

Bioengineering Division Newsletter

Farshid Guilak (BED Editor)
Fall 1997

Chair's Message

In last year's Chair's message, Steve Goldstein mentioned the renewed vitality of the Division. I am happy to report that the momentum is continuing and we are indeed a very active and progressive division. Below, let me briefly summarize some of the achievements and important activities that we have made during this year:

(1) In 1996 IMECE in Atlanta, six ASME Society Honors were bestowed upon our members: Y. C. Fung and Ash Shapiro received the ASME Honorary Member Award, Sheldon Weinbaum and his co-workers received the ASME Melville medal for the Best Original Paper, Albert King received the ASME Lissner Award, David Ku received the Gustus L. Larson Award, Boris Rubinsky received the Heat Transfer Memorial Award, and Don Giddens delivered the prestigious ASME Thurston Lecture. We also congratulate Drs. Robert Soutas-Little and Paul Stein for becoming new ASME fellows, Tony Keaveny for winning the 1996 Y. C. Fung Young Investigator Award, and Michael Buschmann and Alan Grodzinsky for winning the Division's best paper award for 1996.

(2) Our membership continues to grow; the latest information shows that our current primary membership is 1,982 which represents an increase of 272 over the previous year.

(3) The Division is in very good financial shape. The revenue that was generated from the summer meetings has allowed us to have a positive balance in the custodial account to support the needs of our many divisional activities. Thanks also to the effort of Gerald Miller and Ed Grood, we have received funding from Johnson & Johnson, Ethicon Endosurgery and from the Whitaker Foundation for our Honors and Awards endowment account, which will sustain our student paper awards and the Y. C. Fung Young Investigator Award for several years ahead. We take this opportunity to thank our generous supporters.

(4) We had a very successful 1996 Congress Program, with a total of 35 sessions (32 podium sessions and 3 poster sessions). The total number of papers presented (podium, poster and student competition papers) was 251 which was 14% more than last year. Of the 251 papers, 12 were student competition papers (M.S. and Ph.D. level). The quality of the student papers continued to be very high which made the job of the judges very pleasantly difficult. Many thanks to the judges. Congratulations to all of the student paper winners. The program committee (chaired by Mike Askew with Sohi Rastegar as Program rep.) did an outstanding job in making the conference a great success.

(5) A new biomaterials committee has been formed within the Bioengineering Division. The first chair for the committee is Vasanti Gharpuray. We look forward to many exciting activities from the Committee.

(6) At the 1996 IMECE, there was an inaugural Lissner Award Lecture given by Dr. Albert King, the 1996 Lissner Awardee. In the past, the awardee only gave an informal after-dinner speech. This change was made to increase the visibility of our Division and at the same time shorten the

Banquet time. For 1996, the inaugural lecture was sponsored by the General Motors Corporation, MTS and Instron, who provided a very enjoyable reception after the lecture. We take this opportunity to thank the sponsors.

(7) We have had two very successful summer bioengineering conferences in 1993 and 1995. This year, the summer conference will be in Sun River, Oregon. According to Ray Vanderby, there was a 20% increase in abstract submissions over the 1995 conference. This promises not only a technically successful meeting, but also a financially successful one based on Jerry Miller's planning. Many thanks to the hard work by the summer conference committee (chaired by Ray Vanderby).

(8) After ten years' dedicated and selfless service as the technical editor of the Journal of Biomechanical Engineering, Bob Nerem will officially step down in July 1997. We salute him for a job well done; the Journal has grown significantly both in size and in quality in the past ten years. We take this opportunity also to congratulate Ken Diller, chosen by the search committee and approved unanimously by the BED's executive committee to succeed Bob. We look forward to Ken's able leadership.

(9) Thanks to Ed Grood and Gerard Ateshian, the Division now has a Web page. The URL is <http://www.asme.org/divisions/bed/index.html>.

Looking to the future there are many ways to improve the Division. Among them, we need to have more participation from the industrial sector; we need to address certain non-technical but important issues in Bioengineering, such as ethical and health cost issues and bioengineering education. These are indeed some of the items the New Directions Committee (chaired by Don Giddens) has recommended that we take steps to do.

The success of any ASME division depends on the dedication of volunteers, past and future. I would like to take this opportunity to thank the many people who have given their time and effort to make this an active and progressive division. Let me conclude this message by listing the new and continued chairs of our committees from whom we look to their leadership for an even more active division: Peter Torzilli, new Division Chair; John Chato, new Honors Chair (replacing Bob Roemer), Gerard Ateshian, new Membership Chair (replacing Mike Askew); Tom Khalil, new Industrial Liaison Chair (replacing Roger Haut); G. Gharpuray, new Biomaterial Chair; M. Miller, new Design & Rehab Chair (replacing Ted Conway); Louis Soslowsky, new Solids Committee Chair (replacing Advinash Patwardhan, who will become an executive committee member in charge of Technical Affairs), S. Clegg, new Heat & Mass Committee Chair (replacing Linda Hayes), and Stanley Rittgers, Fluid Mech Chair. Last, but not the least, I wish to thank Alex Majewski of the ASME's department of Technical Affairs for his invaluable help in many matters concerning the functioning of the Division.

W. Michael Lai
BED Chair

Journal of Biomechanical Engineering - Past

This article is to provide a brief progress report on our journal, but it also is an opportunity for me to say thank you. It has been an honor to serve as technical editor for two terms. During this time the journal has grown considerably, not because of my efforts but rather those of many others. The Journal's success is due to the previous technical editors, the efforts of the associate editors, and all those who choose to submit their manuscripts for publication in JBE. The most satisfying part of

the job is the personal interaction with the bioengineering community. For this opportunity to serve, I thank you.

Since I took over from Richard Skalak JBE has grown significantly. For example, in 1987 JBE published a total of 360 pages, and there literally was not a backlog. Now JBE has a page budget of 560 pages, and our backlog is almost a year. This large backlog is unfortunate for it means that, once a manuscript is accepted, it will be 9-12 months before it will appear in print. This is a serious problem, one I have not been able to solve. I can only hope that the new editor, working with the Bioengineering Division Executive Committee, will be able to begin to make progress on this serious issue.

It would not have been possible to do the job without the support of Marilyn, my wife, who for the past nearly decade has handled all the administrative aspects of our editorial office. She has been the de facto "mother" of JBE, and I believe we all owe her our thanks.

Now the office transitions to the University of Texas at Austin where the new editor, Ken Diller, resides. Ken was an exceptional associate editor and under his leadership JBE will rise to new heights. New manuscripts should be submitted directly to Ken. His address is: Kenneth R. Diller, Ph.D., Biomedical Engineering, University of Texas at Austin, ENS 612, Austin, TX 78712-1084.

Finally, I again thank you for the opportunity to serve. It has been an honor, a privilege, and a pleasure. Best wishes to Ken and all of you.

Robert M. Nerem
Outgoing Technical Editor

Journal of Biomechanical Engineering - Future

As the new Technical Editor of the Journal of Biomechanical Engineering I feel quite honored to be able to follow in the tradition of the highly distinguished group of preceding Technical Editors, including Bob Nerem for the past 10 years. The journal has grown to a position of acknowledged excellence in the field of bioengineering in large degree because of their outstanding leadership, and there is now surely a very sound basis of excellence on which to build.

I also am quite excited about the opportunities which lie ahead for the growth of the journal. The present time is one of rapid development of bioengineering, and the JBE should play a prominent role in that all process. Many of the most talented young engineers are choosing bioengineering as a career. New discoveries are occurring at a rapid pace, and the state-of-the-art is advancing at a rate greater than ever. Biomedical engineers play an increasingly central and integral role in the health care research and delivery process. Thus, the present time is rich in fertile intellectual activity in bioengineering, and JBE needs to continue to have a key role in the world-wide dissemination of the fruit of this activity. This situation present both opportunities and challenges.

As new discoveries are made, the definition of the cutting edge of knowledge is continually changing. JBE must grow simultaneously in its capability to meet the needs of the biomedical research community. A primary mechanism for growth is by enhancing the composition of the board of Associate Editors. The Associate Editors have been one of the long time strengths of the journal, and I consider that one of my primary responsibilities will be to ensure that Associate Editors are identified who can work to assure the quality of publications in new technical areas as they develop.

With the rapid pace of new discoveries, it is becoming increasingly important to provide timely publication of research results. Unfortunately, the rate of submission of manuscripts has far exceeded the ability to publish accepted papers, resulting in a large backlog for the JBE. Although this backlog attests to the esteem with which JBE is held by authors, the backlog is a serious problem, and it is probably the area in which the JBE has the greatest need for improvement. I, the Board of Associate Editors, and the Bioengineering Division Executive Committee must make reduction of the time to publication a top priority. Fortunately, a number of possible new options are becoming available to address this issue, and these will be pursued rigorously. I hope strongly that progress can be made in the near future.

In addition to the technical activities, I am looking forward as Technical Editor to meeting the broad spectrum of authors who submit manuscripts to JBE. Bioengineering is an exciting and vibrant field, and the journal office is an excellent venue to learn what is developing at the forefront of knowledge. I have an excellent editorial assistant, Jenni Cork, who will be working with me. Together, we look forward to interacting with and serving you on behalf of the journal. Please feel free to contact us at the journal office by any of the following means.

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Bioengineering at the 1996 IMECE

At the meeting in Atlanta, the Bioengineering Division sponsored 32 podium sessions at which 174 contributed papers were presented. Two of these sessions featured the Doctoral and Master's sessions of the Eighth Annual Student Paper Competition. Three of the Division's podium sessions were co-sponsored with the Heat Transfer Division. In addition, 77 papers were presented as posters. The presented papers were published in the "1996 Advances in Bioengineering," edited by Sohi Rastegar, who organized a great program while solving some very difficult scheduling problems. Thanks Sohi! Albert I. King, Ph.D. was the 1996 H. R. Lissner awardee. Dr. King's noon Lissner Award Lecture was followed by a reception at which refreshments and a light lunch was served. Sponsors of the reception were General Motors, Instron, Johnson and Johnson Professional and MTS. The Division Awards Banquet was held at Planet Hollywood-Atlanta. See you in Dallas.

1997 IMECE

The 1997 International Mechanical Engineering Congress and Exposition (IMECE) ASME Winter Annual Meeting will be in Dallas, Texas. The meeting is to be held at Wyndahm Anatole Hotel on November 16-21, 1997. The Bioengineering Division (BED) has received original abstracts in all areas of bioengineering for publication and presentation at the IMECE. The Highlight Topic for the meeting is "Intelligent and Flexible Systems" and the BED has several highlight sessions including specialized sessions on the biomechanics and crashworthiness in conjunction with the automobile industry and the Applied Mechanics Division.

The BED will present 38 podium sessions and 3 poster sessions at the IMECE. There will be special sessions for "Ethics and Entrepreneurship," the Lissner Award Lecture, and the Student Paper Competitions at the bachelor's, master's, and doctoral levels. In addition to general sessions on various aspects of bioengineering, the BED has organized a variety of special technical

sessions which are associated with the standing technical committees in the division. The presentations in these sessions include topics from (1) the newly formed Biomaterials Committee: biotribology, material-tissue interfaces, biodegradable materials, and mechanics of biologically derived materials; as well as topics from the committees on (2) Design and Rehabilitation: orthopaedic implant design, geriatric engineering, design of assistive devices, external orthotics and prosthetics, quantification of human kinetics in rehabilitation, and rehabilitation devices; (3) Fluid Mechanics: drug delivery in the pulmonary circulation, microcirculation, interaction of vessel wall mechanics and blood flow, collapsible tubes, intravascular devices, tissue engineering, computational biofluid mechanics, and cardiovascular devices; (4) Heat and Mass Transfer: bioheat and mass transfer under micro-gravity conditions, heat transfer and thermal regulation aspects of entomology, advances in modeling bioheat and mass transfer, large scale symmetric and gene therapy, heat and mass transfer in cells and biomolecules, clinical applications of bioheat and mass transfer, novel instrumentation in bioheat and mass transfer and (5) Solid Mechanics: micro-mechanics, mechano-sensory stimuli, cell mechanics, extracellular matrix mechanics, electrokinetics-transport, back and neck pain injuries, computational biomechanics, dental-cranial-facial mechanics, computer aided surgical planning, imaging, tissue engineering, contact mechanics-wear-interface phenomena, and gate- running.

Further information regarding BED activities at the IMECE may be obtained from Bruce R. Simon, Aerospace and Mechanical Engineering Department, The University of Arizona, Tucson, AZ 85721; tel. (502) 621-2235, fax (502) 621-8191; email: imece97@caec.ece.arizona.edu or from the ASME homepage, <http://www.asme.org/divisions/bed/> which is continuously updated with the latest information regarding BED events at the IMECE.

1996 Y. C. Fung Young Investigator Award

The Y C. Fung Investigator Award was established by the Bioengineering Division of the ASME in 1985 to encourage young investigators to pursue research in Bioengineering by acknowledging recipients early in their career for the quality of their research and their commitment to Bioengineering. The Honors Committee of the Bioengineering Division is delighted to announce that Tony M. Keaveny, Ph.D. is the recipient of the 1996 Y. C. Fung Young Investigator Award. Dr. Keaveny is an Assistant Professor in the Department of Mechanical Engineering at the University of California, Berkeley and in the Department of Orthopaedic Surgery at the University of California, San Francisco. He received a B.E. (1984) degree from the University College of Dublin, Ireland, and M.S. (1988) and Ph.D. (1991) degrees in mechanical engineering from Cornell University. He then completed a post-doctoral fellowship with Dr. Wilson C. Hayes in the Biomechanics Laboratory at Beth Israel Hospital in Boston. Prior to assuming his faculty position at the University of California, Dr. Keaveny was a Senior Research Associate and then an Instructor at the Harvard Medical School. He joined the U. C. Berkeley staff in 1993.

Dr. Keaveny's main research interests are in Orthopaedic Biomechanics, and more specifically, the mechanical behavior of bone, stress analysis of whole bones, and design and analysis of total joint replacements. He has made significant contributions to our understanding of the mechanical behavior of trabecular bone, in particular the post-yield and multi-axial failure properties. His studies on whole bone have combined theoretical finite element analyses with state-of-the-art experimental techniques.

Dr. Keaveny has been a leader in the field, with 20 refereed publications and numerous presentations at national and international meetings. He has also been the recipient of several major research grants, including a Biomedical Engineering Research Grant from the Whitaker

Foundation, a FIRST Award and an ROI from the National Institutes of Health, a CAREER Award from the National Science Foundation, as well as several grants from industry.

1997 Y. C. Fung Young Investigator Award

The Y. C. Fung Young Investigator Award was established by the Bioengineering Division of ASME in 1985 to encourage young investigators to pursue research in Bioengineering by acknowledging recipients early in their career for the quality of their research and their commitment to Bioengineering. The Honors Committee of the Bioengineering Division of the American Society of Mechanical Engineers is proud to announce that Gerard A. Ateshian, Ph.D. is the recipient of the 1997 Y. C. Fung Young Investigator Award. Dr. Ateshian is an Associate Professor in the Department of Mechanical Engineering at Columbia University and an associate in Research at the Columbia-Presbyterian Medical Center, New York City. He received his B.S. (1986) and Ph.D. (1991) degrees from Columbia University, and was the Stinchfield Fellow in Orthopaedic Biomechanics in the Orthopaedic Research Laboratory at Columbia-Presbyterian Medical Center. Dr. Ateshian's current areas of research include theoretical and experimental diarthrodial joint contact mechanics and biotribology, computer-aided orthopaedic surgery, and MRI imaging of joint surfaces. He has co-authored over 25 full-length publications and 73 abstracts, and has received funding from the Whitaker Foundation, Orthopaedic Research and Education Foundation, the National Science Foundation, and the National Institutes of Health. Dr. Ateshian is currently the Chair of the Membership Development Committee of the Bioengineering Division.

The 1997 Herbert R. Lissner Award Lecture and Reception

The 1997 H. R. Lissner Award Lecture and Reception will be held Tuesday, November 18, 1997 from 11:15 am to 1:00 pm. The Lissner Awardee for 1997 is Ajit Yoganathan.

1996 Lissner Award

The ASME Bioengineering Division is proud to announce that Dr. Albert I. King, Ph.D. was the 1996 recipient of the Lissner Award. Dr. King's research areas are impact biomechanics and low back pain. His accomplishments over the last 30 years include studies on the response, tolerance and injury mechanisms of body segments from head to foot. His first study on spinal injuries was to test successfully the hypothesis that there is a dual path for load transmission down the lumbar spine. In 1975, he developed a reliable and unique method of measuring angular acceleration of a rigid body, which is still the method of choice used by researchers in the field.

He has made a major contribution to side impact protection in regards to the stiffness of padding which provides the optimal effect. In studying the ankle, he has found tolerances in the range of motion which lead to ligamentous and bony injury. His seminal work on brain injury has included development of a model which can predict diffuse axonal injury. In the area of low back pain, he established a neurophysiology laboratory to study causes of back pain, including mechanical effects on the facet joints and the dorsal root ganglion. Current research in this area involves the sympathetic nervous system as another possible source of back pain. His ongoing studies include research in the area of knee and leg injuries due to frontal impacts as well as research on the causes of hip fracture in the elderly.

Dr. King has been an important member and contributor to the Bioengineering Division. His activities have included: Chair of the Executive Committee, 1988-89; Member of the Executive

Committee, 1986-93; ASME Basic Engineering Technical Group Operating Board, and Associate Editor, 1989-95, ASME Journal of Biomechanical Engineering.

Dr. King has been the recipient of numerous honors, awards, and citations, including: the Boris A. Bakmeteff Doctoral Fellowship, 1961; the NIH Career Development Award, 1972-78; the ASME Charles Russ Memorial Award, 1980; the Volvo Award, 1984; the Arnold W. Siegel Award, 1992, 1993; the Kappa Delta Award from the American Academy of Orthopaedic Surgeons, 1995; and the SAE Ralph H. Isbrandt Automotive Safety Engineering Award, 1995.

National and International Affairs Report

The American Institute of Medical and Biological Engineering (AIMBE) is an umbrella biomedical society with a goal of being a voice for all biomedical engineers and affecting national policy on behalf of member societies. A Summit Meeting in Minneapolis was held October 11-13, 1996. Representatives of 15 member societies of the Council Of the Societies (COS) and the AIMBE Board of Directors attended (including Michael Lai representing ASME-BED). The theme of the meeting was "Communication, Building a Future for Medical and Biological Engineering." Numerous action items resulted from the Summit Meeting that were intended to increase each society's role in AIMBE, expand federal funding for BME research, and generate public support for medical and biological engineers and the industry.

Representatives from member societies were split into four task forces which generated a set of action plans. The task forces had the following objectives:

1. Communication Between the Officers of Members Societies and AIMBE
2. Communication Between the 32,000 Members of the Societies and AIMBE
3. Communication Between the 32,000 Members and the Public (which can be the industry, local community, government officials, and Congress)
4. Infrastructure and Funding to Carry Out the Communication Tasks

Election results for new officers of the COS yielded these results: Art Erdman (ASME-BED) will assume a two year term as the Chair, Jerry Harris -Vice Chair, and Ed Hinman - Secretary/Treasurer. Vijay Goel (vijay-goel@uiowa.edu) and Art Erdman (agerdman@maroon.tc.unm.edu) are the current ASME voting representatives to COS. Anyone interested in participating in any aspect of the COS including its new goals are urged to contact one of us.

Summer Conference Committee

From June 11-15 the third biennial Summer Bioengineering Conference was held in Sunriver, Oregon. This series of conferences evolved from the Summer Biomechanics Symposia which started as a small portion of a biennial applied mechanics conference. With the maturation of bioengineering as a discipline in ASME, the bioengineering portion of this conference grew steadily in size, scope, and needs. In 1993 the present Summer Bioengineering Conference became independent. This autonomy afforded us the opportunity to alter the traditional conference format, schedule, and venue so we could enhance the exchange of information and create more synergy in the bioengineering community. The 1997 conference preserved the casual atmosphere and style of our previous two conferences with free time for relaxed discussions and recreation with bioengineering colleagues. In addition, we have made four specific changes. First, evening podium sessions were replaced with a Student Poster Competition accompanied by wine and cheese. This

provided a venue for casual discussions and a way to feature the contributions of our graduate students. Second, a plenary session was included to focus on "Cost Reduction in Health Care through Bioengineering." A third change was that workshops were introduced to replace podium sessions in three key areas: Bioartificial Tissues, intimal Hyperplasia in Vascular Grafts, and Bone Damage. The workshops featured some of the world's leading authorities in these areas and were intended to summarize the state-of-the-art, provoke discussions, and recommend future directions for research. The fourth and final change in our conference arose because of the record number of abstracts submitted for presentation at this meeting. Hence, for the first time, six parallel podium sessions were held. Conference attendance was excellent, with 195 full members, 120 student members, and 44 guests for a total of 359 attendees. Because of the highly interdisciplinary nature of bioengineering, the summer conference now includes the cooperation and contributions of many bioengineering organizations. The Bioengineering Division of ASME, the Bioprocess Engineering Subdivision of ASME, the Engineering Mechanics Division of ASCE, the Food, Pharmaceutical and Bioengineering Division of AIChE, and the Biomedical Engineering Society have all contributed to the technical program. The content, format, organization, etc., of this series of conferences can and must be continuously changed to satisfy the needs of a dynamically growing and evolving discipline. Our thanks to Kevin Meade who was in charge of the student poster competition and Samir Hefzy who organized the publications and proceedings. The Summer Conference Committee welcomes your comments and encourages your participation to shape future conferences.

K-17 Bio-Heat and Mass Transfer Committee Report

The K-17 Committee sponsored five sessions at the 1996 IMECE in Atlanta, which were well attended and excellent in content. The committee met afterwards, and thanks went out to all of the participants and session organizers. The organization of the CryoLife tour was also greatly appreciated. The committee finalized the session titles and chairs for the 1997 IMECE meeting in Dallas. These are Bioheat and Mass Transfer Under Micro Gravity Conditions (P. Ayyaswamy and D. Meaney), Aspects of Transport Phenomena in Entomology (R. Roemer and J. J. McGrath), Advances in Modeling Bioheat and Mass Transfer (A. Shitzer and L. Xu), Engineering of Biomaterials (A. Hubel and M. Toner), Heat and Mass Transfer in Cells and Biomaterials (S. Rastegar and K. Diller), Clinical Applications of Bioheat and Mass Transfer (E. Moros and D. Gao), Clinical Instrumentation in Bioheat and Mass Transfer (J. Valvano and T. Diller). With the theme of the 1997 IMECE meeting being Intelligent and Flexible Systems, the last two sessions listed above were identified as possible highlight sessions. Also, another tour and dinner will be organized. Details will be available at the meeting in Dallas. The committee also proposed eight session titles for the 1998 IMECE in Anaheim, CA.

A number of upcoming conferences were discussed, including the Allerton Conference Workshop April 19-22, 1997, the International Conference on Heat and Mass Transfer in Biological and Medical Engineering in Kusadasi, Turkey, June 8-12, 1998, and a Topical Conference on Heat Transfer in Japan in the year 2000, with a focal topic on bioheat transfer.

Linda Hayes concluded her two years as chair of the K-17 Committee. A special thanks went out to Linda for her outstanding job during her tenure as chair. Scott Clegg assumed the chair for the next two years, and Elaine Scott was elected as Vice-Chair. Finally, the Committee recognized several members who received honors and awards during the year: Boris Rubinsky, 1996 Heat Transfer Memorial Award; Sheldon Weinbaum, 1996 Melville Medal for Best Original Paper and election to the National Academy of Engineering; Ken Diller, on his appointment to Director, Center for Biomedical Engineering UT; Linda Hayes, 1996 Outstanding Educator in Aerospace; and

Portonovo Ayyaswamy, on his appointment to the Asa Whitney Professor of Dynamical Engineering, University of Pennsylvania.

Membership Development Committee

The leadership of the Membership Development Committee passed to Gerard A. Ateshian of Columbia University in the summer of 1997. Best wishes to Gerard with the membership growth initiatives he will be developing on behalf of the Bioengineering Division. If you would like to participate in the activities of the Membership Development Committee or have suggestions that would spur Division growth, contact Gerard at (212) 854-8602, by Fax at (212) 854-3304 or at gaa3@columbia.edu.

Biomaterials Committee

The 1996 IMECE Meeting, the BED Executive Committee elected to create a new technical committee: the Biomaterials Committee. This fledgling committee currently has 9 members, and is looking to increase its membership. We would welcome participation from anyone who might be interested in developing technical sessions and symposia in the Biomaterials field.

Because of the active participation and diligence of the current committee members, the Biomaterials Committee will sponsor 2 technical sessions at the 1997 IMECE: Orthopaedic Biomaterials and Cardiovascular Biomaterials. In addition, we will organize one session jointly with the Fluids Committee: Mechanical Characteristics and Fluid Dynamics of Cardiovascular Devices. For the 1998 IMECE, the committee has planned sessions in biodegradable materials, material-tissue interfaces, biotribology and mechanics of biologically derived materials. Again, thanks go to the committee members who have made this committee a success in its first year. Please contact Vasanti M. Gharapuray (vasanti@ces.clemson.edu) if you are interested in becoming involved with the Biomaterials Committee.

Report of the Honors and Awards Committee

The Bioengineering Division again produced an impressive array of recipients of honors and awards. Our Lissner Awardee was Professor Albert I. King from Wayne State University "for his contribution of more than thirty years to impact biomechanics and vehicle design, and for his long-standing professional services to the ASME Bioengineering Division and the biomechanical engineering community in general."

The 1996 Y. C. Fung Young Investigator Awardee was Professor Tony Keaveny from the University of California at Berkeley. The Award for the Best Paper in our Journal of Biomechanical Engineering went to Drs. Michael D. Buschmann and Alan J. Grodzinsky from the Massachusetts Institute of Technology for their paper entitled, "A Molecular Model of Proteoglycan-Associated Electrostatic Forces in Cartilage Mechanics." This paper presented a theoretical biomechanical model of articular cartilage based on a microstructural, molecular-level solution of the Poisson-Boltzmann equation within a unit cell containing a charged matrix molecule and its surrounding atmosphere of mobile ions. Predictions made with this model were found to agree closely with experimental measurements of cartilage properties.

In the Ph.D. level student paper competition, Daniel Kwak from Columbia University earned the first prize. Second place went to Andrea Garcia from the University of Pennsylvania and the third

place was awarded to Beop-Min Kim of Texas A&M University. In the MS level competition two first prizes were awarded to William L. Dunbar, Jr. from Rensselaer Polytechnic Institute and to Vincent Wang of Columbia University. Third place went to Elisa Bass of the University of California at Berkeley.

The Bioengineering Division is pleased to announce that the Fellow membership grade was awarded to Professor Robert W. Soutas-Little from Michigan State University and to Dr. Paul D. Stein, Medical Director of the Henry Ford Hospital.

In addition to our divisional awardees, Professor Boris Rubinsky from the University of California at Berkeley, was honored with the Heat Transfer Memorial Award "for seminal contributions to the solution of a broad range of problems in low-temperature biology theory in the application of heat transfer by experimental and analytical methods, and applications in cryosurgery and cryopreservation of living tissues." Dr. David N. Ku from Georgia Tech won the Gustus L. Larson Memorial Award "for outstanding achievements in mechanical engineering within ten to twenty years following graduation." Sheldon Weinbaum, Distinguished Professor at the City College of New York, was one of the winners of the Melville Medal given by ASME for the best original paper. The 1997 Y. C. Fung Awardee is Dr. Gerard A. Ateshian of Columbia University. Congratulations to all!

John C. Chato
Chair

Solid Mechanics Committee Report

At the 1996 IMECE meeting in Atlanta the Solid Mechanics Committee sponsored 13 podium sessions and 2 poster sessions on a wide range of topics including ergonomics in the workplace, soft-tissue mechanics, gait and lower extremity joint mechanics, dynamic modeling and simulation of human response, muscle mechanics, computer-aided surgery and planning. In addition, we jointly organized sessions on the interaction of cardiovascular fluid and solid mechanics in conjunction with the Fluids committee of BED, and on damage mechanics in conjunction with the Applied Mechanics Division.

For the next IMECE in Dallas, the Solids committee has organized 13 sessions in the following areas: electrokinetics and transport, micro and cellular mechanics, extracellular matrix mechanics, spine mechanics, soft tissue and bone mechanics, joint mechanics, plastics in orthopaedic implants, computer-assisted modeling and imaging. A strength of the 1996 IMECE program was the sessions and symposia that resulted from the collaboration among the different technical committees. The 1997 IMECE program reflects a continuation of this collaborative effort.

Finally, thanks to the members who took time to attend the Committee meeting in Atlanta. Your active participation will enable the Solid Mechanics Committee to enhance the quality of technical sessions and organize symposia that are of interest to the membership. Any one wishing to contribute in this capacity should contact Avinash Patwardhan (708- 343-7200, ext. 5804; Email: apatwar@orion.it.luc.edu).

Avinash Patwardhan
Chair

1997-1998 Bioengineering Division

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