



**ENGINEERING  
MECHANICS  
INSTITUTE**

## 2010 Award Recipients

### BIOT MEDAL

*The Maurice A. Biot Medal was established to recognize the lifetime achievement of Dr. Maurice A. Biot and is awarded to an individual who has made outstanding research contributions to the mechanics of porous materials.*



Biot Medal



Robert W. Zimmerman, Ph.D., M.ASCE

**Robert W. Zimmerman, Ph.D.**, Imperial College London, is awarded the 2010 Maurice A. Biot Medal, for his outstanding contributions in applying poroelasticity to rock mechanics and flow in fractured media. As an exceptionally prolific researcher Dr. Zimmerman has had a major impact on rock mechanics and theory of poroelasticity. He has made significant contributions to the study of fluid flow in fractured rocks, along with numerous contributions in the areas of rock mechanics, geophysics, and hydrology. He pioneered investigations of the effect of pore space geometry on the overall properties of porous materials, such as effective elasticity and permeability. He provided quantitative analyses of inclusions with radially variable properties – a problem of key importance for the micromechanics of concrete. Dr. Zimmerman also developed a methodology of direct incorporation of the image analysis data into the theoretical modeling. He is the Editor-in-Chief of the *International Journal of Rock Mechanics and Mining Sciences*, and is on the Editorial Boards of *Transport in Porous Media* and the *International Journal of Engineering Science*. He is the author of the monograph *Compressibility of Sandstones* (Elsevier, 1991), and co-author, with JC Jaeger and NGW Cook, of *Fundamentals of Rock Mechanics* (4th ed., Wiley-Blackwell, 2007).

## FREUDENTHAL MEDAL

*The Alfred M. Freudenthal Medal recognizes distinguished achievement in safety and reliability studies applicable to any branch of civil engineering.*



Freudenthal Medal



Arvid Naess, Ph.D., M.ASCE

**Arvid Naess, Ph.D., M.ASCE**, Norwegian University of Science and Technology, is awarded the 2010 Alfred M. Freudenthal Medal, for his *outstanding contributions to the reliability of offshore structures and other complex engineering systems through the development of novel analytical and numerical procedures*. As a researcher and scholar, Dr. Naess has made numerous contributions in the fields of stochastic dynamical systems, structural reliability, marine and offshore structures. His many achievements include the development of a set of new and particularly efficient Monte Carlo based techniques for the purpose of estimating the extreme response of nonlinear structural systems subjected to dynamic loads of a stochastic nature. Another significant contribution is the establishment of numerical path integration techniques to calculate the stochastic response of nonlinear structures subjected to excitation that can be modeled as filtered white noise. And a relatively recent contribution involves the introduction of the "Average Conditional Exceedance Rate" method for the solution of the long unresolved problem of determining the exact empirical distribution of the extreme value of a time series.

## MINDLIN MEDAL

*The Raymond D. Mindlin Medal recognizes outstanding research contributions to applied solid mechanics. ASCE membership is not a requirement.*



Mindlin Medal



Frank L. DiMaggio, Ph.D., P.E.  
F.ASCE

The Raymond D. Mindlin Medal, is presented for the first time in 2010 to **Frank L. DiMaggio, Ph.D., P.E., F.ASCE** for his *lifetime contributions in research, teaching and consulting in the*

*disciplines of applied solid mechanics, including fluid-structure interaction, shock and vibration effects on submerged structures, and constitutive modeling of soils.* Dr. DiMaggio pioneered the development of the CAP model for inelastic constitutive behavior of soils under blast loading. He has made major contributions in the development and application of efficient and practical sub-structuring techniques for the transient response of shells; he has developed practical methods for analyzing surface ships that are subjected to under-water explosions; and has been instrumental in the development of widely-used techniques in acoustic approximations that are applicable to problems involving submerged structures, as well as those involving transient response to shock loads. Dr. DiMaggio is a past Chair of the Engineering Mechanics Division (now Engineering Mechanics Institute), served on technical committees, and was Chair of the 1989 ASCE-ASME Mechanics Conference.

## NEWMARK MEDAL

*The Nathan M. Newmark Medal recognizes an ASCE member for contributions that have substantially strengthened the scientific base of structural engineering; these contributions having been made in the form of papers or other written presentations.*



Newmark Medal



Howard S. Levine, Ph.D., M.ASCE

**Howard S. Levine, Ph.D., M.ASCE**, Weidlinger Associates, is awarded the 2010 Nathan M. Newmark Medal *for developing advanced computational methods, extending them from research to production engineering tools and applying them to protective design of military and civilian structures.* While at Grumman Aircraft Engineering Corporation Dr. Levine was a key contributor to the development, verification and applications of computational methods to address some of the most difficult problems in the area of structural mechanics – namely the nonlinear large deflection, elastic-plastic behavior of complex, highly redundant structures subjected to static and dynamic loads. At Weidlinger Associates he led, together with colleagues, the development of a viscoplastic concrete model that preserves theoretical requirements for uniqueness and stability of solution, preserves positive wave speeds in post-peak regime and matches data from experiments on homogeneous samples and structural elements.

## SCANLAN MEDAL

*The Robert H. Scanlan Medal recognizes distinguished achievement in engineering mechanics based upon scholarly contributions to both theory and practice. The areas of achievement will generally be structural mechanics, wind engineering and aerodynamics.*



Scanlan Medal



Hai-Fan Xiang, Ph.D.

**Hai-Fan Xiang, Ph.D.**, Tongji University, is awarded the 2010 Robert H. Scanlan Medal *for his lifelong contributions to both theory and its application to the design and construction of signature long span bridges and leadership in wind engineering education and research.* Dr. Xiang made significant theoretical contributions to a set of numerical analysis schemes for bridge flutter that range from mode by mode analysis to multi-mode considerations. Other contributions include quantification of the joint distribution of wind speed and direction, equivalent static wind loading on bridges and structures, flutter mechanism and stabilization of super long span bridges, aerodynamic limits of span length of suspension bridges, and wind-induced vibration control with TMDs to name a few. Dr. Xiang has also made a variety of contributions to the wind engineering of tall buildings and TV towers, especially in the fields of aeroelastic response and the statistical analysis of extreme winds. He is among the select group of academicians of the very prestigious Chinese Academy of Engineering, and he has received many international honors including: the Anton Tedesko Medal (IABSE).

## VON KARMAN MEDAL

*The Theodore von Karman Medal recognizes distinguished achievements in engineering mechanics that are applicable to any branch of civil engineering.*



von Karman Medal



Jan D. Achenbach, Ph.D.

**Jan D. Achenbach, Ph.D.** is being awarded the 2010 Theodore von Karman Medal, *for his outstanding contributions in theory and analysis of waves in solids, elastodynamics, acoustic*

*microscopy, and dynamic fracture of materials, composite systems, and structures.* Dr. Achenbach has been a worldwide leader in the general area of waves in elastic solids for a period of over forty-five years. He has contributed to a wide spectrum of topics in elastodynamics, including acoustic microscopy, laser-based ultrasonics, diffraction coefficients, dynamic behavior of composites, and dynamic fracture. Among his early works was his book *Wave Propagation in Elastic Solids*, published in 1973 (Elsevier Science, Ltd., Amsterdam). Dr. Achenbach pioneered the development of ultrasonic techniques for applications to quantitative non-destructive evaluation (QNDE) and structural health monitoring (SHM) of safety-critical structures such as bridges, aircraft and nuclear reactors. He is the recipient of the two highest presidential awards in science and technology in the United States: the US National Medal of Technology (2003) and the US National Medal of Science (2005). He was elected to the National Academy of Engineering in 1982 and to the National Academy of Sciences in 1992. He is the recipient of the two highest presidential awards in science and technology in the United States: the US National Medal of Technology (2003), and the US National Medal of Science (2005).