

CURRICULUM VITAE

Miles Barton Rubin

October 2014

PERSONAL

Name: Miles Barton Rubin
Date of Birth: 7 May 1951
Place of Birth: Washington, D.C., USA
Date of Aliyah: 6 October 1982
Citizenship: USA, ISRAEL
Family Status: Married, 2 sons
Present Address: 43A HaRofe, 34367 Haifa, Israel
Telephone: Home - (04) 825-7690
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ACADEMIC DEGREES

B.Sc., Special Honors, December 1972, Mechanical Engineering,
University of Colorado, Boulder

M.Sc., December 1974, Mechanical Engineering (Applied Mechanics)
University of California, Berkeley

Ph.D., June 1979, Mechanical Engineering (Applied Mechanics)
University of California, Berkeley

ACADEMIC APPOINTMENTS

Faculty of Mechanical Engineering
Technion - Israel Institute of Technology
Haifa 32000, Israel

Gerard Swope Chair in Mechanics	April 2001
Professor	June 1995
Associate Professor	July 1987
Tenured Senior Lecturer	July 1986
Senior Lecturer	May 1984
Lecturer	October 1982

PROFESSIONAL EXPERIENCE

July 1972 - August 1972, Research Assistant
University of Colorado, Boulder
July 1977 - September 1977, Research Assistant
University of California, Berkeley
July 1978 - May 1979, Research Assistant
University of California, Berkeley
July 1979 - August 1982, Research Engineer
SRI International

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July - August 2014, Visiting Faculty at LLNL
July - August 2013, Visiting Faculty at LLNL
August 2010, Visiting Faculty at LLNL
July 2007 - August 2007, Visiting Faculty at LLNL
February 2007 - March 2007, Visiting Faculty at LLNL
July 2006 - August 2006, Visiting Faculty at LLNL
February 2006 - March 2006, Visiting Faculty at LLNL
August 2005 - September 2005, Visiting Faculty at LLNL
February 2005, Visiting Faculty at LLNL
July 2004 - August 2004, Visiting Faculty at LLNL
February 2003, Visiting Faculty at LLNL
July 2003 - August 2003, Visiting Faculty at LLNL
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July 1997 - August 1997, Visiting Faculty at LLNL
July 1996 - August 1996, Visiting Faculty at LLNL
July 1995 - August 1995, Visiting Faculty at LLNL
July 1994 - September 1994, Visiting Faculty at LLNL
July 1993 - September 1993, Visiting Faculty at LLNL
July 1992 - August 1992, Visiting Faculty at LLNL
July 1991 - September 1991, Visiting Faculty at LLNL
August 1987 - September 1987, Visiting Scientist
SRI International
August 1987, Visiting Assistant Research Engineer,
University of California, Berkeley
July 1987 - August 1987, Visiting Assistant Research Engineer,
University of New Mexico, Albuquerque
July 1986 - August 1986, Visiting Assistant Research Engineer,
University of California, Berkeley
July 1985 - August 1985, Visiting Faculty at LLNL

RESEARCH INTERESTS

Continuum mechanics including nonlinear thermomechanical processes. Constitutive equations for finite deformation of elastic-viscoplastic or viscoelastic media including metals, porous geological media and biological tissue. Cosserat theories of shells, rods and points including the application of the theory of Cosserat points to the formulation of numerical solutions of continuum problems.

SABBATICALS

August 1988 - April 1989, Sabbatical
New Mexico Engineering Research Institute
May 1989, Sabbatical, Visiting Professor

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ETH, Zurich, Switzerland

August 1989 - August 1990, Sabbatical, Visiting Faculty

Lawrence Livermore National Laboratory (LLNL)

September 1996 - June 1997, Visiting Professor

University of British Columbia, Vancouver, BC

September-October 2010, Visiting Professor, University of Tokyo

November - January 2010, Visiting Professor, University of Auckland

February - May 2010, Visiting Professor, ETH, Zurich

June - July 2010, Visiting Professor, University of Trento

September 2014, Visiting Professor, University of Victoria, British Columbia

October - November 2014, Visiting Professor, Ecole des Mines, Paris

December 2014 - February 2015, Visiting Professor, University of Auckland

TEACHING EXPERIENCE

Graduate

Introduction to Continuum Mechanics

University of California, Berkeley (Teaching Associate 1978-1979);

SRI International (1980); University of British Columbia (1996); Technion

Foundations of the Theory of Continuous Media

University of California, Berkeley (Teaching Associate, 1978); Technion

Advanced Elasticity, Technion

Cosserat Theories of Shells, Rods and Points, Technion

Undergraduate

Statics, Strength of Materials, Dynamics, Solid Mechanics I,

Applied Thermoelasticity, Technion

TECHNION ACTIVITIES

January 1996 - June 1996, Member of the Standing Senate Committee for
Appointments of Lecturers, etc.

December 2000 - December 2002, Member of the Standing Senate Preparatory
Committee

February 2005 - December 2008, Member of the Academic Court

November 2006 - December 2008, Elected member of the Academic Senate

March 2007 - February 2009, Chairman for Professional Committees

January 2009 - August 2009, Elected member of the Academic Senate

February 2009 - August 2009, Member of the Academic Court

March 2009 - August 2009, Chairman for Professional Committees

October 2010 - December 2012, Chairman for Professional Committees

January 2011 - December 2012, Committee for Appointment
of Research Professor

March 2012 - January 2014, Chairman of the Building Committee

January 2012 - July 2014, Technion Faculty-Student Committee

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February 2012 – June 2013, Technion committee to evaluate the curriculum and load on students

January 2013 - June 2014, Chairman of the Technion Faculty-Student Committee

DEPARTMENTAL ACTIVITIES

November 1995 - 1997, Organizer of the Forum for Nonlinear Mechanics in the Faculty of Mechanical Engineering at Technion

January - December 2000, Coordinator for Undergraduate Studies in the Faculty of Mechanical Engineering at Technion

January 2001 - December 2001, Vice Dean for Undergraduate Studies in the Faculty of Mechanical Engineering at Technion

March 2013 – Present, Member of the Faculty Committee for Improving Teaching

PUBLIC PROFESSIONAL ACTIVITIES

January 1972 - December 1972, President of ASME Student Chapter, University of Colorado, Boulder

June 1993 - June 1994, Chairman of the 25th Israel Conference on Mechanical Engineering, Technion, 25-26 May 1994

October 1994 - January 2005, Secretary of Israel Society for Theoretical and Applied Mechanics

March 1998 - August 2010, Member of the Editorial Board of Journal of Applied Mathematics and Physics (ZAMP)

July 1996 - June 2005, Member of the Editorial Board of the International Journal of Solids and Structures

January 2004 - Present, President of the Israel Society for Theoretical and Applied Mechanics

January 2004 - Present, Member of the General Assembly of the International Union of Theoretical and Applied Mechanics

September 2005 - Present, Member of the Editorial Board of the Journal of Mechanics of Materials and Structures.

March 2007 - Present, Member of the Editorial Board of the International Journal of Engineering Science.

November 2012 - Present, Member of the Bureau of the International Union of Theoretical and Applied Mechanics

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Tau Beta Pi

American Society of Mechanical Engineers

The Israel Society For Theoretical And Applied Mechanics

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HONORS

- August 1971 - July 1972, Western Electric Scholarship Fund
August 1972 - December 1972, Western Electric Scholarship Fund
October 1973 - June 1974, Odell Wilson Scholarship Fund
July 1974 - June 1977, National Science Foundation Fellowship
October 1984 - September 1985, Milton and Lillian Edwards Academic Lecturer
October 1985 - September 1986, Milton and Lillian Edwards Academic Lecturer
October 1986 - September 1987, Milton and Lillian Edwards Academic Lecturer
October 1986 - September 1987, Henri Gutwirth Fund For The Promotion
Of Research
- 1987 Landau Prize for my paper "An Elastic-Viscoplastic Model Exhibiting
Continuity Of Solid And Fluid States"
- 1991 David Doodi Ben-Aharon prize for research on "Large Deformation
Behavior of Elastic-Viscoplastic Materials".
- 2007 2007 Award for Best Applied Research from the American Rock
Mechanics Association (ARMA) for the article: Morris, J.P., Rubin, M.B.,
Blair, S.C., Glenn, L.A. and Heuze, F.E. (2004). Simulations of
underground structures subjected to dynamic loading using the distinct
element method. *Engineering Computations* **21**, 384-408. Awarded at the
US rock mechanics symposium held in San Francisco June 29-July 2,
2008.
- 2007 Technion award for excellence in teaching Dynamics (F07)
2008 Technion award for excellence in teaching Dynamics (F08)
2008 Technion award for excellence in teaching Continuum Mechanics (F08)
2009 Sept.-Oct: Japanese Society for the Promotion of Science (JSPS)
Fellowship, University of Tokyo.
2014 Yanai Prize for Excellence in academic education for the academic year
2013-2014.

GRADUATE STUDENTS

Post-Doctoral Researchers

1. August 2005 - February 2007. Dr. Mahmood Jabareen: GIF contract "Investigation
and extension of a new finite element formulations based on the theory of a
Cosserat point". Assistant Professor in the Faculty of Civil and Environmental
Engineering, Technion.
2. January 2009 - September 2010. Dr. Leah Sharipova: ISF contract "A Cosserat
Point Element for elastic-viscoplastic solids and fluids". Researcher in the Institute
of Mechanical Engineering Problems, Russian Academy of Sciences St. Petersburg
3. March 2011 - October 2011. Dr. Marc Hollenstein: ISF contract "A Cosserat Point
Element for elastic-viscoplastic solids and fluids". Researcher in ANSIS, Zurich,
Switzerland.

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D.Sc. or Ph.D Theses completed

1. October 1993. Mr. David Elata, D.Sc.: "Representations Of The Strain Energy Function Of Anisotropic Elastic Materials With Application To Damage Evolution In Brittle Materials". Principal advisor with Professor E. Altus as a co-advisor. Associate Professor in the Faculty of Mechanical Engineering, Technion.
2. January 1998. Mr. Ilia Roisman, D.Sc.: "Normal And Oblique Penetration Of Rigid And Deformable/Eroding Projectiles Into Elastic-Plastic Targets Including A Description Of Fragmentation And Vulnerability". Co-advisor with Professor A.L. Yarin as the principal advisor. Researcher, Center of Smart Interfaces, Technical University of Darmstadt.
3. March 2001. Mr. Eli Bar-On, Ph.D.: "Local response of brittle materials (ceramics) to impact", Co-advisor with Professor D. Yankelevsky as the principal advisor. Researcher at Rafael.
4. February 2011. Mr. Meir Brand, Ph.D.: "An elastic-plastic Cosserat Point Element for large deformations of impulsively loaded beams". Researcher at Rafael
5. July 2014. Mr. Zvi Cooper, Ph.D.: "A constitutive model for dynamic failure of ceramics including micro-cracking and porous dilation below the Hugoniot Elastic Limit". Started M.Sc. in October 2005 (Brakim). Transferred to direct Ph.D. track in June 2009. Researcher at Israel Aircraft Industries.

M.Sc. Theses completed

1. December 1989. Mr. Roie Chen, M.Sc.: "Second Order Effects In Elastic-Viscoplastic Materials Subjected To Finite Shear Strain". Principal advisor with Professor S. R. Bodner as a co-advisor.
2. June 1993. Mr. Avishay Lindenfeld, M.Sc.: "A Thermodynamic Treatment Of A Viscoplastic Model With Reference To The Stored Energy Of Cold Work". Completed. Co-advisor with Professor S. R. Bodner as the principal advisor. Researcher at Rafael.
3. May, 1999. Mr. Gilad Yossifon, M.Sc.: "Penetration Of A Rigid Projectile Into A Metal Multi-Layered Target And Characterization Of The Debris Cloud", Co-advisor with Professor A.L. Yarin as the principal advisor. Assistant Professor in the Faculty of Mechanical Engineering, Technion.
4. April 2002. Mr. Ben Nadler, M.Sc.: "Post-Buckling behavior of nonlinear elastic beams and truss-like structures (with beam elements) using the theory of a Cosserat point". Associate Professor in the Department of Mechanical Engineering, Victoria University, Victoria, British Columbia.

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5. April 2005. Mr. Meir Brand, M.Sc.: "A simplified constrained theory of a Cosserat point for the numerical solution of dynamic problems of nonlinear elastic rods". Researcher at Rafael.
6. April 2005. Mr. Or Yogev, M.Sc.: "Experimental and analytical investigation of dynamic lateral torsional post-buckling of an elastic beam-mass system using the theory of a Cosserat point." Co-advisor with Prof. I. Bucher and Prof. H. Flashner. Founder of an energy startup company in Israel.
7. July 2005. Mr. Doron Klepach, M.Sc.: "Influence of membrane stresses on postbuckling of rectangular plates using a nonlinear elastic 3-D Cosserat brick element".
8. August 2009. Mr. Zachi Katzir, M.Sc. (Brakim): "A simple formula for dynamic spherical cavity expansion in a compressible elastic-perfectly plastic material".
9. April 2011. Mr. Elad Serman-Cohen, M.Sc.: "Influence of machining processes on the performance of copper liners for Explosively Formed Projectiles (EFP)". Researcher at Rafael.
10. December 2011. Mr. Leonid Rapoport, (Raamim) M.Sc.: "Analysis of spherical cavity expansion in elastic-plastic media and its relevance to penetration mechanics". Ph.D student at MIT (Spring, 2015)
11. March 2012. Mr. Eli Hanukah, M.Sc.: "Development of a higher order tetrahedral Cosserat Point Element (CPE) for nonlinear elasticity". Ph.D. student in the Faculty of Mechanical Engineering at Technion.

Ph.D. Theses in Progress

1. Ms. Dana Solav, Started Oct. 2011 (with Prof. A Wolf)
Transferred to direct Ph.D. track in November 2012.
2. Mr. Mahmoud Safadi, Started Oct. 2011.
Transferred to direct Ph.D. track in May 2014

RESEARCH GRANTS

1994-1995, Grant of the MAFAT, State of Israel, 180,000 NIS.

Principal investigators: Yarin AL and Rubin MB

2005-2007, GIF - 2002963. 150,500 Euro. Investigation and extension of a new finite element formulation based on the theory of a Cosserat point.

Principal investigators: Rubin MB (Israel) and Wriggers P(Germany)

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2008-2012, ISF - 103/08. 521,000 NIS. A Cosserat Point Element for elastic-viscoplastic solids and fluids.

Principal investigator: Rubin MB

2012-2014, HP Indigo - SBB1885373. 100,000 NIS. Modeling the NIP - Developing a constitutive equation for the blanket.

Principal investigators: Rubin MB and Jabareen M

PUBLICATIONS

Ph.D Thesis

Rubin MB (1979) Some Applications Of The Theory Of Fluid Sheets, University of California, Berkeley.

Refereed papers in professional journals

Published papers (The names of graduate students are underlined)

1. Naghdi PM and Rubin MB (1981) On the transition to planing of a boat, *J. Fluid Mech.* **103**, 345-374.
2. Naghdi PM and Rubin MB (1981) On inviscid flow in a waterfall, *J. Fluid Mech* **103**, 375-387.
3. Rubin MB (1982) A thermoelastic-viscoplastic model with a rate-dependent yield strength, *J. Appl. Mech.* **49**, 305-311.
4. Naghdi PM and Rubin MB (1982) The effect of curvature at the detachment point of a fluid sheet from a rigid boundary, *Physics of Fluids* **25**, 1110-1116.
5. Rubin MB (1983) Experimental study of hydraulic fracturing in an impermeable material, *J. Energy Resources Tech.* **105**, 116-124.
6. Rubin MB (1983) A quantitative evaluation of the classical approximations used to predict the extent of vertical hydraulic fractures, *J. Energy Resources Tech.* **105**, 512-527.
7. Naghdi PM and Rubin MB (1984) On the squat of a ship, *J. of Ship Research; Society of Naval Architects and Marine Engineers*, **28**, 107-117.
8. Naghdi PM and Rubin MB (1984) Constrained theories of rods, *J. of Elasticity* **14**, 343-361.
9. Rubin MB (1985) On the theory of a Cosserat point and its application to the numerical solution of continuum problems, *J. Appl. Mech.* **52**, 368-372.

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10. Rubin MB (1985) On the numerical solution of one-dimensional continuum problems using the theory of a Cosserat point, *J. Appl. Mech.* **52**, 373-378.
11. Rosenau P and Rubin MB (1985) Motion of a nonlinear string - some exact solutions to an old problem, *Physical Review A* **31**, 3480-3482.
12. Rubin MB (1986) Free vibration of a rectangular parallelepiped using the theory of a Cosserat point, *J. Appl. Mech* **53**, 45-50.
13. Rubin MB (1986) An elastic-viscoplastic model for large deformation, *Int. J. of Engng. Sci.* **24**, 1083-1095.
14. Rubin MB (1986) Heat conduction in plates and shells with emphasis on a conical shell, *Int. J. of Solids Structures* **22**, 527-551.
15. Rosenau P and Rubin MB (1986) Some nonlinear three-dimensional motions of an elastic string, *Physica* **19D**, 433-439.
16. Rubin MB (1986) A uniqueness theorem for thermoelastic shells with generalized boundary conditions, *Q. of Appl. Math.* **XXIV**, 431-440.
17. Rubin MB (1987) On the numerical solution of nonlinear string problems using the theory of a Cosserat point, *Int. J. of Solids Structures* **23**, 335-349.
18. Rubin MB (1987) On the singular nature of linearization of certain constrained theories of shells, *J. Appl. Mech.* **54**, 472-474.
19. Rubin MB (1987) An elastic-viscoplastic model for metals subjected to high compression, *J. Appl. Mech.* **54**, 532-538.
20. Lindberg HE, Rubin MB, and Schwer LE (1987) Dynamic buckling of cylindrical shells from oscillating waves following axial impact, *Int. J. Solids Structures* **23**, 669-692.
21. Rubin MB (1987) On the numerical solution of spherically symmetric problems using the theory of a Cosserat surface, *Int. J. Solids Structures* **23**, 769-784.
22. Rubin MB (1987) An elastic-viscoplastic model exhibiting continuity of solid and fluid states, *Int. J. Engng. Sci.* **25**, 1175-1191.
23. Rubin MB (1988) The significance of pure measures of distortion in nonlinear elasticity with reference to the Poynting problem, *J. Elasticity* **20**, 53-64.

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24. Naghdi PM and Rubin MB (1989) The effects of energy dissipation on the transition to planing of a boat, *J. Ship Research*; Society of Naval Architects and Marine Engineers, **33**, 35-46.
25. Naghdi PM and Rubin MB (1989) On the significance of normal cross-sectional extension in beam theory with application to contact problems, *Int. J. Solids Structures* **25**, 249-265.
26. Rubin MB (1989) A time integration procedure for large plastic deformation in elastic-viscoplastic metals, *J. of Math. and Physics (ZAMP)* **40**, 846-871.
27. Rubin MB (1990) Analysis of weak shocks in 6061-T6 aluminum, Invited Paper: In *Shock Compression Of Condensed Matter* (Edited by SC Schmidt, JN Johnson, LW Davison) Elsevier Science Pub., B. V., 321-328.
28. Rubin MB (1990) Efficient time integration of a viscoplastic model for shock waves, *J. Appl. Phys.* **68**, 1356-1358.
29. Rubin MB (1990) An elastic-viscoplastic model for large deformations of soils", *ASCE J. Engineering Mechanics* **116**, 1995-2015.
30. Rubin MB (1990) Analysis of viscoplasticity in 6061-T6 aluminum, *J. Appl. Phys.* **68**, 4523-4530.
31. Luehr CP and Rubin MB (1990) The significance of projection operators in the spectral representation of symmetric second order tensors, *Computer Methods in Applied Mechanics and Engineering* **84**, 243-246.
32. Rubin MB (1991) A simple and convenient isotropic failure surface, *ASCE J. Engineering Mechanics* **117**, 348-369.
33. Rubin MB and Chen R (1991) Universal relations for elastically isotropic elastic-plastic materials, *ASME J. Appl. Mech.* **58**, 283-285.
34. Khen R and Rubin MB (1992) Analytical modelling of second order effects in large deformation plasticity, *Int. J. Solids Structures* **29**, 2235-2258.
35. Rubin MB (1992) Hyperbolic heat conduction and the second law, *Int. J. Engng. Sci.* **30**, 1665-1676.
36. Rubin MB and Yarin AL (1993) On the relationship between phenomenological models for elastic-viscoplastic metals and polymeric liquids, *J. Non-Newtonian Fluid Mech.* **50**, 79-88. Corrigendum, **57**, 321 (1995).

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37. Elata D and Rubin MB (1994) Isotropy of strain energy functions which depend only on a finite number of directional strain measures, *ASME J. Appl. Mech.* **61**, 284-289.
38. Rubin MB (1994) Plasticity theory formulated in terms of physically based microstructural variables – Part I: Theory, *Int. J. Solids Structures* **31**, 2615-2634.
39. Rubin MB (1994) Plasticity theory formulated in terms of physically based microstructural variables – Part II: Examples, *Int. J. Solids Structures* **31**, 2635-2652.
40. Bodner SR and Rubin MB (1994) Modeling of hardening at very high strain rates, *J. Appl. Phys.* **76**, 2742-2747.
41. Elata D and Rubin MB (1995) A new representation for the strain energy of anisotropic elastic materials with application to damage evolution in brittle materials, *Mechanics of Materials* **19**, 171-192.
42. Naghdi PM and Rubin MB (1995) Restrictions on nonlinear constitutive equations for elastic shells, *J. Elasticity* **39**, 133-163.
43. Rubin MB, Rosenau P and Gottlieb O (1995) A continuum model of dispersion caused by an inherent material characteristic length, *J. Appl. Phys.* **77**, 4054-4063.
44. Rubin MB (1995) Numerical solution of two- and three-dimensional thermomechanical problems using the theory of a Cosserat point, *J. of Math. and Physics (ZAMP)* **46**, Special Issue, S308-S334. In *Theoretical, Experimental, And Numerical Contributions To The Mechanics Of Fluids And Solids*, Edited by J Casey and MJ Crochet, Birkhauser Verlag, Basel (1995).
45. Rubin MB and Bodner SR (1995) An incremental elastic-viscoplastic theory indicating a reduced modulus for non-proportional buckling, *Int. J. Solids Structures* **32**, 2967-2987.
46. Yarin AL, Rubin MB and Roisman IV (1995) Penetration of a rigid Projectile into an elastic-plastic target of finite thickness, *Int. J. Impact Engng.* **16**, 801-831.
47. Rubin MB, Elata D, and Attia AV (1996) Modeling added compressibility of porosity and the thermomechanical response of wet porous rock with application to Mt. Helen Tuff, *Int. J. Solids and Structures* **33**, 761-793.
48. Rubin MB and Attia AV (1996) Calculation of hyperelastic response of finitely deformed elastic-viscoplastic materials, *Int. J. Numerical Meth. Engng.* **39**, 309-320.

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49. Rubín MB (1996) Restrictions on nonlinear constitutive equations for elastic rods, *J. Elasticity* **44**, 9-36.
50. Rubín MB and Gottlieb O (1996) Numerical solutions of forced vibration and whirling of a nonlinear string using the theory of a Cosserat point, *J. of Sound and Vibration* **197**, 85-101.
51. Rubín MB (1996) On the treatment of elastic deformation in finite elastic-viscoplastic theory, *Int. J. Plasticity* **12**, 951-965.
52. Rubín MB (1997) Relationship of critical flow in waterfall to minimum energy head, *ASCE J. Hydraulics Engng.* **123**, 82-84.
53. Rubín MB (1997) An intrinsic formulation for nonlinear elastic rods, *Int. J. Solids Structures* **34**, 4191-4212.
54. Roisman IV, Yarin AL and Rubín MB (1997) Oblique penetration of a rigid projectile into an elastic-plastic target, *Int. J. Impact Engng.* **19**, 769-795.
55. Rubín MB (1998) Physical restrictions on the impulse acting during three-dimensional impact of two "rigid" bodies, *ASME J. Appl. Mech.* **65**, 464-469.
56. Rubín MB, Bodner SR and Binur NS (1998) An elastic-viscoplastic model for excised facial skin and SMAS, *ASME J. Biomechanical Engng.* **120**, 686-689.
57. Rubín MB (1998) On a continuum model of an intrinsic length scale, Proceedings EUROMECH-MECAMAT '97, *J. de Physique IV* **8**, Edited by A Bertram, F Sidoroff, EDP Sciences, Pr8-333 - Pr8-340.
58. Roisman IV, Weber K, Yarin AL, Hohler V and Rubín MB (1999) Oblique penetration of a rigid projectile into a thick elastic-plastic target: theory and experiment, *Int. J. Impact Engng.* **22**, 707-726.
59. Rubín MB, Vorobiev, OYu and Glenn LA (2000) Mechanical and numerical modeling of a porous elastic-viscoplastic material with tensile failure, *Int. J. Solids Structures* **37**, 1841-1871.
60. Rubín MB and Altus E (2000) An Alternative Method For Teaching Dynamics, *The Int. J. of Engineering Education* **16**, 447-456.
61. Rubín MB (2000) An exact solution for steady motion of an extensible string in multipulley belt drive systems, *ASME J. of Mechanical Design* **122**, 311-316.
62. Rubín MB (2001) A simple derivation of Cosserat theories of shells, rods and points, In *Advances in the Mechanics of Plates and Shells*, The Avinoam Libai

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Anniversary Volume, Solid Mechanics and Its Applications, Vol. 88, pp. 277-294. Kluwer, Dordrecht.

63. Rubin MB (2001) On The Theory Of A Cosserat Point And Shear Locking In Thin Beams, *Communications in Numerical Methods in Engineering* **17**, 201-213.
64. Rubin MB (2001) Numerical solution procedures for nonlinear elastic rods using the theory of a Cosserat point, *Int. J. Solids and Structures* **38**, 4395-4437.
65. Yossifon G, Rubin MB and Yarin AL (2001) Penetration of a rigid projectile into a finite thickness elastic-plastic target – Comparison between theory and numerical computations, *Int. J. Impact Engng.* **25**, 265-290.
66. Roisman IV, Yarin AL and Rubin MB (2001) Normal penetration of an eroding projectile into an elastic-plastic target, *Int. J. Impact Engng.* **25**, 573-597.
67. Rubin MB (2001) Physical reasons for abandoning plastic deformation measures in finite plasticity and viscoplasticity theory, *Archives of Mechanics* **53**, 519-539.
68. Rubin MB and Yarin AL (2002) A Generalized Formula For The Penetration Depth Of A Deformable Projectile, *Int. J. Impact Engng.* **27**, 387-398. Corrigendum, **31**, 1318-1320 (2005).
69. Bar-on E, Partom Y, Rubin MB and Yankelevsky DZ (2002) Porous compaction as the mechanism causing the Hugoniot Elastic Limit, *Int. J. Impact Engng.* **27**, 509-520.
70. Yossifon G, Yarin AL and Rubin MB (2002) Penetration Of A Rigid Projectile Into A Multi-Layered Target: Theory And Numerical Computations, *Int. J. Engng. Science* **40**, 1381-1401.
71. Rubin MB and Bodner SR (2002) A three-dimensional nonlinear model for dissipative response of soft tissues. *Int. J. Solids and Structures* **39**, 5081-5099. Corrigendum, **41**, 1739-1740 (2004).
72. Rubin MB (2003) On the quest for the best Timoshenko shear coefficient, *ASME J. Appl. Mech.* **70**, 154-157.
73. Rubin MB and Lomov I (2003). A thermodynamically consistent large deformation elastic-viscoplastic model with directional tensile failure. *Int. J. Solids and Structures* **40**, 4299-4318.
74. Bar-on E, Rubin MB and Yankelevsky DZ (2003) Thermo-mechanical constitutive equations for the dynamic response of Ceramics, *Int. J. Solids and Structures* **40**, 4549-4562.

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75. Nadler B and Rubin MB (2003) A new 3-D finite element for nonlinear elasticity using the theory of a Cosserat point, *Int. J. Solids and Structures* **40**, 4585-4614.
76. Nadler B and Rubin MB (2003) Determination of hourglass coefficients in the theory of a Cosserat point for nonlinear elastic beams, *Int. J. Solids and Structures* **40**, 6163-6188.
77. Rubin MB (2004). Buckling of elastic shallow arches using the theory of a Cosserat point. *ASCE J. Engrg. Mech.* **130**, 216-224.
78. Peled A, Rubin MB and Tirosh J (2004). Analysis of blank thickening in deep drawing processes using the theory of a Cosserat generalized membrane. *J. Mech. and Phys. of Solids* **52**, 317-340.
79. Rubin MB and Benveniste Y (2004). A Cosserat shell model for interphases in elastic media. *J. Mech. and Phys. of Solids* **52**, 1023-1052.
80. Morris JP, Rubin MB, Blair SC, Glenn LA and Heuze FE (2004). Simulations of underground structures subjected to dynamic loading using the distinct element method. *Engineering Computations* **21**, 384-408.
81. Rubin MB (2004). Restrictions on linear constitutive equations for a rigid heat conducting Cosserat shell. *Int. J. Solids and Structures* **41**, 7009-7033.
82. Nadler B and Rubin MB (2004) Post-buckling behavior of nonlinear elastic beams and three-dimensional frames using the theory of a Cosserat point, *Mathematics and Mechanics of Solids* **9**, 369-398.
83. Bodner SR and Rubin MB (2005). Modeling the Buckling of Axially Compressed Elastic Cylindrical Shells. *AIAA Journal* **43**, 103-110.
84. Rubin MB (2005) Numerical solution procedures for nonlinear elastic curved rods using the theory of a Cosserat point, *Mathematics and Mechanics of Solids* **10**, 89-126.
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12. Control Of Localization Using A Continuum Model For An Intrinsic Length Scale, The First Israel-France Bi-National Workshop on Failure of Materials, Kyriat Anavim, Israel, 11-12 May 1998.
13. Physical Restrictions On The Impulse Acting During Three-Dimensional Impact Of Two "Rigid" Bodies, The 27th Israel Conference On Mechanical Engineering, Haifa, 19-20 May 1998.
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1. 25th Israel Conference on Mechanical Engineering, Technion, 25-26 May 1994, Chairman

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2. James H. (Jimmy) Belfer Memorial Symposium on Nonlinear Mechanics, Technion, 12 June 1996, Chairman
3. 2nd European Mechanics of Materials Conference on Mechanics of Materials with Intrinsic Length Scale: Physics, Experiments, Modelling and Applications, Magdeburg, Germany, 23-26 February, 1998, Member of the Scientific Committee.
4. James H. (Jimmy) Belfer Memorial Symposium on Nonlinear Mechanics, Technion, 11 June 2000, Chairman
5. EDSA2002, 6th Biennial Conference on Engineering Systems Design And Analysis, Istanbul, Turkey, 8-11 July, 2002.
6. EUROMECH Colloquium 510. Mechanics of Generalized Continua: A hundred years after the Cosserats. Paris 13-16 May 2009, Member of the Scientific Committee.
7. Cosserat + 100: International conference on the legacy of "Theorie des Corps Deformables" by Eugene and Francios Cosserat in the centenary of its publication. Paris 15-17 July 2009. Member of the Scientific Committee.

INVITED COURSES

Introduction to Continuum Mechanics, Department of Mechanics, ETH, 15-25 September 2003.

A 3-D brick Cosserat Point Element (CPE) for nonlinear elasticity, CISM Course: Computational and Experimental Mechanics of Advanced Materials, Udine, Italy, 8-12 September 2008.

Cosserat Point Elements (CPEs) for nonlinear elasticity. Ecole des Mines, Paris, October-November 2014.

SEMINARS

1. On The Transition To Planing Of A Boat, University of California, Berkeley, 7 May 1981.
2. On The Transition To Planing Of A Boat, Stanford University, 21 May 1981.
3. On The Theory Of A Cosserat Point And Its Application To The Numerical Solution Of Continuum Problems, Israel Society For Theoretical And Applied Mechanics - Tel Aviv, 15 May 1984.
4. On The Theory Of A Cosserat Point And Its Application To The Numerical Solution Of Continuum Problems, SRI International, 23 July 1984.

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5. On The Theory Of A Cosserat Point And Its Application To The Numerical Solution Of Continuum Problems, Lawrence Livermore National Laboratory, 27 July 1984.
6. On The Theory Of A Cosserat Point And Its Application To The Numerical Solution Of Continuum Problems, ETH, Zurich, February 1986.
7. On The Numerical Solution Of Spherically Symmetric Problems Using The Theory Of A Cosserat Point, University of Southern California, 9 September 1986.
8. On The Numerical Solution Of Spherically Symmetric Problems Using The Theory Of A Cosserat Point, University of New Mexico, September 1986.
9. An Elastic-Viscoplastic Model Exhibiting Continuity Of Solid And Fluid States, Air Force Weapons Laboratory, Kirtland Air Force Base, Albuquerque, 14 August 1987.
10. An Elastic-Viscoplastic Model Exhibiting Continuity Of Solid And Fluid States, ETH, Zurich, 15 February 1988.
11. A Model For Anisotropic Elastic-Viscoplastic Metals Subjected To High Compression, ETH, Zurich, 18 February 1988.
12. On The Numerical Solution Of Nonlinear String Problems Using The Theory Of A Cosserat Point, University of New Mexico, 28 February 1989.
13. An Elastic-Viscoplastic Model Exhibiting Continuity Of Solid And Fluid States, General Motors Research Laboratories, Warren, MI, 9 March 1989.
14. Significance Of Normal Cross-Sectional Extension In Beam Theory With Application To Contact Problems, ETH, Zurich, 25 May 1989.
15. An Elastic-Viscoplastic Model For Large Deformation Of Soils, Lawrence Livermore National Laboratory, 14 September 1989.
16. A Simple And Convenient Isotropic Failure Surface, Lawrence Livermore National Laboratory, May 1990.
17. A Simple And Convenient Isotropic Failure Surface, SRI International, August 1990.
18. Hyperbolic Heat Conduction And The Second Law, Ben Gurion University Of The Negev, 24 February 1993.
19. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, Lawrence Livermore National Laboratory, 1 September 1993.

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20. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, SRI International, 6 September 1993.
21. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, University of California, Berkeley, 15 September 1993.
22. Incremental Theory Of Nonproportional Plastic Buckling, The Israel Society For Theoretical And Applied Mechanics - Technion, 12 December 1993.
23. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, ETH, Zurich, 1 June 1994.
24. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, Delft University, 6 June 1994.
25. Calculation Of Hyperelastic Response Of Finitely Deformed Elastic-Viscoplastic Materials, SRI International, 8 September 1994.
26. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, Florida Atlantic University, 27 January 1995.
27. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, U.R.A. - C.N.R.S., Poitiers, France, 30 January 1995.
28. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, Universite Paris-Nord Institut Galilee, France, 1 February 1995.
29. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, Ecole Central de Lyon, France, 2 February 1995.
30. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, Otto-von-Guericke-Universitaet, Magdeburg, Germany, 20 October 1995.
31. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, National Technical University of Athens, Athens, Greece, 10 November 1995.
32. Intrinsic Equations Of Equilibrium For Nonlinear Elastic Rods, University of British Columbia, Vancouver, Canada, 29 October 1996.
33. Restrictions On Nonlinear Constitutive Equations For Elastic Shells, University of British Columbia, Vancouver, Canada, 13 November 1996.
34. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, Universidade de Brasilia, 12 March 1997.

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35. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, Universidade Federal do Rio de Janeiro COPPE, 18 March 1997.
36. An Intrinsic Formulation For Nonlinear Elastic Rods, Pontificia Universidade Catolica do Rio de Janeiro PUC, 19 March 1997.
37. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, Washington State University, Pullman, 2 April 1997.
38. An Intrinsic Formulation For Nonlinear Elastic Rods, University of Manitoba, Winnipeg, 8 April 1997.
39. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, University of Calgary, Calgary, 10 April 1997.
40. An Elastic-Viscoplastic Model For Excised Facial Skin And SMAS, Pennsylvania State University, 6 May 1997.
41. A Critical Discussion of the Role of Computers in Engineering Education, SETI (Science, Engineering and Technology Innovations) Speakers Series, Green College, University of British Columbia, Vancouver, 13 May 1997.
42. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, University of Michigan, Ann Arbor, 19 May 1997.
43. An Elastic-Viscoplastic Model For Excised Facial Skin And SMAS, University of Buffalo, Buffalo, 23 May 1997.
44. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, University of Toronto, Toronto, Canada, 26 May 1997.
45. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, Darmstadt University of Technology, Darmstadt Germany, 27 February 1998.
46. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, ETH, Zurich, 7 September 1998.
47. An Elastic-Viscoplastic Model For Excised Facial Skin And SMAS, ETH, Zurich, 8 September 1998.
48. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, University of Chicago, 12 February 1999.
49. Numerical Solution Procedures for nonlinear Elastic Rods Using the Theory of a Cosserat Point, University of California, Berkeley, 17 February 1999.

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50. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, Georgia Tech., 1 March 1999.
51. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, Istanbul Technical University, September 1999.
52. Numerical Solution Procedures for nonlinear Elastic Rods Using the Theory of a Cosserat Point, Istanbul Technical University, September 1999.
53. Modeling Inelastic Response of Excised Facial Skin and SMAS, Istanbul Technical University, September 1999.
54. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, CalTech, 24 February 2000.
55. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, Oxford University, 16 October 2000.
56. On The Treatment Of Elastic Deformation In Finite Plasticity Theory, University College Dublin, 18 October 2000.
57. Numerical Solution Procedures for nonlinear Elastic Rods Using the Theory of a Cosserat Point, ETH, Zurich, 29 June 2001.
58. Physical Reasons for Abandoning Plastic Deformation Measures in Plasticity and Viscoplasticity Theory, Lawrence Livermore National Laboratory, 23 August 2001.
59. Physical Reasons for Abandoning Plastic Deformation Measures in Plasticity and Viscoplasticity Theory, L'Ecole des Mines, Centre des Materiaux, Evry , 4 October 2001.
60. Physical Reasons for Abandoning Plastic Deformation Measures in Plasticity and Viscoplasticity Theory, Texas A&M, 6 March 2002.
61. Elimination Of Shear Locking In Thin Elastic Beams Using The Theory Of A Cosserat Point, Texas A&M, 7 March 2002.
62. Physical Reasons for Abandoning Plastic Deformation Measures in Plasticity and Viscoplasticity Theory, Otto-von-Guericke-Universitaet, Magdeburg, Germany, 2 May 2002.
63. Elimination Of Shear Locking In Thin Elastic Beams Using The Theory Of A Cosserat Point, Weierstrass Institute, Berlin, 3 May 2002.

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64. A Thermodynamically Consistent Large Deformation Elastic-Viscoplastic Model With Directional Tensile Failure, Lawrence Livermore National Laboratory, 2 August, 2002.
65. Numerical applications of the theory of a Cosserat Point, University of California, Berkeley, 6 February 2003.
66. Numerical applications of the theory of a Cosserat Point, Stanford University, 13 February 2003.
67. Numerical applications of the theory of a Cosserat Point, Institute for Computational Mechanics, University of Hanover, Hanover, Germany, 16 June 2003.
68. Restrictions on linear constitutive equations for a rigid heat conducting Cosserat shell, ETH, Switzerland, 4 February 2004.
69. A simple time-dependent model for an aging face, University of California, Berkeley, 21 February 2005.
70. A generalized 3-D Cosserat point brick element for nonlinear elasticity: Comparison with other element formulations, University of Alberta, Edmonton, 5 March 2007.
71. An improved 3-D brick Cosserat Point Element (CPE) for nonlinear elasticity. ETH, Zurich, 10 May 2007.
72. Physically based invariants for nonlinear elastic orthotropic materials. Ben Gurion University, 27 March 2008.
73. Surprising failures of the patch test. ISCM-24. The 24th Israel Symposium on Computational Mechanics. Tel Aviv University. 3 April 2008.
74. Physical Reasons for Abandoning Plastic Deformation Measures in Plasticity and Viscoplasticity, Earthquake Research Institute, Tokyo University, 4 September 2009.
75. A simple time-dependent model of an aging face. Riken, Tokyo, Japan. 10 September, 2009.
76. Physical Reasons for Abandoning Plastic Deformation Measures in Plasticity and Viscoplasticity, Ehime University, Shikoku, Japan 24 September 2009.
77. Brittleness of fracture in flowing Magma. Earthquake Research Institute, Tokyo University, 30 October 2009.
78. A simple time-dependent model of an aging face. Bioengineering Institute, University of Auckland. 10 November 2009.

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79. Physical reasons for abandoning plastic deformation measures in plasticity and viscoplasticity, ETH, Zurich 27 April 2010.
80. A simple time-dependent model of an aging face. University of Aachen. 3 May 2010.
81. Physical reasons for abandoning plastic deformation measures in plasticity and viscoplasticity, University of Trento, Italy 9 June 2010.
82. A simple time-dependent model of an aging face. University of Trento, Italy 14 June 2010.
83. A generalized Cosserat point element (CPE) for nonlinear elasticity. University of Trento, Italy 23 June 2010.
84. Brittleness of fracture of flowing magma. Lawrence Livermore National Laboratory. Livermore, CA, 31 August 2010.
85. Brittleness of fracture of flowing magma. Texas A&M, College Station. 11 November 2010.
86. Brittleness of fracture of flowing magma. Tel Aviv University. 7 March 2011.
87. A quadratic ten node tetrahedral Cosserat point element (CPE) for nonlinear elasticity. ISCM-30 Tel Aviv University, 30 March 2011.
88. The Cosserat Point Element (CPE): A new approach for finite elements. Simulia, Providence RI, 3 August 2011.
89. The Cosserat Point Element (CPE): Physically based invariants for nonlinear elastic orthotropic solids. Simulia, Providence RI, 3 August 2011.
90. The Cosserat Point Element (CPE): Unphysical arbitrariness in constitutive equations for elastically anisotropic nonlinear elastic-viscoplastic solids. Simulia, Providence RI, 3 August 2011.
91. The Cosserat Point Element (CPE): A new approach for finite elements. LSTC, Livermore CA, 9 August 2011.
92. The Cosserat Point Element (CPE): A new approach for finite elements. Schlumberger, Boston MA, 2 September 2011.
93. The Cosserat Point Element (CPE): Physically based invariants for nonlinear elastic orthotropic solids. ETH Zurich, 21 September 2011.

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94. A simple time-dependent model of an aging face. HP Indigo, Rehovot. 3 April 2012.
95. Modeling a smooth elastic-inelastic transition with a strongly objective numerical integrator needing no iteration. Lawrence Livermore National Laboratory, 2 August 2013.
96. Removal of unphysical arbitrariness in constitutive equations for elastically anisotropic nonlinear elastic-viscoplastic solids. Lawrence Livermore National Laboratory, 8 August 2014.
97. Modeling a smooth elastic-inelastic transition with a strongly objective numerical integrator needing no iteration. University of Victoria, 10 September 2014.
98. Modeling rate-independent hysteresis in large deformations of preconditioned soft tissues. University of Victoria, 24 September 2014.
99. Modeling a smooth elastic-inelastic transition with a strongly objective numerical integrator needing no iteration. Ecole des Mines, Paris, 16 October 2014.

TECHNION SEMINARS

1. On The Transition To Planing Of A Boat, Faculty of Mechanical Engineering, 13 December 1982.
2. On The Theory Of A Cosserat Point And Its Application To The Numerical Solution Of Continuum Problems, Faculty of Mechanical Engineering, 9 January 1984.
3. On The Theory Of A Cosserat Point And Its Application To The Numerical Solution Of Continuum Problems, Faculty of Aeronautical Engineering, 29 May 1984.
4. Heat Conduction In Plates And Shells With Emphasis On A Conical Shell, Faculty of Mechanical Engineering, 14 January 1985.
5. On The Numerical Solution Of Spherically Symmetric Problems Using The Theory Of A Cosserat Point, Faculty of Mechanical Engineering, 10 November 1986.
6. Dynamic Buckling Of Cylindrical Shells Due To Axial Impact (Theory And Experiment), Faculty of Aeronautical Engineering, 25 March 1988.
7. Hyperbolic Heat Conduction And The Second Law, Faculty of Mechanical Engineering, 4 May 1992.
8. Plasticity Theory Formulated In Terms Of Physically Based Microstructural Variables, Faculty of Mechanical Engineering, 14 March 1994.

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9. Modeling Nonlinear Geometric, Material, And Dissipational Properties Of A String Using The Theory Of A Cosserat Point, James H. Belfer Memorial Symposium, 8-10 May 1995.
10. Restrictions On Nonlinear Constitutive Equations For Elastic Shells, 19 June 1995.
11. On A Continuum Model Of An Intrinsic Length Scale, 24 November 1997.
12. Cosserat Theories: Shells, Rods & Points, James H. Belfer Memorial Symposium, 26 October 1998.
13. Numerical Solution Procedures for nonlinear Elastic Rods Using the Theory of a Cosserat Point, 25 January 1999.
14. Modeling Inelastic Response Of Excised Facial Skin And SMAS, Program for Excellent Students, 5 May 1999.
15. Modeling Inelastic Response Of Excised Facial Skin And SMAS, Workshop on Tissue Engineering, October 1999.
16. Multiple Nonlinear Solutions Of A Whirling String, James H. Belfer Memorial Symposium, 11 June 2000.
17. Elimination Of Shear Locking In Thin Elastic Beams Using The Theory Of A Cosserat Point, 20 May 2002.
18. Numerical applications of the theory of a Cosserat Point, 16 December 2002.
19. Restrictions on linear constitutive equations for a rigid heat conducting Cosserat shell, 10 May 2004.
20. A simple time-dependent model for an aging face. 6 January 2005.
21. An improved 3-D brick Cosserat Point Element (CPE) for nonlinear elasticity. 21 May 2007.
22. Brittleness of fracture of flowing magma. 1 November 2010.
23. Modeling a smooth elastic-inelastic transition with a strongly objective numerical integrator needing no iteration. 16 December 2013.