



Professor Stuart S. Antman

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<http://www2.math.umd.edu/~ssa/>

<http://www.isr.umd.edu/faculty/gateways/antman.htm>

<http://ipst.umd.edu/researchandfaculty/ssa.php>

<http://www.barnesandnoble.com/c/stuart-s.-antman>

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Professor Antman studies a variety of dynamical and steady-state nonlinear problems for rods, shells, and three-dimensional solid bodies. The bodies are composed of nonlinearly elastic, viscoelastic, plastic, viscoplastic, or magnetoelastic materials. In each case, properly invariant, geometrically exact theories encompassing general

nonlinear constitutive equations are used. In some cases, the solids interact with fluids. The goals of these studies are to discover new nonlinear effects, determine thresholds in constitutive equations separating qualitatively different responses, treat control problems involving "smart" materials, examine important kinds of instabilities, contribute to the theory of shocks and dissipative mechanisms in solids, and develop new methods of nonlinear analysis and of effective computation for problems of solid mechanics.

Biographical Sketch:

Education: B.S., Rensselaer Polytechnic Inst., 1961. M.S., Ph.D., Univ. Minnesota, 1963, 1965.

Regular Faculty Positions: New York Univ., Assistant Professor, 1967–1969, Assoc. Professor, 1969–1972. Univ. of Maryland, Professor, 1972–2001, Distinguished University Professor, 2001–.

Visiting Positions: Courant Inst. of New York Univ., Univ. of Oxford, Univ. of Newcastle upon Tyne, École d'Été d'Analyse Numérique, Univ. de Paris-Sud, Heriot-Watt Univ., Brown Univ., École Polytechnique, Univ. Autónoma de México, Math. Sci. Res. Inst. at Berkeley, Univ. de Paris VI, Math. Res. Ctr. of Univ. of Wisconsin, Inst. for Mathematics and its Applications of the Univ. of Minnesota, Univ. Bonn, Univ. de Paris VI, Univ. Leipzig, Technische Univ. Darmstadt, Max Planck Inst. Leipzig, City Univ. of Hong Kong, Univ. Dortmund, Univ. Köln, Univ. di Roma I.

Awards and Prizes: Guggenheim Fellowship, 1978–1979. L. R. Ford Award of the Mathematical Association of America, 1987. D. Alcaraz Medal, Universidad Nacional Autónoma de México, 1997. Von Kármán Prize of the Society for Industrial and Applied Mathematics, 1999. Inaugural Fellow of SIAM, 2009. Washington Academy of Science Mathematics and Computer Science Award, 2010.

Some Scientific Activities: SIAM Lecturer, 1973–1975. Steele Prize Comm. of A.M.S., 1980–1983. U.S. Natl. Comm. on Theoretical and Applied Mechanics, 1980–1988. Birkhoff Prize Comm. of A.M.S. and S.I.A.M., 1982. Travelling Lecturer for North British Differential Equations Seminar, 1989. Travelling Lecturer for the Midwest Mechanics Seminar, 1992. Steering Comm. 2nd–5th Intl. Congs. on Nonlinear Mechanics, Beijing, 1993, Shanghai, 1998, 2002, 2007. Von Kármán Prize Comm. of S.I.A.M., 1993–1994. Panel for Lecture Series of C.B.M.S, 1993, 1994. Board of Directors, Proyecto Universitario de Fenómenos Nolineales y Mecánica, Universidad Nacional Autónoma de México, 1995–. NSF Panels, 1981, 1985, 1986, 1993, 1996, 1997, 2001, 2003. Member of the Center for Dynamics and Control of Smart Structures, Harvard Univ., 1997–2003.

Some Editorial Activities: Archive for Rational Mechanics and Analysis, Editorial Board, 1972–1989, 1999–2010, Editor-in-Chief, 1989–1999. Springer Tracts in Natural Philosophy, Co-editor, 1972–1980. Acta Applicandae Mathematicae, Editorial Board, 1982–2010. Notices of the A.M.S., Associate Editor for "Queries", 1985–1987. Proceedings of Symposia in Applied Mathematics, Editorial Committee, 1986–1988. Journal of Elasticity, Editorial Board, 1996–. Electronic Research Announcements of the AMS, Editorial Board, 1997–2006. Electronic Research Announcements in the Mathematical Sciences, Editorial Board, 2007–2010. Springer Series in Applied Mathematical Sciences, Advisory Board, 1997–2001, Co-Editor-in-Chief, 2001–. Springer Series in Interdisciplinary Applied Mathematics, Editor of Series in Mechanics and Materials, 1998–2001. Quarterly of Applied Mathematics, Editorial board, 1999–. Acta Mechanica Solida Sinica, Advisory Board, 2000–. Springer Series: Interdisciplinary Applied Mathematics, Co-Editor-in-Chief, 2001–. Springer Series: Texts in Applied Mathematics, Co-Editor-in-Chief, 2001–. Springer Series: Surveys and Tutorials in the Applied Mathematical Sciences, Co-Editor-in-Chief, 2005–.

Books and Monographs: (With J.B. Keller) co-editor of Bifurcation Theory and Nonlinear Eigenvalue Problems, Benjamin, 1969. The Theory of Rods, Handbuch der Physik, Vol. VIa/2, Springer, 1972. (With J.L. Ericksen, D. Kinderlehrer, & I. Müller) co-editor of Metastability and Incompletely Posed Problems, Springer, 1987. (With H. Brezis, B. D. Coleman, M. Feinberg, J. Nohel, & W. Ziemer) co-editor of Analysis and Continuum Mechanics, Springer, 1989. Nonlinear Problems of Elasticity, Springer, 1995, 2005. Editor of The Non-Linear Field Theories of Mechanics, 3rd edn., by C. Truesdell & W. Noll, Springer, 2004.

Selected publications:

(with T. I. Seidman) Parabolic-hyperbolic systems governing the spatial motion of nonlinearly viscoelastic rods, Arch. Rational Mech. Anal. 175 (2005) 85--150.

Nonlinear Problems of Elasticity, 2nd edition, Springer, 2005.

A priori bounds on spatial motions of incompressible nonlinearly elastic rods, J. Hyperbolic Diff. Eqs. } 3 (2006) 481--504.

(with D. Bourne) A non-self-adjoint quadratic eigenvalue problem describing a fluid-solid interaction Part I: formulation, analysis, and computations, Comm. Pure Appl. Analysis 8 (2009) 123-142.

(with W. Lacarbonara) Forced radial motions of nonlinearly viscoelastic shells, J. Elasticity 96 (2009) 155-190