

## A Fourth Successful Year for *JTHT*

**S**UPPORT from the thermophysics and heat transfer community for the *Journal of Thermophysics and Heat Transfer (JTHT)* continues to be strong. Between October 31, 1989 and November 1, 1990, 161 papers were submitted to *JTHT* with 52% originating from technical meetings. During this same time period, over 350 reviews were completed by volunteers to ensure the quality of *JTHT*. The average time between the receipt of a manuscript and the Associate Editor's decision to accept or revise was three months for 1990 articles.

The number of pages in 1990 was increased from 488 to 544. However, a large turnover in the editorial staff at AIAA headquarters has resulted in production delays. Larger issues are planned in 1991 to help reduce our backlog. The patience of our authors and subscribers is greatly appreciated.

### A Full-Spectrum Publication

It should be re-emphasized that *JTHT* is a full-spectrum publication in the field of thermophysics and heat transfer, a breadth illustrated by the following list of pertinent topics:

#### *Aerothermodynamics*

Re-entry  
Thermal protection  
Low density  
Laser interaction  
Ablation  
Plumes  
Computational

#### *Radiative Heat Transfer*

Surface interchange  
Absorbing-emitting media  
Multiple scattering  
Nongray analysis  
Multidimensional  
Coupled with conduction  
Coupled with convection

#### *Thermal Control*

Heat pipes  
Thermal modeling  
Electronics cooling  
Large space structures  
Contamination  
Cryogenics  
Insulation

#### *Conduction/Phase Change*

Contact conductance  
Composite materials  
Inverse problems  
Conjugate problems  
Nonlinear problems  
Analytical techniques  
Melting/solidification

#### *Nonintrusive Diagnostics*

IR signatures  
Remote sensing  
Laser techniques  
Particle sizing  
Scattering techniques

#### *Convective Heat Transfer*

Forced convection  
Natural convection  
Mixed convection  
Internal/external flows  
Boiling/condensation

#### *Thermophysical Properties*

Thermodynamic  
Transport  
Optical/radiative

#### *Numerical Heat Transfer*

Finite difference  
Finite element  
Parallel processing

A discipline oriented publication, *JTHT* presents both original contributions of a fundamental nature and application-type papers. Analytical, numerical, and experimental approaches are all encouraged. Papers on the topics of aerothermodynamics, thermal control, and numerical heat transfer are especially encouraged. Although *JTHT* is published by AIAA, papers are not restricted to aerospace topics. Authors from the international thermophysics and heat transfer community are invited to submit papers.

### Accuracy and Ethics

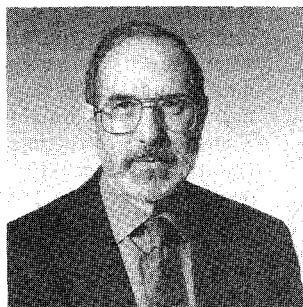
The AIAA Publications Committee has approved the following: "The AIAA journals will not accept for publication any paper reporting (1) numerical solutions of an engineering problem that fails to adequately address accuracy of the computed results or (2) experimental results unless the accuracy of the data is adequately presented." The purpose of this state-

ment is to reiterate the desire to have high quality investigations with properly documented results published in the AIAA journals, and to clarify acceptable standards for presentation of numerical and experimental results. The editors and reviewers will remain the final judges. An ethical standard document has also been approved by the Publications Committee and is reproduced in its entirety elsewhere in this issue. Prospective authors and reviewers are encouraged to study it carefully.

### Manuscript Disks

Authors are encouraged to prepare their manuscripts electronically to reduce publication delays. AIAA now has the equipment that can convert virtually any disk (3 1/2-, 5 1/4-, or 8-inch) directly to type, thus avoiding rekeyboarding and subsequent introduction of errors. Examples of easily converted software programs include TEX and LATEX. If your manuscript was prepared with a word-processing program, please retain the disk until the review process has been completed and final revisions have been incorporated in your paper. If you have any questions or need further information, please telephone Richard Gaskin, AIAA Production Manager, at (202) 646-7496.

### 1990 AIAA Thermophysics Award Recipient



Dr. John R. Howell, Baker-Hughes Professor at the University of Texas at Austin, was selected as the 1990 recipient of the AIAA Thermophysics Award. Dr. Howell was chosen for his outstanding contributions in thermophysics with specific reference to his application of the Monte Carlo method to radiation heat transfer.

The AIAA Thermophysics Award is presented for an outstanding technical or scientific contribution by an individual in thermophysics, specifically as related to the properties and mechanisms involved in thermal energy transport by conduction, convection, and radiation. This award was presented to him at the 5th Joint AIAA/ASME Thermophysics and Heat Transfer Conference in June at Seattle, Washington.

### 1991 Editorial Team

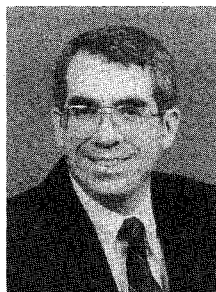
The editorial team includes Associate Editors and members of the Editorial Advisory Board. The Associate Editors are responsible for the technical evaluation of manuscripts, and the burden of maintaining quality rests predominantly with them. Photographs and biographies of the 1991 team are included in this issue. Dr. Carl D. Scott retires after serving five years as Associate Editor. I encourage you to discuss your views of *JTHT* with members of the editorial team.

### Appreciation

I would like to express my personal thanks to the authors who have chosen *JTHT* as the vehicle for their research work. I also want to thank the reviewers who have contributed their time to ensure the success of *JTHT*. Their names are listed in this issue. Finally, I would like to express my appreciation to Bill O'Connor (Managing Editor), Eric Sorensen (Production Editor), David Uffelman (Production Editor), Heather Brennan (Managing Editor), and Norma Brennan (Director of the Editorial Department) for their help.

Alfred L. Crosbie  
Editor-in-Chief

## Editor-in-Chief

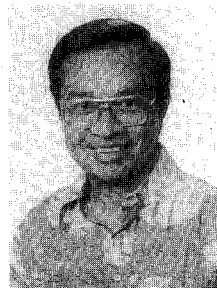


**ALFRED L. CROSBIE**, Professor of Mechanical Engineering at the University of Missouri-Rolla, received his B.S. from the University of Oklahoma in 1964, his M.S. in 1966, and his Ph.D. in 1969 from Purdue University, all in mechanical engineering. He joined the faculty of the University of Missouri-Rolla in 1968, where he was promoted to Professor in 1975. He has been an active researcher in the field of radiative heat transfer since 1964. His current research interests include multidimensional radiative heat transfer, multiple scattering, numerical heat transfer, and laser interaction. Dr. Crosbie has served as a member of the AIAA Thermophysics Technical Committee (1976-78), Technical Program Chairman for the AIAA 15th Thermophysics Conference (1980), Editor of two thermophysics volumes in the AIAA *Progress in Astronautics and Aeronautics* book series (1981), Associate Editor for the *AIAA Journal* (1981-83), and Chairman of the AIAA Thermophysics Technical Committee (1984-86). He is a Fellow of AIAA and ASME, a recipient of the AIAA Thermophysics Award (1987) and the ASME Heat Transfer Memorial Award (1990), and an Associate Editor for the *Journal of Quantitative Spectroscopy and Radiative Transfer* (1979-93). Dr. Crosbie is the author or coauthor of over 70 papers in archival journals.

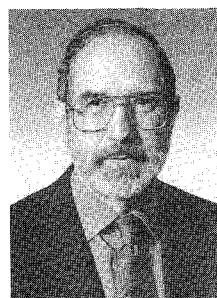
## Associate Editors



**TA-SHEN CHEN**, Curators' Professor of Mechanical Engineering at the University of Missouri-Rolla, received his B.S. from National Taiwan University in 1954, his M.S. from Kansas State University in 1961, and his Ph.D. from the University of Minnesota in 1966, all in mechanical engineering. He joined the faculty of the University of Missouri-Rolla in 1967, where he was promoted to Professor in 1973. His recent research centers on convective heat and mass transfer, natural convection, mixed convection, heat transfer in separated flows, and wave and thermal instability of convective flows. Dr. Chen was a member of the AIAA Thermophysics Technical Committee (1986-88) and is a Fellow of ASME. He is the author or coauthor of about 100 journal articles and 50 technical papers. He has also contributed a chapter each to the *Handbook of Single-Phase Convective Heat Transfer* and the *Handbook of Numerical Heat Transfer*.



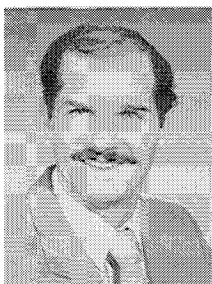
**PING CHENG**, Professor and Chairman of Mechanical Engineering at the University of Hawaii at Manoa, received his B.S. in mechanical engineering from Oklahoma State University in 1958, his M.S. in mechanical engineering from Massachusetts Institute of Technology in 1960, and his Ph.D. in aeronautics and astronautics from Stanford University in 1965. Before joining the University of Hawaii in 1970, he held positions at New York University (1965-67), NASA Ames Research Center (1967-68), and National Taiwan University (1968-70). His recent research centers on convection, boiling and condensation in porous media, and geothermal systems. Dr. Cheng was a member of the AIAA Thermophysics Technical Committee (1988-89) and is a Fellow of ASME. He is the author or coauthor of over 100 publications. He has also contributed chapters on heat transfer in geothermal systems and porous media to *Advances in Heat Transfer*, the *Handbook of Heat Transfer Applications*, and *Natural Convection: Fundamentals and Applications*.



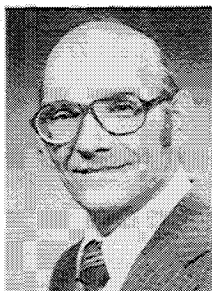
**JOHN R. HOWELL**, Baker-Hughes Professor and Director of the Center for Energy Studies at the University of Texas at Austin, received his B.S. in 1958, M.S. in 1960, and in 1962 his Ph.D., all in chemical engineering, from Case Institute of Technology. Before joining the University of Texas at Austin in 1978, he held positions at the University of Houston (1968-78) and NASA Lewis Research Center (1961-68). His research interests include radiative heat transfer, Monte Carlo methods, and solar energy. He was a member of the AIAA Thermophysics Technical Committee (1975-78, 81), Technical Program Chairman for the 2nd AIAA/ASME Thermophysics and Heat Transfer Conference (1978), and a member of the Scientific Organizing Committee for the International Heat Transfer Conference (1968, 1990). He served as an Associate Editor of the *AIAA Journal* (1978-80). Dr. Howell is an Associate Fellow of AIAA, a Fellow of ASME, and a recipient of the AIAA Thermophysics Award (1990). He is the author or coauthor of over 70 technical publications including five books.



**DARRELL W. PEPPER**, Co-founder and CEO of Advanced Projects Research, Inc. (APRI), Moorpark, California, received his B.S. in mechanical engineering in 1968, his M.S. in aerospace engineering in 1970, and his Ph.D. in mechanical engineering in 1973, all from the University of Missouri-Rolla. He is also a faculty member at California State University-Northridge, and is currently conducting a home study course on the finite element method for AIAA. Before starting APRI, he was Chief Scientist of the Marquardt Company (1987-90) and he worked for 13 years for E.I. DuPont de Nemours at the Savannah River Laboratory in Aiken, South Carolina. His research interests include numerical heat transfer, finite element methods, and computational fluid mechanics. Dr. Pepper is a fellow of the ASME and is the author or coauthor of over 30 technical publications, including two books. He has also contributed two chapters to the *Handbook of Numerical Heat Transfer*.



**GERALD E. SCHNEIDER**, Professor and Associate Dean of Mechanical Engineering at the University of Waterloo, Ontario, Canada, received his B.A.Sc. in 1973, M.A.Sc. in 1974, and Ph.D. in 1977 from the University of Waterloo, in mechanical engineering. He joined the University of Waterloo in 1977 and was promoted to Professor in 1985. Most of his research work revolves around conduction heat transfer, computational fluid dynamics, numerical heat transfer, and solid/liquid phase change. He was a member of the AIAA Thermophysics Technical Committee (1977-79, 1982-84) and of the AIAA Publications Committee (1979-86). Dr. Schneider is the author or coauthor of more than 75 publications. He was guest editor for the July-August 1986 *Journal of Spacecraft and Rockets* special issue on thermophysics. He is an editor of the *Handbook of Numerical Heat Transfer* and is a member of the Editorial Advisory Board for *Numerical Heat Transfer*.



**ROBERT SIEGEL**, Senior Research Scientist at NASA Lewis Research Center, received his B.S. in 1950 and M.S. in 1951 from the Case Institute of Technology, in mechanical engineering, and his Sc.D. in mechanical engineering from Massachusetts Institute of Technology in 1953. Before joining NASA in 1955, he worked for General Electric as a heat transfer engineer and analyst. He has been an active researcher in heat transfer since 1950. The majority of his research revolves around convective heat transfer, radiative heat transfer, and solidification heat transfer. He is a recipient of the ASME Heat Transfer Division's Memorial Award (1970) and is a Fellow of ASME. He served as an Associate Technical Editor for the *Journal of Heat Transfer* (1973-83) and received the NASA Exceptional Scientific Achievement Medal (1986). Dr. Siegel is a Fellow of AIAA and ASME and is the author or coauthor of over 130 publications, including a textbook on thermal radiation heat transfer.

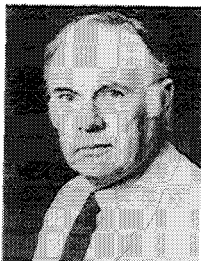


**ALLIE M. SMITH**, Dean of Engineering and Professor of Mechanical Engineering at the University of Mississippi, received his B.S. in mechanical engineering from North Carolina State University in 1956, his M.S. in 1961 and his Ph.D. in 1966 from North Carolina State University, in mechanical and aerospace engineering. Before joining the University of Mississippi in 1979, he worked for ARO for 14 years as a thermal physics supervisor and as a research manager. His research work has been in the area of radiative heat transfer, particularly the experimental and theoretical understanding of cryodeposits. Dr. Smith has been active in the AIAA thermophysics community: member of the AIAA Thermophysics Technical Committee (1973-75, 1985-88), Chairman of the AIAA Thermophysics Technical Committee (1976-77), and General Chairman of the 10th AIAA Thermophysics Conference (1975). He served as an Associate Editor of the *AIAA Journal* (1975-77), Editor for two thermophysics volumes in the *AIAA Progress in Astronautics and Aeronautics* book series (1976, 1977), General Chairman of the 17th Aerospace Sciences Meeting (1977), and Chairman of the AIAA Terrestrial Energy Systems Committee (1981-82). Dr. Smith is a Fellow of AIAA and ASME, and recipient of the AIAA Thermophysics Award (1978) and the AIAA Hermann Oberth Award (1985). He is the author or coauthor of over 75 publications.

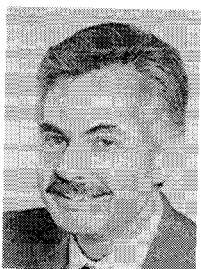


**GERALD D. WALBERG**, Research Professor of Engineering and Applied Science, George Washington University/NASA Joint Institute for Advancement of Flight Sciences, received his B.S. in aeronautical engineering in 1956 and M.S. in aerospace engineering in 1961 from Virginia Polytechnic Institute and State University and his Ph.D. in 1974 from North Carolina State University in aerospace engineering. Prior to assuming his present position, he worked for 32 years at the NASA Langley Research Center where he carried out research on transonic aerodynamics, aeroelasticity, re-entry heating, ablation, and aerothermodynamics and held numerous management positions including Head of the Aerothermodynamics Branch, Chief of the Space Systems Division and Deputy Director for Space. He has served as Associate Editor of the *Journal of Spacecraft and Rockets* (1980-82), as a member of the AIAA Technical Committees on Space Systems (1983-85) and Space Transportation (1986-88), and as a member of the Editorial Advisory Board for the *Journal of Thermophysics and Heat Transfer* (1986-89). Dr. Walberg is a Fellow of AIAA and the author of more than 40 technical papers, including several survey papers on advanced entry vehicle technology.

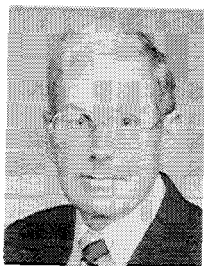
## Editorial Advisory Board



**GRAEME A. BIRD**, Professor of Aeronautical Engineering at the University of Sydney, received his B.Sc. in 1951, his B.E. in 1953, his M.E. in 1959, and his Ph.D. in 1963, all from the University of Sydney. Before joining the University of Sydney in 1960, he served as scientific officer for the Australian Defence Scientific Service. He has held temporary appointments at the College of Aeronautics in Cranfield (1955), at the Royal Aircraft Establishment in Farnborough (1956), at the University of Manchester (1964), and at the California Institute of Technology (1969). He has made many significant contributions to the development of the direct simulation Monte Carlo method for simulating real gas flows for re-entry and space applications. He is a Fellow of AIAA and of the Australian Academy of Technological Sciences and Engineering, the Australian Institution of Engineers, and the Royal Aeronautical Society. Dr. Bird is a recipient of the AIAA Thermophysics Best Paper Award (1987), the AIAA Thermophysics Award (1988), and the NASA Exceptional Scientific Achievement Medal (1988).



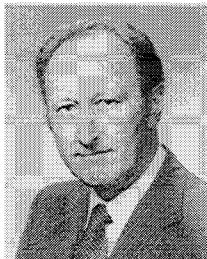
**DONALD K. EDWARDS**, Professor of Mechanical and Aerospace Engineering at the University of California, Irvine, received his B.S. in 1954, M.S. in 1956, and Ph.D. in 1959 from the University of California, Berkeley, all in mechanical engineering. In 1959 he joined the faculty of the University of California, Los Angeles, where he was promoted to Professor in 1968 and served as Chairman of Chemical, Nuclear, and Thermal Engineering (1975-78). He received the ASME Heat Transfer Division's Memorial Award (1973) and was the first recipient of the AIAA Thermophysics Award (1976). He was a Technical Editor for the *Journal of Heat Transfer* (1975-81) and an Associate Editor for the *International Journal of Solar Energy* (1983-85). He is a Fellow of AIAA, a Fellow of ASME, and a member of the Editorial Advisory Board for the *International Journal of Heat and Mass Transfer*.



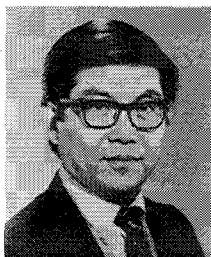
**JOHN T. HOWE**, Senior Staff Scientist at NASA Ames Research Center, received his B.S. from the University of Michigan in 1950 and his M.S. in 1956 and the degree of Engineer in 1958 from Stanford University, all in engineering and mechanics. He teaches Hypervelocity Atmospheric Flight and Real Gas Phenomena at Stanford University. After a brief period with Stanford Research Institute, he joined the Ames Laboratory of NACA. During his 33 years with NASA, he has served as Head of Aerothermodynamics, Assistant Chief for the Physics Branch, and Branch Chief for Fluid Dynamics. He is known for his pioneering research contributions to the aerothermodynamics of atmospheric entry, including radiative energy transfer, reactive gas flows, and innovative thermal protection systems. He was a member of the AIAA Thermophysics Technical Committee (1982-84) and an Associate Editor for the *Journal of Spacecraft and Rockets* (1982-84). He is a recipient of the AIAA Thermophysics Award (1986) and a Fellow of AIAA.



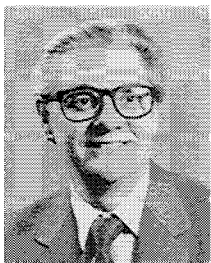
**TOM J. LOVE**, George Lynn Cross Professor Emeritus of Aerospace, Mechanical, and Nuclear Engineering, and Halliburton Professor of Engineering at the University of Oklahoma, received his B.S. from the University of Oklahoma in 1948, his M.S. from the University of Kansas in 1956, and his Ph.D. from Purdue University in 1963, all in mechanical engineering. In 1956 he joined the faculty of the University of Oklahoma, where he was promoted to Professor (1965) and served as Director of the School of Aerospace, Mechanical, and Nuclear Engineering (1963-72). He was a member of the AIAA Thermophysics Technical Committee (1970-72), an Associate Editor for the *AIAA Journal* (1972-75), and an Associate Editor for the *ASME Journal of Bioengineering* (1976-79). He is a Fellow of AIAA and a Fellow of ASME. Dr. Love is a recipient of the AIAA Thermophysics Award (1984) and of the ASME Memorial Heat Transfer Award (1989).



**WALTER B. OLSTAD**, Director of Planning and Research Development for R&D Division, Lockheed Missiles and Space Company, received his B.S. in mechanical engineering from Brown University in 1954, his M.S. in aeronautical engineering from Virginia Polytechnic Institute and State University in 1958, and his Ph.D. in applied mathematics from Harvard University in 1967. Before joining Lockheed in 1983, he worked 29 years for NASA where he held many important leadership positions including Associate Administrator for Management and Acting Associate Administrator for Aeronautics and Space Technology. He is known for his pioneering research and outstanding leadership in the analysis of planetary atmospheric entry aerothermophysics. He was a member of the following AIAA technical committees: Thermophysics, Fluid Dynamics, Space Systems, and Space Transportation. He has served as Technical Program Chairman for AIAA 12th Thermophysics Conference (1977), Associate Editor of the *Journal of Spacecraft and Rockets* (1977-79), General Chairman of the AIAA 14th Thermophysics Conference (1979), and Editor of two volumes in the AIAA *Progress in Astronautics and Aeronautics* book series (1980). He is a recipient of the AIAA Thermophysics Award (1981) and a Fellow of AIAA. Currently, he serves on the AIAA Honors and Awards Committee and the Standards Executive Council.



**CHANG-LIN TIEN**, A. Martin Berlin Professor and Chancellor at the University of California, Berkeley, received his B.S. from National Taiwan University in 1955, his M.M.E. from the University of Louisville in 1957, and his M.A. and Ph.D. in 1959 from Princeton University. He joined the University of California, Berkeley, in 1959, where he was promoted to Professor in 1968 and was appointed A. Martin Berlin Chair Professor in 1987. He served as Chairman of Mechanical Engineering (1974-81) and as Vice Chancellor—Research (1983-85). Dr. Tien moved to the Irvine campus in 1988 and returned to the Berkeley Campus in 1990. He was a member of the AIAA Thermophysics Technical Committee (1970-72), General Chairman of the 7th Thermophysics Conference (1972), General Chairman of the AIAA 12th Aerospace Sciences Meeting (1974), and Editor of a volume in the AIAA *Progress in Astronautics and Aeronautics* book series (1973). He is a recipient of the ASME Heat Transfer Division's Memorial Award (1974), the AIAA Thermophysics Award (1977), and the ASME/AIChE Max Jakob Memorial Award (1981). He is an AIAA Fellow, an ASME Fellow, and a member of the National Academy of Engineering. He is an Editor for the *International Journal of Heat and Mass Transfer*, and an Associate Editor for the *Journal of Quantitative Spectroscopy and Radiative Transfer*.



**RAYMOND VISKANTA**, W.F.M. Goss Distinguished Professor of Engineering at Purdue University, received his B.S. from the University of Illinois in 1955, and his M.S. in 1956 and Ph.D. in 1960 from Purdue University, all in mechanical engineering. After a brief period with Argonne National Laboratory, he joined the faculty of Purdue University, where he was promoted to Professor in 1966. He was a member of the AIAA Thermophysics Technical Committee (1972-75), General Chairman of the 2nd AIAA/ASME Thermophysics and Heat Transfer Conference (1978), and Editor of two volumes in the AIAA *Progress in Astronautics and Aeronautics* book series (1979). He is a recipient of the ASME Heat Transfer Division's Memorial Award (1976), the AIAA Thermophysics Award (1979), the ASEE Senior Research Award (1984), the ASME/AIChE Max Jakob Memorial Award (1986), and the ASME Melville Medal (1988). Dr. Viskanta is a Fellow of ASME, and a member of the National Academy of Engineering. He was an Associate Editor for the *Journal of Quantitative Spectroscopy and Radiative Transfer* (1969-72) and a Technical Editor for the *Journal of Heat Transfer* (1981-87) and *Experimental Heat Transfer* (1987-90). He is the Technical Editor of the ASME *Journal of Heat Transfer* and is a member of the Editorial Advisory Boards of the *International Journal of Heat and Mass Transfer*, *International Journal of Heat and Fluid Flow*, and *Numerical Heat Transfer*.

## Reviewers for the *Journal of Thermophysics and Heat Transfer*—1990\*

- |                  |                       |                  |                  |                   |                   |
|------------------|-----------------------|------------------|------------------|-------------------|-------------------|
| Ahluwalia, R.K.  | Celenligil, M.C.      | Gaddis, J.L.     | Kosson, R.L.     | Nowinski, J.L.    | Soliman, H.M.     |
| Alexander, J.I.  | Chan, C.L.            | Gerner, F.M.     | Kraus, A.D.      |                   | Sonin, A.A.       |
| Allen, D.H.      | Chan, S.H.            | Glakpe, E.K.     | Kuehn, T.H.      | Orozco, J.        | Soo, S.L.         |
| Amano, R.S.      | Chellaiah, S.         | Gnoffo, P.A.     | Kuhn, D.C.S.     | Ozisik, M.N.      | Spores, R.        |
| Ambrose, J.H.    | Chen, C.F.            | Goldstein, R.J.  | Kulkarni, A.K.   | Ozoe, H.          | Stack, J.P.       |
| Andreopoulos, J. | Chen, C.J.            | Gordon, R.T.     | Kunc, J.A.       |                   | Stone, H.A.       |
| Antar, B.N.      | Cheng, H.K.           | Gore, J.P.       |                  | Padovan, J.       | Sucec, J.         |
| Armaly, B.F.     | Cheng, K.C.           | Gorla, R.S.R.    | Lavine, A.G.     | Page, R.          | Sutton, K.        |
| Arnas, O.A.      | Cheung, F.B.          | Grossman, B.     | Law, C.K.        | Palmer, G.        | Swaminathan, P.   |
| Arpaci, V.S.     | Cho, C.S.K.           | Gupta, R.N.      | Lee, H.O.        | Park, C.          | Swanson, L.W.     |
| Aydilott, J.C.   | Choi, K.J.            |                  | Lee, S.C.        | Pearce, B.E.      |                   |
| Ayyaswamy, P.S.  | Chow, L.C.            | Haji-Sheikh, A.  | Lefebvre, A.H.   | Penko, P.         | T'ien, J.S.       |
| Aziz, A.         | Chung, T.J.           | Hamilton, H.H.   | Libby, P.        | Peterson, G.P.    | Taghavi, K.       |
|                  | Chyu, M.C.            | Harloff, G.J.    | Liburdy, J.A.    | Petley, D.        | Tam, L.T.         |
| Back, L.H.       | Chyu, M.K.            | Hartnett, J.P.   | Limbaugh, C.C.   | Pope, S.B.        | Tamma, K.K.       |
| Baganoff, D.     | Clay, C.L.            | Hartung, L.C.    | Lin, C.S.        | Potter, J.L.      | Tan, Z.           |
| Baker, A.J.      | Cunnington, G.R.      | Haskin, W.L.     | Lior, N.         | Poulikakos, D.    | Tezduyar, T.      |
| Balboni, J.      | Curran, F.            | Hassan, H.A.     | Lloyd, J.R.      | Powe, R.E.        | Thomas, J.L.      |
| Bar-Cohen, A.    | Curry, D.             | Heinrich, J.C.   | Lockman, W.K.    | Prakash, C.       | Thornton, E.A.    |
| Barber, J.R.     |                       | Hensel, E.       | Look Jr., D.C.   | Prasad, V.        | Thynell, S.T.     |
| Baron, J.R.      | Deiwert, G.S.         | Hermance, C.E.   | Loth, E.         |                   | Tilton, D.E.      |
| Bau, H.          | DeJarnette, F.R.      | Hickox, C.E.     |                  | Ramachandran, N.  | Tiwari, S.N.      |
| Bayazitoglu, Y.  | Demkowicz, L.         | Hitchcock, J.E.  | Man, T.          | Ramadhyan, S.     | Touryan, K.J.     |
| Beam, J.E.       | Desai, P.             | Holman, J.P.     | Marrone, P.Y.    | Ramsey, J.W.      | Treanor, C.E.     |
| Beckermann, C.   | Dhir, V.K.            | Horton, T.E.     | Martin Jr., F.W. | Ratzel, A.C.      |                   |
| Bejan, A.        | Dobbins, R.           | Howe, J.T.       | Mattick, A.T.    | Renkin, K.        | Viskanta, R.      |
| Bennon, W.D.     | Dogra, V.K.           | Hsiao, S.W.      | McGary, J.       | Rhea, L.G.        |                   |
| Bergman, T.L.    | Dolling, D.S.         | Humphrey, J.A.C. | McKinzie, R.L.   | Riccitiello, S.R. | Wanniarachchi, A. |
| Bird, G.A.       | Douglass, R.W.        | Hwang, T.H.      | Megaridis, C.M.  | Rish III, J.W.    | Warrington, R.O.  |
| Blackwell, B.F.  | Drolen, B.L.          |                  | Melnik, W.L.     | Rockenfeller, U.  | Watts, R.G.       |
| Boudart, M.      |                       | Imber, M.        | Menguc, M.P.     | Rogers, B.B.      | Webb, R.L.        |
| Bowman, J.       | Eaton, J.K.           |                  | Meserole, J.S.   | Roux, J.A.        | White, A.K., III  |
| Boyd, I.D.       | Ebadian, M.A.         | Jaluria, Y.      | Mesler, R.       | Ryan, B.M.        | Wijeysundera, N.  |
| Brewer, E.B.     | Eberhardt, D.S.       | Jensen, M.K.     | Metzger, D.E.    |                   | Willey, R.        |
| Brewer, L.E.     | Edwards, D.K.         | Jiji, L.M.       | Meyers, J.F.     | Schmidt, P.       | Williams, W.D.    |
| Brewster, M.Q.   | Emery, A.F.           | Johnston, J.P.   | Micol, J.R.      | Senterfitt, D.R.  | Wilkins, R.L.     |
| Burmeister, L.C. | Engel, C.D.           | Juhasz, A.J.     | Mikic, B.B.      | Shapiro, A.B.     | Wilmoth, R.       |
|                  |                       |                  | Modest, M.F.     | Sharma, S.P.      | Witte, L.C.       |
| Caledonia, G.    | Faghri, A.            | Kamotani, Y.     | Moody, D.M.      | Sheffield, J.W.   | Wittliff, C.E.    |
| Candler, G.V.    | Faghri, M.            | Kassem, M.       | Moss, J.N.       | Shepherd, J.E.    |                   |
| Caretto, L.S.    | Fant, D.B.            | Kath, W.L.       | Moutsoglou, A.   | Sherif, S.A.      | Yang, K.T.        |
| Carey, V.P.      | Farouk, B.            | Katto, Y.        | Mukherjee, S.    | Shih, T.M.        | Yao, S.C.         |
| Carling, J.C.    | Fernandez-Pello, A.C. | Kaviany, M.      | Murman, E.       | Simon, T.W.       | Yener, Y.         |
| Carlson, L.A.    | Fiveland, W.A.        | Kazmierczak, M.  |                  | Simpkins, P.G.    | Yucel, A.         |
| Cattolica, R.    | Fletcher, L.S.        | Kearney, R.J.    | Nagano, Y.       | Singh, S.N.       | Yuen, E.          |
| Catton, I.       | Foster Jr., E.L.      | Kelkar, K.       | Nelson, D.A.     | Smith, T.F.       | Yuen, W.W.        |
| Caveny, L.H.     |                       | Keyhani, M.      | Nelson, H.F.     | Smooke, M.        | Zoby, E.V.        |

\*This list represents names received through October 1990. We regret any inadvertent omissions.

## Ethical Standards for Publication of Aeronautics and Astronautics Research

### Preface

The American Institute of Aeronautics and Astronautics (AIAA) serves the engineering and scientific aerospace communities and society at large in several ways, including the publication of journals that present the results of scientific and engineering research. The Editor-in-Chief of a journal of the AIAA has the responsibility to maintain the AIAA ethical standards for reviewing and accepting papers submitted to that journal. In the main, these ethical standards derive from the AIAA definition of the scope of the journal and from the community perception of standards of quality for scientific and engineering work and its presentation. The following ethical standards reflect the conviction that the observance of high ethical standards is so vital to the whole engineering and scientific enterprise that a definition of those standards should be brought to the attention of all concerned.

### Ethical Standards

#### A. Obligations of Editors-in-Chief and Associate Editors\*

1. The Editor-in-Chief has complete responsibility and authority to accept a submitted paper for publication or to reject it. The Editor-in-Chief may delegate this responsibility to Associate Editors, who may confer with reviewers for an evaluation to use in making this decision.
2. The Editor will give unbiased and impartial consideration to all manuscripts offered for publication, judging each on its scientific and engineering merits without regard to race, gender, religious belief, ethnic origin, citizenship, or political philosophy of the author(s).
3. The Editor should process manuscripts promptly.
4. The Editor and the editorial staff will not disclose any information about a manuscript under consideration or its disposition to anyone other than those from whom professional advice is sought. The names of reviewers will not be released without the reviewers' permission.
5. The Editor will respect the intellectual independence of authors.
6. Editorial responsibility and authority for any manuscript authored by an Editor-in-Chief and submitted to the journal must be delegated to some other qualified person, such as an Associate Editor of that journal. When it is an Associate Editor participating in the debate, the Editor-in-Chief should either assume the responsibility or delegate it to another Associate Editor. Editors should avoid situations of real or perceived conflicts of interest. If an Editor chooses to participate in an ongoing scientific debate within the journal, the Editor should arrange for some other qualified person to take editorial responsibility.
7. Unpublished information, arguments, or interpretations disclosed in a submitted manuscript must not be used in the research of an Editor-in-Chief, Associate Editor, or reviewer except with the consent of the author.
8. If an Editor is presented with convincing evidence that the main substance or conclusions of a paper published in the journal are erroneous, the Editor must facilitate publication of an appropriate paper or technical comment pointing out the error and, if possible, correcting it.

#### B. Obligations of Authors

1. An author's central obligation is to present a concise, accurate account of the research performed as well as an objective discussion of its significance.
2. A paper should contain sufficient detail and reference to public sources of information such that the author's peers could repeat the work.
3. An author should cite those publications that have been influential in determining the nature of the reported work and that will guide the reader quickly to the earlier work that is essential for understanding the present investigation. Information obtained privately, as in conversation, correspondence, or discussion with third parties, should not be used or reported in the author's work without explicit permission from the investigator with whom the information originated. Information obtained in the course of confidential services, such as refereeing manuscripts or grant applications, should be treated similarly.
4. Fragmentation of research papers should be avoided. A scientist who has done extensive work on a system or group of related systems should organize publication so that each paper gives a complete account of a particular aspect of the general study.

5. It is inappropriate for an author to submit manuscripts describing essentially the same research to more than one journal of primary publication.

6. An accurate, nontrivial criticism of the content of a published paper is justified; however, in no case is personal criticism considered to be appropriate.

7. To protect the integrity of authorship, only persons who have significantly contributed to the research and paper preparation should be listed as authors. The corresponding author attests to the fact that any others named as authors have seen the final version of the paper and have agreed to its submission for publication. Deceased persons who meet the criterion for co-authorship should be included, with a footnote reporting date of death. No fictitious name should be listed as an author or co-author. The author who submits a manuscript for publication accepts the responsibility of having included as co-authors all persons appropriate and none inappropriate.

8. It is inappropriate to submit manuscripts with an obvious marketing orientation.

#### C. Obligations of Reviewers of Manuscripts

1. Inasmuch as the reviewing of manuscripts is an essential step in the publication process, every publishing engineer and scientist has an obligation to do a fair share of reviewing. On the average, an author should expect to review twice as many papers as an author writes.
2. A chosen reviewer who feels inadequately qualified or lacks the time to judge the research reported in a manuscript should return it promptly to the Editor.
3. A reviewer of a manuscript should judge the quality of the manuscript objectively and respect the intellectual independence of the authors. In no case is personal criticism appropriate.
4. A reviewer should be sensitive even to the appearance of a conflict of interest. If in doubt, the reviewer should return the manuscript promptly without review, advising the Editor of the conflict of interest or bias.
5. A reviewer should not evaluate a manuscript authored or co-authored by a person with whom the reviewer has a personal or professional connection if the relationship would bias judgment of the manuscript.
6. A reviewer should treat a manuscript sent for review as a confidential document. Its contents, as well as the reviewers' recommendations, should neither be shown to nor discussed with others except, in special cases, to persons from whom specific advice may be sought; in that event, the identities of those consulted should be disclosed to the Editor.
7. A reviewer should explain and support judgments adequately so that Editors and authors may understand the basis of the comments. Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation.
8. A reviewer should be alert to failure of authors to cite relevant work by other scientists. A reviewer should call to the Editor's attention any substantial similarity between the manuscript under consideration and any published paper or any manuscript submitted concurrently to another journal.
9. A reviewer should not use or disclose unpublished information, arguments, or interpretations contained in a manuscript under consideration, except with the consent of the author.

#### D. Obligations of Engineers and Scientists Making Statements to Society at Large

1. A scientist or engineer publishing in the popular literature has the same basic obligation to be accurate in reporting observations and to be unbiased in interpreting them as when publishing in a technical journal.
2. A scientist or engineer should strive to keep public writing, remarks, and interviews as accurate as possible.
3. A scientist or engineer should not proclaim a discovery to the public unless the support for it is of strength sufficient to warrant publication in the technical literature. An account of the work and results that support a public pronouncement should be submitted as quickly as possible for publication in a technical journal.

### Acknowledgments

The ethical standards embodied in this document were adopted by the Publications Committee of AIAA on August 16, 1989, and are endorsed by the Editors-in-Chief. With minor changes, these standards are adapted from those published by the American Geophysical Union and are used with their permission.

\*Throughout this document, the term "Editor," when used alone, applies to both Editor-in-Chief and Associate Editor. When one or the other bears the specific responsibility, the full title is used.

## AIAA Manuscript Review Process

This description of AIAA manuscript review procedures is given so that authors, reviewers, and readers will better understand the paper selection and publication process. The first step in manuscript evaluation is an examination by the Editor-in-Chief of papers submitted to the journal. The Editor-in-Chief first tests the manuscript for the several criteria of subject scope, archival editorial style, apparent technical validity, topical importance, timeliness, relationship to prior publication, conciseness, appropriate references, and length. Precise requirements are given on the inside back cover of each journal issue.

### Formal Review

If it passes these first tests, the paper is sent to that journal's Associate Editor with the most direct knowledge of the subject matter and of expert reviewers in the field. The Associate Editor then evaluates the paper according to the same criteria and, in most cases, has the paper sent to two or more reviewers in the field for confidential review. The review report form, reproduced here, is designed both to encourage the reviewer's objectivity and to ensure the thoroughness of his or her evaluation.

Considerable significance is attached to the review reports. Each reviewer is asked to judge the technical validity of the manuscript and the extent of its advance beyond work previously published. The reviewer is asked also for advice as to whether the paper merits publication in an archive journal. However, the decision to publish, to require major revision before publication, or to reject for reasons cited lies first with the Associate Editor and ultimately with the Editor-in-Chief.

It takes a minimum of several months (at least three) after receipt of the manuscript to accomplish the evaluation and review steps discussed above.

### Revision or Rebuttal

The next step is up to the author. If the paper has been re-

jected or if extensive revisions have been requested which the author believes are incorrect or unwarranted, he or she is entitled to submit a point-by-point rebuttal to the Editor's statement of reasons and the reviewers' comments. The rebuttal then is analyzed by the Editors, and a final decision is made, although there may be a need for an additional review cycle. Authors who revise their papers must make an effort to do so within the stated time period.

A reviewer who feels strongly that a particular paper should not be published may choose to write his or her criticism as a Technical Comment. The author then will be allowed to write a closing response for publication in the same issue as the Comment.

Formal acceptance will not occur until the author has complied with all of the revision requests (if any) made by the Associate Editor and has prepared the paper in AIAA archival style. (Or the Associate Editor may accept the author's rebuttal, as described above.)

### Acceptance and Publication

When a paper is formally accepted, it will be scheduled for publication in a forthcoming issue, and the author will be so informed. Depending upon the number of papers awaiting publication and projected size of issues, this may require that papers be scheduled several issues ahead. When feasible, papers will be published in the order of their original receipt.

Galley proofs will be sent to authors for correction and release approximately two months prior to publication. In order to allow for late or nonreturn of galleys by authors and to provide the flexibility to meet issue-length and topic-mix constraints, issues will be over-scheduled by about 25%. Thus, there will always be a certain number of papers held over for the next issue. All authors and co-authors receive a complimentary copy of the issue in which their papers appear.



American Institute of Aeronautics and Astronautics

### Confidential Review Report

#### Guidelines for Review Comments

##### Length

The paper/synopsis needs . . . % reduction. Concise presentation is important in any case. Please indicate what material can be deleted, shortened, or covered by a readily available reference.

##### Title

Precise, informative, less than twelve words.

##### Abstract

Proper and specific summary of objectives, contents, major results, and conclusions; 100 to 200 words.

##### Introduction

Adequate discussion of need and purpose of the work and its relation to prior work.

##### Content

Adequate definition of assumptions, inputs, references, test conditions, etc., so that information presented is useful.

##### Figures

Readily understandable and useful as data or for design. Please point out unnecessary figures, especially photographs, that can be deleted, as well as any errors or deficiencies.

##### References

Adequate (see *Introduction and Content*) and accurate.

##### Synoptic

A 2-page extract from the full-length article of the key results in a form useful for direct application by the reader.

##### Journal Scopes

AIAA JOURNAL: Original papers which disclose new technical knowledge and exploratory developments based on new knowledge.

JOURNAL OF AIRCRAFT, JOURNAL OF GUIDANCE, CONTROL, AND DYNAMICS, JOURNAL OF PROPULSION AND POWER, JOURNAL OF SPACECRAFT AND ROCKETS, and JOURNAL OF THERMOPHYSICS AND HEAT TRANSFER: Original papers which reveal significant applications of existing technical knowledge in the fields of aircraft (of aeronautics); guidance, dynamics and control; propulsion and power; spacecraft (or astronautics); and thermophysics and heat transfer, respectively.

AEROSPACE AMERICA: Papers of general interest and current importance to the entire membership.

#### Confidential Report Policy

Do not sign the Report, since it is the policy of the Institute to maintain the anonymity of the reviewer unless he has a specific reason for making himself known to the author.

Please return the original Review Report, signed letter, and manuscript to the Associate Editor (large manuscript envelope enclosed). Send a copy of the Review Report and letter to the Editor-in-Chief (letter envelope enclosed).

Author(s): \_\_\_\_\_

Title: \_\_\_\_\_

Log No.: \_\_\_\_\_

Date Logged: \_\_\_\_\_

Assigned to (journal): \_\_\_\_\_

Date Sent: \_\_\_\_\_

Date Due: \_\_\_\_\_

Date Returned: \_\_\_\_\_

#### Comments

The Editors particularly desire your specific comments on technical content, overall value, relevancy, and revisions needed for conciseness, clarity, and/or completeness. Guidelines are given on the reverse side. Please start your comments here and add sheets as necessary.

Please rate the paper/synoptic here:

Technical Content  
Importance to Field  
Conciseness  
Style & Clarity  
Completeness\*

	Excellent	Good	Fair	Poor
Technical Content				
Importance to Field				
Conciseness				
Style & Clarity				
Completeness*				

\*Please note any major deficiency above or on another sheet.

#### Recommendation

Publish:  Full paper  Note  Synoptic  Other

Publish after major revision\*.....

Decline to publish .....  
(state reasons above or on added sheet)

Refer to\*\* .....  
(other journal)

\*Would you be willing to review the revised manuscript if the technical editor feels it is necessary? YES  NO

\*\*A different AIAA journal (see scope, reverse side) or other journal.