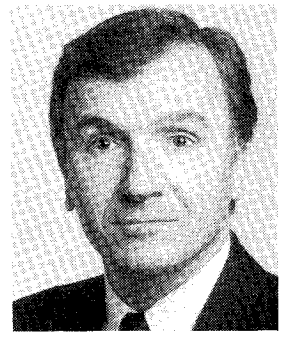
Associate Editors

Dr. William U. Borger, Manager of the Electrical Systems Technical Area of the Aero Propulsion Laboratory, Air Force Wright Aeronautical Laboratories, received his B.S. in Electrical Engineering from the Indiana Institute of Technology in 1971, his M.S. in Electrical Engineering from Ohio State University in 1974, and his Ph.D. in Electrical Engineering from the University of Dayton in 1981. The majority of his work has centered around aircraft power systems, with emphasis on the application of high-energy rare earth magnets to rotating machinery. He is responsible for research and development in advanced electrical power technologies for aircraft, as well as for special purpose loads for both aircraft and spacecraft. Dr. Borger has authored or co-authored 10 technical reports and papers on power system technology.

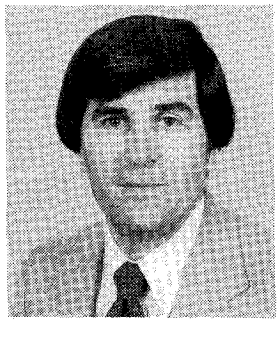


Dr. Robert S. Brown, Senior Staff Scientist at United Technologies/Chemical Systems Division, received his B.S.E. in Chemical Engineering from Princeton University and his Ph.D. in Chemical Engineering from the University of California. He conducts and supervises research on combustion-related problems in solid propellant rocket motors and in ramjet engines and also advises on design and development of propulsion systems. Prior to joining United Technologies, he worked for Shell Development Company on computer simulation of refinery processes with integration into nonlinear economic optimization codes. Dr. Brown is a former Associate Editor of the Journal of Spacecraft and Rockets and has been a member of both the AIAA Solid Rockets and Propellants and Combustion Technical Committees. In addition, he has served on the JANNAF Program Committee for several combustion meetings. He received the OT/CSD Outstanding Technical Contributions Award in 1980 and 1982 and the Outstanding Service and Technical Contribution Award of the JANNAF Combustion Committee in 1984.

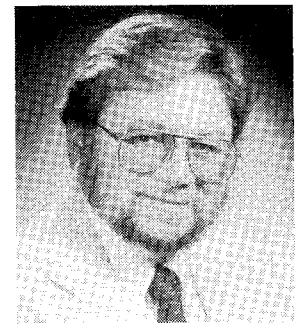
Dr. Larry A. Diehl, Chief of the Combustion Branch at NASA Lewis Research Center, received his B.S. in Aeronautical and Astronautical Engineering from the University of Detroit in 1965, and his Ph.D. in Aeronautical and Astronautical Engineering from Ohio State University in 1969. Dr. Diehl began his career at NASA Lewis in 1969 as an Aerospace Engineer in the Combustion Branch; from 1976 to 1981, he was Head of the Combustion Fundamentals Section. He has served on a variety of government and industry coordinating groups associated with combustion research, advanced combustion diagnostics, pollutant formation, and pollutant measurement. During 1977-1978, he served on an International Working Group responsible for recommending international regulatory levels for aircraft pollutant emissions. His present research interests include experimental and analytical investigations in the fundamentals of combustion, the development of combustor analytical models, and the design and evaluation of combustor components and advanced combustor concepts. He was Chairman of the AIAA Propellants and Combustion Technical Committee and a member of the 1983 AIAA National Nominating Committee.



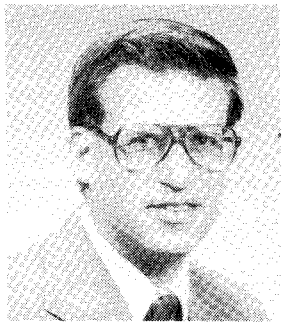
Dr. Robert P. Dring, Manager of Gas Turbine Technology at United Technologies Research Center, obtained his BSME from Clarkson College in 1962, M.S. from Cornell in 1965, and Ph.D. from Cornell in 1968. Following graduation he joined Pratt and Whitney Aircraft in the Turbine Technology Research group as an Assistant Project Engineer, with promotion to Project Engineer coming in 1972. His efforts were directed to the development of fundamental aerodynamic understanding , as well as to the development of advanced turbine aerodynamic design tools. In his current position, he is responsible for the formulation and execution of technology programs that reflect the needs of United Technologies Corporate Divisions in the area of gas turbine technology. Dr. Dring has published widely in the fluid mechanics of turbomachinery area, with more than forty papers authored or co-authored.



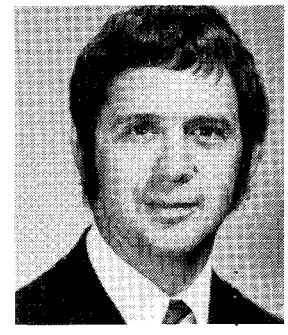
Dr. Clark W. Hawk, Chief of the Liquid Rocket Division of the Air Force Rocket Propulsion Laboratory, obtained his BSME from Penn State University in 1958, his MSME from Purdue in 1968, and his Ph.D. from Purdue in 1970. Dr. Hawk has twenty-six years of total service to the government, with technical responsibilities such as electrical propulsion activity at AFRPL, management of the Colloid Advanced Development Program, and identification (with SAMSO) of using agencies needs. His activity in planning space activities led to his contribution of the AFRPL FY75-80 Technology Plan, of which he was one of two principal drafters. Prior to assuming his present position, Dr. Hawk was Chief, Propulsion Applications Branch, Liquid Rocket Division, and in that capacity he was responsible for the planning, direction, and control of liquid rocket engine R&D and application of related technologies to nonrocket engine problems. His professional experience was subsequently broadened with his identification with the Solid Rocket Division, in which he established a program to advance the state-of-the-art of nozzle materials.



Dr. Herman Krier, Professor of Mechanical Engineering at the University of Illinois at Urbana-Champaign, where he has been on the faculty since 1969, received a BSME from the University of Pittsburg in 1964 and a Ph.D in Aerospace Sciences from Princeton University in 1968. He has been an active researcher, having authored or co-authored over 60 papers for archive journals and 30 technical reports. His work is in the general area of combustion and reactive gas dynamics, including such areas as deflagration and detonation physics, rocket and gun propulsion, two-phase fluid mechanics, and flows with viscous heat transfer. Professor Krier is co-editor of *Interior Ballistics of Guns*, Volume 66 in the AIAA Progress Series, and editor of *Proceedings of the 18th and 19th Symposium (International) Combustion*. He is an Associate Fellow of AIAA and has been Chairman of the AIAA Propellants and Combustion Technical Committee. He also was a member of the Solid Rockets Technical Committee, where he helped to organize several national technical meetings in the combustion area. He heads the AIAA subcommittee on Student Participation in Propulsion and is a technical area leader for JANNAF in solid propellant rocketry and propellant hazard technology.

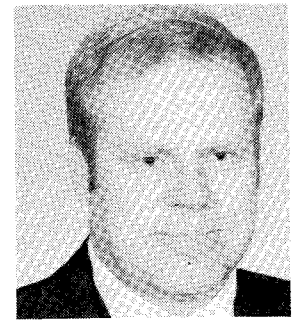


Dr. Julian M. Tishkoff, an Engineer at the Air Force Office of Scientific Research, received his B.S. in Applied Mechanics from Rensselaer Polytechnic Institute in 1966, his M.S. in Engineering from Case Institute of Technology in 1968, and his Ph.D. in Engineering from Case Western Reserve University in 1973. Prior to assuming his present position, he worked in the Fluid Dynamics Department of General Motors Research Laboratories. He is a member of AIAA, ASME, The Combustion Institute, and ASTM. Dr. Tishkoff has authored a number of technical publications.



Dr. Paul J. Wilbur, Professor in the Department of Mechanical Engineering at Colorado State University, obtained his B.S. from the University of Utah in 1960, and his Ph.D. from Princeton University in 1968. He comes to the JPP from the *Journal of Spacecraft and Rockets*, for which he has served as Associate Editor since 1982. His research is centered on advanced propulsion concepts, in which he has authored or co-authored more than eighty publications. In 1982 he received the Halliburton Award for Excellence in Teaching at the College of Engineering, Colorado State University.

Dr. Y. C. L. (Susan) Wu, Professor of Aerospace Engineering and Administrator for Energy Conversion Research and Development Programs at the University of Tennessee Space Institute (UTSI), obtained her B.S. in Mechanical Engineering from National Taiwan University in 1955, her M.S. in Aeronautical Engineering from Ohio State in 1959, and her Ph.D. in Aeronautics from Cal Tech in 1963. Following two years as Senior Engineer at Electro-Optical Systems, Inc., she came to UTSI in 1965, where she was promoted to Professor in 1973. In addition to her professorial teaching responsibilities, Dr. Wu has management responsibility for the Energy Conversion Research and Development Programs. The current primary program is in MHD energy conversion but also includes research in gasification, coal characterization, and other related areas. She has authored or co-authored over sixty technical papers and is active as a consultant to the government, as well as serving on many professional committees. Her creative energies have been well recognized through awards such as Amelia Earhart Fellowship (1958, 1959, 1962), Institute of Aerospace Sciences Best Scholastic Award (1962), Booster Award, AIAA Tennessee Section (1967), Outstanding Educators of America Award (1973, 1975), University of Tennessee Chancellor's Research Scholar Award (1978), and University of Tennessee Women of Achievement, for Significant Publication (1983).



Mr. James T. Younghans, Manager of Low Observable Systems Integration at General Electric, received his B.S. and M.S. degrees in Aerospace Engineering from the University of Cincinnati and an M.B.A. from Xavier University. His professional career commenced with the General Electric Aircraft Engine Business Group upon graduation in 1963. In his 21 years with General Electric, he has worked in the areas of engine operability, aircraft/engine integration, inlet and nacelle aerodynamic design, and aircraft performance. Mr. Younghans is a Senior Member of the AIAA and a U.S. patent holder.

Editors-at-Large

Dr. E. Tom Curran, Chief Scientist of the Aero Propulsion Laboratory at Wright-Patterson Air Force Base, Ohio, was born in England and received an honors degree, B.Sc. (Eng.), from London University, an M.Sc. from Cranfield Institute of Technology, and a Ph.D. in Aerospace Engineering from AFIT. Prior to joining the Aero Propulsion Laboratory in 1968, he served as an RAF engineering officer for twenty years, including appointments in propulsion research and development both in the UK and the USA, in operational research, and in aircraft operations. He also lectured in propulsion topics. At the Aero Propulsion Laboratory, he was initially in charge of the Ramjet Technology Branch and subsequently became Deputy Director of the Ramjet Division, where he was responsible for the development of ducted rockets and ramjet systems. His interests include all forms of aerospace propulsion and power systems, as well as flight mechanics. He is currently responsible for the technical aspects of the Aero Propulsion Laboratory's programs.

Professor Jack L. Kerrebrock, Head of the Department of Aeronautics and Astronautics and Richard Cockburn Maclaurin Professor at the Massachusetts Institute of Technology, received his Ph.D. from California Institute of Technology. From July 1981 to July 1983 he was Associate Administrator for Aeronautics and Space Technology of NASA. He has taught and conducted research in energy conversion and propulsion since 1956. His early work was on nuclear rockets, space propulsion and power, and magnetohydrodynamic generators. More recently, he has addressed the fluid mechanics of turbomachinery for aircraft engines and is the author of a text on aircraft engines and gas turbines. He was the Director of the M.I.T. Gas Turbine Laboratory from 1968 to 1978, when he became Head of the Department of Aeronautics and Astronautics. Professor Kerrebrock is a Fellow of the AIAA and of the American Academy of Arts and Sciences. He is also a member of the National Academy of Engineering. He was decorated by the U.S. Air Force for Exceptional Civilian Service in 1981, and received the Distinguished Service Medal from NASA in 1983.

Dr. Kenell J. Touryan, Senior Vice President and General Manager of Flow Industries in Kent, Washington, did his undergraduate work in Electrical Engineering at the American University of Beirut, Lebanon, from 1953 to 1956; he received an M.S. in Mechanical Engineering in 1959, an M.A. in Physics from Princeton in 1961, and a Ph.D. in Aerospace and Mechanical Sciences from Princeton in 1962. In addition to his position at Flow Industries, where he organized a team that put together the first commercial 120-kW vertical axis wind turbine and assembled a team of engineers and scientists to launch a solar pond design and development project, Dr. Touryan is associated with an energy technology trust, where he has been in charge of two international projects. Prior to assuming his present position, he served as Deputy Director of the Solar Energy Research Institute (SERI) and as Manager of the Thermal Sciences Department at Sandia Laboratories. He teaches courses in renewable energy at the Colorado School of Mines as Adjunct Professor of Engineering and is the author of over 40 journal articles.

Dr. Richard R. Weiss, Chief Scientist of the Air Force Rocket Propulsion Laboratory, received his Ph.D. in Mechanical Engineering from Purdue University in 1970, his M.S. in Mechanical Engineering from the University of Southern California in 1964, and his B.S. in Aeronautical Engineering from the University of Michigan in 1957. Dr. Weiss started his career at Rocketdyne as a Development Engineer on the Jupiter Missile rocket engine. He served as a Second Lieutenant with the USAF, where the bulk of his time was spent with the rocket group at Edwards AFB, serving as a unit chief and test conductor in the Thor Missile test program. After leaving the service, he remained at the Laboratory and served in several key technical positions in the Laboratory's Liquid Rocket Division. He is currently the AFRPL focal point for SDI. Dr. Weiss has over 20 technical publications in related fields of rocket propulsion. He is a member of AIAA, Combustion Institute, and Advanced Defense Preparedness Association and has served as an officer and/or committee member for both the AIAA and Combustion Institute.