



# AMD

## Applied Mechanics Division Newsletter

Lori Graham, Editor

Fall 2000

### Report of the Chair



AMD Chair  
A. Needleman

The Applied Mechanics Division has a long and distinguished history. For many years, the ASME Winter Annual Meeting (now the IMECE) was the annual meeting for Applied Mechanics and

the *Journal of Applied Mechanics* was the journal to publish in. It has been a long time since either of these has been the case. To a certain extent, the reduced status of the Division's main meeting and its Journal is an outcome of the explosive growth and enormous success of Applied Mechanics over the last 30 years or so. Neither the Applied Mechanics Division nor ASME has capitalized on this growth. Computational Mechanics and Biomechanics have become disciplines in their own right with their own meetings and journals. Materials oriented mechanics has become an integral part of the Materials Science and Applied Physics communities which have their own meetings and journals. A large part of the Fluid Mechanics community now aligns itself with the American Physical Society so that APS fluid mechanics meetings and journals have become central rather than the ASME alternatives. Hence, many, if not most, members of the Applied Mechanics Division have substantial professional involvement in and loyalties to other

organizations. Furthermore, there are active Applied Mechanicians who have no ties at all to our Division. There is nothing to be done now about missed opportunities. Rather, as a community, we need to define the role of the Applied Mechanics Division given the current situation.

Because of its long history and the many distinguished mechanicians who have been active in it, the Applied Mechanics Division can play a central role in documenting and archiving the history of Applied Mechanics. One step already taken is to make the Timoshenko addresses and Koiter lectures archival by publishing them in the *Journal of Applied Mechanics*. A few previous Timoshenko addresses have been published in this newsletter, but it would be worthwhile to try and track down as many of these addresses as possible and, if we can find enough, publish a collection of them as an AMD volume. Applied Mechanics Reviews now publishes retrospectives by leading researchers and I think it would be worthwhile from time to time to collect these and publish them as separate volumes. Also, there is a basic core of mechanics knowledge that reappears in different guises. To cite a specific example, the recent interest in nonlocal theories of plasticity has revived interest in higher order continuum theories. Another example where this may happen is an emerging activity in the mechanics of biological molecules and membranes which may extend interest in nonlinear theories of beams, plates and shells. It could be useful at such times for the Applied

(continued on page 2)

### 1999 Timoshenko Medal



Timoshenko Medal  
Recipient  
A. Roshko

Professor Anatol Roshko was awarded the Timoshenko Medal at the Applied Mechanics' Dinner at the 1999 IMECE in Nashville. His seminal studies in applied mechanics include research on bluff-body aerodynamics, turbulent

shear flows, shock-wave/boundary-layer interaction, and other issues pertaining to fluid mechanics.

Dr. Roshko is internationally known for his research work in various areas of gas dynamics and fluid mechanics that are important in aerospace engineering, vehicle aerodynamics, and wind and ocean engineering. He has made contributions to problems of separated flow; bluff-body aerodynamics; shock-wave boundary-layer interactions; shock-tube technology; and structure of turbulent shear flows. He is co-author with H. W. Liepmann of "Elements of Gasdynamics," which has been widely used as a textbook since 1956.

He was born in Canada, obtained his undergraduate education in Engineering Physics at the University of Alberta in 1945, his M.S. degree from the California Institute of Technology in 1947 and the

(continued on page 7)

## Chair's Message

(continued from page 1)

Mechanics Division to sponsor volumes of collected classic papers in such areas. These are just a few suggestions that may or may not prove worthwhile, but it is worth thinking about how the Applied Mechanics Division can build on its distinguished history to foster a sense of continuity and community within our field.

In recent years, the summer meetings have been exciting, vital meetings. The June 1999 summer meeting at VPI, held jointly with the Materials Division, was a big success. There were nearly 1000 attendees and excellent technical sessions. The efforts of the organizers led by Professor Romesh Batra are much appreciated. In 2000, there will be no summer meeting because the IUTAM Congress is being held in the U.S. The 2001 summer meeting will be held in La Jolla, CA with the Materials Division taking the lead in the organization. There will be no summer meeting in 2002 because of the U.S. National Congress (to be held at VPI) and in 2003, the Applied Mechanics Division will again take the lead in organizing the Summer Meeting. The 2003 Summer Meeting will be at the Camelback Inn in Arizona with Professor Dusan Krajcinovic in charge of the organization. One reason for the success of the Summer Meetings is that by being held jointly with the Materials Division, often in cooperation with other societies such as the Society for Engineering Science and ASCE, they have appealed to a wide range of interests. We can build on and expand this success by, from time to time, also pursuing alliances with other organizations such as those of the Computational Mechanics and Biomechanics communities. Another reason for the success of the Summer Meetings is that the Division has much more control over them than it does over the Winter Meetings.

Applied Mechanics participation at the Winter Meeting (the IMECE) has been much smaller, with Division attendance hovering in the 300-350 range. In particular, there seem to be many fewer younger people at the Winter Meeting. This is unfortunate because it is at the IMECE that the Division usually confers its highest honors - the Timoshenko and Koiter medals and (in 1999) the Drucker Medal. Attendance at the Applied Mechanics Dinner is typically now in the 100-150 person range. There are undoubtedly many reasons for the low attendance, but the limited number of Applied Mechanics sessions is a likely contributing factor. While it is not obvious to me what, if anything, can be done to make participation in the IMECE more attractive for Applied Mechanics Division members, it seems worth exploring possibilities. For the year 2000 IMECE to be held in Orlando, FL the week of November 5-10, we have initiated a poster session. The poster must be presented by a current student, graduate or undergraduate (faculty can be co-authors). The posters will be judged by a committee appointed by the Executive Committee and a \$1000 prize will be awarded for the poster judged best. A runner-up prize of \$500 will also be awarded. The prizes will be announced and presented at the Applied Mechanics Dinner. This is an experiment and we may well need to iterate to find a format that works. The hope is that this session will get students (and faculty) excited

about participating in the IMECE and the Applied Mechanics Dinner.

As I hope most of you are aware, there has been a significant change in policy regarding the *Journal of Applied Mechanics*. As of January 1, 2000 articles can be 9 pages long before incurring mandatory page charges. This is a 50% increase over the previous limit. Our hope is that this, together with the timely publication of articles, will encourage people to submit more of their best work to the *Journal of Applied Mechanics*. The increased flexibility opens up a variety of options for the Journal that will hopefully be pursued. For example, having a focused set of articles on a topic of current interest or some invited overview articles are possibilities. Proposals to the Executive Committee or to the Editor, Professor Lewis Wheeler, from Technical Committees or individuals on how to exploit this new flexibility are welcome. It is our Journal, let's take advantage of it.

The finances of the Division are not in very good shape. Our custodial account has hovered around \$20,000. This is a minimal amount to carry on the business of the Division and is inadequate for supporting new programs to revitalize it. Funds are particularly low now because of commitments associated with new awards. We have been exploring ways of increasing the Division's income. One source of income is from the Summer Meeting registration fee. That has been fixed at \$5 per person for some time. That is being increased first to \$10 a person and then to \$15 a person. We feel this will have minimal impact on the registration fee, but will give a significant increase in Division resources. The Applied Mechanics Division is the among the largest in ASME and the *Journal of Applied Mechanics* is among the most successful. Relatively little of the income that the Division provides ASME gets directly returned to the Division. Part of the problem stems, I think, from the fact that the Applied Mechanics Division is academically oriented, whereas the recent focus of ASME has been on industrial activity and participation. We need to work with ASME to provide the atmosphere and the finances for an academically oriented Division to grow and prosper.

I want to thank Dusan Krajcinovic for organizing the technical part of the Division's activities at the IMECE in Nashville, Tennessee. The 1999 Koiter Medalist was Professor Charles R. Steele of Stanford University. His fascinating Koiter Lecture was entitled "Shell Stability Related to Pattern Formation in Plants." Professor Steele was cited for his "leading research in the biomechanics of the inner ear." The Division's highest award, the Timoshenko Medal, was awarded to Professor Anatol Roshko of Caltech for "his seminal studies on bluff-body aerodynamics, turbulent shear flows, shock-wave/boundary layer interaction." Professor Roshko's engaging acceptance speech was entitled "Small is Good." The Drucker Medal was presented to Professor Ascher Shapiro of M.I.T. for "leadership in engineering education and research that advanced the understanding of fluid flows in the human vascular system." Also, the Applied Mechanics Division Award was presented to Professor Karl S. Pister of the University of California and the Young Investigator Award was presented to Professor Huajian Gao of Stanford. In addition, Professors Michael M. Carroll (Rice University) and

John Dundurs (Northwestern, Emeritus) were awarded Honorary Membership in ASME; Dr. H. Norman Abramson (Southwest Research Institute) was the ASME Medalist; Professor David B. Bogy (University of California, Berkeley) was awarded the Mayo D. Hersey Award; and Professor Sephen C. Cowin (City University of New York) was awarded the H.R. Lissner Medal. It is gratifying that the contributions of so many of our distinguished colleagues were recognized.

I am pleased to announce the most recent honors voted by the ASME Committee on Honors: the year 2000 Timoshenko Medalist is Professor Rodney J. Clifton of Brown University, the year 2000 Koiter Medalist is Professor Giulio Maier of the Politecnico di Milano, and the year 2000 Drucker Medalist is Professor Phil Hodge of Stanford.

Serving on the Executive Committee has given me the opportunity to work with and get to know a group of outstanding individuals. In particular, I would like to mention Tom Cruise, Carl Herakovich, Stan Berger and Lalit Anand, the Executive Committee Chairs I served under; Tom Hughes, Dusan Krajcinovic, Stelios Kyriakides and Pol Spanos, who are the current Executive Committee members; Lewis Wheeler, the Editor of the *Journal of Applied Mechanics*; Alex Majewski who provides staff support for the Applied Mechanics Division; Cliff Lissenden who manages the AMD homepage and Lori Graham who edits this newsletter. I would also like to thank the Technical Committee chairs for all that they have done in organizing symposia and nominating colleagues for honors. The Technical Committees are the heart of the Division and the work that goes into making them effective is much appreciated.

A special thanks to Pol Spanos for joining us in the middle of a term when Hassan Aref resigned from the Executive committee due to the pressure of other commitments. Hassan's departure leaves the Executive Committee without a fluid mechanics representative for the first time in many years. The role of fluid mechanics within the Division needs to be addressed. As mentioned previously, a significant segment of that community has its primary affiliation within APS and within ASME there is the separate Fluids Engineering Division.

Tom Hughes takes over for me as Chair and Mary Boyce of M.I.T. replaces me on the Executive Committee. The Division is in good hands to meet the challenges it faces.

A. Needleman, Chair

### World Wide Web URLs

ASME Homepage

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

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

A copy of this Newsletter may now be accessed electronically through the Applied Mechanics Division homepage. We welcome your feedback and suggestions on how the web-version of the newsletter can best be structured to suit your needs.

## SMALL IS GOOD\*

By A. Roshko  
California Institute of Technology

David Belden's letter announcing the award was really a surprise, almost a shock. At first I wondered whether it was another example of a story which you may have heard and which, I believe, originated in the FSU. Two friends are at a grand reception sipping cocktails when one notices a man with his chest almost completely covered with medals. Says one to the other, "Do you have any idea what those medals are for?" and the other replies, "Well, you see that one at the top left? That one was a mistake; and the others followed automatically." I humored myself out of that thought but not out of a feeling of guilt. You see, I suddenly felt terrible that I was not a member of the ASME. There had been opportunities but somehow I had let them go by. One reason is that I was concerned about another onslaught of communications, information and other paper that always results and requires attention. Fortunately, ASME lost no time in relieving my guilt. In a few weeks I received a nice invitation and forms to fill out, and now I am Member No. 6143358. And sure enough, information has begun to roll in: a beautiful, glossy magazine, notices of various meetings, etc.

I sincerely thank those who put my name forward and the Division of Applied Mechanics for this honor. I want to assure you that, though not a joiner, my destiny has always been in Applied Mechanics, as you will see as my talk progresses.

Other medalists have had some acquaintance or connection with Professor Timoshenko. Mine is mainly through the ending "-ko". I understand that there are some who think that Tim O'Shenko was an Irishman but, as most of you know, he was Ukrainian. The "-ko" is almost certain identification. So even though I did not have the good fortune to meet Stephen Timoshenko I feel some connection.

Originally, when informed by Dr. Belden about the award and tonight's dinner, I assumed that it was going to be appropriate to make a few acceptance remarks and that something like what I just said would do it. Not being a member, I was not familiar with the rituals of the Applied Mechanics Division. So when, a few months later, Professor Needleman informed me of the custom, I again had a bit of shock, especially when he told me it should be a NON technical talk; and no blackboard, no overhead projector! And a written copy would be needed for the Newsletter! Well, I have here my illegible hand written notes which I hope to have in printable form before the due date.

What do you want to hear in a non technical talk? Humor? Advice? An appraisal of the field and projections for the future? Views on public policy for Applied Mechanics? I'm not very good at any of that. So I've modeled my talk somewhat on that of Professor Willis, the 1997 Medallist, whose acceptance speech I read in the AMD Newsletter and liked very much. Some back copies were kindly provided by Professor Needleman and Mr. Majewski.

The theme is "how to pursue a satisfying career in Applied Mechanics", and I feel very satisfied with mine. I discovered the generalized formula only at the end of my career, but perhaps someone else can use it. Simply stated it is this: "Be in the right place at the right time." But there's an important caveat: the places should be small. I use the term "places" as a generalization for various entities, as you will see. Hence the title of this talk.

My career started in a small high school in a small coal mining town in the Canadian Rock-

ies. There were 15 in the graduating class. Bellevue High School provided me with an excellent education in the basics, up to introductory calculus. The town was an ethnic pot, it was poor, everyone in it was poor, but the three high school teachers had University degrees! I still don't know how that worked and why it doesn't seem to work so well now, but I think one clue may be in the word "small".

From there I went to the University of Alberta, which at that time had a total enrollment of about 2500. I was in the Civil Engineering class, some 15 in all, but on a special track called Engineering Physics, which allowed me to substitute extra Math and Physics for courses like Concrete Mixing. The Eng. Phys. option was the brainchild of Applied Mechanics professors in the Civil Engineering Department (there was no M.E. Department at that time); they were mainly in Structures and Soil Mechanics. Many of them had gone to the University of Illinois for graduate work. One of them, my good friend George Ford, an Applied Mechaniker at heart, went to Stanford to work with Goodier, the son-in-law of Timoshenko who was still very active then. So I got to know a bit about Timoshenko from George Ford, who went back to Alberta and was instrumental in establishing an M.E. Department there.

From Alberta, after some diversions, I came to Caltech for graduate work in GALCIT. This is, effectively, the department of Aeronautics, but the Division of Engineering and Applied Science does not have Departments. I guess each department would be TOO small. Lucky for me; I got to teach some of the Applied Mechanics courses that George Housner and Don Hudson had established.

In 1946 the enrollment at Caltech was about 1500, half undergrad and half graduate. After half a century it has grown to about 2000, still half and half. Bigness is not big at Caltech. You probably noticed that US News and World Report recently ranked Caltech at the top of Universities in the U.S. (even though it's not a University!). You may have also heard, at about the same time, another education story from LA County, namely the crisis in the Los Angeles Unified School District. It's difficult to avoid comparisons—no, not with Caltech but with Bellevue High School. In fact, one of the proposals being suggested is to break up LAUSD into smaller units. About the size of the old Bellevue School District should be about right. (This ends my venture into Public Policy.)

I was fortunate to come into the orbit of Hans Liepmann the first day I arrived at Caltech. Much of my way of seeing and doing things has been influenced by him. Hans was wary of bigness. He liked to keep things lean; big funding brings big baggage with it; you should seek funding for research you want to do, not the other way around; research must be enjoyable to be productive; "smaller" makes it easier to recover from setbacks, even crashes, and so on.

Echoing Professor Willis' observations, I believe that a productive career in research in Academia is helped by three elements, all related to the fact that research is nurtured by questions and questioning. An ideal mix is the combination of teaching, consulting and research; the elements of this triangle feed each other constructively.

To teach technical material convincingly it is necessary to understand it, and students encourage you to do so. Digging deeply often reveals gaps not only in your own understanding but often in the subject itself. When interacting with students at the research level we teach each other. Liepmann delighted in asserting that even before a PhD thesis is finished the student should know more about his subject than anyone else, including his advisor.

The second element of the triangle which leads to questions and questioning is consulting, using this term in the broad meaning of interaction with the outside world, whether it be industrial companies, government laboratories or other societal entities. My own work was strongly influenced by such activities. Observing engineers solve tough technical problems, with imperfect technologies at their disposal, gave me a healthy respect and admiration for how they get their jobs done, and it often left me with feelings of inadequacy to help. I also realized how inadequate even our best students may be feeling as they stepped out into the real world. This led to the introduction, with Don Coles, of a new course in our curriculum, officially called Technical Fluid Mechanics but unofficially Dirty Fluid Mechanics, the kind you can't find in textbooks. This enabled us to pass on to our future engineers and researchers some extra help; at the same time it impacted our own research, by the feedback process I've mentioned. I suspect that there's also a place for a course in Dirty Solid Mechanics.

The third corner of the triangle, scientific research, is at the apex. Feynmann called it "the pleasure of finding things out". Exhilaration may be a better describer. I feel privileged to have experienced it. Professor Oden, in his 1996 acceptance speech, said "I have experienced this phenomenon many times. I am constantly amazed by it, but find it awkward to explain or rationalize". I had thought to give a few examples here, but there's no blackboard or overhead projector! But I have promised to write up one of them for *Applied Mechanics Reviews*.

It seems to me that it is the nature of Applied Mechanics research that it is best carried out by individual investigators or small groups. So it concerns many of us that the trend is toward large consortia of researchers who are supposed to interact with each other and across disciplines. This is inevitably directed research, about which many thoughtful people were concerned when government funding of research accelerated, continuing a process that had begun during World War II. Other thoughtful people point out that this is the only way that societal expenditures on research can continue and even increase, and that anyway there is no net loss to the undirected research that would and will otherwise flourish. Perhaps this trend toward more directed research should be viewed as a contribution to the consulting corner of the triangle which I described and that individuals may still be able to work on their creative ideas under the umbrella of a large consortium. A little moonlighting might be helpful. In fact, life could be very comfortable, except possibly for the Director. But, inevitably, creative people will be left out.

Also troubling is that bigness seems to be crowding out some of the culture that has served Applied Mechanics so well, i.e. the abstraction of well posed scientific questions from important but messy practical ones (a phrase which I've borrowed from Garry Brown). As someone (Prandtl?) remarked, "there is nothing so practical as a sound scientific theory". It is idealized models, leading to analytical descriptions, that reveal the innermost workings of nature, and they help develop the "intuition" which engineers need to do their "dirty" work. This culture should not diminish; it is already small.

Mr. Chairman, again I thank you and the Division for the honor you have given me, the ASME for signing me up, and you the audience for the opportunity of speaking to you.

\*The text of the Timoshenko Medal Acceptance Speech delivered at the Applied Mechanics Dinner of the 1999 IMECE in Nashville, TN.

## AMD Honors and Awards

Pi Tau Sigma Gold Medal: Greg S. Chitik  
Applied Mechanics Award: Sheila E. Widnall  
Nadai Award: James R. Rice  
Charles Russ Richards Memorial Award: Tsu-Wei Chou  
Lissener Award: Albert I. King  
Worcester Reed Warner Medal: Adrian Bejan  
Edwin F. Church Medal: John Lienhard  
Fluids Engineering Award: Fazle Hussain  
Freeman Scholar Award: Yogesh Jaluria  
Y.C. Fung Young Investigator Award: Farshid Guilak  
Machine Design Award: Joseph Duffy  
Performance Test Codes Medal: John C. Westcott  
Marshall B. Peterson Award: Matthew P. Szolwinski

The following AMD members were elected to Fellow Grade: Junjiro Iwamoto, Koichiro Yoshida, Choon F. Shih, Jean Bataille, Joseph Zarka, Giulio C. Maier, Alexander Solan, Haym Benaroya, Maciej P. Bieniek, Mark S. Shephard, Sunil Saigal, Stanley M. Halperson, Mohammad N. Noori, Gregory M. Hulbert, Victor C. Li, William W. Schultz, Alan S. Wineman, Kyung K. Choi, Isaac M. Daniel, Kent L. Lawrence, Krishnaswa Ravi Chandar, Juan C. Heinrich, Stephen W. Attaway, Guruswamin Ravichandran, Fai Ma.

Information and nomination materials for Pi Tau Sigma Awards, the Henry Hess Award, Alfred Noble Prize, Arthur Williston Medal and other awards, may be obtained from the Awards Committee Chair.

*A NEEDLEMAN, Chair*

## Young Investigator Award to Gao

**P**rofessor Huajian Gao was awarded the Special Achievement Award for Young Investigators in Applied Mechanics at the Applied Mechanics' Dinner at the 1999 *IMECE* in Nashville. Professor Huajian Gao received his B.S. degree from Xian Jiaotong University of China, and his M.S. and Ph.D. degrees in Engineering Science from Harvard University. He joined the Stanford faculty in 1988. At present, he is Associate Professor in the Mechanics and Computation Division of the Department of Mechanical Engineering and, by courtesy, Department of Materials Science and Engineering of Stanford University.

Professor Gao conducts research in the area of Micromechanics and Fracture. He studies nucleation of cracks and dislocations in microelectronic thin films, dynamic crack tip instabilities, fracture of piezoelectric ceramics and crack growth in thin film devices. He also develops physically based constitutive models for fracture simulation. He is author/co-author of over 80 scientific papers.

Professor Gao is a recipient of numerous academic awards including the IBM Faculty Development Award, the NSF Young Investigator Award, the Guggenheim Memorial Fellowship, the Alcoa Science Award and the Humbolt Research Fellowship.

## Applied Mechanics Award to Pister

**P**rofessor Karl S. Pister was awarded the Applied Mechanics Award at the Applied Mechanics' Dinner at the 1999 *IMECE* in Nashville. Dr. Pister received a B.S. with honors in 1945 and a M.S. in 1948 from the University of California at Berkeley. He completed graduate studies at the University of Illinois at Urbana-Champaign, where he received the Ph.D. in Theoretical and Applied Mechanics in 1952.

Dr. Pister joined the faculty of the Department of Civil Engineering at Berkeley in 1952, where he was active in undergraduate and graduate teaching and in research in mechanics of solids and structures. A major focus of this research included identification and characterization of the behavior of engineering materials and optimization-based, interactive computer-aided design of structures subjected to seismic loads. At U.C. Berkeley, he served as Vice Chairman and Chairman of the Division of Structural Engineering and Structural Mechanics before appointment as Dean of the College of Engineering in 1980, a position which he held for a period of ten years. He was appointed Chancellor of the University of California, Santa Cruz in 1991, and served in that capacity for five years.

Dr. Pister is a member of the National Academy of Engineering and a fellow of the American Academy of Arts and Sci-

ences. He is also a fellow of the American Academy of Mechanics, the American Society of Mechanical Engineers, the American Association for the Advancement of Science and an Honorary Fellow of the California Academy of Sciences.

Dr. Pister retired from the University of California in 1996, after forty-six years of service. Currently, Dr. Pister serves as Chairman of the Board of Directors of the California Council on Science and Technology and is a member of the Board of Directors of the Monterey Bay Aquarium Research Institute, the Board of Trustees of the American University of Armenia and the Board of Trustees of the Monterey Institute of International Studies.

## Drucker Medal to Shapiro

**P**rofessor Ascher H. Shapiro was awarded the Drucker Medal at the Applied Mechanics' Dinner at the 1999 *IMECE* in Nashville. Professor Shapiro, a renowned authority on fluid dynamics and a leader in engineering education, is Institute Professor Emeritus at M.I.T.

A native of New York City, Dr. Shapiro studied at C.C.N.Y., then transferred to M.I.T., where he received S.B. and Sc.D. degrees in 1938 and 1946. He was appointed an Instructor of Mechanical Engineering in 1940 and rose to the rank of Professor in 1952. In 1962 he was named Ford Professor of Engineering and in 1975 Institute Professor. He was Chairman of the MIT faculty in 1964-65, resigning to become Head of Mechanical Engineering, a position in which he remained until 1974.

For twenty-five years, Dr. Shapiro's research and professional activities were related principally to power production, high-speed flight, turbomachinery, and propulsion by jet engines and rockets. Recognizing that many problems of physiology and medicine could profit from the methods, concepts and skills of engineering, Dr. Shapiro in the early 1960s turned his research activities in that direction and is now recognized as one of the founders of the field of biomedical engineering.

Beside his teaching and research, Prof. Shapiro has been particularly active in revising and improving engineering education. While Head of the Department of Mechanical Engineering, he encouraged the growth of biomedical research and teaching. He has received numerous awards and honors including election to the National Academy of Engineering, the National Academy of Sciences, the American Academy of Arts and Sciences, and is the recipient of Honorary Membership in ASME.

# News from the Technical Committees

Most committees maintain an open policy toward membership. Please contact the Committee Chair if you wish to join and/or participate in the activities of the Committee.

## • Committee on Composites

The Composites Committee co-sponsored four symposia at the 1999 IMECE: "Symposium Honoring the 70th Birthdays of Profs. Charles W. Bert and Jack R. Vinson," (V. Birman and A. K. Noor); "Thick Composites for Load Bearing Structures," (Y. D. S. Rajapakse and G. A. Kardomateas); "Durability and Damage Tolerance of Composite Materials and Structures," (A. A. Pelegri, W. Chen, A. Haque and H. Mahfuz); and "Design and Manufacture of Composites," (S. White and A. M. Sastry).

At the 2000 IMECE, the Composites Committee will sponsor/co-sponsor three symposia (eight sessions): "Dynamic Failure in Composite Materials and Structures" (Y. D. S. Rajapakse and C. T. Sun); "Recent Developments in the Mechanics of Sandwich Structures" (Y. D. S. Rajapakse, George A. Kardomateas, and Victor Birman); "Analysis and Design of Composite Structures" (S. Abrate and Scott White); and "Multifunctional Composites" (N. Sottos, and, A. Dasgupta).

The next meeting of the Composites Committee will be held, during the 2000 IMECE. Current members, and other interested persons, are invited to participate. Proposals for symposia dealing with mechanics of composites are encouraged for future conferences. Potential organizers are encouraged to highlight emerging areas of composites research.

*YAPA D. S. RAJAPAKSE, Chair*

## • AMD-MD Joint Committee on Constitutive Equations

This committee is the focal group at ASME promoting the state of the art and science of Applied Mechanics and Materials in the area of modeling the mechanical and physical behavior of materials and structures. First, on the formal note: in the summer 1999, Hussein Zbib has begun as Vice-Chair/Secretary of the committee. He has thus replaced George Z. Voyiadjis. We thank George for the service to our committee as Chair and Vice-Chair/Secretary over the past three years!

At the 1999 IMECE (Nashville, TN) we had a Symposium on "Physical Modeling of Dynamic Failure Processes". It was organized by T.W. Wright, A.M. Rajendran and M. Zikry. At the ASME Summer 1999 Mechanics-and-Materials Conference a Symposium on "Mechanics of Cellulosic Materials" was run by H. Haslach, G. Kyanka, M.K. Ramasubramanian and Richard Perkins. The proceedings came out as the AMD-Vol. 231 and MD-Vol. 85, 1999.

The committee members continue to be active at organizing new symposia. For the 2000 IMECE three symposia are being planned: "Recent Advances in Structured Continua" by M. Massoudi

and K. Rajagopal; "Recent trends in constitutive modeling of advanced materials" by M. Khraisheh and K. Willam; "Plasticity at small scales for emerging technologies" by C. Basaran.

Also, several related activities are being organized by our members. For this and other information about the committee you are welcome to visit <http://www.asme.org/divisions/amd/constit.html>.

*MARTIN OSTOJA-STARZEWSKI, Chair*

## • Committee on Computing in Applied Mechanics (CONCAM)

CONCAM is sponsoring several symposia to be held at the 2000 IMECE:

"Symposium of Advances in Metal Forming," organized by J. Cao, Z. C. Xia, and W. K. Liu

"Symposium on Computational Micromechanics," organized by D. Benson and Scott Schoenfeld

"Symposium on Recent Advances in Dynamic Behavior of Materials," organized by P. H. Geubelle, R. Singh, and V. Prakash

"Symposium on Durability and Damage Tolerance of Heterogeneous Materials," organized by A. M. Sastry, W. Soboyejo and J. Qiu

Lorraine Olson is the New Vice-Chair of CONCAM.

*GREG HULBERT, Chair*

## • Committee on Dynamic Response of Materials:

The Committee organized two symposia during the 1999 IMECE: (i) A Symposium on the Physical Modeling of Dynamic Failure Processes, organized by T.W. Wright, A.M. Rajendran, and M. Zikry; (ii) A Symposium on Recent Advances of Ultrasonic NDE and Material Characterization in Honor of Prof. Ajit Mal, organized by T. Kundu and V. Kinra. Both symposia were very well-attended. The Technical Committee met on November 15. A new Vice-Chair (Prof. Jianmin Qu of Georgia Tech) was elected at this meeting: he will take over as Chair in July 2001.

Several possible symposia were discussed for future meetings. A Symposium on Nondestructive Evaluation and Characterization of Engineering Materials for Reliability and Durability Predictions will be organized by J. Qu for the Orlando conference. Proposed symposia for the San Diego meeting include "Innovative Experiments on Impact Problems" organized by A.M. Rajendran and "Steady State Waves in Anisotropic Elastic Materials" organized by T.C.T. Ting. Individuals interested in these proposed symposia should contact either the organizers or the Committee Chair (K.T. Ramesh, [ramesh@jhu.edu](mailto:ramesh@jhu.edu)). Proposals for other symposia are also welcome.

*K.T. RAMESH, Chair*

## • Elasticity Committee

The Elasticity Committee was quite active last year. Professor Jim Casey organized a very interesting symposium for the

Nashville meeting. He and Professor Kouris are each organizing a symposium for the Orlando meeting. Professor Yi-Chao Chen organized a symposium in honor of Professor Roger Fosdick and in conjunction with the 1999 ASME Mechanics and Materials meeting. Papers presented at this Symposium are undergoing the usual review process for the *Journal of Elasticity* and will appear in the journal in the near future.

*ROMESH BATRA, Chair*

## • Committee on Instability in Solids and Structures

During this year our Committee has participated with a four session symposium at the ASME June meeting at Virginia Polytechnic Institute. Three sessions addressed various stability problems in microstructured solids and one session addressed stability issues in pore pressure solution problems arising in geomechanics.

There will be no ASME meeting this summer, due to the ICTAM 2000 conference in Chicago, where we expect to see most of our colleagues and look forward to hearing many interesting contributions to our field. Our technical committee also plans to be present in the upcoming Winter Annual Meeting this November. Any colleague interested in our activities is welcomed in our TC meetings and is also encouraged to contact the committee chair at any time to share ideas and volunteer his/her help.

*NICOLAS TRIANTAFYLIDIS, Chair*

## • Committee on Materials Processing and Manufacturing

The committee met in Nashville to reorganize and reinvigorate the committee. There was an excellent response from the attendees at the meeting. The operating rules for the committee were revised to shorten the time required in leadership of the committee. The chair of the committee now serves for two years, and the vice-chair, who is chair-elect, also serves a two year term. We hope that these changes will keep the leadership fresh and will better meet the needs of this rapidly changing area of technology.

We are co-sponsoring two symposia at the 2000 IMECE. The symposium on Damage and Durability of Heterogeneous Materials is under the direction of A. M. Sastry. Advances in Metal Forming (<http://www.mech.nwu.edu/imece2000/>) is being planned by J. Cao. These two individuals also form the new leadership of the committee. Ann Marie, ([amsastry@umich.edu](mailto:amsastry@umich.edu)) is the incoming chair, and Jian ([jcao@nwu.edu](mailto:jcao@nwu.edu)) is the vice-chair. I am sure that you will give them your full support. As always, new members are welcome.

*RONALD E. SMELSER, Interim-Chair*

## • Committee on Stochastic and Probabilistic Mechanics

Under the initiative of Pol Spanos and Sal-

*(continued on page 6)*

## News from the Technical Committees

(continued from page 5)

vatore Torquato there has been an effort to focus activities in the area of stochastic and probabilistic mechanics into a coherent committee. As part of this effort two symposia were organized at the 1999 IMECE in Nashville. Current interim officers of the committee are Salvatore Torquato (Chair), Pol Spanos (Vice-Chair), and Lori Graham (Secretary). The committee strongly encourages anyone interested in joining this newly developing committee to contact Lori Graham (graham@virginia.edu) or Sal Torquato (torquato@matter.princeton.edu).

SALVATORE TORQUATO, *Interim-Chair*

## Koiter Medal to Steele

Professor Charles R. Steele was awarded the Koiter Medal at the Applied Mechanics' Dinner at the 1999 IMECE in Nashville. Dr. Steele, a professor of applied mechanics at Stanford University, is recognized worldwide for his contributions to the theory, practice and applications of applied mechanics. His efforts include shell theory, dynamics of the inner ear, mechanical properties of bone and the development of plant morphology. He is also working on the complicated motions of the tympanic membrane, commonly known as the eardrum.

Dr. Steele has published 88 scholarly articles in archival journals and has produced a host of subsidiary reports, articles and surveys. He is editor-in-chief of the *International Journal of Solids and Structures*. A Fellow of ASME, Dr. Steele was on the Applied Mechanics Division Executive Committee (1979-1984) and served as chairman (1983-84). He also was chairman of the Applied Mechanics Reviews Advisory Board (1985-95) and a member of the ASME Board on Publications (1989-95). Dr. Steele is a Fellow of the American Academy of Mechanics, and a member of the American Institute of Aeronautics and Astronautics, the Acoustical Society of America, the American Society of Biomechanics, the American Academy of Engineering and the American Society for Gravitational and Space Biology.

His honors and awards include a Certificate of Recognition from NASA (1987) for bone tissue analysis and method; the Humboldt Senior Fellowship Award from Germany (1994); an honorary doctorate from Zaporozhye State University, Ukraine (1997); and Eminent Academician of the Ukrainian Academy of Higher Education (1998). Dr. Steele received his bachelor's degree in mechanical engineering at Texas A&M, College Station, in 1956. He earned his doctorate in engineering mechanics at Stanford University in 1960.

## USNC/TAM

The 1999-2000 year has been a very active one for USNC/TAM (U. S. National Committee on Theoretical and Applied Mechanics). The USNC/TAM is the official host of the 20th International Congress of the Union of Theoretical and Applied Mechanics (IUTAM) to be held August 27 to September 2, 2000, in Chicago, Illinois. The Congress, ICTAM 2000, was invited by the U. S. National Academy of Sciences upon the recommendation of the U.S. National Committee on Theoretical and Applied Mechanics. The Congress venue is the Chicago Marriott Downtown conference hotel. President of ICTAM 2000 is Prof. Hassan Aref of the University of Illinois at Urbana-Champaign. Additional information on the Congress can be viewed at the Congress web site: [www.tam.uiuc.edu/icatam2000](http://www.tam.uiuc.edu/icatam2000).

The third SCORDIM (Special Communication on Research Directions in Mechanics) report has now been published under the auspices of the U.S. National Committee on Theoretical and Applied Mechanics. Entitled *Research Trends in Solids Mechanics*, the report was edited by George J. Dvorkin. The report includes an executive summary and 31 review chapters by leading experts in different areas of Solid Mechanics. The report was published in September, 1999, in the *International Journal of Solids and Structures*, Vol. 37, No. 1 & 2, pp. 1-422, and as a hard bound book by Elsevier (ISBN 0-08-043572-6), 432 pages, price USD 119. A 30% discount is available to all Elsevier authors.

The 14th U.S. National Congress on theoretical and Applied Mechanics will be held at Virginia Tech, Blacksburg, VA, June 23 - 28, 2002. The United States is also hosting the next International Congress on Theoretical and Applied Mechanics (ICTAM2000) in Chicago, Aug. 27-Sept. 2, 2000.

The web site for the USNCTAM is [www.iastate.edu/~usnctam](http://www.iastate.edu/~usnctam). Here you will find additional information on the USNC/TAM including the 1999-2000 Newsletter, the current officers and committee members, and information and application materials for IUTAM symposia. Links to the fourteen societies represented on the committee can also be found on the USNC/TAM webpage.

CARL T. HERAKOVICH,  
*ASME Representative*

## Journal of Applied Mechanics

The *Journal of Applied Mechanics* enjoys the distinction of being the most widely circulated of the 17 journals, which are issued as Transactions of the American Society of Mechanical Engineers. Dating back to 1933, the year

in which the Applied Mechanics Division was formed, it is also the oldest Transaction Journal. For a more complete account of the *Journal's* history and of the Division's, please consult "A Brief History of the Applied Mechanics Division of ASME," which was written by Paul Naghdi in celebration of the 50th anniversary of the Division and appeared the December 1979 issue of the *Journal*.

The Transaction Journals have been under review by the ASME Publications Committee in recent years. With the aim of providing objective criteria, various metrics have been developed and a survey was completed in 1997 based upon data from Journal Citation Reports<sup>®</sup>. Of the various metrics compiled, two stand out. According to one of these, the number of citations to the *Journal* in 1997, the *Journal* outranks all other Transaction Journals as well as all peer journals. This is the good news.

By another measure, the *impact factor*, the *Journal* ranks third among Transaction Journals and ranks even further down the list compared to peer journals. What does this mean? The impact factor is a measure of the frequency with which articles are cited on a per article basis. It would thus appear that there are quite a few papers appearing in the *Journal* which fail to be cited in the near term and it is clear that if such a trend continues, the *Journal* will suffer.

Over the last few years, I have been in numerous discussions with the Executive Committee of the AMD concerning the foregoing problem. Two particular issues were identified as requiring change for the *Journal* to become once again the leading mechanics periodical. The first is a faster processing time. During the last two years this has, to a large extent, been addressed. The backlog of papers has been reduced to nearly nil so that today we aim for papers to be processed in less than 12 months (submission to publication time). The second issue is the six-page limit that an article traditionally could occupy without incurring mandatory page charges. I am pleased to announce that **for manuscripts submitted on or after January 1, 2000; the page limit not subject to mandatory page charges is increased from six to nine.** Other changes such as increasing the number of issues published per year from four to six, the designation of theme issues, and going online are currently being evaluated.

I would like to take this opportunity to draw attention to the World Wide Mechanics Meetings List, which has been published in the *Journal* for several years. It will no longer appear in the pages of the *Journal*, but is available online.

The board of Associate Editors, as ever, plays an important part in the successful operation of the *Journal of Applied Mechanics*. An Associate Editor serves for a term of three years, once renewable, plus an

(continued on page 7)

## Journal of Applied Mechanics

(continued from page 6)

additional year reserved for clearing paper evaluations. John Bassani, Isaak Daniel, J. T. Jenkins, Wing-Kam Liu, and Minoru Taya completed their service as Associate Editors on July 1, 1999. We would like to welcome to the Editorial Board as new Associate Editors, Demetris A. Kouris, Brian Moran, and K. Ravi-Chandar who joined us on July 1, 1999. In closing, I would like to extend thanks to all who have helped to make 1999 a productive year. I look forward to maintaining the high standard of excellence expected of the *Journal* in the coming year.

LEWIS WHEELER, Technical Editor

### Future Meetings

**Summer 2000: IUTAM International Congress on Theoretical and Applied Mechanics**, August 27 - September 2, 2000, Chicago, Illinois. Chair: Hasan Aref, <http://www.tam.uiuc.edu/ICTAM2000>.

**ASME International Mechanical Engineering Congress and Exhibition 2000**, November 5-10, 2000, Orlando, Florida.

**2001 MECHANICS AND MATERIALS CONFERENCE**, June 27-29, 2001, University of California, San Diego. Contact: Dr. S. Kyriakides, University of Texas at Austin, Tel: (512) 471-5963, [skk@mail.utexas.edu](mailto:skk@mail.utexas.edu)

**2001 International Mechanical Engineering Congress and Exposition**, November 11-16, 2001, New York, New York

The 14th US National Congress of Applied Mechanics will be hosted by the Engineering Science and Mechanics Department of Virginia Tech and held on the Virginia Tech Campus on June 23-28, 2002. Drs. E. G. Henneke ([henneke@vt.edu](mailto:henneke@vt.edu)) and R. C. Batra ([rbatra@vt.edu](mailto:rbatra@vt.edu)) will serve as general co-chairs of the conference. Persons interested in organizing a symposium in conjunction with the conference should contact one of them ASAP.

### 1999 Timoshenko Medal

(continued from page 1)

Ph.D. in 1952. His academic career includes two years of teaching at the University of Alberta and forty years at Caltech, where he is now Theodore von Kármán Professor of Aeronautics, Emeritus. He is a member of the National Academy of Engineering, a Fellow of the American Institute of Aeronautics and Astronautics, the Canadian Aeronautics and Space Institute, the American Physical Society, and the American Academy of Arts and Sciences. He is also a corresponding member of the International Academy of Sciences, and an Honorary Fellow of the Indian Academy of Sciences. He helped organize the Wind Engineering Research Council and was a member of its Executive Board from 1970 to 1983.

Dr. Roshko has been a consultant to government laboratories and various companies, including McDonnell-Douglas, Rockwell, and General Motors Corporation 1961-62. In he was Liaison Scientist with the U.S. Office of Naval Research in London and in 1969 was a National Science Foundation Visiting Scientist in India. He is a member of the Editorial Advisory Board of the *AIAA Journal*, is an Editor-at-Large of the *Journal of Fluids and Structures*, and has been an Associate Editor of *Physics of Fluids*.

## Applied Mechanics Reviews

During the past year we had a decrease in review articles, with 18 being published in AMR in 1999. In addition we had Retrospective articles written by world-renowned, senior scientists V.V. Bolotin, M. Mansour, J. Singer and W. Goldsmith.

I encourage researchers who have worked extensively on a relevant topic in solid or fluid mechanics, heat transfer or biomechanics, and have collected its related literature, to write a review article on it for us. Although review articles normally require more time and effort to write than typical research articles, they are also normally of greater value to others working in the field. Writing a review article can also be an excellent way for one to organize one's thinking for a subsequent book-length monograph. Prospective authors are invited to contact one of the Associate Editors or me to discuss a proposed article.

Beginning in July the complete issues of AMR (including review articles, Retrospectives, book reviews and abstracts of the journal literature) will be available online. Complete printed issues will also continue throughout the present year. After that abstracts will only be available electronically. Beginning with January, 2001 printed issues will consist of review articles, Retrospectives, book reviews and selected announcements, and will appear bimonthly, six times per year.

I want to acknowledge the tremendous conscientious efforts made by our Technical Editors: O.H. Burnside, H.J.S. Fernando, H.A. Hadim, R.L. Huston, R. Kapania, D. Karamanlidis, A. Nachman, M. Nagurka, J.J. Telega and C.Y. Wang. In 1999 they looked through some 475 journals, selected more than 19,000 abstracts as being relevant for AMR, and classified each of them according to our detailed organizational scheme. Some of them have been doing it for a decade or more.

AMR has been published by ASME since 1985. The first review article in AMR during this era appeared in November, 1985, written by Eric Reissner. Since then, through 1999, another 278 have been published, covering our broad scope of interests. We have summarized them in a "Catalogue of Review Articles and Special Issues", along with their abstracts. This compendium is truly impressive as a source of research knowledge. A free copy is available by contacting Lori Murray by e-mail at [amr@asme.org](mailto:amr@asme.org).

Arthur W. Leissa, Editor-in-Chief

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