ASME International

3 Park Avenue, New York, NY 10016-5990

MATERIALS

Materials Division Newsletter

Editor Paul F. Joseph *Fall 1998*

Message from the Chair

Theodore Nicholas

I inherit the chair of a Division which has been growing rapidly over the past 8 years and is now established as one of the premiere divisions within the society. When one takes a broad look at Materials Division activities, it is easy to see how we play a key role in many activities within ASME because materials are an integral part of almost everything that mechanical engineers deal with. Among the activities we look forward to this year are our participation the IMECE in Anaheim where we have 13 symposia in all, and 41 technical sessions. Thanks are due to Prof. Rishi Raj of the University of Colorado for his enthusiastic leadership as technical program chair and to the technical committee chairs and volunteers for their hard work in organizing these sessions. Among the sessions are several in honor of Nick Pagano on his 65th birthday! And to top that off, Nick will be the guest speaker at our Materials Division dinner. Other future meetings where MD will actively participate are the IMECE to be held on November 14-19, 1999 in Nashville, TN and the 1999 ASME AMD/MD Joint Conference which will be held June 27-30 at Virginia Tech.

Our Division has been and will continue to be active in communicating with its members. Last year, we published a Division Newsletter prior to the 1997 IMECE, edited by Prof. Paul Joseph of Clemson University. We also established a Materials Division web page, edited by Prof. Karthik Ramani of Purdue University. We are continually working to provide and update information to make that web page more and more useful to our members. Other accomplishments during the past year include the formal change from the Nadai Award, which is a Division award, to the Nadai Medal which is a Society award. And congratulations to Prof. Ali Argon of MIT for his selection as the first Nadai Medalist. We have also resumed our participation in the A.O. Schaefer Award Committee this last year. Congratulations to Michael Gold who was selected to receive this award from the Materials & Structures Group of ASME.

During the past year we have updated our bylaws to reflect changes in the awards committees and to do some long overdue housekeeping to reflect our current goals and methods of operation. Finally, to bore you with statistics, it can be stated confidently that MD is as financially sound today as we have ever been. At least we were when I wrote this! We achieved a balance of $17,050 in the Division fund as of 2/28/98 to fund Division expenses. This fund has grown from $12,990 on 7/1/96. We also increased the balance in the Nadai Medal fund to $30,440 as of 6/30/97 in order to sponsor that award. This fund has grown

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ASME Journal of Engineering Materials and Technology

With a new Technical Editor this past year, David L. McDowell of Georgia Tech, the Journal continues its service to the communities of University, government and industry researchers and practitioners engaged in design, materials selection, structural analysis, materials processing and failure analysis. The Journal publishes original research papers in the various branches of materials engineering, including constitutive models for behavior, creep, materials processing, environmental effects, failure analysis, fatigue and fracture mechanics, friction and wear, lifetime prediction, structure-property relationships, and test procedures. Papers which introduce new fields of materials engineering, or which provide new insights into established fields, are particularly welcome.

The Materials Division is grateful for the leadership of the most recent Past Technical Editor George Weng. During these past five years, significant strides have been taken to establish JEMT as a leading journal in its topical areas. Our peer group of competing journals has shifted somewhat over the past five years to those that emphasize a focus at the interface between materials science, materials processing and mechanics. This has been reflected in communication to the ASME Board of Editors in November 1997.

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Chair's Message

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from only a few thousand dollars several years ago, thanks mainly to the efforts of Vijay Stokes, the outgoing chair of the Division in 1995.

I end this message with a very positive outlook for our future. We have been growing and prospering over the past several years due to the efforts of the many people who volunteer for the various duties and responsibilities which keep our Division moving forward. It is the people in our Division who make us what we are, and I am proud to be part of an outstanding team. I would like to acquaint you with some of the new people you will be seeing on our web site. Sue Cunningham (Pratt & Whitney) joined as the incoming member of the Executive Committee in 1997, and we welcome Bill Curtin (Brown University) as the latest member of the committee who will join us at the upcoming IMECE. We appointed David McDowell (Georgia Tech) as new editor of JEMT, replacing George Weng who had held that position for many years. And there have been new technical committee chairs appointed recently: John Coulter (Lehigh University) of the Materials Processing Committee and Vipin Kumar (University of Washington) of the Polymer Committee. To those who have joined, I say welcome. To those who have been replaced, thank you all for a wonderful job. So as we head into 1999, I am proud to be chair of the MD Executive Committee surrounded by fellow members Brian Cox, Rishi Raj, Sue Cunningham and Bill Curtin. To Sia Nemat-Nasser, our outgoing chair, I say thanks for his inspirational leadership and for his many contributions during his 5 year tenure. I will do all I can to help this Division prosper over the next year and I will leave it for Brian Cox to continue the tradition and let him deal with Y2K when he becomes chair in 1999.

Theodore Nicholas

Materials Division Web Site

An extended version of this newsletter is available on the Materials Division Web Page at http://www.asme.org/divisions/materials. While the full ASME Materials Division Webpage is still under development, the basic framework is complete through the efforts of Prof. Karthik Ramani from Purdue University. You are invited to visit this site to learn more about the Materials Division, the Executive Committee, and the technical committees.

1997 Nadai Award

David L. McDowell

The Nadai Award was established in 1975 to honor Dr. Arpad L. Nadai in recognition of his pioneering work in the field of mechanics of materials, specifically their plastic flow. David L. McDowell, the Regents' Professor at Georgia Tech and a Fellow of the ASME, was the 1997 recipient of the Nadai Award.

David L. McDowell has contributed substantially to the development of experimentally-based models for multiaxial cyclic plastic and thermoviscoplastic stress-strain behavior of metals, small crack propagation laws for multiaxial fatigue, constitutive laws for creep-fatigue-environment interaction and thermomechanical fatigue, models for deformation-induced anisotropy and compressibility effects at finite strain, time-dependent fracture mechanics modeling approaches for both creep ductile and creep brittle high temperature materials, modelling of cyclic plasticity and progressive deformation, and deformation and failure of materials used for applications ranging from electronic packaging to prosthetic devices for biomedical applications. Author of over 100 research articles, McDowell has advised or co-advised 35 graduate students.

Dr. McDowell's principal contributions to mechanics of materials revolved around the combined use of experiments and computational solid mechanics to construct appropriate evolutionary laws for inelastic deformation and damage (fatigue/fracture) of polycrystalline metallic materials. These contributions have been primarily influential in the subjects of multiaxial plasticity and viscoplasticity of metallic materials, multiaxial fatigue of metallic polycrystals, and high temperature fatigue and creep-fatigue interaction.

Professor McDowells's teaches undergraduate and graduate courses in mechanical behavior of materials, continuum mechanics, nonlinear constitutive relations, fatigue and fracture. He serves as Director of the Mechanical Properties Research Laboratory at Georgia Tech, an internationally recognized interdisciplinary center for research in deformation, fracture and fatigue of engineering materials. As Chair of the Institute's Materials Council, McDowell provides leadership for the Institute's strategic materials thrust involving over 100 faculty from a broad cross-section of disciplines. Finally, Dr. McDowell currently serves as the technical editor of the Materials Division Journal, the ASME Journal of Engineering Materials and Technology.

ASME Journal of Engineering Materials and Technology

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From July 1, 1996 to June 9, 1997, the Journal received 92 papers, most of them still under review or in revision. The page allocation is now 590 pages per year. For the past few years, the average waiting time for a paper has been about nine months. We will be able to provide more complete information regarding the 1997-98 review cycle in the next annual report of the Journal.

Responsive and technically well-respected Associate Editors are instrumental in promoting the quality of any journal. To this end, we have added Hussein Zbib of Washington State University and Namas Chandra of Florida State University for three-year terms. Hussein is an expert in plasticity and localization, while Namas is accomplished in materials processing and superplasticity. We are grateful to Bob Pangborn of Penn State for his years of service to the Journal prior to stepping down this past year to concentrate on other administrative responsibilities.

Continuing to serve on the Board are David Allen, Romesh Batra, Cate Brinson, Kwai Chan, Fu-Pen Chiang, Subhendu Datta, Woody Ju, Shaker Meguid, G. Ravichandran, and Huseyin Sehitoglu. We are indeed fortunate to have such highly qualified and dedicated individuals on the Editorial Board of the Journal.

Our strategy continues to focus on maintaining and enhancing timely, high quality reviews and publishing special lectures and special issues of the Journal. These special issues emerge from symposia, workshops or contributions that enhance the development of new directions in research and development. In Fall 1998 JEMT will publish a special issue entitled "Shape Memory Alloys: Microstructure and Properties" to be guest edited by Huseyin Sehitoglu and Yuriy Chumlyakov. Another special issue is earmarked for April 1999 on multiscale modeling of deformation and fracture of engineering materials, to be guest edited by Hussein Zbib and John Hirth of Washington State University, based on the Fall 1998 SES meeting in Pullman. Special review articles have been invited in the coming year on mechanics and materials connections in nonlocal theories and in advances in polycrystal plasticity for forming applications.

Finally, I would like to take this opportunity to invite readers of the Journal to submit their papers for publication, and to thank both the Materials Division and its Executive Committee for their continued support. I especially thank Connie Monahan at ASME and Joyce Jones at Georgia Tech for their significant roles in assisting the Journal through its various phases of publication.

David L. McDowell, Technical Editor

1998 Nadai Medal Award Lecture

Ali S. Argon

Professor Ali S. Argon of the Department of Mechanical Engineering, Massachusetts Institute of Technology, is the first Nadai Medallist of the Materials Division. Dr. Argon will give the Nadai Lecture at the Anaheim IMECE on Tuesday, November 17 from 5:30 PM to 7:00 PM. The title and abstract for the presentation follow.

Mechanisms of Inelastic Deformation and Fracture

Arpad Nadai was a pioneering engineer in the field of the "Flow and Fracture of Solids". In his remarkable two volume treatise, having the same title he combined a rare sweep of sophisticated experimentation of the mechanical phenomena of inelastic deformation and fracture processes for numerous engineering problems with equally sophisticated treatment of the associated mechanics that elucidate them. While he often reflected a deep understanding of many governing mechanisms of these processes at the microscopic and sub-microscopic scales, he chose to deal with them primarily on the macroscopic scale related to the specific engineering applications.

In this lecture we will deal in some detail with a number of the mechanics governing these phenomena on inelastic deformation and fracture that were often implied by Nadai but left out by him in his research.

Message from the Outgoing Chair

Sia Nemat-Nasser

It has been a pleasure to serve in the Executive Committee (EC) of the Materials Division of ASME at a time when this division experienced its greatest expansion and growth of activities, probably since its inception, over 75 years ago. This has been, to a large extent, due to the ceaseless efforts of my predecessors and individuals who served on the EC, and our technical committees' efforts, over the past 10 years. In particular, the number of technical sessions organized by our division grew from less than a dozen to a steady state of greater than forty. I am therefore confident that the division will continue to prosper and play a leading role in the American Society of Mechanical Engineers for many years to come, particularly because the division is in the hands of competent and dedicated individuals, with Ted Nicholas as Chair, Brian Cox as Vice Chair, Rishi Raj as Publications Committee Chair, Sue Cunningham as Program Committee Chair, and our newest member Bill Curtin (Brown University), joining as the division's Secretary. I want to welcome Bill and I look forward to seeing his contributions to the division. Our seven technical committees are also in good hands, and I expect that they will continue to be active in organizing technical sessions.

Two important accomplishments of the division, over the past year, are worthy of special notice: The first is the creation of the ASME Nadai Medal, (from the division's Nadai Award) with its first recipient Professor Ali Argon being recognized at the upcoming IMECE meeting in Anaheim. The Nadai Medal Committee has been structured to include the current Chair, Vice Chair and the Publication Committee Chair of the EC, three most recent past recipients of the medal, three most recent past chairs of the EC, and one of the current chairs of the divisions technical committee (on a rotating basis). The second is the creation of a separate Honors and Awards committee, chaired by the current Publications Committee chair of the EC, and is comprised of the current EC Program Chair and Secretary, three past chairs of the EC and the seven current chairs of the divisions technical committees. This committee will seek to identify deserving members of the division, and seek to recognize them by nominating them for the various available honors and awards which ASME provides, including the nomination for the grade of fellow.

Another function of our division has been to coordinate the editorial process associated with the divisions' Journal of Engineering Materials and Technology (JEMT), which was artfully spearheaded by George Weng and a group of competent associate editors. I am pleased to see that this important task is now under the guidance of our new editor, Professor David McDowell who, I am pleased to remind the reader, was our last Nadai Awardee. David has already assembled a fine group of associate editors and I am confident that the journal will continue to prosper under his leadership. Not coincidentally, the journal is among the best sellers and revenue producers of the ASME publications.

It has been a pleasure to serve the division over the past five years, and I look forward to playing an active role in the technical sessions that the division sponsors. As a final, but intimately related note, I wish to report that our division and the Applied Mechanics Division (AMD) had agreed to take turns in leading the joint annual summer conferences. The next joint summer conference, to be hosted by AMD, (Professor R. Batra serving as local chair), will be at Virginia Polytechnic Institute and State University, June 27–30, 1999. There will not be a joint meeting in the year 2000, as ICTAM will take place in Chicago that year. In the year 2001, our division will lead the joint summer meeting, which will be held during the week of June 25th - June 29th, at the University of California, San Diego, and I have the distinct honor of serving as the local chair of this activity.

Sia Nemat-Nasser

Recent Fellows

The following ASME members, with the Materials Division as their primary or secondary division, were recently elected to the Fellow grade: Rohan C. Abeyaratne, Shyam Bahadur, John M. Barsom, Eric H. Jordan, Jiann-Wen Ju, Kenneth M. Liechti, June Ling, Jack R. Maurer, Mysore L. Ramalingam, Mamdouh M. Salama, and Timothy W. Tong.

Materials Division Symposia for IMECE 98 in Anaheim

The seven committees of the Materials Division are presenting thirteen symposia spread over a total of 41 sessions. Additional sessions are being contributed to these symposia at this Congress from other Divisions of the ASME through cosponsorship. These Divisions include the Applied Mechanics Division, Aerospace Division, Fluids Engineering Division and the Textile Division.

The demand for sessions from the Materials Division committees continues to grow. Our allotment of sessions is about 15% greater than last year. This growth was achieved through an aggressive campaign for industrial highlight sessions, which are awarded on a competitive basis through a proposal process. The session organizers wrote strong proposals that demonstrated significant participation of industrial members of the ASME in the Symposia, so that nearly all the proposals were accepted. We hope to continue to meet the demand for more sessions through interdivisional sponsorship of symposia and through greater industrial involvement in our programs.

The Committee Chairs and those interested in organizing sessions for the 1999 annual meeting should please submit their requests to the Program Representative for 1999, Susan Cunningham:

Dr. Susan E. Cunningham, Mail Stop 715-88, Pratt and Whitney, P.O. Box 109600, West Palm Beach, FL 33410, Phone: 561-796-8603, FAX: 561-796-9001, e-mail: cunnsusa@pwfl.com

The Symposia for Anaheim '98, the organizers of the symposia and the technical committees of the Materials Division sponsoring these symposia, are given below:

Ceramics (Chair: H. F. Nied)
- Ceramic Coatings (Ahmet C. Kaya, GE R&D Center, Schenectady, NY)

Composites (Chair: S. R. Swanson)
- Symposium on Micromechanics and Laminate Analysis Honoring Nick Pagano (Ajit Roy, Steve Donaldson, and Jeff Paine, Wright Patterson Air Force Base, Dayton OH) Jointly with Aerospace and Applied Mechanics Divisions
- Durability and Damage Tolerance of Heterogeneous Materials (Ann Marie Sastry, University of Michigan, Ann Arbor, Robert Wetherhold, University of Buffalo, State University of NY, and Assimina A. Pelegri, Rutgers, The State University of NJ) Jointly with Applied Mechanics Division
- Multifunctional Composites and Structural Health Monitoring (Fuo Kuo Chang, Stanford University and Abhijit DasGupta) Jointly with Aerospace Division

Constitutive Equations (Joint with AMD) (Chair: G. Z. Voyiadjis)
- Symposium on Scale Effects in Heterogeneous Materials (M. Ostoja-Starzewski) Jointly with Applied Mechanics Division
- Symposium on Phase Transformations and Active Composites (D. Lagoudas and K. Bhattacharya) Jointly with Applied Mechanics Division
- Symposium on Large Deformation and High Strain Rate (A. Rajendran and R. Batra) Jointly with Applied Mechanics Division

Electronic Materials (Joint with EEPD) (Chair: M. Taya)
- Symposium on Microscale Mechanics of Materials and Structures (Martin L. Dunn, University of Colorado at Boulder)

Materials Processing (Chair: J. P. Coulter)
- Rheology and Fluid Mechanics of Non-Linear Materials (Dennis Siginer, New Jersey Institute of Technology, and Prof. DeKee) Jointly with Fluids Engineering Division

Metallic Materials (Chair: D. C. Davis)
- Sheet Metal Forming (Juo Pan, University of Michigan, Sing Tang and Peter Friedman, Ford Motor Company) Jointly with Manufacturing Engineering Division
- Advances in Metallic Materials: Fatigue and Fracture (Daniel Davis, New Jersey Institute of Technology)

Polymers (Chair: V. Kumar)
- Cellular and Microcellular Materials (Vipin Kumar, University of Washington, Seattle)
- Phase Transitions in Polymer Processing (Karl Jacob, Georgia Tech) Jointly with Textile Division

Schedule of Materials Division Events at the Anaheim IMECE '98

Nadai Lecture
Professor Ali Argon
Tuesday, November 17 from 5:30 to 7:00 PM

Materials Division Banquet
After Dinner Speaker, Dr. Nicholas J. Pagano
Tuesday, November 17 at 7:00 PM

Committee Meetings:

Monday, November 16
- Metallic Materials, from 11:00 AM to 12:00 Noon
- Executive Committee (Closed), from 2:00 PM to 5:00 PM

Tuesday, November 17
- Polymers, from 12:00 Noon to 1:00 PM
- Ceramics, from 1:00 PM to 2:00 PM
- Materials and Structures Group Meeting (EC to attend) from 2:00 PM to 5:00 PM

Wednesday, November 18
- Composites, from 12:00 Noon to 1:00 PM
- Materials Processing, from 12:00 Noon to 1:00 PM
- Electronic Materials, from 1:00 PM to 2:00 PM
- AMD-MD Joint Committee on Constitutive Equations, from 1:00 PM to 2:00 PM
- Executive Committee (Open), from 2:00 PM to 5:00 PM

Dr. Nicholas J. Pagano

After Dinner Speaker for the Materials Division at IMECE '98

Dr. Nicholas J. Pagano

A Symposium on Composites and Laminates is being held at IMECE '98 to honor Nick Pagano's many contributions to the field of mechanics and materials science. He has kindly agreed to give us his own view of the topic at the Materials Dinner which will be held at 7:00 PM on Tuesday, November 17th. Participants in the Symposium are cordially invited to attend the dinner as well.

Dr. Pagano's research over the years has emphasized accurate representation of the stress fields in composite laminates. His classic work on delamination of composites explains the mechanism controlling free-edge delamination and is the starting point for researchers in the field. His exact solutions are still used as the basis for studying the requirements for theories of laminated plates. At the materials laboratory of Wright Patterson Air Force Base, where he is a Wright Lab Fellow, he has led the development of models that describe the thermomechanical response of composite materials, with a view to their damage tolerance, for application in aerospace structures.

Dr. Pagano has published in the mechanics and composites journals, is co-author of a recognized textbook on the theory of elasticity and contributor of a reference book on composite delamination. He was the first winner of the Air Force Basic Research Award and a member of the first group of Wright Lab Fellows. He was the recipient of the Distinguished Research Award presented by the American Society of Composites in 1989 and named a fellow of that organization. He was the NASA-Virginia Tech Distinguished Lecturer in 1987 and received the Dayton Affiliate professional achievement in 1991. Dr. Pagano has won the Charles J. Cleary Award three times, and is the recipient of the Meritorious Civil Service Award. He is also the first bench scientist to attain super-grade status in the Air Force. He was recently honored by having a number of his technical papers collected by Dr. J. N. Reddy and published in a monograph entitled "Mechanics of Composite Materials: Selected Works of N. J. Pagano" by Kluwer in 1994.

Dr. Pagano received the Ph.D. degree in Applied Mechanics from Lehigh University.

News from the Technical Committees

AMD-MD Joint Committee on Constitutive Equations

My term as chair of this committee expired June 30 of this year. I would like to thank you all for your help and contributions to this committee for the past three years. Dr. Martin Ostoja-Starzewski who was elected three years ago as the Vice Chair of this Committee is the incoming chair. I would like to solicit nominations at this time for the new Vice Chair who will take over from Martin.

New symposia are currently organized by the Constitutive Equations committee for the upcoming ASME meetings. The symposium on "Physical Modeling of Dynamic Failure Processes" is organized by T.W. Wright, A.M. Rajendran, and M. Zikry for the 1999 IMECE in Nashville. Hank Haslach, George Kyanka, M.K. Ramasubramanian and Richard Perkins are organizing a symposium on the Mechanics of Cellulosic Materials for the forthcoming ASME summer mechanics meeting at Virginia Tech, Blacksburg, Virginia. The committee is also organizing symposia for the, IMECE '98 on "Scale Effects in Heterogeneous Materials" by M. Ostoja-Starzewski, "Constitutive Relations for Engineering Materials" by A. Rajendran and R. Batra, and "Phase Transformations and Active Composites" by D. Lagoudas and N. Bhattacharya.

The committee is calling for proposals for new symposia to be held at the future winter and summer ASME conferences.

George Z. Voyiadjis, Chair

Ceramics Committee

The Ceramics Committee exists to promote all aspects of the advancement of engineering and science related to ceramic materials. This includes sponsoring symposia at major ASME conferences such as the annual ASME summer conference and the ASME IMECE held in November. For example, in 1997, Dr. Shuo Yang (Bosh Braking Systems) organized a very successful Symposium on Advances in Ceramics and Ceramic Composites at the ASME IMECE in Dallas, TX. This symposium consisted of five sessions that included such topics as ceramic processing, abrasive machining, ceramic matrix composites, fiber coatings and ceramics in electronic applications. It should be noted that this symposium contained a balanced mix of industrial and university participation. At this year's IMECE in Anaheim, a symposium on Ceramic Coatings has been organized by Dr. Ahmet C. Kaya (GE Corporate Research and Development, Ahmet. Kaya@crd.ge.com). The symposium's five sessions will be held on Monday, Nov. 16th and Tuesday, Nov. 17th. The Ceramic Coatings symposium includes three Industrial Highlight Topics related to Global Technologies for the Competitive Edge, with a focus on state-of-the-art practices and ideas. The considerable industrial participation in these sessions will cover a large number of topics, including presentations on thermal barrier coatings, tribological coatings, functionally graded ceramic coatings, fabrication and processing, interfaces, and fracture mechanics. Planning for future Ceramics Committee sponsored symposia is currently underway. The Ceramics Committee will meet at 1:00 PM on Tuesday, Nov. 17, in Anaheim during the IMECE. Look for the room location in the final conference program. The Ceramics Committee invites all members to participate in these activities. If you are interested in organizing a ceramics related symposium or would like to participate as a co-organizer or session chair, you are encouraged to attend this meeting. For the future, the committee is especially interested in hosting joint symposiums with other ASME technical divisions and other technical societies. Members interested in joining the Ceramics Committee should contact me directly, e-mail hfn2@lehigh.edu or phone (610)-758-4128.

Herman F. Nied, Chair

Composites Committee

The Materials Division Composites Committee is working to represent the interests of ASME members active in composite materials, and to promote the technology of composite materials through technical conferences and publications. The committee actively seeks members who are interested in composite materials and can help with our charter to facilitate further understanding of the processing, design, and manufacturing of composite materials. The incoming Chair of the MD Composites Committee is Professor Robert C. Wetherhold, of the State University of New York at Buffalo [Phone: (716) 645-2593 x2241, Fax: (716) 645-3875, or e-mail: mecrcw@ubvms.cc.buffalo.edu]. A new Vice Chair will be elected at the 1998 IMECE. Your input on current and future activities of the Committee would be welcomed.

The committee meeting held at the 1997 IMECE in Dallas was attended by 21 members. Three symposia were held at the 1997 IMECE. These symposia were: Composites Design and Manufacture, organized by Sue Mantell, Alfred Loos, and Suresh Advani; Durability and Damage Tolerance of Composites, organized by Karl Jacob, Noriko Katsube, and Walter Jones; and Functional Composite Materials, organized by Greg Carman and Abhijit DasGupta. These symposia were highly successful in terms of technical content and attendance.

Three symposia have been organized for the 1998 IMECE in Anaheim, which are: Symposium on Micromechanics and Laminate Analysis Honoring Nick Pagano, organized by Jeff Paine, Steve Donaldson, and Ajit Roy; Durability and Damage Tolerance of Heterogeneous Materials, organized by Ann Marie Sastry, and Bob Wetherhold; and Multifunctional Composites and Structural Health Monitoring, organized by Fuo Kuo Chang and Abhijit DasGupta.

Finally, plans are underway to organize three symposia for the 1999 IMECE, which will be: Durability and Damage Tolerance, organized by Wen Chan and Anwar Haque; Design and Manufacture of Composites, organized by Scott White; and Multifunctional Composites, organized by Marty Dunn and Abhijit DasGupta, in collaboration with the Aerospace Division. This will also include joint sponsorship of a symposium on Multifunctional Materials with Vibroacoustic Applications, in collaboration with the Noise Control and Acoustics Division's Material Characterization Committee.

Meetings of the Composites Committee will be held during these conferences, and interested prospective members are invited to attend.

Stephen R. Swanson, Chair

MD-EEPD Joint Committee on Electronic Materials

The main activity of the MD-EEPD Joint Committee on Electronic Materials (MD-EEPD-EMC) over the past 12 months was the preparation of two co-sponsored symposia: (1) NSF-IMM Symposium on Micromechanic Modeling for Industrial Materials, which was held at the University of Washington, July 20–22, 1998 and (2) US-Japan Workshop on Pacific Rim Distance Learning on Electronic Packaging and Microelectronics, to be held, June 11-12, 1999, Maui, Hawaii. More than 80 people from many countries attended the stand-alone NSF-IMM symposium, which was aimed at promoting micromechanical modeling as applied to industrial materials of today and the future. The topics covered in the symposium ranged from dislocation theory and experiment to smart materials. This symposium also celebrated Prof. T. Mori's 65th Birthday. Dr. Mori, currently Affiliated Professor of Northwestern University, has contributed to the advancement of Micromechanic Modeling for mechanical and physical behavior of various types of industrial

materials. The US-Japan workshop on Pacific Rim Distance Learning on Electronic Packaging and Microelectronics (EPM) is aimed at a discussion of the future of the educational program in the area of EPM, which is a primary R&D activity as well as a current robust industrial output for the Pacific Rim countries. Since the EPM subject area is interdisciplinary, and is rapidly expanding in the Pacific Rim countries, there is a lack of standardized text books, nor is there an established curriculum. The participants in the workshop are mainly US and Japanese educators who are active in this EPM area, and include some EPM engineers from the US and Japan, as well as several observers from other Pacific Rim countries. A strong commitment to this type of educational program by the MD-EEPD-EMC is becoming increasingly important as we seek more cost-effective educational programs to train both students in universities and engineers in the EPM industry.

The MD-EEPD-EMC is seeking new ideas for future activities as well as new committee members. Please contact Dr. Taya by e-mail (tayam@u.washington.edu) for any suggestions and to join the committee.

Minoru Taya, Chair

Materials Processing Committee

During the past year, the material processing committee continued to promote the development and dissemination of material processing technology through both internal and external efforts. At the November 1997 International Mechanical Engineering Conference and Exhibition held in Dallas, the committee sponsored two symposia. One, organized by Professor T. S. Srivatsan from the University of Akron, dealt with the "Processing and Performance of Functionally Graded Materials", while the other, organized jointly by Professors K. Ramani from Purdue University and S. Sitaraman from the Georgia Institute of Technology, focused on "Manufacturing Processes, Design, and Mechanics of Dissimilar Material Systems". Both of these symposia were well attended, and provided well-organized and productive forums for the discussion of advancements in these important material processing areas. The committee greatly appreciates the efforts of the organizers and participants that led to this successful result.

For the 1998 IMECE in Anaheim, the committee has sponsored a symposium organized by D. A. Siginer, Professor and Chairman of the Mechanical Engineering Department at the New Jersey Institute of Technology. The symposium is focused on an extremely important material processing issue, which is the "Rheology and Fluid Mechanics of Nonlinear Materials". Those involved and/or interested in this exciting material processing area are encouraged to attend the symposium sessions and participate in the discussion in November.

As far as ongoing conference organization efforts are concerned, a symposium entitled "The Science, Automation, and Control of Processes Involving Coupled Material Transport and State Change" is currently being organized for the 1999 IMECE. The symposium is intended to focus on both fundamental science and industrial implementation issues related to such processes, and is being jointly organized by Dr. G. O. Oyeleye of AMP Incorporated [(717) 592-6692, gunju.oyeleye@amp.com] and Professor O. J. Ilegbusi of Northeastern University [(617) 373-4121, ilegbusi@meceng.coe.neu.edu]. Those interested in participating in this symposium are encouraged to contact either of the organizers or Professor John Coulter of Lehigh University [(610) 758-4503, jc0I@lehigh.edu] for further information.

In addition, in recognition of the size and breadth of the material processing industry, the committee has initiated the formation of a group of interested individuals representing a wide variety of disciplines, employers, and/or professional societies. The purpose of the group will be to promote improved technological advancement and deployment in the material processing area by better integrating broadly applicable and inter-disciplinary developments. Persons interested in being involved in this activity are encouraged to contact Professor John Coulter or the current material processing committee Vice Chair, Professor Devdas Pai of North Carolina A&T State University [(336) 334-7620, ext. 316, pai@garfield.ncat.edu].

John P. Coulter, Chair

Metallic Materials Committee

The current interests of the Committee are fundamental research, development, processing and application of metal alloys, superalloys, metallic composites and intermetallics as related to engineering systems and components. As well, there is strong interest in industrial applications. At the 1998 IMECE in Anaheim, CA the Committee is sponsoring two symposia. The Symposium on Fatigue and Fracture of Metallic Materials has two sessions with a total of 10 papers being presented. The Symposium on Sheet Metal Forming has three sessions. These sessions focus on Material Modeling, Springback and New Processes. This symposium is co-sponsored by the Applied Mechanics Division. The time and locations of these symposium sessions will appear in the final program of the 1998 IMECE. For the 1999 IMECE the Metallic Materials Committee will sponsor a major symposium on High and Low Cycle Fatigue. Please submit one page abstract by Jan. 15, 1999 to S. Mall or T. Nicholas, FRL/MLLN, Bldg. 655, 2230 Tenth Street, Ste. 1, Wright-Patterson Air Force Base, OH 45433-7811; (937) 255-3636 x 4587; email small@afit.af.mil; fax (937) 656-7621, or D. C. Davis, New Jersey Institute of Technology, Room 5700 GITC, University Heights, Newark, NJ 07102-1982; fax (973) 596-2316; e-mail davisd@admin.njit.edu. Notification of acceptance of Abstract for presentation will be made by Feb 15, 1999. Full manuscript for the publication in a 1999 IMECE-WAM volume will be due by June 1, 1999. The Metallic Materials Committee Chair seeks individuals who wish to serve on the Committee and participate in developing programs for the future. Please attend the Committee Business Meeting at the 1998 IMECE on Monday November 16 between 11 am – 12 noon. The location will be printed in the final program.

Daniel C. Davis, Chair

Polymer Committee

At the 1997 IMECE in Dallas, the polymer committee chair H.P. Wang of General Electric stepped down after his three year term. We are all grateful for his leadership and service. On behalf of all, thank you, HP. I was elected the new chair (vkumar@u.washington.edu), and Prof. Karthik Ramani of Purdue university was elected the new vice chair (ramani@ecn.purdue.edu). Please feel free to contact us for any information regarding the committee activities.

The polymer committee is organizing three symposia at the upcomming 1998 IMECE at Anaheim. The first is a symposium on "Porous, Cellular and Microcellular Materials" that I have organized at the University of Washington. The second symposium is on "Rheology and Processing of Nonlinear Materials", organized by Dennis Signer of the New Jersey Institute of Technology, for which we are a co-sponsor. The third symposium is entitled "Phase Transformations in Polymer Processing" organized by Karl Jacob of Georgia Tech.

The membership of the committee is open to all. The committee meets once a year at the IMECE. The primary purpose of this meeting is to plan future polymer related symposia. All interested are invited to attend our meeting at Anaheim IMECE in November 1998 to be held on Tuesday, Nov.17, 12 to 1 PM.

Vipin Kumar, Chair