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Four types of communications are published in the Journal. **Regular Articles** are of substantial length, and describe the findings of an original research project that satisfies the aims and scope of the Journal, described above. **Communications** are brief technical or scientific articles. **Reviews** summarize the current status of an important area within the aims and scope of the Journal. **Letters to the Editor** usually contain comments on recent articles that have appeared in the Journal.

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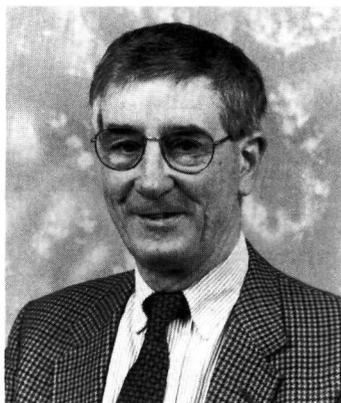
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Biological Sciences

Patrick Echlin obtained a B.Sc. degree in Botany from University College, London in 1957 and a Ph.D. in Medical Microbiology from the University of Pennsylvania in 1961. He returned to England to the Department of Plant Sciences, University of Cambridge in 1962 since when he has held a number of research, teaching, administrative, collegiate and ceremonial positions. He was Director of the Multi-Imaging Centre, University of Cambridge until 1999 and an Editor of the *Journal of Microscopy* for thirty years. He is currently the President of the Royal Microscopical Society and the Director of Cambridge Analytical Microscopy.

Following being severely bitten by the SEM bug in the mid-sixties, his research interests have continued to centre on devising minimally invasive preparation, imaging and analytical procedures for the SEM and x-ray microanalysis of bio-organic samples. His current research centres on localising aluminium in growing tea leaves. He has published 150 research papers, and has written, co-authored and edited nine books on various aspects of electron microscopy and x-ray microanalysis. He continues to enjoy teaching and lecturing all over the world.



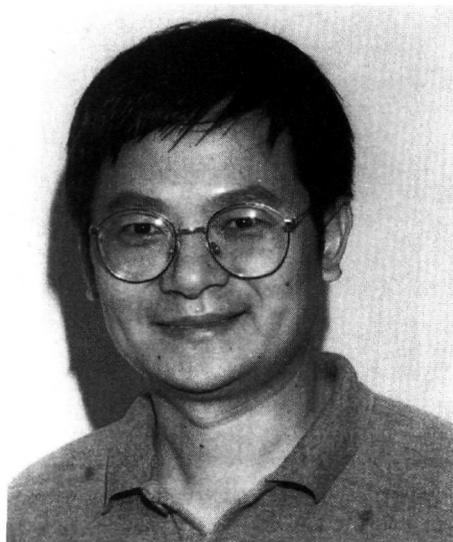
THOMAS MULVEY
Physical Sciences

Tom Mulvey's career in Electron Physics has already spanned over 60 years. He began as an apprentice and concluded as a world-renowned expert on the subject with many remembering him producing a lens from his pocket to illustrate the advantages of superconducting technology or simply enjoying his clear lectures on the subject. In 1940, Tom began a pre-University year on a Probationary College Apprentice course at Metropolitan-Vickers Electrical Company (MVE). At the same time he pre-enrolled in the Officers Training Course (OTC) at Manchester University. After this year, Tom joined the Honors Degree Program in Electrical Engineering at Manchester University. He was commissioned as an Electrical Anti-Submarine Officer of the R.N.V.R. with the rank of Sub-Lieutenant.

Returning to civilian life in 1947, Tom rejoined MVE as a staff member of the MV Research Department working on electron microscopes. He also began his Masters research at Manchester and was awarded the M.Sc. in 1948. In the same year he was appointed a staff member at the AEI Research Laboratory at Aldermarston in the lovely County of Berkshire. Here he was involved in early experimental studies with M.E. Haine and J. Dyson to produce the first in-line electron holograms; this work was in connection with Prof. Denis Gabor, the Nobel Laureate and inventor of holography, at Imperial College, London.

In 1965 Tom became Reader and later Professor of Electron Physics at Aston University in Birmingham. He was also appointed Visiting Professor at the University of Delft in the Netherlands, another center of electron optics. His Alma Mater, Manchester University, awarded Tom the degree of D.Sc. in recognition of his important contributions to the understanding of electron physics. He finally took Emeritus status at Aston University in 1986.

BURTON MEDAL

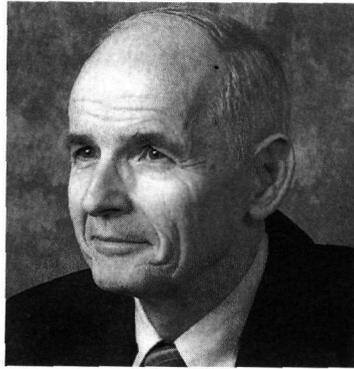


J. M. ZUO

Jian-Min Zuo is an assistant professor of the Department of Materials Science and Engineering and Frederick-Seitz Materials Research Laboratory at University of Illinois, Urbana-Champaign. He received his Ph.D. from Arizona State University in 1989, which was followed by postdoctoral training and research scientist position at ASU before moving to Illinois in 2000. He is the co-author of one book and author of more than 60 publications and several widely used computer programs.

Prof. Zuo's research interest centers on quantitative electron microscopy and the structure and property relationship in advanced materials. His contribution to electron microscopy includes several pioneering works on quantitative electron diffraction, digital detectors and electron diffraction theory. More recently, he has explored new applications of electron diffraction ranging from charge density to phase transitions in complex oxides. Previously, he was a 1989 MSA presidential scholar and the Japan Society for the Promotion of Science postdoctoral research fellow.

MSA OUTSTANDING TECHNOLOGIST AWARD



CONRAD BREMER

After receiving his Associate degree in Electrical Technology, Conrad Bremer began what was to become a 44 year career through some of IBM's most interesting advancements: IBM's first Vacuum tube powered computer, diode device development, reed relay and finally to today's most advanced microdevices which IBM supplies worldwide.

In 1960 he moved into IBM's Research Division where he worked on III-V compounds, GaAs injection lasers, third order elastic properties, and then began his association with Dr. O.C. Wells. Together they rebuilt IBM's first SEM into what was to become the vehicle for developing many new techniques for SEM research. Among them, voltage contrast, low-loss imaging, the accurate measurement of low-loss scattering, and forward electron imaging, which was to become the basis of a CD (critical dimension) metrology system some 15 years later at IBM's Burlington Vermont chip plant where he transferred in 1974.

After a 10 year assignment in the E-Beam Lithography area in Burlington, he continued implementing SEM's into CD metrology for in line process control. In association with IBM's Standards lab team he was responsible for the development of an SEM based Fixed Beam Moving Stage metrology system. In his current position as Equipment Engineer for Overlay metrology he continues to bring the latest SEM capability for critical metrology work to IBM's Standards Lab, while supporting manufacturing for overlay and X-ray equipment.

OPTICAL IMAGING ASSOCIATION AWARD
for ACHIEVEMENT in OPTICAL MICROSCOPY



CLARE WATERMAN-STORER

Clare Waterman-Storer became interested in microscopy during her Master's studies at the University of Massachusetts (1991), where she used immuno-electron microscopy to examine changes in muscle after exercise. For this work, she received MSA Presidential and Polaroid scholar awards, and a University of Massachusetts Graduate Fellowship. She received a Ph.D. in 1995 from the University of Pennsylvania where she studied intracellular organelle transport using biochemistry and high resolution confocal and video DIC microscopy of living cells. For this work, she earned her degree with Distinction and was the recipient of the Saul Weingrad Thesis award, as well as fellowships from the American Heart Association and Pennsylvania Muscle Institute. In her post-doctoral studies as a Jane Coffin Childs Fellow in the lab of E.D. Salmon at the University of North Carolina, she used digital multi-mode microscopy to study cytoskeletal dynamics in migrating cells. There, she was a co-discoverer of Fluorescent Speckle Microscopy (FSM), which allows visualization of fluorescent protein dynamics and turnover in living cells. Since 1999, she has been an Assistant Professor in the Department of Cell Biology at the Scripps Research Institute, where she continues her work on the cytoskeleton in cell motility using FSM and multimode imaging. She has authored 29 papers, given 40 invited lectures, been a member of the MSA since 1990, and serves on the editorial board of the *Journal of Microscopy*.

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Y. Zhang, J. Lemasters, and B. Herman, “Localization of rat liver group 11A phospholipase A₂ in secretory pathways: green fluorescent protein approach,” *Microsc. Microanal.* 6 (2000) 150–155.

Physical

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J. Rüsing, J. T. Sebastian, O. C. Hellman, and D. N. Seidman, “Three-dimensional investigation of ceramic/metal heterophase interfaces by atom-probe microscopy,” *Microsc. Microanal.* 6 (2000) 445–451.

MSA DISTINGUISHED SCIENTIST AWARD

Biological Sciences		Physical Sciences	
1975	Keith Porter	1975	Robert Heidenreich
1976	L.L. Marton	1976	Albert Crewe
1977	Robley Williams	1977	James Hillier
1978	Thomas Anderson	1978	V.E. Cosslet
1979	Daniel Pease	1979	John Cowley
1980	George Palade	1980	Gareth Thomas
1981	Sanford Palay	1981	Vladimir Zworykin
1982	Richard Eakin	1982	Benjamin M. Siegel
1983	Hans Ris	1983	Otto Scherzer
1984	Cecil Hall	1984	Sir Charles Oatley
1985	Gaston Dupouy	1985	Ernst Ruska
1986	F.O. Schmitt	1986	Peter Hirsch
1987	Marilyn Farquhar	1987	Jan LePoole
1988	Morris Karnovsky	1988	Hatsujiro Hashimoto
1989	Don W. Fawcett	1989	Elmar Zeitler
1990	Audrey M. Glauert	1990	Gertrude F. Rempfer
1991	Hugh E. Huxley	1991	Archie Howie
1992	Fritiof Sjöstrand	1992	Oliver Wells
1993	Jean-Paul Revel	1993	Ken Smith
1994	Andrew Somlyo	1994	Dennis McMullan
1995	Shinya Inoué	1995	David B. Wittry
1996	Myron C. Ledbetter	1996	John Silcox
1997	S. J. Singer	1997	Peter Swann
1998	Avril V. Somlyo	1998	Michael J. Whelan
1999	Sir Aaron Klug	1999	Takeo Ichinokawa
2000	Kiyoteru Tokuyasu	2000	Severin S. Amelinckx

MSA BURTON MEDALIST

1975	James Lake	1987	Ronald Milligan
1976	Michael Isaacson	1988	A.D. Romig, Jr.
1977	Robert Sinclair	1989	Laurence D. Marks
1978	David Joy	1990	W. Mason Skiff
1979	Norton B. Gilula	1991	Joseph R. Michael
1980	John Spence	1992	Kannan Krishnan
1981	Barbara Panessa-Warren	1993	Joseph A. N. Zasadzinski
1982	Nestor Zaluzec	1994	Jan M. Chabala
1983	Ronald Gronsky	1995	Joanna L. Batstone
1984	David B. Williams	1996	Vinayak P. Dravid
1985	Richard Leapman	1997	P. M. Ajayan
1986	J. Murray Gibson	1998	Ian M. Anderson
		1999	Zhong Lin Wang
		2000	Eva Nogales

THE MORTON D MASER
MSA DISTINGUISHED SERVICE AWARD

1992	Ronald Anderson	1993	E. Laurence Thurston
	G.W. "Bill" Bailey	1994	Richard F.E. Crang
	Frances Ball	1995	Raymond K. Hart
	Blair Bowers	1996	José A. Mascorro
	Deborah Clayton	1997	William T. Gunning, III
	Joseph Harb	1998	Nestor J. Zaluzec
	Kenneth Lawless	1999	Charles E. Lyman
	Morton Maser	2000	Barbara A. Reine
	Caroline Schooley		
	John H.L. Watson		

MSA OUTSTANDING TECHNOLOGIST AWARD

1993	Ben O. Spurlock	1997	John P. Benedict
1994	Bernard J. Kestel		Stanley J. Klepeis
1995	Kai Chien	1998	Hilton H. Molenhauer
1996	David W. Ackland		Charles J. Echer
		1999	John M. Basgen
			John C. Wheatley
		2000	Nancy C. Smith

OPTICAL IMAGING ASSOCIATION AWARD
FOR ACHIEVEMENT IN OPTICAL MICROSCOPY

2000	Gregg G. Gundersen
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MSA PAST PRESIDENTS

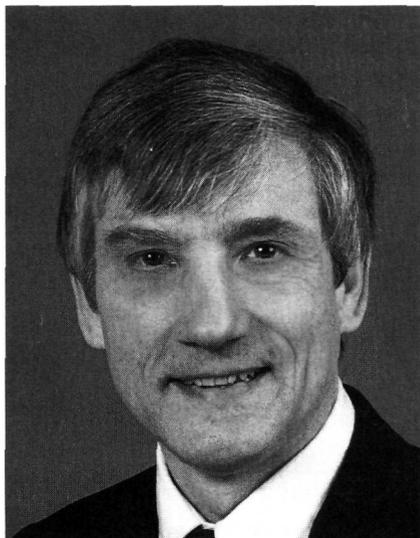
1942	G.L. Clark ¹	1972	Daniel C. Pease
1943	R. Bowling Barnes ²	1973	Benjamin Siegel
1944	R. Bowling Barnes	1974	Russell J. Barnett
1945	James Hillier	1975	Gareth Thomas
1946	David Harker	1976	Etienne de Harven
1947	William G. Kinsinger	1977	T.E. Everhart
1948	Perry C. Smith	1978	Myron Ledbetter
1949	F.O. Schmitt	1979	John Silcox
1950	Ralph W.G. Wyckoff	1980	Michael Beer
1951	Robley C. Williams	1981	John Hren
1952	R.D. Heidenreich	1982	Lee Peachey
1953	Cecil E. Hall	1983	David Wittry
1954	Robert G. Picard	1984	J. David Robertson
1955	Thomas F. Anderson	1985	Dale Johnson
1956	William L. Grube	1986	Robert Glaeser
1957	John H.L. Watson	1987	Linn W. Hobbs
1958	Max Swerdlow	1988	John-Paul Revel
1959	John H. Reisner	1989	Ray Carpenter
1960	D. Gordon Sharp	1990	Keith R. Porter
1961	D. Maxwell Teague	1991	Charles Lyman
1962	Keith R. Porter	1992	Patricia Calarco
1963	Charles Schwartz	1993	Michael S. Isaacson
1964	Sidney S. Breese	1994	Robert R. Cardell
1965	Virgil G. Peck	1995	Terence E. Mitchell
1966	Walter Frajola	1996	Margaret Ann Goldstein
1967	Joseph J. Comer	1997	C. Barry Carter
1968	John H. Luft	1998	Ralph M. Albrecht
1969	W.C. Bigelow	1999	David Joy
1970	Russell Steere	2000	Kenneth Downing
1971	Robert M. Fisher		

¹Chair of committee to arrange first meeting

²Temporary (pre-constitution)

2001 MICROBEAM ANALYSIS SOCIETY AWARDS

PRESIDENTIAL SCIENCE AWARD



PHILIP BATSON

Philip E. Batson was born in Dexter, Maine and completed both his undergraduate and graduate education at Cornell University, receiving the Ph.D. degree in Applied Physics in 1976 under the direction of John Silcox. After post-doctoral work at the Cavendish Laboratory supported through Glasgow University, he became a Research Staff Member at the IBM Thomas J. Watson Research Center in Yorktown Heights, New York, where he continues to date. His major interest, growing both out of the Cornell and Cavendish experiences, is in the area of EELS-STEM techniques. This led him, in 1986, to build a high energy resolution EELS capability for the STEM which has allowed detailed observation of the conduction bandstructure of silicon-based compounds. He is a Fellow of the American Physical Society, and has served on the board of the New York State Section of the American Physical Society. He is a member of the Institute of Physics, the American Association for Advancement of Science, the Microscopy Society of America and the honor societies, Phi Kappa Phi and Tau Beta Pi.

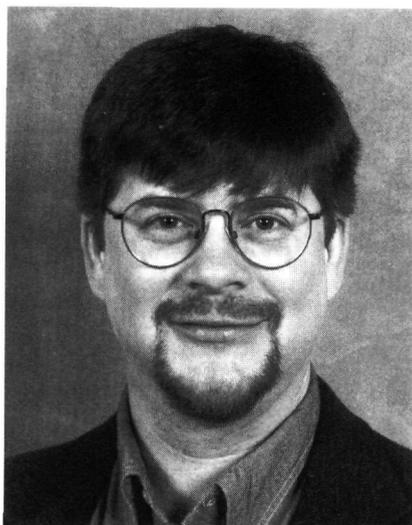
PRESIDENTIAL SERVICE AWARD



CHARLES E. LYMAN

Charles E. Lyman, Professor of Materials Science and Engineering at Lehigh University, received his B.S. from Cornell in 1968 and his Ph.D. from the Massachusetts Institute of Technology in 1974. Before joining Lehigh in 1984, he worked at the University of Oxford (post-doc), Rensselaer Polytechnic Institute, and the DuPont Co. Dr. Lyman served as the 2000 President of the Microbeam Analysis Society and the 1991 President of the Microscopy Society of America. Currently he is also Editor-in-Chief of the journal *Microscopy and Microanalysis*, official journal of MAS and MSA. Lyman has organized and participated in many symposia on analytical electron microscopy and the characterization of catalysts sponsored by the American Chemical Society, the Microscopy Society of America, the Microbeam Analysis Society, and the Materials Research Society. Professor Lyman has over 100 technical publications and over 30 years' experience in the application of electron microscopy and microanalysis techniques to materials problems.

K.F.J. HEINRICH AWARD



CHRIS JACOBSEN

Chris Jacobsen received his B.A. in Physics from St. Olaf College in 1983, and his PhD in Physics from SUNY Stony Brook in 1988. Following a postdoc at the Center for X-ray Optics at Lawrence Berkeley Laboratory, he returned to Stony Brook first as a postdoc and then as faculty in 1991. His research has centered on coherent x-ray optics, and applications of x-ray microscopy. This has included work in x-ray holography, x-ray lithography, nanofabrication of zone plate optics, x-ray spectroscopy of organic specimens, and image and spectrum analysis; and application of these methods to the study of biological and environmental science specimens. He is the recipient of a Presidential Faculty Fellow award (White House/NSF, 1992), the International Denis Gabor Award (1996), an R&D 100 award (1999), and the MAS Young Scientist Award (2001), and he is a Fellow of the Optical Society of America.

2001 MAS DISTINGUISHED SCHOLAR AWARDS

P-G Astrand Stockholm University	S.W. Morgan University of Technology—Sydney
S.R. Gilliss University of Minnesota	D. Qian University of Kentucky
P. Horny Université de Sherbrooke	S. Rubanov University of New South Wales
J.D. Kessler University of California—Irvine	S. Zhu University of Michigan

MAS PRESIDENTIAL AWARDS

Science		Service	
1977	R. Castaing	1977	P. Lublin
1978	K.F.J. Heinrich	1978	D.R. Beaman
1979	P. Duncumb	1979	M.A. Giles
1980	D.B. Wittry	1980	A.A. Chodos
1981	S.J. Reed	1981	R. Myklebust
1982	R. Shimizu	1982	J. Doyle
1983	J. Philibert	1983	D. Newbury
1984	L.S. Birks	1984	J.I. Goldstein
1985	E. Lifshin	1985	M.C. Finn
1986	R. Myklebust	1986	V. Shull
1987	O.C. Wells	1987	D.C. Joy
1988	J.D. Brown	1988	C.G. Cleaver
1989	J. Hillier	1989	W.F. Chambers
1990	T.E. Everhart	1990	C.E. Fiori
1991	J.I. Goldstein	1991	T.G. Huber
1992	G. Lorimer	1992	E. Etz
	G. Cliff	1993	H.A. Freeman
1993	D.E. Newbury	1994	J.L. Worrall
1994	D.C. Joy	1995	R.W. Linton
1995	G. Bastin	1996	P.F. Hlava
1996	A.V. Somlyo	1997	J.A. Small
	A.P. Somlyo	1998	J.J. McCarthy
1997	D.B. Williams	1999	T.G. Huber
1998	F.H. Schamber	2000	R.B. Marinenko
1999	R.A. Sareen		
2000	R.F. Egerton		

MAS K.F.J. HEINRICH AWARDS

1986	P. Statham	1993	P.E. Russell
1987	J.T. Armstrong	1994	J.R. Michael
1988	D.B. Williams	1995	N. Lewis
1989	R. Leapman	1997	R. Gauvin
1990	R.W. Linton	1998	V.P. Dravid
1991	A.D. Romig, Jr.	1999	J. Bruley
1992	S. Pennycook	2000	H. Ade

MAS PAST PRESIDENTS

1968	L.S. Birks	1985	D.E. Newbury
1969	K.F.J. Heinrich	1986	C.G. Cleaver
1970	R.E. Ogilvie	1987	C. Fiori
1971	A.A. Chodos	1988	W.F. Chambers
1972	K. Keil	1989	D.B. Wittry
1973	D.R. Beaman	1990	A.D. Romig, Jr.
1974	P. Lublin	1991	J.T. Armstrong
1975	J.W. Colby	1992	D.B. Williams
1976	E. Lifshin	1993	T.G. Huber
1977	J.I. Goldstein	1994	J. Small
1978	J.D. Brown	1995	J. McCarthy
1979	D.F. Kyser	1996	D.E. Johnson
1980	O.C. Wells	1997	Joseph R. Michael
1981	J.R. Coleman	1998	Ryna B. Marineko
1982	R. Myklebust	1999	John J. Friel
1983	R. Bolon	2000	Charles E. Lyman
1984	D.C. Joy		



RONALD M. ANDERSON
MSA President



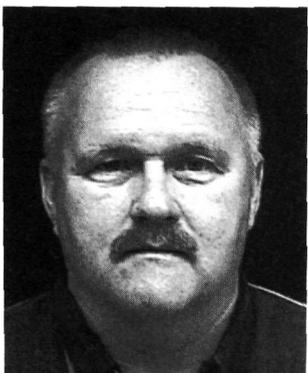
RICHARD W. LINTON
MAS President



ROBERT KOCH
Local Arrangements Chair



ZED MASON
Local Arrangements
Treasurer



ROBERT L. PRICE
MSA Program Chair



EDGAR VOELKL
MSA Program Vice Chair



INGA HOLL MUSSELMAN
MAS Program Co Chair

MICROSCOPY AND MICROANALYSIS 2001

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Edgar Voelkl, MSA Program Vice Chair

Inga Holl Musselman, MAS Program Co Chair

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Kathi Alexander	Mike Marko
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Ron Anderson	Kent McDonald
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John Bruley	D. A. Muller
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Lucille Giannuzzi	Mark Sanders
Bill Gunning	John H. Scott
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Bob Koch	John Spence
Ratnesh Lal	Louis Terracio
Richard Leapman	Michiko Watanabe
J. L. Lee	Andrew Whitley
Eric Lifskin	Janet Woodward
Charlie Lyman	Yimei Zhu

FOREWORD

Ronald M. Anderson, President
Microscopy Society of America

Richard W. Linton, President
Microbeam Analysis Society

On behalf of the Microscopy Society of America and the Microbeam Analysis Society, we welcome you to the Microscopy and Microanalysis 2001, meeting.

Once again our thanks are due to Bill Bailey, the MSA Proceedings Editor, whose tireless attention to detail keeps us on schedule with a first-class proceedings available at our meeting. We expect that this will be the last year that our proceedings will be published in this large book format. Our meetings have grown to the point that a single volume will no longer serve our purposes. We are evaluating different options for future proceedings. One attractive suggestion would have invited papers in book format with an enclosed CD, which would contain both invited and contributed papers in a fully searchable electronic format. We cannot predict the final form of the 2002 Proceedings at this writing. We invite interested members of both societies to contact us for more information or to offer suggestions. This is also the last year of our publishing contract with Springer-Verlag. We thank Herb Neimerow and his staff at Springer for five years of professional publishing services. Springer is a first-class operation and a pleasure to work with!

The Program Chair, Bob Price, and Co-Chairs Edgar Voelkl (MSA) and Inga Holl Musselman (MSA), have assembled another excellent technical program that continues the tradition of exciting and current presentations at the meetings. An outstanding list of invited speakers highlight the symposia in a number of key areas. Special symposia this year again cover a wide range, including "Microscopy and Microanalysis in the Real World," a special biological symposium honoring Dr. Inoue, and "Atom Location by Channeling Enhancement of X-Ray and EELS Signals" among others, plus a wide variety of applications in biology and materials research.

A special pre-meeting congress, "Imaging Life: From Cells to Whole Animals," as well as several workshops and short courses on important, basic techniques precedes the meeting. Special symposia, tutorials and presentations sponsored by the Technologists' Forum, the MSA Education Committee, and various commercial exhibitors will be held during the course of the meeting. There are also Presidential Happenings, ceremonies for Award Winners, and the world's largest display of microscopes and related equipment.

Our Local Arrangements Committee, headed by Robert Koch, has provided for an excellent venue at the Long Beach Convention Center for both the scientific sessions and the exhibits. They have also arranged a memorable program of social events including a Sunday night reception on the Queen Mary, the annual golf tournament, a harbor cruise, and a large number of options for enjoying the city and the surrounding area. With its rich history, wealth of educational institutions and active industry, Long Beach provides a wonderful context for this meeting. The Microscopy and Microanalysis Meeting has been managed by the Rebedeau Group, ably directed by Mary Beth Rebedeau in close conjunction with the Local Arrangements and the Program Committees.

We extend congratulations to all the MSA and MAS award winners honored at this meeting. Patrick Echlin and Thomas Mulvey have been selected for MSA Distinguished Scientist Awards in Biological and Physical Sciences, respectively. J. M. Zuo is the Burton medalist, the MSA Outstanding Technologist Award goes to Conrad Bremer, and the MSA Award for Achievement in Optical Microscopy (sponsored by OPIA) goes to Claire Waterman-Storer. The MAS Presidential Science Award goes to Philip Batson and the recipient of the MAS Presidential Service Award is Charles Lyman. This year the K. F. J. Heinrich Award goes to Chris Jacobsen. Special congratulations go to our other award winners: MSA Professional Technical Staff awardees, MSA Presidential Scholars and MAS Distinguished Scholars.

We thank the city of Long Beach for its warm hospitality and all of the organizers and participants for making M&M-2001 the premier event in the world of microscopy. We now look forward to Quebec City, the site of the Microscopy and Microanalysis 2002.

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**2001: A SPACE ODYSSEY: BIOLOGICAL AND MATERIALS SCIENCE EXPERIMENTS
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