

# **CURRICULUM VITAE**

## **PERSONAL DATA**

Name: Marcelo Epstein

Place of Birth: Buenos Aires, Argentina.

Citizenship: Canadian

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## **UNIVERSITY DEGREES**

Civil Engineer (BSc), University of Buenos Aires, April 1967. (Diploma of Honour)

Master of Science (MSc), Technion - Israel Institute of Technology, March 1970. (With honours)

Doctor of Science (PhD), Technion - Israel Institute of Technology, May 1972.

Bachelor of Arts (BA) (Classics), University of Calgary, June 1993 (First Class Honours)

## **ACADEMIC EXPERIENCE**

1983-pres. Professor, Department of Mechanical and Manufacturing Engineering, University of Calgary

2005 Invited Professor, University of Rome, Tor Vergata (Jan.-June)

2002-pres. University Professor of Rational Mechanics, University of Calgary.

2000-pres. Adjunct Professor, Faculty of Humanities, Department of Greek and Roman Studies, University of Calgary.

1992-pres. Adjunct Professor, Faculty of Physical Education (Kinesiology), University of

## Calgary

- 1999      Invited Sabbatical Scholar, Consejo Superior de Investigacion Cientifica, Madrid (Jan-June)
- 1998      Invited Professor, Mathematics Department, University of Pisa, June1-30
- 1997      Invited Professor (by competition), University of Paris (VI), 6 weeks.
- 1994      Invited Researcher, Consejo Superior de Investigacion Cientifica, Madrid (Jan - June)
- 1990      Invited Professor, Departamento de Hidraulica, Universidad Nacional de la Plata, Argentina (Jan. - April)
- 1989      Invited Professor, Laboratoire de Modelisation en Mecanique, Universite Pierre et Marie Curie, Paris VI (Sept. - Dec.)
- 1983      Invited Professor, Department of Mechanical Engineering, Ben Gurion University of the Negev (Jan. - June)
- 1979-83    Associate Professor, Department of Mechanical Engineering, University of Calgary
- 1976-79    Assistant Professor, Department of Mechanical Engineering, University of Calgary
- 1975-76    Research Associate, Department of Civil Engineering, University of Alberta
- 1974-75    Post-Doctoral Fellow. Also, Sessional Lecturer of Advanced Structural Analysis (graduate course), Department of Civil Engineering, University of Alberta
- 1972-73    Lecturer (Methods in Advanced Statics, Applied Mechanics for Undergraduates, Applied Mathematics for Graduates, Mathematical Shell Theory), Technion - Israel Institute of Technology.
- 1968-72    Instructor (Theory of Structures, Reinforced Concrete, Steel Construction, Applied Mathematics), Technion - Israel Institute of Technology
- 1965-67    Instructor of Stability I and II (Statics and Strength of Materials), University of Buenos Aires

**ACADEMIC ADMINISTRATION**

- 1997-99 Associate Head (Graduate Studies), Department of Mechanical Engineering, University of Calgary
- 1996-97 Acting Associate Head (Graduate Studies), Department of Mechanical Engineering, University of Calgary
- 1996-97 Associate Dean (Research), Faculty of Engineering, University of Calgary

### **PROFESSIONAL EXPERIENCE**

- 1985-pres. Independent consultant. Consulting for: Tri-Ener-Tech, Revenue Canada, Umatac, RTI, Stevens and Associates, Revolve Technologies, Nova Gas Transmission, Trans Canada Pipelines, and others.
- 1981-84 President, COSMEC Engineering Consultants, Ltd. Consulting for: Gulf Canada, Petro-Canada, Dome Petroleum, Tri Ocean Engineering, Control Data, Canadian Foremost, Amerada, Simpson-Lester-Goodrich, Foothills Pipelines, and others.
- 1973-74 Structural Engineer, Albert Kahn Associates Inc., Detroit, Michigan
- 1970-73 Consulting for Computers for Engineering Ltd, and for Yotam Ltd. (Consultants in Advanced Civil Engineering Design): Structural Design of the Intensive Care Hospital at Tel-Hashomer, Stability analysis of Reinforced Plastic Pedestrian Bridge in Tel-Aviv, Structural Design of the Pyramidal Building at the Haifa University Complex, Structural Design and Mathematical Model for a Mechanical Harvesting System.
- 1967-68 Structural Engineer, Techint, Compania Tecnica Internacional, Buenos Aires

### **CONFERENCES ORGANIZED**

Euromech Colloquium 445, Mechanics of Material Forces, University of Kaiserslautern, May 21-24, 2003, (Member of the International Scientific Committee).

CANCAM 2003, 19<sup>th</sup> Meeting of the Canadian Congress of Applied Mechanics, held in Calgary, June 2003 (Chair).

2nd Canadian Conference on Nonlinear Solid Mechanics (CanCSM), Vancouver, BC, June 19-23 (2002), Member of the organizing committee.

Sixth Meeting on Current Ideas in Mechanics and Related Fields, Berlin, 2001. (Co-organizer)

Euromech Colloquium 394, Theory and Numerics of Anisotropic Materials at Finite Strains, Graz, Austria, March 1999. (Member of the International Scientific Committee).

Fifth Meeting on Current Ideas in Mechanics and Related Fields, Jerusalem, Israel, August 23-27, 1999. (Co-organizer)

Fourth Meeting on Current Ideas in Mechanics and Related Fields, Kraków, Poland, August 25-29, 1997.

Third Meeting on Current Ideas in Mechanics and Related Fields (with M. de León), Madrid, June 1995.

A World of Shells, Conference in Honour of P.G. Glockner, Banff, August 31- September 2, 1994.

Second Meeting on Current Ideas in Mechanics and Related Fields (with M. Elzanowski), Banff, September 1-3, 1993.

First Meeting on Current Ideas in Mechanics and Related Fields (with M. Elzanowski), Portland, Oregon, June 1991.

Music and Science in the Age of Galileo (with V. Coelho), an International Symposium and Festival, Calgary, April 26-29, 1989.

Geometrical and Topological Methods in Mechanics, 32nd Meeting of the Society for Natural Philosophy (with M. Elzanowski), Calgary, June 21-23, 1989.

Recent Developments in the Theory and Application of Generalized and Oriented Media (with P.G. Glockner and D.J. Malcolm), Calgary, August 1-3, 1979.

## **MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**

APEGGA (Association of Professional Engineers, Geologists and Geophysicists of Alberta), P.Eng.

ASCE (American Society of Civil Engineers) Member  
1980-83: Member of subcommittee on the Analysis of Structural Continua

AAM (American Academy of Mechanics). Fellow since January 2000.

Society for Natural Philosophy

Executive of CSME, Calgary Chapter 1988-89

Executive of EIC, Calgary Chapter 1988-89

Society for the Interaction of Mechanics and Mathematics, Member of the Executive, 1998-2001.

IUTAM, International Union for Theoretical and Applied Mechanics, member of the executive of the Canadian Chapter. 2000-2002, 2005-2007

Cancam Central Committee (President) 2005-2007

## **AWARDS**

- 2005 Research Excellence Award, Department of Mechanical and manufacturing Engineering, University of Calgary.
- 2003 Teaching Excellence Award, Engineering Students' Society of the University of Calgary.
- 2002 Awarded a five-year University Professorship in Rational Mechanics, University of Calgary.
- 2001 Research Excellence Award, Department of Mechanical and Manufacturing Engineering, University of Calgary.
- 2000 Elected Fellow of the American Academy of Mechanics (AAM)
- 1998 Best Technical Paper Award (Shared with Dr. M. Slawinski), Canadian Society of Exploration Geophysicists (CSEG) National Convention, Calgary.
- 1996 Teaching Excellence Award, Department of Mechanical Engineering, University of Calgary.
- 1995 Teaching Excellence Award, Engineering Students' Society of the University of Calgary.
- 1992 Teaching Excellence Award, Engineering Students' Society of the University of Calgary.

## **SOME RECENT INVITED PRESENTATIONS**

### **1995**

“Geometrical Aspects of Material Uniformity in Elasticity and Plasticity”, invited 45-minute talk at the 8<sup>th</sup> International Symposium on Continuum Models of Discrete Systems, Varna, Bulgaria, June 11-16, 1995.

### **1996**

“Notions of Material Uniformity and Inhomogeneity”, invited 1-hour talk at the 19<sup>th</sup> International Congress of Theoretical and Applied Mechanics, Kyoto, Japan, August 25-31, 1996

“Moses Mendelssohn: From the Margins to the Mainstream”, invited 50-minute talk at the Symposium “Why XVIII-Century Studies?” organized by the Calgary XVIII-th Century Studies Group, Calgary, October 10-11, 1996.

“Geometry and Continuum Mechanics”, two invited 1-hour seminars at the Faculty of Engineering, University of La Corunna, Ferrol Campus, Spain, May, 1996.

“Topics in the Geometrical Foundations of Continuum Mechanics”, two invited 1-hour seminars at

the Mathematics Department, University of Mannheim, Germany, November, 1996.

### **1997**

“On Material Evolution Laws”, invited 45-minute lecture at the International Seminar on Geometry, Continua and Microstructure, Paris, France, May 28-29, 1997.

“Introduccion a la Mecanica de los Medios Continuos”, invited 1-hour talk University of LA Corunna, Spain, April 24, 1997.

### **1998**

“Second-Grade Evolution and Growth”, invited 1-hour seminar at the Mathematics Department, University of Pisa, June, 1998.

“Geometry and Nonlinear Continuum Mechanics”, invited 1-hour presentation for the Interdisciplinary Colloquium on Nonlinear Phenomena, Department of Physics and Astronomy, The University of Calgary, May 11, 1998.

### **1999**

“Un Aspecto Matematico de los Materiales FGM (Homogeneidad sin Uniformidad)”, invited 1-hour seminar at the Department of Materials Science, Universidad Autonoma de Madrid, Spain, June 1, 1999.

“Geometria y Mecanica de Solidos”, invited 1-hour seminar at the ICAI, Universidad Pontificia Comillas, Madrid, Spain, June 18, 1999.

“Homogeneidad y Uniformidad: Hacia una Teoria Matematica de Materiales Gradiente”, invited 1-hour seminar at the Instituto de Matematicas y Fisica Fundamental, CSIC, Madrid, Spain, June 17, 1999.

“The Differential Geometry of Materials with Microstructure”, invited 1-hour seminar at the Mathematics Department, University of Alberta, October 14, 1999.

### **2000**

“Who Invented Calculus?”, invited 1-hour talk at the Calgary XVIII-th Century Studies Group, Calgary, January 11, 2000.

“Some Aspects of Geometry and Continuum Mechanics”, invited 50-minute seminar at the Mathematics Colloquium, Department of Mathematics and Statistics, The University of Calgary, March 2, 2000.

“Usos y Abusos de las Matematicas en la Ingenieria”, invited 1-hour lecture and round table at the Mathematics Department, University of La Rioja, Logrono, Spain, May 9, 2000.

“Uses and Abuses of Mathematics in Engineering”, invited 1-hour lecture at the International

Symposium on Mathematics as the Conceptual Support of Science and Engineering, Fundacion Ramon Areces, CEAMM2000, Madrid, Spain, May 11-12, 2000.

## **2001**

“Usos y Abusos de las Matematicas en la Ingenieria”, invited 1-hour lecture at the Faculty of Engineering, University of Granada, Spain, June 13, 2001.

## **2002**

"The uses of Differential Geometry in the Mechanics of Deformable Media", Spotlight Lecture Series, The Pacific Institute for the Mathematical Sciences, Calgary, March 21, 2002.

"Whitney's Geometric Integration: Theory and Applications", invited 1-hour seminar at the Department of Mathematics and Statistics, The University of Calgary, September 24, 2002.

"Fluxes through strange Boundaries", invited 45-minute lecture at the Accademia Nazionale dei Lincei, Rome, October 15, 2002.

## **2003**

“The Mechanics of Continuous Media”, a 10-hour invited short course at the Department of Applied Mathematics IV, UPC (Polytechnic University of Catalonia), Spain, June 23-27, 2003.

“Nonlocal Configurational Entities”, invited 50-minute presentation at the SNP Meeting on Multiscale Effects in Material Microstructures and Defects, University of Kentucky, Lexington, KY, September 27, 2003.

## **2004**

“De la Mecánica Racional a la del Medio Continuo”, invited 1-hour presentation at the Seminar Series, Department of Structural Mechanics, University of Granada, Spain. October 2004.

Advanced Continuum Mechanics for Mathematicians, 19th International Workshop on Differential geometric Methods in Theoretical Mechanics, Bedlewo, Poland, 26/09/2004, Invited, 3-hour invited presentation at the Banach International Mathematical Center.

Mardi Gras' Three-Legged Round Table, Department of Studies in Structures (Division of Mathematical Structures of Materials Physics), University of Rome La Sapienza, Rome, Italy, 1 day, February 2004, February 2004, This was an invited participation in a "three-legged" round



table (the other two "legs" were: Prof. Miroslav Silhavy, of the Czech Academy of Sciences, and Prof, Antonio di Carlo, of the University of Rome La Sapienza). Each presenter spoke for an hour in the morning, followed by a general discussion in the afternoon. Twenty five people (mostly professors) were in attendance. The round table took place on February 24, 2004.

## **PUBLICATIONS**

### **A. Papers in Refereed Journals**

#### **1971**

Epstein, M. and Tene, Y., "Nonlinear Analysis of Pin-Jointed Space Trusses", ASCE Journal of the Structural Division, 97, No. ST9, 2189-2202 (1971).

#### **1973**

Epstein, M. and Tene, Y., "A Linear Theory of Thin Elastic Shells, Based on Conservation of a Non-Normal Straight Line", International Journal of Solids and Structures, 9, 257-268 (1973).

#### **1974**

Tene, Y., Epstein, M. and Sheinman, I., "A. Generalization of Potters' Method", Computers and Structures, 4, 1099-1103 (1974).

#### **1975**

Tene, Y., Epstein, M. and Sheinman, I., "Dynamics of Curved Beams Involving Shear Deformation", International Journal of Solids and Structures, 11, 827-840 (1975).

#### **1976**

Epstein, M. and Murray, D.W., "Large Deformation In-Plane Analysis of Elastic Beams", Computers and Structures, 6, 1-9 (1976).

Epstein, M. and Murray, D.W., "Three-Dimensional Large Deformation Analysis of Thin-Walled Beams", International Journal of Solids and Structures, 12, 867-876 (1976).

#### **1977**

Epstein, M. and Glockner, P.G., "Nonlinear Analysis of Multilayered Shells", International Journal of Solids and Structures, 13, 1081-1089 (1977).

#### **1978**

Epstein, M., Nixon, D. and Murray, D.W., "Large Displacement Inelastic Analysis of Beam-Columns", ASCE Journal of the Structural Division, 104, No. ST5, 841-853 (1978).

Epstein, M. and Murray, D.W., "A Biaxial Constitutive Law for Concrete Incorporated in BOSOR5 Code", Computers and Structures, 9, 57-68 (1978).

Epstein, M., "Waves in Constrained Materials and Thin-Walled Beams", ASCE Journal of the Engineering Mechanics Division, 104, No. EM5, 1213-1228 (1978).

#### **1979**

Epstein, M., "A Note on Nonlinear Compatibility Equations for Sandwich Shells and Cosserat Surfaces", Acta Mechanica, 31, 285-289 (1979).

Epstein, M., "Thin-Walled Beams as Directed Curves", Acta Mechanica, 33, 229-242 (1979).

Chowdhury K.L., Epstein, M. and Glockner, P.G., "On the Thermodynamics of Nonlinear Elastic Dielectrics", International Journal of Nonlinear Mechanics, 13, 311-322 (1979).

Epstein, M. and Glockner, P.G., "Multilayered Shells and Directed Surfaces", International Journal of Engineering Science, 17, 553-562 (1979).

Cohen, H. and Epstein, M., "Acceleration Waves in Constrained Elastic Rods", Archive for Rational Mechanics and Analysis, 72, 141-154 (1979).

### **1980**

Epstein, M. and Segev, R., "Differentiable Manifolds and the Principle of Virtual Work in Continuum Mechanics", Journal of Mathematical Physics, 21, 1243-1245 (1980).

Epstein, M. and Glockner, P.G., "On Non-Isothermal Rigid Shell Theory", ZAMM, 60, 65-70 (1980).

### **1981**

Epstein, M. and Glockner, P.G., "Deep and Multilayered Beams", ASCE Journal of the Engineering Mechanics Division, 107, EM6, 1029-1037 (1981).

### **1982**

Cohen, H. and Epstein, M., "Wave Fronts in Elastic Membranes", Journal of Elasticity, 12, 249-263 (1982).

### **1983**

Cohen, H. and Epstein, M., "Homogeneity Conditions for Elastic Membranes", Acta Mechanica, 47, 207-220 (1983).

Epstein, M. and Huttelmaier, H.P., "A Finite Element Formulation for Multilayered and Thick Plates", Computers and Structures, 16, 645-650 (1983).

Cohen, H. and Epstein, M., "A Note on Nonlinear Elastic Wave Propagation", Mechanics Research Communications, 10, 37-44 (1983).

### **1984**

Cohen, H. and Epstein, M., "Remarks on Uniformity in Hyperelastic Materials", International Journal of Solids & Structures, 20, 3, 233-243 (1984).

### **1985**

Epstein, M. and Gozde, S., "On Exceptional Waves in Membranes", SM Archives, 10, 87-99 (1985).

Huttelmaier, H.P. and Epstein, M., "A Finite Element Formulation for Multilayered and Thick Shells, Computers and Structures, 21, 6, 1181-1185 (1985)

Elzanowski, M. and Epstein, M., "Geometric Characterization of Hyperelastic Uniformity", Archive for Rational Mechanics and Analysis, 88, 347-357 (1985).

Elzanowski, M. and Epstein, M., "Decay of Strong Shocks in Nonlinear Elasticity", Journal of Sound and Vibration, 103, 3, 371-378 (1985).

Epstein, M., Elzanowski, M. and Sniatycki, J., "Locality and Uniformity in Global Elasticity", in Lecture Notes in Mathematical Physics, No. 1139, Springer Verlag (1985).

### **1986**

Elzanowski, M. and Epstein, M., "Attenuation of Shocks by Viscoelastic Support", ASCE Journal of the Engineering Mechanics Division, 112, 6, 587-592 (1986).

Dost, S. and Epstein, M., "One-dimensional Nonlinear Shock Waves in Rigid Dielectrics", Bulletin of the Technical University of Istanbul, 39, 33-40 (1986).

### **1987**

Epstein, M., "A Question of Constant Strain", Journal of Elasticity, Vol. 17, pp. 23-34 (1987).

### **1988**

Elzanowski, M. and Epstein, M., "The Decay and Formation of One-dimensional Nonconservative Shocks", Applied Mathematical Modelling, 12, 3, 280-284 (1988).

### **1989**

Huttelmaier, H.P. and Epstein, M., "A Multilayered Finite Element Formulation for Vibration and Stability Analysis of Plates", ASCE Journal of the Engineering Mechanics Division, 115, 2, 315-325 (1989).

Elzanowski, M., Sniatycki, J., and Epstein, M., "Geometry of Uniform Materials", invited contribution, in Geometry and Topology, (ed. M. Raffias and G.M. Stratopoulos), 134-151, World Scientific Publications, Singapore (1989).

Elzanowski, M. and Epstein, M., "On Uniformity and Homogeneity of Elastic Materials with Internal Constraints", in Continuum Mechanics and its Applications (ed. G.A.C. Graham and S.K. Malik), Hemisphere Publishing, 51-57 (1989).

### **1990**

Elzanowski, M., and Epstein, M., "Propagacion de ondas en elasticidad no-lineal", Sismodinamica, 1, 45-55 (1990).

Elzanowski, M., Epstein, M. and Sniatycki, J., "G-structures and Material Homogeneity", Journal of Elasticity, **23**, 167-180 (1990).

Huttelmaier, H.P. and Epstein, M., "A Large-Displacement Finite Element for Multilayered Plates", Finite Elements in Analysis and Design, **6**, 189-196 (1990).

Epstein, M. et Maugin, G.A., "Sur le Tenseur de Moment Matériel d'Eshelby en Elasticité non-linéaire", C.R. Acad. Sci. Paris, II., **310**, 675-678 (1990).

Epstein, M. and Maugin, G.A., "The Energy-Momentum Tensor and Material Uniformity in Finite Elasticity", Acta Mechanica, **83**, 127-133 (1990).

### 1991

Elzanowski, M. and Epstein, M., "The Interplay of Uniformity with Constrained Elasticity", Stability and Applied Analysis of Continua, **1**, 1, 95-107 (1991).

Maugin, G.A. and Epstein, M., "The Electroelastic Energy-Momentum Tensor", Proc. Royal Soc. London, **A433**, 299-312 (1991).

Epstein, M. and Maugin, G.A., "Energy-Momentum Tensor and J-integral in Electrodeformable Bodies", International Journal of Applied Electromagnetics in Materials, **2**, 141-146 (1991).

### 1992

Epstein, M. and Sniatycki, J., "Fermat's Principle in Elastodynamics", J. of Elasticity, **27**, 45-56 (1992).

Maugin, G.A., Epstein, M. and Trimarco, C., "Pseudomomentum and Material Forces in Inhomogeneous Materials", International Journal of Solids and Structures, **29**, 1889-1900 (1992).

Maugin, G.A., Epstein, M. and Trimarco, C., "Theory of Elastic Inhomogeneities in Electromagnetic Materials", International Journal of Engineering Science, **30**, 1441-1449 (1992).

Elzanowski, M. and Epstein, M., "The Symmetry Group of Second-Grade Materials", Int. J. of Non-Linear Mechanics, **27**, 635-638 (1992)

### 1993

De León, M. and Epstein, M., "On the Integrability of Second-Order G-Structures with Applications to Continuous Theories of Dislocations", Reports on Mathematical Physics, **33**, 419-436 (1993)

### 1994

Cohen, H. and Epstein, M., "On a Class of Planar Motions of Flexible Rods", Journal of Applied Mechanics, **61**, 206-208 (1994)

Epstein, M., "On the 'Original' Septuagint", The Bible Translator, **45**, 323-329 (1994).

De León, M. and Epstein, M., "Material Bodies of Higher Grade", C.R. Acad Sci Paris, I-319, 615-620, (1994)

Epstein, M. and de León, M., "Dislocaciones Distribuidas en Medios Elasticos", Anales de Ingenieria Mecanica, **2**, 577-583 (1994).

Epstein, M., "Thoughts on Humanistic Engineering", Bulletin of the Canadian Society for Mechanical Engineering, November issue, pp. 6-11 (1994).

### **1995**

Epstein, M. and Maugin, G.A., "Thermoelastic Material Forces: Definition and Geometric Aspects", C.R. Acad Sci Paris, II-320, 63-68, (1995)

Forcinito, M. and Epstein, M., "Granular Media Model with Internal Structure", Physica D, **81**, 305-313 (1995)

### **1996**

Epstein, M. and De León, M., "Homogeneity Conditions for Generalized Cosserat Media", Journal of Elasticity, **43**: 189-201 (1996).

De León, M. and Epstein, M., "The Geometry of Uniformity in Second-Grade Elasticity", Acta Mechanica, **114**, pp. 217-224 (1996).

Epstein, M. and Maugin, G.A., "On the Geometrical Material Structure of Anelasticity", Acta Mechanica, **115**, pp. 119-131 (1996).

Allinger, T.L., Herzog, W. and Epstein, M., "Stability of Muscle Fibres on the Descending Limb of the Force-Length Relation: A Theoretical Consideration", Journal of Biomechanics, **29**, pp. 627-633 (1996).

Allinger, T.L., Herzog, W. and Epstein, M., "Force-Length Properties in Stable Skeletal Muscle Fibres - Theoretical Considerations", Journal of Biomechanics, **29**, pp. 1235-1240 (1996).

Epstein, M. and Maugin, G.A., "Geometrical Material Structure of Finite Strain Elasticity and Anelasticity", Zeit. Angew. Math. Mech., **76** (S4), pp. 125-128 (1996).

Epstein, M. and de León, M., "Geometric Characterization of the Homogeneity of Media with Microstructure", Extracta Mathematicae, **11**, pp. 116-126 (1996).

Epstein, M. and de León, M., "Uniformity and Homogeneity of Deformable Surfaces", C.R. Acad. Sci. Paris, t. 323, Série II b, pp. 579-584 (1996).

Epstein, M. and de León, M., "The Differential Geometry of Cosserat Media", in New Developments in Differential Geometry, (Debrecen, 1994), Math. Appl., 350 Kluwer, pp. 143-164 (1996).

Epstein, M. and de León, M., "Uniformity and Homogeneity of Elastic Rods, Shells and Cosserat Three-Dimensional Bodies", Archivum Mathematicum (Brno) (1996).

Segev, R. and Epstein, M., "On Theories of Growing Bodies", in Contemporary Research in the Mechanics and Mathematics of Materials (CIMNE), Eds. R.C. Batra and M.F. Beatty, Barcelona, 119-130 (1996).

### **1997**

Wu, J.Z., Herzog, W. and Epstein, M., "An Improved Solution for the Contact of Two Biphasic Cartilage Layers", J. Biomechanics, **30**, No. 4, 371-375 (1997).

Epstein, M. and de León, M., "Uniformidad Material de Vigas Alabeadas", Anales de Ingeniería Mecánica, **3**, pp. 539-545 (1997).

Forcinito, M., Epstein, M. and Herzog, W., "Theoretical Considerations on Myofibril Stiffness", Biophysical Journal, **72**, pp. 1278-1286 (1997).

### **1998**

Maugin, G.A. and Epstein, M., "Geometrical Material Structure of Elastoplasticity", International Journal of Plasticity, **14**, Nos. 1-3, pp. 109-115 (1998).

Epstein, M. and de León, M., "On Uniformity of Shells", Int. J. Solids Structures, **35**, No. 17, 2173-2182 (1998).

Epstein, M. and de León, M., "Geometrical Theory of Uniform Cosserat Media", J. of Geometry and Physics, **26**, 127-170 (1998)

Forcinito, M., Epstein, M. and Herzog, W., "A Numerical Study of the Stiffness of a Sarcomere", Journal of Electromyography and Kinesiology, **8**, 133-138 (1998).

Wu, J.A., Herzog, W. and Epstein, M., "Articular Joint Mechanics with Biphasic Cartilage Layers Under Dynamic Loading", J. of Biomechanical Engineering, **120**, 77-84 (1998).

Ru, C.Q., Mao, X. and Epstein, M., "Electric-Field Induced Interfacial Cracking in Multilayer Electrostrictive Actuators", J. of the Mechanics and Physics of Solids, **46**, No. 8, pp. 1301-1318 (1998).

Wu, J., Herzog, W. and Epstein, M., "Evaluation of the Finite Element Software ABAQUS for Biomechanical Modelling of Biphasic Tissues", J. of Biomechanics, **31**, 165-169 (1998).

Epstein, M. and Slawinski, M., "On Some Aspects of the Continuum-Mechanics Context", Revue de l'Institut Français du Pétrole, **53**, pp. 669-677 (1998).

Wu J.Z., Herzog W., and Epstein M., "Effects of Inserting a Pressensor Film into an Articular Joints on the Actual Contact Mechanics", Journal of Biomechanical Engineering, **120**, 655-659 (1998).

Herzog, W., Diet, S., Suter, E., Mayzus, P., Leonard, T.R., Muller, C., Wu, J.Z. and Epstein, M., "Material and functional properties of articular cartilage and patellofemoral contact ...", Journal of Biomechanics, Dec 1998.

## **1999**

Epstein, M., "On the Anelastic Evolution of Second-Grade Materials", Extracta Mathematicae, **14**, No. 2, pp. 157-161 (1999).

Epstein, M., "Toward a Complete Second Order Evolution Law", Mathematics & Mechanics of Solids, Vol. 4, No. 2, pp. 251-266 (1999).

Epstein, M., "On the Wrinkling of Anisotropic Elastic Membranes", Journal of Elasticity, Vol. 55, pp. 99-109 (1999).

Epstein, M. and Johnston, C., "Improved Solution for Solitary Waves in Arteries", J. of Mathematical Biology, **39**, pp. 1-18 (1999).

Wu, J.Z., Herzog, W. and Epstein, M., "Modelling of Location-and-time-dependent Deformation of Chondrocytes During Cartilage Loading", Journal of Biomechanics, Vol. 32, pp 563-572 (1999).

Forcinito M., Epstein M. and Herzog W., "Can a Rheological Muscle Model Predict Force Depression/Enhancement?", Journal of Biomechanics, Vol. 31, pp. 1093-1099 (1999).

Epstein, M., "On Material Evolution Laws", in Geometry, Continua and Microstructure, Collection Travaux en Cours, Vol. 60, pp. 1-10, Hermann, Paris (1999).

## **2000**

Johnston, C.R. and Epstein, M., "On the Exact Amplitude, Speed and Shape of Ion-Acoustic Waves", Physics of Plasmas, Vol. 7, No. 3, pp. 906-910 (2000).

Epstein, M. and Maugin, G.A., "Thermomechanics of Volumetric Growth in Uniform Bodies", Int. J. of Plasticity, Vol. 16, pp. 951-978 (2000).

Epstein, M. and de León, M., "Homogeneity Without Uniformity: Toward a Mathematical Theory of Functionally Graded Materials", International Journal of Solids and Structures, Vol. 37, pp 7577-7591, (2000).

Wu, J.Z., Herzog, W. and Epstein, M., "Joint Contact Mechanics in the Early Stages of



Osteoarthritis”, Medical Engineering and Physics, Vol. 22, pp.1-12 (2000).

Epstein, M. and Maugin, G.A., “Material Evolution in Plasticity and Growth”, in Continuum Thermomechanics, Volume in Honour of Professor Paul Germain, Kluwer Academic Publishers, (2000).

Epstein, M. and Slawinski, M.A., “Rays and Ray Parameters in Inhomogeneous Isotropic Media”, CSEG Journal, Vol. 35, No. 12, pp 7-19 (2000).

Epstein, M. and Slawinski, M.A., “On Raytracing in Constant-Velocity-Gradient Media: Geometrical Approach”, CSEG Journal, Vol. 35, No. 12, pp 1-6 (2000).

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### **C. Theses**

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Epstein, M., "A General Kinematic Approach to the Nonlinear Analysis of Structures with Applications to the Theory of Shells", Thesis for the D.Sc. Degree (in Hebrew), Haifa, 1972.

### **D. Some Additional Research Reports**

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Segev, R. and Epstein, M., "Some Geometrical Aspects of Continuum Mechanics", Report No. 158, Department of Mechanical Engineering, The University of Calgary, March, 1980.

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Epstein, M., "Mendelssohn: From the Margin to the Mainstream", Report No. 494, Department of Mechanical Engineering, The University of Calgary, 1996.

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Epstein, M. and Slawinski, M.A., "Rays and Ray Parameters in Inhomogeneous Isotropic Media", Report No. 504, Department of Mechanical & Manufacturing Engineering, University of Calgary, January 1998.

Epstein, M. and Slawinski, M.A., "On Raytracing in Constant-Velocity-Gradient Media: Geometrical Approach", Department of Mechanical and Manufacturing Engineering, Report No. 505, November 1998.

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### **E. Books**

Mechanics, Encyclopedia of Neuroscience. (eds.: M. Binder, N. Hirokawa, and U Windhorst), Within the framework of an encyclopedic reference of Neuroscience to be published by Springer, I was invited to contribute a number of long essays for the Biomechanics area, amounting to a total of 40 single-spaced typed pages. , In Press

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Recent Developments in the Theory and Application of Generalized and Oriented Media (P.G. Glockner, M. Epstein and D.J. Malcolm, editors), Calgary, 1979.

Segev, R. and Epstein, M., "An Invariant Theory of Stress and Equilibrium" in Mathematical Foundations of Elasticity, by J. Marsden and T. Hughes (Prentice Hall Inc.). Invited Contribution.

Epstein, M., "Introduction to the Finite Element Method in Elasticity", Class notes (The University of Calgary), Calgary, 1985.

A World of Shells (M. Epstein, editor), Calgary, 1995.

### **F. Films**

"Women in Engineering", (M. Epstein, content specialist), Com-Media, The University of Calgary, 1979.

### **G. Software**

"A computer-aided tutorial system for Mechanics of Materials", developed with the assistance of



Academic Computing Services, The University of Calgary, 1987.

## **H. Other Interests**

Modern Languages:	Spanish, Hebrew, French and Italian.
Ancient Languages:	Classical Greek, Latin and Classical Arabic.
Musical Instruments:	Piano, Baroque traverse flute and recorder.