



2003 Timoshenko Medal

Presented to

Professor L.B. Freund

In recognition of
**Seminal contributions to the mechanics of
dynamic fracture, seismology, and the
mechanical behavior of thin films.**

Presented at

**The Applied Mechanics Division Banquet
The 2003 International Mechanical
Engineering Congress
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Presiding: Pol D. Spanos
ASME/AMD Chair 2003-2004**



ASME International





L. B. FREUND, Ph.D.

Brown University
Providence, RI

Dr. Freund began his career at Brown University (Providence, R.I.) in 1967 as a postdoctoral research associate in the division of engineering. He joined the teaching faculty as assistant professor in 1969, and was promoted to associate professor in 1973 and professor in 1975. He served as chair of the Engineering Executive Committee (1979-83) and, in 1987, he was appointed as the Henry Ledyard Goddard University professor.

He has held visiting appointments at Stanford University, California; Harvard University (Cambridge, Mass.); the California Institute of Technology, Pasadena; the University of California at Berkeley; and Jet Propulsion Laboratory (Pasadena, Calif).

Freund's early research focused on the dynamic response of materials to applied loading, an interest that evolved into a long-term study of dynamic fracture phenomena, including work on seismic source modeling, rupture of natural gas transmission lines, crack arrest in ship hulls and reactor pressure vessels, computational methods for dynamic fracture, the influence of crack tip plasticity on rapid crack growth and other materials issues. This effort culminated in the publication of a monograph, *Dynamic Fracture Mechanics* (Cambridge University Press, 1990). Freund continues to pursue several

issues in this general area, including plastic bifurcation and ductile fragmentation of materials at high rates of deformation.

Beginning in the late 1980s, Freund turned his attention to deformation and failure of thin film materials. This interest developed into a broad activity in mechanics of materials for microelectronic devices, including studies of dislocation formation and growth, evolution of microstructure during semiconductor deposition, microvoiding in interconnect lines and electromigration, the influence of elastic strain on quantum mechanical transport in semiconductors, and compliant substrate technology. A monograph, *Thin Film Materials: Stress, Defect Formation and Surface Evolution*, co-authored with S. Suresh, will be published by Cambridge University Press in 2003.

Freund currently serves as co-editor of the *Journal of the Mechanics and Physics of Solids*, as general editor of *Cambridge Monographs in Mechanics*, and as treasurer of the International Union of Theoretical and Applied Mechanics. He also serves as an industrial consultant, most recently with the Defense Sciences Research Council, Penney & Edmonds Attorneys at Law, Jet Propulsion Laboratory and Belford Research Inc.

A Fellow of ASME and a member of the Society for 37 years, Freund served as associate editor (1979-83) and technical editor (1983-88) of the *Journal of Applied Mechanics*, and was also a member of the ASME Board of Editors. He served as a member of the Executive Committee of the ASME Applied Mechanics Division (1989-94) and was chair of the Division in 1993-94. He is also a Fellow of the Society of Engineering Science and the American Academy of Mechanics, and is a member of the Materials Research Society.

Freund was elected to the National Academy of Sciences (1997), the National Academy of Engineering (1994) and the American Academy of Arts and Sciences (1993). His other honors range from ASME's Henry Hess Award in 1974 to the William Prager Medal from the Society of Engineering Science in 2000.

Freund received his bachelor's degree in engineering mechanics and his master's degree in theoretical and applied mechanics at the University of Illinois, Urbana-Champaign, in 1964 and 1965, respectively. In 1967, he earned his doctorate in theoretical and applied mechanics at Northwestern University (Evanston, Ill.).





Timoshenko Medal

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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.