



## APPLIED MECHANICS DIVISION

### Report of the Chair



**K. Ravi-Chandar**

[www.asme.org/divisions/amd](http://www.asme.org/divisions/amd)

SUMMER NEWS 2008

KENNETH M. LIECHTI, EDITOR

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It has been an honor and privilege for me to serve on the Executive Committee (EC) of the Applied Mechanics Division (AMD); the AMD is one of the oldest Technical Divisions in ASME, established eighty years ago by Timoshenko and colleagues. The experience of working closely with past members Pol Spanos, Mary Boyce, Wing-Kam Liu, and Tom Farris, as well as with current members Dan Inman, Zhigang Suo, Tayfun Tezduyar and Ares Rosakis during my five-year tenure on the Committee was extremely enjoyable and rewarding. The past year has been very eventful for the AMD and I hope to provide an update of the activities and status of the AMD in this newsletter. Reports of the Technical Committees, the Journal of Applied Mechanics and Applied Mechanics Reviews provide more specific details of these activities.

The ASME has changed the structure of its annual Congresses, switching to a Track based system rather than the Technical Division based system of previous years; the 2007 International Mechanical Engineering Congress and Exhibition was the first meeting under the new system. Under the new scheme, sessions were not pre-allocated to the Division, but were developed as a result of abstracts submitted to symposia organized by volunteers within the Technical Committees directly under the tracks. It also became difficult to determine the exact extent of AMD participation in the 2007 Congress. In the experience of the AMD Program Chair, Zhigang Suo, the switch was painful particularly since it appeared that the experience of the past had been completely ignored in installing a new system. My sincere thanks go to Zhigang for shepherding us through this difficult transition. The Executive Committee discussed the problems with the Track system with the General Chair of the 2008 Congress and made sure that the AMD Program Chair, Tayfun Tezduyar, was appointed as the sole Track Chair for Track 12, now renamed Mechanics of Solids, Structures and Fluids. So, the AMD will still continue to develop Symposia through its Technical Committees and the AMD Program Chair will continue to coordinate the program development through Track 12. It is imperative that the Executive Committee make sure that the AMD Program Chair is always appointed as the Track Chair for Track 12. For 2008, thanks to Tayfun Tezduyar's efforts, 514 abstracts

for oral presentations in 105 sessions and 18 posters are scheduled in Track 12 Mechanics of Solids, Structures and Fluids, at 2008 Congress.

As per tradition, in the year when the International Congress on Theoretical and Applied Mechanics (ICTAM) is held, the AMD does not organize a summer meeting; the AMD encouraged its members informally to contribute to the ICTAM 2008 in Adelaide. Furthermore, the American Academy of Mechanics organized its first conference in June 2008; the AMD encouraged participation in this event as well. After a long search, the Joint ASME/ASCE/SES Conference for 2009 was awarded to Virginia Tech. Professor Iswar Puri and his colleagues have undertaken the task of coordinating this meeting for June 2009.

The Applied Mechanics Division Honors and Awards Banquet was held at the Sheraton Hotel on Tuesday, November 13, 2007. Held annually during the International Mechanical Engineering Congress and Exposition, this Banquet represents a signature event of the Applied Mechanics community. The AMD administers two Division Level Awards – the Applied Mechanics Division Award and the Young Investigator Award – and three Society Level Awards – the Drucker Medal, the Koiter Medal and the Timoshenko Medal. Professor Oscar Dillon, University of Kentucky, was the recipient of the AMD Award, “for his leadership and service to the Applied Mechanics community”. Professor Assad Oberai, Rensselaer Polytechnic Institute, was recognized for “fundamental developments in solving inverse problems and problems with multiple spatial and temporal scales” with the Young Investigator Award. The Drucker Medal was presented to Prof. Albert S. Kobayashi of the University of Washington in June 2007 during the McMAT 2007 held in Austin. A special symposium was also organized during this event. Prof. Kobayashi was recognized “for his seminal contributions to the fields of experimental and fracture mechanics”. The Koiter Medal was awarded to Prof. C.T. Sun of Purdue University for his “for pioneering research in composite structural mechanics and damage tolerant materials; and the creation of a worldwide generation of composite materials engineers, researchers, and university faculty”. Prof. Sun delivered his Koiter Medalist Lecture entitled “Testing and modeling fiber composites using off-axis specimens” on Tuesday, November 13, 2007. The Timoshenko Medal was given to Prof. Thomas J.R. Hughes “for his pioneering contributions to computational mechanics, particularly nonlinear finite element methods for solids and fluids”; the text of his non-technical after-dinner lecture can be found in the next article and at <http://www.imechanica.org/node/2293>.

A fund-raising committee led by Professor Wing-Kam Liu raised about \$170,000, in order to endow the Applied Mechanics Division Award, the Young Investigator Award and a new award in nonlinear dynamics. In setting up the endowments, the fund-raising committee proposed that the awards be elevated to Society Level awards. The Executive Committee approved this request and formally made an application to the ASME Committee on Honors (CoH); unfortunately, despite our best and concerted efforts, the CoH rejected the proposal, citing a proliferation of Society Level awards among other reasons. Hence the Executive Committee instituted these three awards as Division Level awards; these are now named the Ted Belytschko Applied Mechanics Award, the Thomas JR Hughes Young Investigator Award and the Thomas K. Caughey Dynamics Award. The new and newly renamed awards will consist of a medal, plaque and a cash honorarium. Details on the awards and the nominating procedures can be found at the AMD website. My sincere thanks to Wing-Kam Liu, J.S. Chen, Woody Ju, Tayfun

Tezduyar, Sami Masri, Jim Knowles, Tom Farris and many others who worked very hard on these awards over the past two years.

The recipients of the 2008 awards have been announced on the ASME website; I list them here: Chad Landis, University of Texas will receive the Thomas JR Hughes Young Investigator Award; Fong Shih, President of the National University of Singapore, will receive the Ted Belytschko Applied Mechanics Award, Ali Nayfeh, Virginia Tech, will receive the Thomas K. Caughey Dynamics Award, Tom Ting, Stanford University, will receive the Drucker Medal, Rich James, University of Minnesota, will receive the Koiter Medal, and Sia Nemat-Nasser, University of California, San Diego, will receive the Timoshenko Medal. These awards will be presented during the 2008 Honors and Awards Banquet in Boston on Tuesday, November 4, 2008. My congratulations to all award winners. Also, I would like to request all members of the AMD to remember to nominate worthy candidates to all six awards that the AMD coordinates; good nominations are essential to keeping up the standards of these awards.

Structural and business reorganization has resulted in a decision by ASME to share some of the revenue generated by its Journals with the Divisions that provide the intellectual effort in developing the journals. The AMD is directly responsible for the Journal of Applied Mechanics and is the main custodian of the Applied Mechanics Reviews. The algorithm for revenue sharing was worked out between the ASME Publications Committee and the Basic Engineering Group Operating Board, of which AMD is a member. As a result, AMD is expected to receive approximately \$58,000 for the year 2007. The AMD Executive Committee is now faced with the pleasant task of determining how best to use of these funds and promote the activities of the Division. I am sure the EC will welcome suggestions from the community!

Numerous individuals contributed to the success of the AMD during my term as Chair; my thanks go to the other members of the Executive Committee; to Jerry Qi, University of Colorado, who served as the Recording Secretary for the AMD Executive Committee; Ken Liechti of the University of Texas Austin, for producing the newsletters; Jacinta McComie at ASME Headquarters, who took care of the many details in the organization of the Technical Committee meetings, banquet, printing of the brochures, production of the medals etc; Stacey Cooper at ASME Headquarters, who works on the webtool used in conference organization and has been invaluable in interfacing with the Congress; and the many individuals, too numerous to name individually here, who run the Technical Committees, symposia, etc.

As I step down as Chair of the AMD, Dan Inman takes over as Chair and Ken Liechti will replace me as the new incoming member of the AMD Executive Committee. The EC and the AMD are in good hands that will ably steer the AMD in the years to come.

***K. Ravi-Chandar, AMD Chair***

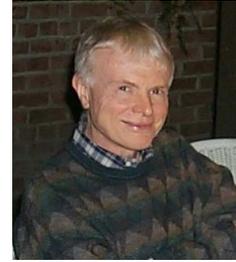
[kravi@mail.utexas.edu](mailto:kravi@mail.utexas.edu)

## TIMOSHENKO MEDAL

Tom Hughes



The Timoshenko Medal was established in 1957 and is conferred annually in recognition of distinguished contributions to the field of applied mechanics. Instituted by the Applied Mechanics Division, it honors Stephen P. Timoshenko, world-renowned authority in the field, and it commemorates his contributions as author and



teacher. This year the medal was awarded to T. J. R. Hughes, Professor of Aerospace Engineering and Engineering Mechanics and Computational and Applied Mathematics Chair III at the University of Texas at Austin *for his pioneering contributions to computational mechanics, particularly nonlinear finite element methods for solids and fluids*”;

*The acceptance speech was presented at the Applied Mechanics Dinner of the 2007 Winter Annual Meeting of ASME, on Tuesday, November 13, 2007.*

I would like to begin by thanking the members of the Timoshenko Medal Committee, consisting of the five members of the Applied Mechanics Division Executive Committee, Ravi-Chandar, Dan Inman, Zhigang Suo, Tayfun Tezduyar, and Ares Rosakis, the five previous chairs of the Executive Committee, Tom Farris, Wing Kam Liu, Mary Boyce, Pol Spanos, and Stelios Kyriakides, and the five previous Timoshenko Medalists, Ken Johnson, Grisha Barenblatt, Mort Gurtin, Ben Freund, and John Hutchinson. As a former member of the Executive Committee, I completed my ten-year tenure on the Timoshenko Committee the year before last, and now I will have the opportunity to return for another five years. Actually, I am looking forward to it. I enjoyed my time on the Executive and Medal Committees, and the opportunity to work with outstanding mechanicians, such as Carl Herakovich, Stan Berger, Lallit Anand, Alan Needleman, the late Dusan Krajcinovic, and many others. I also want to thank everyone in attendance here tonight.

This award is a great honor. Frankly, I am thrilled to receive it, but I am also humbled by it. The previous recipients represent a who’s who of twentieth century engineering science. It is quite an incredible club to join. I promise to do my best to live up to the standard as I continue my scientific work.

Years back, it was customary in a Timoshenko lecture to cite one’s contacts with Timoshenko, but that seemed to end around 1992 when Jan Achenbach mentioned in his lecture that he thought he was the first recipient of the Timosheko Medal who had never set eyes on Timoshenko. Since that time it has become customary to cite secondary contacts with Timoshenko. Here are a couple of mine: I was at Stanford for 22 years and for more than half that time I chaired the Applied Mechanics Division, which was later renamed the Division of Mechanics and Computation. This was Timoshenko’s group. He chaired it for many years. I believe I am the fifth Timoshenko medalist from that group: The others were Timoshenko himself, the elastician Norman Goodier, the plastician Ras Lee and the applied mathematician Joe Keller. Ras Lee and I overlapped at Stanford for about two years prior to his taking a chair at Rensselaer Polytechnic Institute. Ras had been one of Timoshenko’s PhD students and he told me Timoshenko abhorred

administrative work. Those of you that know me will realize that there is at least one thing that I have in common with the great man.

Timoshenko created an endowment at Stanford with the instructions that the funds were to be used to support visitors, the teaching of the history of science, and the general advancement of engineering mechanics. The Chairman of Engineering Mechanics (the group's name in Timoshenko's time) was assigned to administer the fund. Presently, the expendable interest is a very significant amount of money. Legend has it that the funds derived from royalties of the famous black books.

Receiving the Timoshenko Medal comes with the responsibility of delivering the Timoshenko lecture. I have enjoyed listening to many Timoshenko lectures in the past and so I thought that it must be a very pleasant and rewarding experience to deliver one. That changes when the moment of truth arrives. I am apparently not the first to have felt a sense of panic when I could not think of what to say. That was evident from reading some of the previous lectures. Often, a member of the Medal Committee will offer helpful advice. It was mentioned in more than one previous lecture that John Hutchinson told the lecturer to "just keep it short." That was helpful, but I needed more help than that. Ravi-Chandar told me to "make it entertaining." Frankly, this did not help. You tell Jerry Seinfeld to make it entertaining, not me. What to do? What would Jerry Seinfeld do? Of course ... he would give "the speech about nothing" and it would be the best speech ever. I soon came to realize that it is not easy to speak about nothing, although some of you may think that is what I am actually doing. So I gave up and tried to find inspiration from the past. I downloaded all the presently [available Timoshenko lectures](#) from the iMechanica website and read them. In reading them it occurred to me that I was probably the first to have done this. So I contacted Zhigang Suo and asked him if the speeches were available prior to this year and he confirmed that they were not. Very interesting. At the 50th anniversary of the initial award ceremony, I found myself in a unique situation. Ideas began to emerge. For example, I could excerpt the best from the past, "The Timoshenko Lecturers's Greatest Hits." There are some nuggets in those lectures, but this would lack originality and this is frowned upon in our business. Another thought occurred to me. It took me quite a long time to read the lectures and the situation will only be worse in the future. So I decided I could help out all future Timoshenko lecturers by discerning the anatomy of a Timoshenko lecture and presenting a concise guide to preparing one. It might become the Cliff Notes of the Timoshenko lectures.

I will begin with some statistics: There are presently 24 Timoshenko lectures posted on the iMechanica website. Some more will probably be found and uploaded but probably not very many. Every one since 1988 is there. The average length of the 24 lectures is approximately 2500 words. The shortest is about 1500 words and the longest about 3500 words. However, the record setters, mentioned in other lectures, are not amongst the ones available. The shortest was a simple "thank you" and the longest consisted of an autobiography that reached the age of 18 at 10:00 pm. The oldest is Maurice Biot's 1962 lecture. It is quite different than the rest in that it is very philosophical. The style of the lectures seems to have changed quite a bit, assuming Biot's is representative of that era. It is hard to say. It is the only one of the early lectures available.

The first three topics typically are: thanking everyone; citing some contact with, or inspiration from, Timoshenko; and musing about what to speak about. (If you go back, you will see that I followed this format.) The next topic is where the originality lies, but it seems that there are several themes that have become recurrent at one time or another, possibly because lectures were not readily available previously. One theme that was quite

popular until recently was “the glorious 1960’s.” (This one seems destined to fade in popularity in the future for obvious reasons.) Common themes recently have been somewhat pessimistic, reflecting changes that have occurred in academia (e.g., overemphasis on funded research, student evaluations of teaching, etc.) and in mechanics (e.g., funding levels, perception, the name itself, etc.).

With respect to these themes, there is little to add. Everything has been said, and said very well. What I would like to do is to present some thoughts about computational mechanics.

Computational mechanics has been one of the two main growth areas in the field of mechanics for the last 50 years. I will refer to the lectures of Jim Rice and John Hutchinson who described the other. When I started my career, the field of computational mechanics did not exist. Now it is enormous, and it is still growing. I grew up with this field and perhaps I can provide a few insights about its current state.

Obviously, computational mechanics goes hand in hand with new developments in computer technology. So I would like to say a few words about what is happening now in the world of hardware and what it seems to mean for the future.

I think everyone is familiar with Moore’s Law (1965): “the number of transistors on an integrated circuit for minimum component cost doubles every 24 months.” It is not a law but it has been quite an accurate prognostication of what has happened since 1965. Transistor density is roughly proportional to processor performance. Consequently, one strategy for improving performance of a computer program has been simply to wait for the next computer. It is sometimes referred to as the “Beach Strategy.” Go to the beach and when you return, your program runs faster. This has created a generation of lazy programmers. I am here to tell you, the party may be over. Processor performance seems to have saturated about three years ago. What happened? Was it the ultimate encounter with physical limitations imposed by miniaturization that were long anticipated to terminate Moore’s Law? No, it happened before those limits were encountered. It turns out that power consumption grows nonlinearly with performance, in the range of quadratic to almost cubic. Processors that consume too much power run too hot and fail because the heat cannot be removed. Heat transfer is the show-stopper, a mechanical engineering problem. However, this does not mean that performance improvements are over. There are other ways, but the most promising entail some form of “parallelism.” Parallel architectures will be everywhere, even on the laptop, and the only way to take advantage of them will be through more sophisticated programming. It may be routine in the future for students to take courses in parallelization.

For quite some time parallelism has been the predominate paradigm of supercomputing. The supercomputer of today is very different than the supercomputer of twenty years ago. The Cray 2 at the time was the fastest computer in the world, and not much larger than a refrigerator. (Seymour Cray understood very early on that keeping processors cool was a fundamental problem in supercomputer design.) Today’s supercomputers require their own buildings. The computer typically fills one floor and the footprint is the size of a football field, or larger. The other floors house the cooling units. There are tens to hundreds of thousands of processors, with millions on the horizon. The cost, size, and power requirements boggle the mind. One wonders how long this trend can continue, and what are the implications. It would seem that it is destined to reach a limit, but perhaps not. Experimental facilities in particle physics may suggest otherwise.

What will be the future role for computational mechanics? In the early days, computational mechanics programmed just about everything, namely, mesh generators,

equation solvers, elements, constitutive routines, post-processors, and data managers. Lately, mesh generation, equation solving, visualization, and data management are becoming the province of computer scientists. Theoretical issues are now dealt with by computational mathematicians. However, the more physics-based technologies, and in particular, mechanics, still belong to application scientists and I believe that that will continue to be the case. The skills and knowledge of mechanics are ideally suited for the creation of fundamentally new theories and models, and corresponding numerical formulations. There are many fruitful application areas, such as, materials, nanotechnology, biology, medicine, multiscale and multiphysics problems, and the integration of disparate areas of engineering, such as design and analysis.

To know a field, you need to know its people. I do not think the mechanics community knows very much about the individuals who have made important contributions to computational mechanics. So, for my last topic, I would like to present vignettes of a few computational mechanics, in particular, the four who preceded me as Timoshenko medalists. Think of this as a brief finite element analogue of Vasari's *Lives of the Artists*.

The first computational mechanic to be awarded the Timoshenko medal was John Argyris in 1981. John was a true pioneer and visionary. Perhaps more than anyone, he may be considered the father of the finite element method. His series of articles in the journal *Aircraft Engineering* formalized the matrix methods of structural analysis and introduced the first finite element. He later wrote a prescient article entitled *The Computer Shapes the Theory* that anticipated the field of computational mechanics. He was a larger than life figure. In his prime, he led an institute of approximately 125 engineers and scientists in Stuttgart. He had a car and chauffeur on call at all times and he traveled to conferences by private jet with an entourage of assistants. John passed away a few years ago. I worked with him for almost 25 years as an editor of the journal *Computer Methods in Applied Mechanics and Engineering*, along with J. Tinsley Oden. Tinsley received the Timoshenko Medal in 1996. He educated himself about finite elements while working in the aircraft industry in the early 1960's. He was instrumental in transforming the finite element method from its intuitive beginnings to a rigorous science based on mechanics and mathematics. His text, *Finite Elements of Nonlinear Continua*, published in 1972, was a landmark in this process. Of late, his interests have been drawn to nanoimprint lithography, the treatment of cancer, and biology. He is the most articulate spokesman for the field and is a charismatic leader with broad skills spanning research, teaching, administration, and entrepreneurship. Arguably, his greatest achievement is the creation of the Institute for Computational Engineering and Sciences (ICES) at the University of Texas at Austin. I would like to tell you more about ICES but space and time do not permit. The ICES website is a good source of information (<http://www.ices.utexas.edu/>).

Olek Zienkiewicz, another larger than life figure, received the Timoshenko Medal in 1998. Olek left Northwestern University to chair the Civil Engineering Department at the University of Wales at Swansea in the late 1950's and established it as a center of computational mechanics activity. Olek and his colleagues made many important contributions to the finite element method, including the patch test, the isoparametric concept and isoparametric elements. He published the first finite element text in 1967 and followed it with several expanded editions. His single-minded determination and competitiveness are legendary. (There are some amusing stories.) He traveled the world for years enthusiastically promoting the finite element method. A Swansea riddle went

like this: What is the difference between God and Olek? God is everywhere but Olek is everywhere except Swansea. Olek was, and is, a very congenial individual who enjoys people. He is in his mid-eighties and has retired, but still has an avid interest in the field. The sixth edition of his book appeared in 2000, a three-volume set, and rumor has it the seventh may be on the way. I visited Olek and his wife Helen last June in Sitges, a beach resort south of Barcelona, where they spend three months each spring. His enthusiasm and joie de vivre remain unabated.

Ted Belytschko received the Timoshenko Medal in 2001. Ted did his PhD with Phil Hodge and has been a very prominent member of the mechanics community throughout his career. He has also been very active in ASME, and the Applied Mechanics Division in particular, and is probably very well known to many of you. Ted has made fundamental contributions to explicit transient analysis, the most widely used technology in crash dynamics and metal forming, and was the prime mover behind the meshless revolution. Of late, his interests have turned to failure mechanisms, nanotechnology, and quantum-to-continuum coupling. Ted's work is characterized by its creativity. It has had tremendous impact on computational mechanics and engineering analysis. On a personal note, Ted and I have taught industrial short courses together for over 25 years and we are still on speaking terms (we taught one in Austin two weeks ago). Apparently, he is a very easy person to get along with.

Well, I have now slightly exceeded the average length of a Timoshenko lecture. So it is time to stop. I am not sure I satisfied Ravi, but I hope I satisfied John Hutchinson. His lecture was 2802 words. Mine is only 2672.

I will finish by thanking everyone once again. I am very proud to be a member of the community of mechanicians and deeply appreciative of this award.

*Tom Hughes*

**DANIEL C. DRUCKER MEDAL**

**Albert Kobayash**



The Daniel C. Drucker Medal, established in 1997, is conferred in recognition of distinguished contributions to the field of applied mechanics and mechanical engineering through research, teaching and service to the community over a substantial period of time. This year it was awarded to Professor

Albert S. Kobayashi, of the University of Washington for *his pioneering work in elastoplasticity, homogenization theory and numerical methods; and his contributions to the applied mechanics community through various leadership positions.*



**WARNER T. KOITER MEDAL**

**C. T. Sun**

The Warner T. Koiter Medal was established in 1996 to recognize distinguished contributions to the field of solid mechanics with special emphasis on the effective blending of theoretical and applied elements, and on a high degree of leadership in the international solid mechanics community. The medal honors the late Dr. Warner T. Koiter (1914-1997), world-renowned authority in the field of solid mechanics, and it commemorates his vast contributions as research engineer and teacher. The



medal was funded by the Technical University of Delft, the Netherlands. This year, it was awarded to **C. T. Sun** of Purdue University *for his for pioneering research in composite structural mechanics and damage tolerant materials; and the creation of a worldwide generation of composite materials engineers, researchers, and university faculty.*

### **THE APPLIED MECHANICS DIVISION AWARD**

**Oscar Dillon**

The Applied Mechanics Division Award was made to **Professor Oscar Dillon**, University of Kentucky *for his leadership and service to the Applied Mechanics community.*

### **YOUNG INVESTIGATOR AWARD**

**Assad Oberai**

This year's award was made to **Professor Assad Oberai**, Rensselaer Polytechnic Institute, was recognized *for fundamental developments in solving inverse problems and problems with multiple spatial and temporal scales.*



### **JOURNAL OF APPLIED MECHANICS**

The Journal of Applied Mechanics, edited by Bob McMeeking, is once more the leading comprehensive publication in the area of applied mechanics, with articles in all relevant areas, including solid mechanics, dynamics and fluid mechanics. JAM now publishes special issues in topical areas, and it encourages researchers in applied mechanics to come forward with proposals for such editions. The Journal's team of Associate Editors has worked hard to improve the handling of papers, to ensure that JAM attracts the best papers in the field. Thus the Journal of Applied Mechanics is an excellent vehicle for your manuscripts, and we ask you to encourage your colleagues and students to submit their best work to the Journal

**Bob McMeeking, Editor**

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### **2008 APPLIED MECHANICS DIVISION PROGRAM**

The AMD-Driven Conference Track 12 on Mechanics of Solids, Structures and Fluids is expected to be a big success at IMECE 2008. The AMD technical committees and ASME members affiliated with the AMD have been very active in organizing a wide range of mechanics-related symposia (topics) in Track 12 Mechanics of Solids, Structures and Fluids of the ASME International Mechanical Engineering Congress (IMECE 2008). IMECE 2008 will be held on October 31 to November 6, 2008, in Boston, Massachusetts. <http://www.asmeconferences.org/Congress08/>.

According to the count taken at the time this report was prepared, Track 12 had a total of 517 presentations in 31 symposia, a plenary session and a poster session. Track 12 will have two track-plenary lectures on Monday (November 3rd) morning, to be delivered by Thomas J.R. Hughes (University of Texas, Austin) and Robert McMeeking (University

of California, Santa Barbara). The currently-posted titles of the plenary presentations by Hughes and McMeeking are "Isogeometric Modeling and Analysis of Fluid–Structure Interaction with Particular Emphasis on Patient-Specific Cardiovascular Simulation" and "The Mechanics of the Cytoskeleton and Cell Adhesions", respectively. Track 12 will include a 10-session symposium honoring John W. Hutchinson and a 2-session symposium honoring the 2008 Drucker Medalist: Thomas C.T. Ting. The AMD Executive Committee thanks all the Track 12 topic organizers and co-organizers for their effort in putting this track on a path to be a big success at IMECE 2008.

*Tayfun E. Tezduyar, Track 12 Chair, Mechanics of Solids, Structures and Fluids*  
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**2009 JOINT ASCE/ASME/SES CONFERENCE on MECHANICS and MATERIALS**  
June 24-27 Blacksburg, VA.

This conference provides a major forum for the exchange of ideas and discussion of recent developments in all mechanics and materials research fields. The technical sessions and symposia on fundamentals, tools and applications serve to highlight and promote educational needs, emerging thrusts, novel techniques, and innovative applications in areas that span across many engineering disciplines. Researchers, engineers, industry representatives, public officials, and all others who have an interest are invited to attend and participate. For further information see <http://www.cpe.vt.edu/mech09/index.html>

*Ishwar K. Puri, Chair*  
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**NEWS FROM THE TECHNICAL COMMITTEES**

The reports that follow are from the Chairs of the Technical Committees of the Division of Applied Mechanics. If you are interested in the activities of a particular committee, please feel free to contact the Chair.

**Mechanics in Biology and Medicine**

*Gang Bao, Chair*  
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**Composite Materials**

*Mina Pelegri, Chair*  
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**Computing in Applied Mechanics**

The committee on Computing in Applied Mechanics (CONCAM) met on November 12, 2007 during the IMECE 2007 at the Sheraton Hotel in Seattle, Washington. Chair, Somnath Ghosh introduced G. Paulino as the incoming vice-Chair of CONCAM. The committee recognized some CONCAM members and friends, who have received awards at IMECE 2007. Major awardees are T.J.R. Hughes (Timoshenko Medal), W.K. Liu (Robert Henry Thurston Lecture Award), A. A. Oberai (AMD Young Investigator Award). Two mini-symposia were organized by CONCAM members for IMECE 2007.

(i) “Multiscale, Multiphysics, and Multiprocessor Computations” by Y. Mikata and (ii) “Discrete and Continuum Modeling and Experiments on Granular Materials, Powders, and Soils” by F. Bobaru, J.S. Chen and J. A. Turner. Based on the latter symposium, a special issue with Bobaru, Chen, and Turner as guest editors will be published in *Mechanics of Materials* by the end of 2008. There was an enthusiastic motion to resurrect the CONCAM dinner at the IMECE meetings, during which the CONCAM sponsored/related ASME fellow awards could be presented.

A number of mini-symposia have been proposed by CONCAM members and introduced by CONCAM for IMECE 2008 in Boston. They are: (i) Multi-scale, Multi-physics, and Multi-processor Computations by Y. Mikata and J. Knap, (ii) Recent Advances in Computational Study of Nanostructures by H. S. Park, G. M. Odegard and H. E. Fang, (iii) Computational Methods for Deformation and Failure Behavior of Cellular Structures and Soft Materials by S. Maiti, (iv) Recent Advances in Computational Materials Science and Multiscale Materials Modeling by K. Matouš and Ç. Oskay, (v) Computational Analysis of Nanostructured Thermoelectric Materials by G. Li and H. Jiang, and (vi) Nonlocal Methods for Length-Scale Effects in Materials and Systems by F. Bobaru, Z. Bazant and S. Ghosh. Most of these mini-symposia have been incorporated in track 12 of IMECE 2008.

In other news, CONCAM member Wing Kam Liu is leading an informal ASME Nano Council to begin the coordination of NanoTech activities from the ASME standpoint. The 1st Global Congress on Nano-Engineering: Engineering and Computational Approaches in Medicine and Health Care is currently being planned for 2010. The focus of this global congress will be on the use of engineering and computational approaches in nano-medicine and health care. The co-Chairs for the Congress will be M. Ferrari, T.J.R. Hughes and Wing Kam Liu with the support of the rest of the Council.

**Somnath Ghosh, Chair**  
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### **Joint Committee on Constitutive Equations, Applied Mechanics Division-Materials Division**

The last AMD-MD Joint Committee on Constitutive Equations was held on November 12, 2007 at the Washington State Convention and Trade Center in Seattle, Washington. The meeting was chaired by George Z. Voyiadjis. The new Vice Chair, Doug Bammann from Mississippi State University, Mississippi State, Mississippi was introduced. The committee organized numerous symposia in this conference and has already initiated numerous symposia in the forthcoming ASME 2008 IMECE meeting in Boston.

New symposia organized by the committee for the IMECE Boston meeting in 2008 are as follows:

***Symposium on Multi-Scale Constitutive Modeling***, Topic Organizers: George Voyiadjis, Louisiana State University and Cemal Basaran, State University of New York at Buffalo  
***Modeling and Experiments in Nanomechanics and Nanomaterials***, Topic Organizers: Yozo Mikata, Lockheed Martin and Jeffrey Kysar, Columbia University.

***Nonlocal And Micromechanics-Based Continuum Materials Modeling for Simulating Multiscale Material Behavior***, Topic Organizers: George Z. Voyiadjis, Louisiana State University and Richard Rugeiro, University of Colorado.

*Mechanics of Random and Fractal Materials*, Topic Organizer: Martin Ostoja-Starzewski

The committee has initiated its own newsletter which is maintained by Gregory M. Odegard of Michigan Technological University, Houghton, Michigan. The newsletter appears on the iMechanica website (<http://imechanica.org/node/3307>).

It is with deep sorrow that a long member of this committee Dr. Thomas "Tom" Gates passed away on April 18, 2008. Tom worked at NASA Langley Research Center for 18 years conducting research on multiscale modeling of nanostructured materials, characterization of viscoelastic materials, and experimental testing of polymer-composites. In memory of his contribution to developing constitutive models for a host of materials, a series of special sessions are being organized for the 50<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference in Palm Springs, CA, May 4-7, 2009. Please contact Greg Odegard ([gmodegar@mtu.edu](mailto:gmodegar@mtu.edu)) for more information.

Professor Martin Ostoja-Starzewski has published a book "Microstructural Randomness and Scaling in Mechanics of Materials," Chapman & Hall/CRC Press/Taylor & Francis. The book develops and reviews a number of stochastic models and methods useful in mechanics of random media, a field at the intersection of solid mechanics, materials science, stochastic mathematics and statistical physics.

Dr. Gregory Odegard has been chosen as a recipient of the 2008 Ferdinand P. Beer and E. Russell Johnston, Jr. Outstanding New Mechanics Educator Award. Established in 1992, this award is given annually to up to three individuals who have shown a strong commitment to mechanics education. The award consists of a \$200 cash prize and a plaque. The award was presented at the ASEE Mechanics Division's awards banquet at the ASEE Annual Conference in Pittsburgh on June 24, 2008.

Professor George Voyiadjis, the chair of the committee and Professor of Civil Engineering at Louisiana State University, received the 2008 Nathan M. Newmark Medal. It was presented to him during the Engineering Mechanics Institute's inaugural International Conference, May 18-21, 2008 in Minneapolis, MN. He was chosen by the Structural Engineering Institute and the Engineering Mechanics Institute. The award citation reads: "For his outstanding contributions to the fields of structural mechanics and geomechanics, his fundamental research in constitutive modeling and characterization of damage mechanisms in metals, composites, and soils, and his pioneering contributions in multi-scale modeling and localization problems." The selection committee particularly noted his development of a number of widely used nonlinear constitutive models for steel as well as ceramic and composite materials.

Professor George Z. Voyiadjis co-published a book with Pawel Woelke entitled "Elasto-Plastic and Damage Analysis of Plates and Shells," Springer Press. This book presents a finite element model for the elasto-plastic and damage analysis of thin and thick shells. Linear elastic, inelastic and softening behaviors caused by damage in structural shells, as well as large rotations are investigated. The textbook is addressed to graduate students and researchers in civil, mechanical and aerospace engineering as well material scientists and applied mechanics. The formulation presented here was developed primarily for large scale structural analyses. Special emphasis is therefore placed in computational efficiency. Despite ever increasing capabilities of nowadays computers, small scale constitutive models are hardly ever applicable to analysis of large structures. This book provides a constitutive model which allows for accurate

representation of the non-linear shell behavior up to failure, while offering high efficiency and applicability to large scale structural analyses. This is achieved by representing the elasto-plastic behavior by means of the non-layered approach, with an updated Lagrangian method used to describe the geometric non-linearities. For the treatment of material non-linearities an Iliushin's yield function expressed in terms of stress resultants is adopted, with isotropic and kinematic hardening rules. Damage effects modeled through the evolution of porosity are incorporated into the yield function, giving a generalized and convenient yield surface expressed in terms of the stress resultants.

***George Z. Voyiadjis, Chair***

[voyiadjis@eng.lsu.edu](mailto:voyiadjis@eng.lsu.edu)

### **Dynamics and Control of Systems and Structures**

The Dynamics and Control of Structures and Systems Committee organized 2 well received symposia spread over 5 sessions at ASME IMECE 2007.

#### ***Nonlinear Dynamics, Control and Stochastic Mechanics Symposium,***

Organizers: B. I. Epureanu, M. Amabili, and D. Caruntu

#### ***Dynamics and Control of Structures and Systems Symposium,***

Organizer: B. I. Epureanu, M. Amabili, B. Mann, and B. Balachandran

The committee organized 2 symposia spread over 3 tracks and 17 sessions at the upcoming ASME IMECE 2008, totaling more than 115 papers. News about this remarkable growth in the number of papers will be reported after the conference takes place. Committee members have been active in organizing other conferences and symposia:

Professor H.-S. Tzou of the University of Kentucky served as the Program Chair for the ASME 2007 International Design Engineering Technical Conferences to be held during the period of September 4-7, 2007 at Las Vegas, Nevada.

Professor Marco Amabili of Università di Parma, Italy served as the Co-chairman of the EUROMECH Colloquium 483 entitled "Geometrically non-linear vibrations of structures", held during the period of 9-11 July 2007 at Porto, Portugal.

The committee welcomes the following four new members elected at IMECE 2007:

Professor A. Al-Jumaily Auckland University of Technology, New Zealand, Professor H. Hamidzadeh, Tennessee State University, Professor X. Zhao, University of Kentucky and Professor S. Lenci of the University Politecnica delle Marche, Ancona, Italy.

***Bogdan Epureanu, Chair***

[epureanu@umich.edu](mailto:epureanu@umich.edu)

### **Dynamic Response of Materials**

The Dynamic Response of Materials (DRM) Technical Committee met on November 12, 2007, during 2007 ASME International Mechanical Engineering Congress and Exposition in Seattle. A total of eleven sessions with about 45 papers were dedicated to topics related to the dynamic properties of materials, including blast and fragmentation, novel experimental and computational techniques, and the dynamic response of

heterogeneous materials. Six DRM-sponsored sessions will take place at IMECE 2008 in Boston and will cover similar topics.

The current officers of the committee are Philippe Geubelle (University of Illinois) – Chair, and Ghatu Subbhash (University of Florida) – Secretary.

*Philippe Geubelle, Chair*

[geubelle@uiuc.edu](mailto:geubelle@uiuc.edu)

### **Mechanics Education**

The Applied Mechanics Education Technical Committee organized a mini-symposium on “Problem Based Learning in Engineering Education” at the 2007 IMECE in Seattle, WA. In the first of the four sessions, two invited keynote speakers shared their research and experience. This committee also organized a session on “Advances in Applied Mechanics Education.”

At the 2008 IMECE in Boston, MA, the Education Technical Committee is organizing two technical sessions on “Problem Based Learning,” and one session on “Educating Engineers for the Energy Industry.”

*Sanjeev Khanna, Chair*

[khannas@missouri.edu](mailto:khannas@missouri.edu)

### **Elasticity**

The Committee met on November 13<sup>th</sup>, 2007 during the Seattle IMECE meeting. Present at the meeting were Emmanuel Ayorinde, Xin-Lin Gao, Yanfei Gao, Vikram Gavini, Hanging Jiang, Harley Johnson, Demitris Kouris, Robert Kukta, Oscar Lopez-Pamies, and Pradeep Sharma

The Committee Members reviewed the three symposia sponsored at the 2007 IMECE. They were:

**(a) Nanoscale, Biological, Cellular and Nonlinear Materials**, organized by:

Dr. Emmanuel Ayorinde, Wayne State University, Detroit, [ayorinde@eng.wayne.edu](mailto:ayorinde@eng.wayne.edu)

Dr. Xin-Lin Gao, Texas A&M University, College Station, TX, [xlgao@tamu.edu](mailto:xlgao@tamu.edu)

Dr. Valeria La Saponara, University of California-Davis, CA, [vlasaponara@ucdavis.edu](mailto:vlasaponara@ucdavis.edu)

**(b) Mechanics of Nanofabrication and Nanostructure Growth**, organized by:

Yanfei Gao, Department of Materials Science and Engineering, University of Tennessee, Knoxville, TN, [ygao7@utk.edu](mailto:ygao7@utk.edu)

Claus Daniel, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, [danielc@ornl.gov](mailto:danielc@ornl.gov)

**(c) Mechanics of Biological & Biologically Inspired Systems**, organized by:

Pradeep Guduru, Brown University, Providence, RI, [Pradeep\\_Guduru@brown.edu](mailto:Pradeep_Guduru@brown.edu)

Chad Korach, Stony Brook University, Stony Brook, NY, [ckorach@notes.cc.sunysb.edu](mailto:ckorach@notes.cc.sunysb.edu)

Four symposia sponsored by the committee at the McMAT 2007 meeting in Austin, Texas were also reviewed. They were:

**(a) Nanomechanics of Solids**, organized by:

Pradeep Sharma, University of Houston, [psharma@uh.edu](mailto:psharma@uh.edu)

Dimitris Lagoudas, Texas A & M University, [lagoudas@tamu.edu](mailto:lagoudas@tamu.edu)

**(b) Mechanics of Nano-, Biological and Cellular Materials**, organized by:

Dr. Xin-Lin Gao, Texas A&M University, [xlgao@tamu.edu](mailto:xlgao@tamu.edu)

Dr. Ghatu Subhash, Michigan Technological University, [subhash@mtu.edu](mailto:subhash@mtu.edu)

Dr. J. N. Reddy, Texas A&M University, [jnreddy@tamu.edu](mailto:jnreddy@tamu.edu)

**(c) Mechanics of Biological & Biologically Inspired Systems**, organized by:

Pradeep Guduru, Brown University, [Pradeep\\_Guduru@brown.edu](mailto:Pradeep_Guduru@brown.edu)

Chad S. Korach, Stony Brook University, [chad.korach@stonybrook.edu](mailto:chad.korach@stonybrook.edu)

**(d) Contact Mechanics**, organized by:

Thomas Farris, Purdue University, [farrist@purdue.edu](mailto:farrist@purdue.edu)

The Committee solicited nominations for a new Chair and Vice Chair. By unanimous vote they selected Robert Kukta ([robert.kukta@stonybrook.edu](mailto:robert.kukta@stonybrook.edu)) of Stony Brook University as Chair and Pradeep Sharma ([psharma@uh.edu](mailto:psharma@uh.edu)) of University of Houston as Vice Chair.

The Committee discussed nominations for ASME awards and proposed symposia for the 2008 IMECE meeting in Boston. It was decided that the committee would sponsor the following four symposia:

### **Symposium on Mechanics of Soft Matter, Biomaterials, and Biological Systems**

This symposium will address recent advances in the mechanics of soft-matter systems, including polymer-based composites, and biological systems and biomaterials that may address a variety of issues such as adhesion, friction, strength, stiffness, toughness, flaw tolerance, adaptability to harsh environments, self-healing, weight optimization, water repellency, etc. Contributions will include, but will not be limited to, novel constitutive modeling with emphasis on microstructural aspects, coupled-phenomena such as magneto- and thermo-elasticity, instabilities, hard and soft tissues, materials for tissue engineering and implants, single-cell organisms, experimental techniques, and bio-mimetics and bio-inspiration in design, though any observations and/or analyses of soft matter or novel biological phenomena at all length scales are welcome

#### **Organizers:**

Oscar Lopez-Pamies, Department of Mechanical Engineering, Stony Brook University, Stony Brook, NY, [oscar.lopez-pamies@sunysb.edu](mailto:oscar.lopez-pamies@sunysb.edu), 631-632-8249

Chad S. Korach, Department of Mechanical Engineering, Stony Brook University, Stony Brook, NY, [chad.korach@sunysb.edu](mailto:chad.korach@sunysb.edu), 631-632-1182

Martin Idiart, Department of Engineering, University of Cambridge, UK, [mii23@cam.ac.uk](mailto:mii23@cam.ac.uk), +44 (0) 1223 748524

Francois Barthelat, Department of Mechanical Engineering, McGill University, [francois.barthelat@mcgill.ca](mailto:francois.barthelat@mcgill.ca), 514-398-6318

### **Symposium on Defects in materials: Theory and applications**

This minisymposium aims to bring together researchers involved in the broad area of defected solids. Defects play a crucial role in influencing the various materials properties, and exhibit complex structure on varying lengths scales - from electronic structure of the defect core (sub-nanometer and below) to elastic fields of the continuum (micrometer and beyond). This minisymposium discusses the recent theoretical, and computational advances in understanding the various aspects of defects in materials including nucleation, kinetics, and their influence on various materials properties.

The range of physical models of interest span quantum mechanics-based theories, atomistic and molecular dynamics, and continuum mesoscale models. Computational techniques include concurrent multiscale methods, spatio-temporal coarse-graining, as well as methods to extract sub-grid models from fundamental theories. Finally, the

physical problems addressed include multi-physics aspects of various defects such as vacancies, dislocations, cracks, interfaces, surfaces and nano-clusters.

**Organizers:**

Vikram Gavini, Department of Mechanical Engineering, University of Michigan, Ann Arbor, [vikramg@umich.edu](mailto:vikramg@umich.edu), 734-763-9685

Kaushik Dayal, Department of Civil and Environmental Engineering, Carnegie Mellon University, [kaushik@cmu.edu](mailto:kaushik@cmu.edu), 412-268-2949

**Symposium on Nano-, Bio-, Cellular and Nonlinear Materials**

Authors and presenters are invited to participate in this symposium designed to review recent advances in the mechanics of nano-, bio-, nonlinear and cellular materials and to identify future research opportunities in the subject area, while expanding international cooperation and understanding. Innovative theoretical, computational and experimental approaches will be discussed. Topics of interest include, but are not limited to, the following:

- Nanocomposites reinforced by carbon nanotubes or other nanoparticles
- Processing-structure-property relations for micro- and nanostructured materials
- Modeling of biomaterials and living tissues
- Simulation and design of new bio-sensing materials
- Cellular materials and structures, including honeycombs, auxetic foams, truss core and frame structures, and sandwich composites with foam cores
- Multifunctional behavior and failure of foamed materials
- Nonlinear elasticity and biomechanics
- Plasticity and deformation in materials
- Non-local and higher-order strain gradient continuum theories

**Organizers:**

Emmanuel Ayorinde, Mechanical Engineering Department, Wayne State University, Detroit, [ayorinde@eng.wayne.edu](mailto:ayorinde@eng.wayne.edu), 313-577-5548

Xin-Lin Gao, Department of Mechanical Engineering, Texas A&M University, College Station, TX, [xlgao@tamu.edu](mailto:xlgao@tamu.edu), 979-845-4835

Valeria La Saponara, Dept. of Mechanical and Aeronautical Engineering, University of California-Davis, CA, [ulasaponara@ucdavis.edu](mailto:ulasaponara@ucdavis.edu), 530-754-8938

**Symposium on Computational Analysis of Nanostructured Thermoelectric Materials**

**Organizers:**

Gang Li, Department of Mechanical Engineering, Clemson University, [gli@clemson.edu](mailto:gli@clemson.edu), 864-656-3294

Hanqing Jiang, Mechanical and Aerospace Engineering, Civil and Environmental Engineering, Arizona State University, [hanqing.jiang@asu.edu](mailto:hanqing.jiang@asu.edu), 480-965-1483

We hope to see all of you in Boston at the IMECE 2008!

Robert Kukta, Chair  
[robert.kukta@stonybrook.edu](mailto:robert.kukta@stonybrook.edu)

## **Experimental Mechanics**

The Experimental Mechanics Technical Committee met on November 12, 2007 in Seattle. The meeting was chaired by Ioannis Chasiotis, Univ. of Illinois – Urbana Champaign. The Secretary is Sanjeev K. Khanna, University of Missouri-Columbia. The meeting was well attended and there was lively discussion regarding the new Track system, which holds some promise for the future but has some teething problems. The following sessions were held in Seattle:

### ***Modeling and Experiments in Nanomechanics and Nanomaterials***

Organizers: Yozo Mikata (Lockheed Martin) and Jeff W. Kysar (Columbia University)

### ***Static and Dynamic Mechanical Behavior of Biomaterials***

Organizers: Roy Xu (Vanderbilt U.) and K.T. Ramesh (JHU)

Co-sponsorship with Dynamic Behavior of Materials Committee

We have collaborated with several other Technical Committees in bringing forward several interesting sessions for Boston. We look forward to your participation in the sessions and Committee. The sessions that have been proposed include:

### ***Nanomechanical Behavior of Nanocomposite Materials***

L. Roy Xu. In collaboration with the AMD Composite Materials committee.

### ***Modeling and Experiments in Nanomechanics and Nanomaterials***

Yozo Mikata. In collaboration with the AMD Constitutive Equations committee.

### ***In-situ Experimental Techniques in Nanoscale Structure Property Studies,***

Aman Haque. In collaboration with the Electronic Materials committee.

### ***Mechanical behavior of Nanoporous Materials.***

Junlan Wang. In collaboration with the Multifunctional Materials Track.

We look forward to meeting everyone at the Boston meeting and encourage thoughts on topics for future conferences.

***Ioannis Chasiotis, Chair***

[chasioti@uiuc.edu](mailto:chasioti@uiuc.edu)

## **Fluid Mechanics**

The Fluid Mechanics Committee sponsored a four session mini-symposium titled "Advances in Computational Techniques for Fluid Mechanics and Fluid-Structure Interactions", at the 2007 ASME International Mechanical Engineering Congress, in Seattle. The mini-symposium was organized by Tayfun Tezduyar (Rice University) and Arif Masud (University of Illinois). A number of leading researchers from the United States, Japan, Brazil, Spain and Italy gave presentations at this symposium.

At the 2008 ASME International Mechanical Engineering Congress, in Boston, the Fluid Mechanics Committee is sponsoring a mini-symposium titled "Stabilized, Multiscale and Multiphysics Methods", organized by Arif Masud (University of Illinois) and Thomas Hughes (University of Texas, Austin).

*Arif Masud, Chair*  
[amasud@illinois.edu](mailto:amasud@illinois.edu)

### **Committee on Fluid-Structure Interaction**

In December 2006 the AMD Executive Committee approved a new technical committee, Committee on Fluid–Structure Interaction (CFSI). The CFSI is sponsoring 6 mini-symposia within Track 12 (Mechanics of Solids, Structures and Fluids) of the ASME International Mechanical Engineering Congress, in Boston, October 31 – November 6, 2008. These 6 mini-symposia will have a total of 17 sessions and are titled: Topic 12-1: Advances in Computational Techniques for Fluid Mechanics and Fluid-Structure Interactions (4 sessions), Organizers: T. Tezduyar (Rice U) and Y. Matsumoto (U of Tokyo)

Topic 12-7: Complex Multi-Physics Flows in Environmental and Energy Sciences (3 sessions), Organizer: F. Xiao (Chinese Academy of Sciences)

Topic 12-9: Computational Bio-fluid and Bio-structural Mechanics (2 sessions), Organizer: L. Zhang (RPI)

Topic 12-13: Mechanical Modeling of Interface Phenomena (2 sessions), Organizers: R. Sauer and P. Wriggers (Leibniz U Hannover) and T. Laursen (Duke U)

Topic 12-15: Advances in the Theory and Simulation of Flow through Porous Media (3 sessions). Organizers: R. Juanes and L. Cueto-Felgueroso (MIT) and S. Matringe (Stanford)

Topic 12-30: Reduced Order Models in Fluid Dynamics and Heat Transfer (3 sessions), Organizers: D. Gartling and R. Hogan (Sandia National Laboratory)

A large number of leading researchers in fluid mechanics, computational mechanics, and fluid–structure interactions will give presentations at these 6 mini-symposia. Many of the speakers will be from the United States, Japan and European Union, but we will also have speakers from China, South America and other parts of the world.

*Tayfun Tezduyar, Chair*  
[tezduyar@gmail.com](mailto:tezduyar@gmail.com)

### **Fracture and Failure**

The Committee held its yearly meeting at the 2007 IMECE meeting in Seattle, WA. The current Chair and Vice-Chair, Mark Walter (The Ohio State University) and Ashraf Bastawros (Iowa State University), respectively, are at the half-way points in their terms. L. Roy Xu (Vanderbilt University) was elected to the vacant Secretary position. Roy will serve a one year term as secretary. At the 2008 IMECE meeting Ashraf will be promoted to Chair, Roy will be promoted to Vice-Chair, and a new Secretary will be elected. The new terms will last for two years starting in June of 2009. If you are interested being elected to the Secretary position please attend the upcoming Committee meeting at the 2008 IMECE in Boston or let Mark Walter know of your desire to serve. As always, committee membership is open to anyone; membership is granted by attending a committee meeting at an IMECE meeting or by contacting a committee officer.

For the 2007 IMECE the process of requesting symposia was decentralized and became organizer initiated. Committee members helped to organize several successful sessions related to Fracture and Failure Mechanics. For the 2008 IMECE the Committee

has taken the lead in organizing a large symposium to honor Professor John Hutchinson as he moves into semi-retirement. Through the work of Professors P. Geubelle, H. Bruck, Z. Suo, T. Nakamura, A. Bastawros, and M. Walter, 50 high quality papers were submitted and a complete set of 10 sessions have been allocated. This promises to be an exciting symposium.

For the 2009 IMECE the Committee plans to again take an active role in proposing symposia. The current session allocation system is based on how many abstracts are received. It is the Committee's goal to encourage and assist its members in proposing fracture and failure mechanics symposia that have high quality presentations and are well attended. Please come to our Committee meeting at the 2009 IMECE in Boston or talk to a committee officer if you wish to organize a symposium. We look forward to seeing you in Boston in November.

***Mark Walter, Chair***  
[walter.80@osu.edu](mailto:walter.80@osu.edu)

### **Geomechanics**

The Geomechanics Committee is a co-sponsor of 13 sessions on granular materials and 4 sessions on pavement mechanics at the Inaugural International Conference of the Engineering Mechanics Institute (EM08) at University of Minnesota at Minneapolis on May 18-21, 2008. Currently, the Geomechanics Committee is working with the Granular Materials committee of ASCE to co-sponsor 4 topics related geomechanics at the upcoming 2009 ASCE-ASME-SES Joint Conference on Mechanics and Materials, June 24-27, 2009, Blacksburg, VA. They are:

1. Jamming/granular flow (organizers: Matthews, Roux)
2. Creep/viscoelastic of granular materials (organizers: Chang, Anil)
3. Multi-scale/multi physics in granular materials (organizers: Shen, Mufata, Peters)
4. Impact//blasting/penetration of granular materials (organizers: Wang)

The secretary of Geomechanics Committee, Prof. Percy Tang-tat Ng of University of New Mexico, will become the Chair for the Granular Materials Committee of ASCE in the coming year. Therefore, more collaboration between these two committees is expected.

***K.T. Chau, Chair***  
[cektchau@polyu.edu.hk](mailto:cektchau@polyu.edu.hk)

### **Instabilities in Solids and Structures**

During the last year, the committee organized a six-session symposium at ASME Congress in Seattle. The program included presentations in the areas of cellular materials, shape memory alloys, composite materials, structural shells, etc. A similar symposium has been organized by Edmundo Corona and Stelios Kyriakides for the upcoming Congress in Boston with 20 presentations scheduled in four sessions. The presentation topics include a wide range of problems in the areas of instabilities in solids, structures and materials. Colleagues in academia, industry and national laboratories working on problems in the area of instability are invited to submit their presentation-ready work in future events organized by the committee. In general, the committee participates in the ASME Mechanics and Materials Conference in the summer and the ASME Congress in November.

*Edmundo Corona, Chair*

[ecorona@sandia.gov](mailto:ecorona@sandia.gov)

### **Integrated Structures:**

The committee organized three technical sessions at the 2007 IMECE, within Track 10 for Mechanics of Solids and Structures, with the theme of Mechanics of Integrated Materials and Structures in Advanced Technologies. This year, we are organizing seven sessions in the 2008 IMECE to be held at Boston, Massachusetts. The committee members who have organized these sessions are: Xiaohu Liu (IBM), Teng Li (University of Maryland), Xiaodong Li (University of South Carolina), Xi Chen (Columbia University), and Chad Landis (University of Texas at Austin). The committee is currently in search for new leadership to take places of Jun He (Intel) and Rui Huang (UT Austin) as co-chairs. Nominations are welcome from both industrial and academic researchers and should be send to Rui Huang ([ruihuang@mail.utexas.edu](mailto:ruihuang@mail.utexas.edu)).

*Rui Huang, co-chair*

[ruihuang@mail.utexas.edu](mailto:ruihuang@mail.utexas.edu)

### **Materials Processing and Manufacturing**

The AMD-MPM committee held its regularly scheduled meeting on November 12, 2007 during the IMECE 2007 in Seattle with Somnath Ghosh of the Ohio State University conducting the meeting. S. Ghosh introduced Xin Wu of Wayne State University as the incoming vice-Chair, and thanked Antoinette Maniatty of RPI for her leadership and efforts as the outgoing Chair of MPM. The status of some MPM committee sponsored symposia was discussed. A number of mini-symposia have been sponsored by the AMD-MPM committee in Track 13: "Processing and Engineering Application of Novel Materials". These include: (a) Recent Advances in Damage and Fracture of Engineering Materials, organized by C. Chow, X. Wu, C. Xia and M. Li (co-sponsored by AMD-MD Constitutive Equations); (b) Materials Processing and Manufacturing, organized by A. Maniatty, C. Chow, X. Wu, S. Ghosh, M. Li, C. Xia, H. Bruck, M. V. Hosur, D. Yao, A. Yi, B. Kinsey, Z. Li, R. Ivester. For IMECE 2008, a mini-symposium entitled "Processing of Micro- and Nano-structured Materials" has been proposed by H. Bruck. There has been some concern about the recent lack of participation in the MPM committee. The committee is looking into ways to renew

interest in special areas of MPM. I invite all interested professionals to participate in the IMECE 2008 AMD-MPM committee meeting to discuss possibilities of rejuvenation.

*Somnath Ghosh, Chair*

[ghosh.5@osu](mailto:ghosh.5@osu)

### **Uncertainty and Probabilistics**

The Committee on Uncertainty and Probabilistics has continued the development of connections to committees with a similar theme within other engineering societies. Our committee organized a session with the AIAA Non-deterministic Approaches committee at the AIAA/ASME/ASCE/AHS/ACS Structures, Structural Dynamics, and Materials Conference/AIAA Non-deterministic Approached Conference, in Schaumburg, IL, continuing a very positive relationship with the AIAA Non-deterministic Approaches community. Activities sponsored jointly with the ASCE EMD Probabilistic Methods Committee continued with joint sessions held at the ASCE Engineering Mechanics Institute conference in Minneapolis, MN. A change in leadership is planned for the coming year, with elections to be held at the upcoming IMECE in Boston in November. We are also always looking for new members, so if you are interested in joining, please contact the Chair, Mohammad Noori.

*Mohammad Noori, Chair*

[mnoori@calpoly.edu](mailto:mnoori@calpoly.edu).