ASME International

Three Park Avenue, New York, NY 10016-5990

NON-PROFIT ORG
U.S. POSTAGE
PAID
American Society
of
Mechanical
Engineers

MATERIALS

Materials Division Newsletter

Paul Joseph, Editor *Fall 2002*

Chair's Message

Bill Curtin

I am pleased to ascend to the position of Chair of the MD Executive Committee (EC) for the coming year. It is my hope to keep building MD following upon the outstanding work of the previous chairs (Ted Nicholas, Brian Cox, Rishi Raj, and Sue Cunningham) during my tenure on the EC. Under their leadership, the MD has evolved and strengthened, and our current EC is dedicated toward continuing on that path. The EC operates with considerable input from the Technical Committees (TC) in the division. It is rare that the EC appeals directly to the membership, partly due to our size (well over 2,000 primary members and at least as many secondary members), but this year I will do so. Below, I lay out some issues that have been emerging at various scales - the Division, ASME, and the entire Materials community - and solicit any thoughtful comments from the Division's membership on how our group should move forward.

Materials as a discipline seems always to be at a cross-road. Should materials be defined by types of materials or by applications? The types of materials are inviolate: new ones may be found, but the existing ones are here to stay. Applications are transient but provide tremendous excitement and drive the entire field forward. Our current TCs are organized primarily around types of materials. This structure presents some barriers to the introduction of new technical areas. While our creative membership has beaten down those barriers to some degree (for instance, the Metals TC has sponsored symposia on Biomaterials in recent years) we do not have a natural mechanism for expansion. Traditional materials areas may also wane because some of the previous active participants have moved into new areas (MEMS, Biomaterials, Fuel Cells, Nanomaterials), some of which are applications-oriented. Thus, one of the issues for MD is how we should be structured to take advantage of both facets of the materials discipline. We certainly wish to retain the strengths of the many existing TCs but to permit an easier incorporation of new trends in the vibrant research community. Several avenues are possible. One possible spectrum of TCs, which I offer as a means to spur discussion and comment by members, is arranged mainly by applications and includes Structural Materials, Composite Materials, Electronic Materials, Biomaterials, Nanomaterials, and Materials Processing. Only within each TC would the distinctions between metals, ceramics, and polymers, be made. In the spirit of multidisciplinary research that is perhaps most appropriate for materials science

(continued on page 2)

ASME Journal of Engineering Materials and Technology

The Journal is a leading source of high quality research papers in the various branches of materials engineering, including constitutive models for behavior, materials processing, environmental effects, failure analysis, fatigue and fracture mechanics, creep, friction and wear, lifetime prediction, structure-property relationships, and test procedures. The audience includes university, government and industry researchers and practitioners engaged in design, materials selection, structural analysis, materials processing and failure analysis.

JEMT emphasizes broad coverage of the interface between experimental characterization and state-of-the-art modeling of the processing and behavior of engineering materials, including constitutive equation development for deformation, fracture and fatigue and process / structure / property relations. The focus is on *real materials* and their structure, including experimentally observed behaviors and corresponding models that address relevant engineering issues. Pure analysis / computation or pure experiment, taken by themselves, rarely offer glimpses into the underlying complexity of real materials and processes that are crucial to the mission of JEMT.

(continued on page 3)

Chair's Message

(continued from page 1)

among the science and engineering disciplines, this organizational structure holds some attractions. The status quo is also an acceptable structure within which the creativity and expanding interests of members can be accommodated.

The highlight of the ASME Materials Division activities are the conferences, in particular the annual IMECE Congress held each November. MD within ASME must, however, compete with the dedicated Materials societies (TMS, MRS, ACerS) each of which holds one or more major annual conferences attended by most of the general materials community. Due to such competition, attendance at MD/IMECE symposia has declined in recent years, in spite of outstanding efforts by our TCs in generating interesting and timely symposia. MD must continually strive to maintain a position that distinguishes it from the other societies and yet makes it attractive to the community. One unique aspect of MD is the specific coupling to the Mechanical Engineering discipline, encompassing many applications areas from Aerospace, Applied Mechanics, Fluids, Pressure Vessels, NDE, MEMS, etc. Suggestions on how to entice broader participation in IMECE are welcome. Here, I also ask active MD members to encourage colleagues who have not regularly attended the Congress to give it a try by contributing and participating.

In noting the coupling of Materials to Mechanics in ASME, it is important to inform MD members that the ASME Council on Engineering, which is the overarching structure within which MD operates, is undergoing a restructuring. The current organization of ASME dictates that the primary alliances among divisions exist at the Group level, thus separating MD (in the Materials and Structures Group along with NDE and Pressure Vessels and Piping) from the Basic Engineering Group (containing Applied Mechanics, Bioengineering, Tribology, and others) and the Environment and Transportation Group (containing Aerospace and others) and the Systems and Design Group (containing Electronic and Photonic Packaging, Micromechanical Systems, and others). The current organization also dictates which part of the IMECE week contains the bulk of the MD sessions, and puts us at the opposite end of the week from, for instance, Applied Mechanics, every year. ASME restructuring thus provides a unique opportunity for Materials to form new alliances with other divisions, including those outside of the existing "Materials and Structures Group". If we are not proactive now, our future alignment will certainly be in hands that have no special knowledge of our needs. Your views on a forward-looking alignment of MD with other divisions are thus requested.

ASME has, in general, a strong coupling between industry and academics. For MD, the IMECE is typically dominated by academicians who serve as TC chairs or organize symposia. Industrial participation is sought and encouraged every year, but with varying, and often disappointing, results. The needs of industrial and academic engineers are different but, at the core as engineers, we are all aimed at solving important problems, both fundamental and applied. I encourage our members to take a broad view of the science and engineering taking place within MD and highlighted at IMECE. Academics: attend talks by industrial engineers to learn what problems they face and gain ideas about basic research that might provide industry with tools and knowledge to solve their problems. Industrialists: attend talks on fundamental science and consider how, if fully successful, such work could impact your research and your company's products. Above all, communicate in the sessions and in the hallways. Conferences, and the interactions among researchers of difference outlook and scope that naturally arise therein, are an incubator for new ideas, new focus, and new applications. I strongly encourage industrial members to both contribute and attend the IMECE and similarly encourage symposium organizers to accommodate industrial input in discussions, panels, and talks.

Finally, I would like to thank two key people who have served the Materials Division well and are now retiring from their respective positions. First, Mr. Erwin Weinberg is retiring after many years of dedicated service to ASME in the role of liaison with the MD Executive Committee. It is to Erwin that we have turned again and again for advice and information on policies and operations within ASME. His experience, help, and easy-going manner will be missed by the EC. We wish him well. Second, Dave McDowell has retired as editor of JEMT and the editorship has been transferred to Huseyin Sehitoglu at UIUC. During his tenure, JEMT expanded, the editorial board was strengthened, and the articles are of even higher quality. We appreciate Dave's exceptional efforts and ask members to thank Dave personally when you see him next.

Look for the scheduling of the MD EC Open Meeting and the TC meetings at the IMECE in November to join us in planning for that future.

Bill Curtin

Nadai Lecture to be Given by Sia Nemat-Nasser

At the 2002 New Orleans IMECE, on Tuesday November 19 at 2:00-3:30p.m. Rm# 217 Prof. Sia Nemat-Nasser will give the Nadai Lecture. The title of the lecture is "Compression-Induced Failure of Brittle Materials and Brittle Failure of Ductile Materials: Experiments and Modeling." The abstract for the presentation follows.

Tensile failure of solids has been extensively studied. Compression failure, on the other hand, has received less attention. Historically, Bridgman's experiments on compression failure of brittle materials such as rocks led to "paradoxes" that have since been named after him. Features common to these paradoxes include formation of tension cracks in specimens subjected to pure compression. Post-experiment electron microscopy of compressively failed samples has resulted in further confusion, since microscopic tensile cracks are seen to have emanated from a variety of defects in various directions, though predominantly in the direction of maximum compression.

Over the past two decades, several developments have helped to bring the issue of *brittle failure in compression* to a level of basic understanding. All Bridgman paradoxes have been fully resolved. Models which quantitatively explain axial splitting, faulting, and transition from brittle to ductile modes of failure have been developed, and, most importantly, the mechanisms of fracturing in *loading* and *unloading* have been captured experimentally and by laboratory models. Examination of quasi-static and dynamic experimental results, suggests that pre-existing flaws of progressively smaller dimensions are activated at progressively higher pressures, leading to tensile cracking and plastic deformation in the neighborhood of these flaws. In compression, even ceramics such as silicon nitride or silicon carbide, show dislocation activities, and may potentially fail in *ductile mode* under extreme pressures. Remarkably, micro-mechanical modeling suggests and experiments verify that high-rate compression loading of very ductile materials such as copper, can lead to *brittle tensile fracturing* (i.e., cleavage cracking), even though no tension has been applied.

In this lecture Dr. Sia Nemat-Nasser will present a summary of experimental and theoretical results on compression induced failure of both brittle and ductile materials over a broad range of loading rates, from quasi-static to regimes encountered in high-velocity impact.

ASME Journal of Engineering Materials and Technology

(continued from page 1)

Our strategy continues to focus on discernment in the review process and publication of targeted, high quality special issues of the Journal. These special issues typically emerge from symposia or workshops that foster new directions in research and development. To this end, we are proud of several high quality special issues that have appeared this past year. A special issue on "Advances in Metal Forming" based on papers presented at the IMECE in Orlando held in November 2000, appeared in the October 2001 issue, guest-edited by Jian Cao (Northwestern University) and Z. Cedric Xia (Ford Motor Company). A special issue on "Micromechanics in Crystal Plasticity" appeared in January 2002, guest-edited by Mohammed Cherkaoui and László S. Tóth (LPMM, University of Metz), was an outcome of the Fifth Asia Pacific Symposium on Advances in Engineering Plasticity, held June 12-16, 2000 in Hong Kong. A special issue on plasticity is scheduled to appear in July 2002, guest edited by Tariq A. Khraishi (University of New Mexico) and Hussein M. Zbib (Washington State University), and is based on a symposium held at the 2001 SES meeting in San Diego. Finally, a special issue on "Experimental and Computational Mechanics of Advanced Materials", guest-edited by Ewald Werner of TU-Munich, is scheduled to appear in January 2003.

From July 1, 2000 to December 31, 2001, the Journal received 140 submitted papers. Of these, 59 have been accepted for publication, with another 24 still in the review process. The annual page allocation presently stands at 590 pages per year. In 2001, JEMT published 529 pages. Over the past few years, the average waiting time for a paper from initial submission to acceptance or rejection has been about nine months.

Responsive and technically adept Associate Editors are instrumental in advancing the quality and image of any journal. New Associate Editors approved in 2002 for an initial three-year term include Mohammed Cherkaoui of the University of Metz in France, Matthew P. Miller of Cornell University, and Wolé Soboyejo of Princeton University. Mohammed is a leader within the European community in modeling of solid-state phase transformations and micromechanics of solids, with research emphases ranging from micro and nanomechanics to multiscale transition methods. Matt is an expert in the field of modeling crystallographic texture and wrought metals processing. Wolé's current materials systems of interest include micromechanical machines, metallic foams, biomedical materials for prosthetic devices, advanced aerospace / automotive materials, and infrastructure materials.

Other ongoing Associate Editors include Ann Marie Sastry of the University of Michigan, Golam Newaz of Wayne State University, Esteban Busso of the Imperial College of the University of London, Namas Chandra of Florida State University, Hussein Zbib of Washington State University, Min Zhou of Georgia Tech, Arunachalam Rajendran of the U.S. Army Research Office, R. Craig McClung of Southwest Research Institute, and Shankar Mall of the Air Force Institute of Technology. All of their ongoing efforts are very much appreciated.

I am grateful for the long and meritorious service given to the journal by L. Cate Brinson of Northwestern University and Didier Marquis of the Institute Francais de Mecanique Avancee, who completed their terms as Associate Editors in 2002. Ewald Werner of TU-Munich is also thanked for his two years of contributions in serving as an Associate Editor of JEMT, concluding this past year. Their dedication and sense of quality and high standards for the Journal have helped to increase its stature markedly, and has gained increased contributions from the European community over the past few years.

It seems like only a few years ago that I started my first Associate Editor term with JEMT, but ten years have passed! It has been an honor and privilege for me to serve as Editor since 1997. I hope that I've been able to consistently push in the direction of making JEMT more timely, exciting, stimulating, and relevant to its readership. I believe that JEMT now resides in a niche between materials science and mechanics of materials that is rather unique among its competitors, a position that serves the ASME readership well and reflects the leading edge of symposia organized within the Materials Division. I am pleased to announce that effective July 1, 2002, Professor Huseyin Sehitoglu of the University of Illinois at Urbana-Champaign will start his term as Editor. Over the next year I will finish up editorial duties on papers submitted to the Journal up to the end of June 2002. Huseyin will build on his unusually strong combination of materials science and mechanics to lead JEMT into this next exciting era. Among his key objectives over the next few years will be the transition to electronic paper submission and review processes.

Finally, I would like to take this opportunity to invite readers of the Journal to submit their best 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 Ms. Cecelia Jones of Georgia Tech for their professional, efficient performance in assisting the Journal through its various phases of publication this past year.

D.L. McDowell
Editor, ASME JEMT

Recent Fellows

The following ASME members, who have chosen the Materials Division as their primary or secondary division within ASME, were recently elected to the Fellow Grade from June 2001 to present:

CHRIS BECKERMANN
RAVINDER CHONA
DANIEL C. DAVIS
WALTER F. JONES
ALEXANDER L. KALAMKAROV
KLOD KOKINI
SRIDHAR KOTA
ROBERT J. LANKSTON
JANG M. LEE
ARUNAVA MAJUMDAR, PH.D.
SUDHAKAR E. NAIR
SU-SENG PANG
TINA L. PANONTIN
JIANMIN QU
KALIAT T. RAMESH
SAMUEL D.REYNOLDS
A. C. ROGERS
AJIT K. ROY
MASAO TOYODA
HUSSEIN M. ZBIB

Materials Division Web Site

The web site for the Materials Division is located at

www.asme.org / divisions / materials

Members are encouraged to contact the secretary of the Executive Committee if they have pertinent information for posting.

Schedule of Materials Division Events at the New Orleans IMECE 02

Nadai Lecture
Professor Sia Nemat-Nasser from UC San Diego: "Compression-induced Ductile Failure of Brittle Materials and Brittle Failure of Ductile Materials: Experiments and Modeling"
Tuesday, November 19, 2:00 p.m.

Materials Division Luncheon
Tuesday, November 19, 12:00 p.m.

Committee Meetings:
Monday, November 18
Polymeric Materials, 4:45 p.m.
Materials Processing, 4:45 p.m.
Ceramic Materials, 4:45 p.m.

Tuesday, November 19
Composite Materials, 6:30 p.m.
Metallic Materials, 6:30 p.m.
Electronic Materials, 6:30 p.m.
MD Executive Committee (Closed Session), 1:30-5:00 p.m.

Wednesday, November 20
MD Executive Committee (Open Session), 1:30-5:00 p.m.

Thursday, November 21
AMD-MD Joint Committee on Constitutive Equations, 11:00 a.m.

MATERIALS DIVISION SYMPOSIA FOR IMECE 02 IN NEW ORLEANS

The Materials Division's Technical Committees and members have put together an outstanding and broad technical program for the IMECE 02, to be held in New Orleans, LA from November 17-22, 2002. The symposia are listed below. The Division is sponsoring 48 sessions at the Congress, with some of the Symposia being jointly sponsored with other ASME Divisions. In total, the Materials Division is sponsoring 151 papers. The committee chairs and those interested in organizing sessions for IMECE 03 which will be held in November 16-21, 2003 in Washington, DC, should please submit their requests to Robert C. Wetherhold, (mecrcw@acsu.buffalo.edu)

Composites (Chair: Scott White):
* Modeling and Characterization of Nanocomposites I & II (R.F. Gibson and T.W. Chou)
* Design and Manufacturing of Composites:
  - Design & Performance (M. Mahinfalah and U. Vaidya)
  - Micromechanics & Microstructure (R. Gibson and J. Whitcomb)
  - Low Cost Manufacturing (U. Vaidya and E. Lee)
  - Manuacturing (J. Chen and F. Just-Agosto)
  - Thermoplastics (K. Gleich and D. Buckley)
  - Design & Applications (J. Chen and A. Pelegri)
* Composites for Space Application-Ii (A.K. Roy and S.L. Donaldson)
* Experimental Characterization (A. Karlsson and R.C. Wetherhold)

Constitutive Equations (Chair: Hussein Zbib)
* Damage Modeling
* Mechanics of Granular Materials (M. Massoudi)
* Advances in Damage Mechanics:
  - Advances in Modeling Damage Mechanics (C. Basaran and C.L. Chow)
  - Constitutive Modeling of Damage Mechanics (C.L. Chow and C. Basaran)
  - Experimental Damage Mechanics of Microelectronics Packaging (C. Basaran and E.T. Wong)

Electronic Materials (Chair: Zhigang Suo):
* Nanoscale Material Behavior And Modeling(Y. Huang and R. Ruoff)
* Mechanical Issues In Microelectronics And Photonics (H. Eliot Fang, Xiantao Yan & Yu-Lin Shen)

Materials Processing (Chair: Devdas Pai):
* Processing, Characterization and Modeling of Novel Nanoengineered and Surface Engineered Materials - I, II & III (J. Sankar and D.M. Pai)

Metallic Materials (Chair: Winston O. Soboyejo):
* Fatigue of Advanced Materials (C. Mercer and K. Chan)

Polymers (Chair: Karl Jacob)
* Advances in Materials Processing Science -
  - Material Flow Issues (D.A. Siginer and K.K. Kabanemi)
  - Injection Molding (K. Choukairy and B.P. Huynh)
  - Heat Transfer Issues (A. Derdouri and T. Tseng)
  - Process Modeling (N. Correia and R. Chiou)
  - Small Scale Processing (S. Adanur and V. Ranatun)

Workshop on Electric and Magnetic Phenomena in Micro- and Nano-Scale Systems - I, (D.A. Siginer, B.M. Khusid), II, (M. Krihak, S.I. Bakhtiyarov), and III, (J.R. Lloyd, A. Castellanos)

Program Chair: Mahyar Dadkhah

Sia Nemat-Nasser

PROFESSOR SIA NEMAT-NASSER 2002 NADAI MEDAL RECIPIENT

In his 40-year career in materials engineering, Sia Nemat-Nasser has consistently produced outstanding theoretical and experimental research embodying a remarkably wide range of materials engineering topics, and leading to universal advancement in the understanding of the response of materials. For this work, Professor Nemat-Nasser, Mechanical and Aerospace Engineering, University of California San Diego, has been awarded the 2002 ASME Nadai Medal. The Nadai Medal is awarded annually on the nomination of the Materials Division's Nadai Medal Committee to recognize distinguished achievements and contributions to the field of engineering materials. The medal takes its name from Arpad L. Nadai, one of the pioneers in the field of materials engineering, who contributed particularly in the areas of plasticity, fatigue, and high temperature behavior.

Sia Nemat-Nasser earned all of his engineering degrees in California, starting with his B.S. in Engineering from the California State University of Sacramento, then following with his M.S in Civil Engineering and Ph.D. in Structural Engineering, both from the University of California, Berkeley. While earning his advanced degrees, he assumed an assistant professorship in Civil Engineering at California State University at Sacramento. Following his Ph.D. degree, Sia undertook a post-doctoral assignment at Northwestern University, eventually leading to his first assignment as Assistant Professor at the University of California, San Diego, followed by fifteen years at Northwestern University as Professor of Civil Engineering and Applied Mathematics. He was lured back to San Diego in 1985 as Professor of Applied Mechanics and Engineering Science (now called Mechanical and Aerospace Engineering), where he continues today.

Sia's remarkable vision and management talents are evident in his efforts at UCSD where he was a driving force in the development of the Center of Excellence for Advanced Materials (CEAM), which he has directed since 1986. CEAM was founded with a tri-fold mission aimed at advancing experimental, modeling, and computing research in advanced materials. In 1989 Sia founded the Materials Science Graduate Program at UCSD and served as its coordinator for the next five years. From 1992 to 1997, Sia spent 5 years as the Co-Director of the Institute for Mechanics and Materials at UCSD, followed by 2 years as its Director. Many researchers have derived benefit from the establishment and continuation of this laboratory for testing materials at high strain rates that has contributed to advancements for testing methodologies to permit data gathering not previously available. For these efforts and his outstanding research achievements, Sia was honored as the recipient of the

John Dove Isaacs Chair in Natural Philosophy from the UCSD Jacobs School of Engineering from 1995 through 2000.

Sia is one of the major figures working on understanding the mechanics of materials, and he has contributed significant work over a remarkably broad range of topics. A partial but substantive list of topics in which he has made significant discoveries include: constitutive response and liquefaction in granular media; brittle crack growth and bifurcation in compressive loading; plasticity at large strain; elastic-plastic crack tip fields; failure of ductile metals under shock wave conditions; cracking though fiber-reinforced composites; overall properties of composites; and thermodynamics of deformation. Research in these areas has led to many publications and presentations. Sia has authored, co-authored, or edited over nineteen books and proceedings and has organized over 40 scientific workshops and meetings. He has published over 380 scientific articles and has presented over 420 lectures and seminars at scientific meetings and at various institutions, 20 of which were plenary or keynote lectures. He currently supervises 11 graduate students at UCSD. Under his supervision, 32 students received their Ph.D. and 29 students received M.S. degrees from either UCSD or Northwestern.

Sia has been an avid supporter and leader within ASME for more than 35 years. Among his prestigious awards, he was elected as Fellow of ASME in 1979, was awarded a Lifetime Membership Certificate for 35 years of support in 2001, and was elected as a Life Fellow of ASME in 2001. As part of his on-going support, Sia chaired the Geomechanics Committee of the Applied Mechanics Division from 1981-1985, chaired the Materials Division from 1997 to 1998, was Group Representative of the Materials and Sturctures Technical Group in 1995, and was a member of various committees within the Materials Division and Applied Mechanics Division throughout his 35 years as an active member of ASME. In addition to this service to ASME, he is the editor-in-chief of the international journal Mechanics of Materials and has edited the book series Mechanics Today and the book series Mechanics of Elastic and Inelastic Solids. He has served and continues to serve on the honorary advisory boards of several international journals, and was President of the American Academy of Mechanics from 1996 to 1997. Other notable honors include receipt of the Gold Medal of the Technical University of Crete in 1997, election to the National Academy of Engineers in 2001, and receipt of the Prager Medal in Solid Mechanics from the Society of Engineering Science in 2002.

Clearly, Sia is an exceptional leader and educator. However, the core of his qualifications for the Nadai Medal stems from the exceptional quality of his research over the last nearly 40 years. Professor Nemat-Nasser continues to maintain the highest standards in both theory development and experiment. He has produced authoritative work on geomaterials, particularly granular materials; compressive failure of brittle materials (see abstract of Nadai Lecture in this Newsletter); and elastic-viscoplastic deformation modeling of metals. In short, he has never stopped producing excellent quality research and publications, and remains today an impressive leader in the field of materials engineering.

News from the Committees

AMD-MD Joint Committee on Constitutive Equations

The Technical Joint Committee on Constitutive Equations of the Applied Mechanics Division, and Materials Division of the American Society of Mechanical Engineers exists to promote, support, and advance the state of the art and science of Applied Mechanics and Materials in the area of modeling the mechanical and physical behavior of materials and structures. The committee's interests cover the area broadly and include relevant physical phenomena, theoretical and mathematical problems, constitutive modeling issues, experimental aspects, computational modeling, etc.

The last meeting of the Committee was held at the 2001 IMECE in New York. Dr. Hussein M. Zbib (zbib@wsu.edu) was elected chair , taking over from Dr. Martin Ostoja-Starzewski, who served as committee chair for three years and will continue to serve as co-chair for one more year. Three new members joined the Committee. They are I.J. Rao of NJIT, M.A.S. Qidwai of NRL and M. Sandeep of Honeywell. The principal business of the committee was the approval of two symposia to be held at the 2002 IMECE.

Dr. Cemal Basaran (University at Buffalo, SUNY, www.packaging.buffalo.edu) and Dr. C.L. Chow (University of Michigan Dearborn) will be organizing the symposium, Advances in Damage Mechanics. The symposium will consist of seven sessions of invited and contributed papers and will discuss advances in the theory and experimental verification of damage mechanics. Applications from nano scale to mega scale structures will be discussed. Dr. Mehrdad Massoudi (U. S. Department of Energy National energy Technology Laboratory, Mehrdad.Massoudi@NETL.DOE.GOV) and Dr. Morteza M. Mehrabadi (Tulane University, mmm@tulane.edu) will organize Constitutive Modeling of Granular Materials with four sessions. The presentations will address theoretical, computational, and experimental issues related to the flow and behavior of granular materials. The symposium organizers will also edit a proceeding for this symposium.

Meetings of the AMD-MD Joint Committee on Constitutive Equations will be held at all ASME conferences, current members are encouraged to bring new ideas and proposals for symposia for future meetings, and new members are always welcome.

Hussein M. Zbib, Chair

Composites Committee

The Materials Division Composites Committee serves as a focal point within ASME to bring together members who are interested in composite materials and their applications and to sponsor technical conferences devoted to composite material themes. The committee is open to any that have technical interests in the processing, manufacturing, design, and testing of composite materials. Every year the Committee sponsors a variety of IMECE symposia including: Design and Manufacturing, Durability and Damage Tolerance, and Smart / Multifunctional Materials, as well as special topics proposed by interested committee members. The Committee is interested in coordinating our efforts with other technical committees within ASME and continues to promote joint sponsorship of symposia. Committee meetings are held during the IMECE and interested prospective members are invited to attend. The Committee Chair is Scott White, Aeronautical and Astronautical Engineering Department, University of Illinois, Urbana, IL [217-333-1077, swhite@uiuc.edu]. The Vice-Chair is Ann Marie Sastry, Mechanical Engineering and Applied Mechanics Department, University of Michigan, Ann Arbor, MI [734-764-3061, amsastry@umich.edu].

There were 16 people who attended the last committee meeting held at the 2001 IMECE in New York. The four symposia for the 2001 IMECE organized by members of the Composites Committee were reviewed: Durability and Damage Tolerance of Heterogeneous Materials - 5 sessions organized by Ann Marie Sastry (Univ. of Michigan), Mina Pelegri (Rutgers Univ.) and Wolé Soboyejo (Princeton Univ.), Design and Manufacturing of Composites - 4 sessions organized by Sue Mantell (Univ. of Michigan), and Composites for Space Applications - 2 sessions organized by Steve Donaldson (AFRL) and Ajit Roy (AFRL), Crashworthiness of Composites - 4 sessions organized by Golem Newaz (Wayne State Univ.). The committee membership organized a total of 15 sessions this year with 4 of these sessions jointly sponsored with the Applied Mechanics Division.

The Composites Committee is organizing four symposia in the 2002 IMECE in New Orleans. These symposia are listed elsewhere in this Newsletter. A total of thirteen Composites Committee members deserve the credit for organizing these symposia.

Preliminary plans were made for several symposia for the 2003 ASME IMECE including: (1) Interfaces in Heterogeneous Materials organized by Mina Pelegri (Rutgers Univ.), (2) Composites for Space Applications organized by Ajit Roy (AFRL) and Steve Donaldson (AFLR), (3) Durability and Damage Tolerance organized by Anette Karlsson (Princeton Univ.) and Wen Chan (U. Texas-Arling-

(continued on page 3)

ton), (4) Design and Manufacturing of Composites organized by Julie Chen (U. Massachusetts-Lowell).

The Committee is also beginning organizational efforts for ICCM-14 to be held in the summer of 2003 in San Diego and co-sponsored by ASME. Interested members who wish to organize sessions are encouraged to contact Scott White.

Scott White, Chair

Electronic Materials Committee

The Electronic Materials Committee serves the ASME members who study material and mechanical phenomena significant to device technologies, including microelectronics, photonics, and MEMS. Such devices integrate extremely different materials at small feature sizes. The structural complexity, as well as the small feature sizes, poses sustainable research challenges, both experimental and computational. The field advances so rapidly that the interaction between academia and industries becomes requisite.

The Committee functions mainly through organizing symposia. At the 2001 IMECE in New York City, the Committee organized three symposia:

- Nanoscale Materials and Structures, 4 sessions, organized by Zhigang Suo (Princeton University) and Reinhold Dauskardt (Stanford University), and funded by the National Science Foundation (Program Director Ken Chong).
- Integration and Reliability Challenges in Advanced Interconnects, 3 sessions, organized by Jun He (Intel Corporation).
- Material Characteristics at the Microstructure Length Scale, 2 sessions, organized by Ashraf Bastawros (Iowa State University).

The Committee sponsored a 14-session symposium on "Mechanics of Thin Films and Other Small Structures," organized by Zhigang Suo and Rui Huang, at the Fourteenth US National Congress of Theoretical and Applied Mechanics, which was held at Virginia Polytechnic Institute in June 2002.

The Committee will organize two symposia at the 2002 New Orleans IMECE:

- Symposium on Nanoscale Material Behavior and Modeling, 5 sessions, organized by Young Huang (huang9@uiuc.edu, University of Illinois, Urbana-Champaign) and Rodney Ruoff (Northwestern University).
- Symposium on Mechanical Issues in Microelectronics and Photonics, 4 sessions, organized by Eliot Fang (hefang@sandia.gov, Sandia National Laboratories), Xiantao Yan (LightCross), and Yu-Lin Shen (University of New Mexico).

At this meeting Zhigang Suo will complete his three-year term as the Committee Chair, and the Chair-Elect, Joost Vlassak (vlassak@esag.harvard.edu), will take over. If you are interested in organizing a symposium for the 2003 Washington DC IMECE, please send Dr. Vlassak a one-page proposal, including the title of the symposium, a short narrative, the number of 90-minute sessions requested, and a list of potential speakers. The Committee will discuss the proposals this November, and present the selected ones to the Materials Division. Please join us in New Orleans, where future activities will be planned. The Committee Meeting is open to all.

Zhigang Suo, Chair

Metallic Materials Committee

The Metals commitee has been very active over the past year. In June of 2001, the committee organized two symposia at the ASME Mechanics and Materials Conference held in La Jolla, CA. The first symposium was entitled, "Materials for Infrastructure and Development" organized by Prof. Wolé Soboyejo (Princeton University), Prof. Alfred Soboyejo (Ohio State University) and Dr. Dan Davis (Texas Southern University). This symposium brought together scientists and engineers from Africa, South America, Europe and North America to discuss issues related to materials and infrastructure for the world's population. The main theme that emerged from the symposium was the need for a holistic approach to the development of materials for infrastructure and development. This was proposed by Prof. Narayan Swamy of Sheffield University. Following the three technical sessions, a brainstorming session was held to identify potential areas for future international collaboration in research and education for infrastructure and development. The ideas have since been developed into research programs that are now beginning to fund collaborations between 18 scientists and engineers in Africa, South America, Europe and North America. The papers presented at the symposium have also been subjected to a peer review process, and are awaiting publication in the International Journal of Concrete and Cement Structures. A follow up workshop was held with the help of Dr. Elbert Marsh of the National Science Foundation, addressing such topics as potential areas for global collaboration in manufacturing research for development.

The second symposium that was held in La Jolla was entitled, Fatigue of Advanced Materials. This featured talks on the fatigue of intermetallics, ceramics, interfaces, composites and micro-electromechanical systems (MEMS). The symposium was organized by Prof. Wolé Soboyejo (Princeton University), Prof. Reiner Dauskardt (Stanford University) and Prof. Robert Ritchie (University of California-Berkeley). The symposium was generally very well attended, and it attracted a wide range of papers from some of the most active researchers in this area. Selected papers from the symposium have been subjected to a peer review process, and recommended for publication in the Mechanics and Materials Journal. The organizers would like to thank Prof. Sia Nemat-Nasser (Editor-in-Chief of Mechanics and Materials) for making it possible to publish this special edition of the journal.

Following the La Jolla meeting in June, 2001, the Metals Committee organized two symposia at the 2001 IMECE in New York. These included a symposium on the Mechanical Properties of MEMS Structures, and a symposium on Cellular Materials. The symposium on the Mechanical Properties of MEMS Structures was organized by Prof. Wolé Soboyejo (Princeton University), Prof. Roberto Ballarini (Case Western University) and Dr. Seyed Allameh (Princeton University). It featured 12 papers that will be included in a forthcoming book on the Mechanical Properties of MEMS Structures. The symposium on Cellular Materials was a joint effort between the Materials and Applied Mechanics Divisions of ASME. It was organized by Prof. Wolé Soboyejo (Princeton University), Prof. Anthony Evans (University of California, Santa Barbara), Dr. Tianjian Lu (Cambridge University), Prof. Iwona Jasuik (Georgia Tech), Prof. Y. Chen (University of Houston) and Prof. Ashraf Bastawros (University of Iowa). The symposium featured 28 papers on the processing, performance and design of cellular materials. Selected papers from the symposium will be published in a special edition of Mechanics and Materials, courtesy of Prof. Nemat-Nasser (Editor-in-Chief).

In addition to organizing symposia / workshops, the committee has also been active in nominating members for ASME fellowships. The committee would like to thank Prof. Alfred Soboyejo (Ohio State University) for coordinating most of the nominations. We would also like to congratulate Prof. Dan Davis of Texas Southern University (Past Chair) on being elected to the well-deserved grade of ASME Fellow.

In summary, the Metals Committee remains active, and there are plans to organize future symposia and workshops in 2002 / 2003. Please contact me (Soboyejo@princeton.edu) if you would like to participate in ongoing activities or initiate some new activities.

Wolé Soboyejo, Chair

MATERIALS DIVISION EXECUTIVE COMMITTEE

Chair
William A. Curtin Ph. D.
Brown University
Div of Engineering
Providence, RI 02912-0001
(B) 401-883-1418 (F) 401-863-l 157
curtin@engin.brown.edu

Vice Chair
Daniel C. Davis Ph. D.
Texas Southern University
College of Science &Tech
3100 Cleburne Avenue
Houston,. TX 77004-4597
(B) 713-313-7007 (F) 713-313-1853
davis_dc@tsu.Edu

Program Chair
Robert C. Wetherhold Ph. D.
State University of New York
Mech &Aero Engineering
Furnas Hall
Buffalo, NY 14260-0001
(B) 716-645-2593 (F) 7166453875
mecrcw@acsu.buffalo.edu

Publications
Mahyar S. Dadkhah Ph. D.
Axiowave Networks
200 Nickerson Road
Madborouah, MA 01752-4603
(B) 508-460-6969 (F) 508-460-8111
mahyardadkhah@yahoo.com

Secretary
David Walls, Ph. D.
Manager, Structural Methods
United Technologies
Pratt & Whitney
(B) 860-557-1934 (F) 860-565-1640
wallsdav@pweh.com

ASME STAFF SUPPORT
Richard M. Ulvila
ASME International
Three Park Avenue, 22nd F
New York, NY 10016
(B) 212-591-7863
ulvila@asme.org

TECHNICAL COMMITTEES
Ceramics
Herman F. Nied Ph. D.
Lehigh University
Mech Engrg Packard Lab
19 Memorial Dr W
Bethlehem, PA 18015-3006
(B) 61 O-758-41 28 (F) 61 O-758-6224
hfn2@lehigh.edu

Composites
Scott R. White
Univversity of Illinois
Aeronautical & Astronauti
306 Talbot Lab 104 S Wright St
Urbana, IL 61801
(B) 217-333-l 077 (F) 217-244-0720
swhite@uiuc.edu

Metallic Materials
Winston 0. Soboyejo
Princeton University
Dept Mech & Aerospace
Engineering Oldenst
Princeton, NJ 08544-0001
(B) 609-258-5499 (F) 609-258-6123
soboyejo@princeton.edu

Electronic Materials
Zhigang Suo Ph. D.
Princeton University
Dept of Mech & Aero Eng
Princeton, NJ 08544-0001
(B) 609-258-0250 (F) 609-258-5877
suo@princeton.edu

ADMINISTRATIVE COMMITTEES
Vice Chair
Daniel C. Davis
National Science Foundation
Civil & Mech Systems Division
4201 Wilson Blvd
Arlinnton, VA 22230-0002
(B) 703-306-0291 (F) 703-306-0291
dcdavis@msf.gov