

October, 2011

CURRICULUM VITAE

Eli ALTUS (ID-010138741)
The Henri Garih Chair in Mechanical Engineering
Faculty of Mechanical Engineering
Technion, IIT, Haifa, 32000 Israel
Email: altus@tx.technion.ac.il

PERSONAL:

Date and Place of Birth: November 17, 1948, Haifa, Israel.
Family Status: Married, 2 children.

ACADEMIC DEGREES:

1973	B.Sc. Mechanical Engineering,	Technion IIT
1976	M. Sc. Materials Science,	Technion IIT
1979	D.Sc. Technical Sciences,	Technion IIT

ACADEMIC APPOINTMENTS:

Technion - Israel Institute of Technology, Faculty of Mechanical Engineering:

2007	Henry Garih Chair in Mechanical Engineering
2004-	Professor
1992- 2004	Associate Professor, Faculty of Mechanical Engineering, Technion
1997- 1999	Head, Department of Pre-U Studies and Youth Activities, Technion
1986	Tenure
1985-1992	Senior Lecturer,
1981-1985	Lecturer.
1976-1979	Instructor.
1973-1976	Assistant

Micromechanics Lab, Faculty of Chemistry, Weizmann Inst. of Science, Rehovot, Israel
1999-2000 Visiting Prof.

Center for Morphological Mathematic, Ecole de Mines de Paris
Summer 1999, Visiting Prof.

Department of Mechanical Engineering, University of British Columbia
Summer 1994, Visiting Prof.

Institute for Aerospace Studies, University of Toronto:
1987-1988, Visiting Prof.

School of Engineering and Applied Science, G.W. University, Washington, D.C.:

1982		Senior Research Engineer
1981	Research Engineer	
1979-1980	Post-Doctoral Fellow	

RESEARCH INTERESTS:

micromechanics, multiscale phenomena, functional perturbation methods, random media, non-homogeneous materials, damage mechanics, morphology, fatigue, failure, composite materials, symmetry, bounds, generalization approaches, teaching-learning approaches

TEACHING EXPERIENCE:

1. Faculty of Mechanical Engineering, Technion

a. Graduate Courses: (* - original course)

1. Analytical Dynamics
2. Mechanics of Composite Materials I
3. Mechanics of Composite Materials II
4. Introduction to Continuum Mechanics
5. Introduction to the Micromechanics*
6. Micromechanics of solids 1*

b. Undergraduate Courses:

1. Statics
2. Dynamics
3. Strength of Materials I
4. Strength of Materials II
5. Advanced Strength of Materials
6. Mechanical Design I
7. Mechanics of Solids
8. Design and experiments of structures
9. Analysis of Structures
10. Material Science
11. Applied Elasticity
12. Experimental methods

c. Continuing education and external studies:

A 24 lectures course on "Fatigue failure of materials and structures" (1993, 1994)

2. The institute for Aerospace Studies, University of Toronto

Graduate Courses:

1. Mechanics of Composite Materials I
2. Mechanics of Composite Materials II

PUBLIC PROFESSIONAL ACTIVITIES

- 2006 - 2010 - Vice dean for graduate studies
- 2006 - 2010 - CISM (Italy), board member
- 2003 - 2004 - ISF, committee on materials and structures (head)
- 2002 - - Council for high education – committee on college accreditation
- 1999 - 2001 - Ministry of Science: research evaluation committee (advanced materials)
- 1998 - 1999 - ISF, Member, professional committee (Material Science)
- 1997 - 1999 - Head, Department of Pre-University Studies and Youth Activities,
- 1995 - 1996 - Assistant Dean for teaching, Faculty of Mechanical Engineering

- 1994 - 1995 - Coordinator of undergraduate studies, Faculty of Mech. Eng.
- 1994 - 2009 - Member, committee for engineering licensing, Ministry of Labor
- 1992 - 1994 - Faculty coordinator with pre-University students

MEMBERSHIP in Scientific and Professional Associations:

1. Editorial Board, Journal of Fatigue and Fracture of Engineering Materials and Structures (FFEMS)
2. ASME, Associate Member
3. Israel Society of Theoretical and Applied Mechanics
4. ASM, ESIS

AWARDS:

- 1982 - Best Lecturer Award, Technion
- 1984 - Best Lecturer Award, Faculty of Mechanical Engineering
- 1986 - Best Lecturer Award, Faculty of Mechanical Engineering
- 1990 - Muriel and David Jacknow Award for Excellence in Teaching
- 1998 - Salomon Mannie award for Excellence in Teaching
- 1999 - Michael fellowship, Weizmann Institute
- 2006 – Best faculty lecturer (student's award)
- 2008 – Best lecturer award (twice, Technion)

SUPERVISION:

a. Post-doc graduates

- Dr. Golubchick, A., 1994-1998
- Dr. Proskura, A., 2002-2004
- Dr. Givli S., 2005-2006

b. Ph.D (D.Sc.) Graduates (completed):

1. Adan, M., 1991, "Buckling of multiply delaminated composite laminates"
(Jointly with Prof. I. Sheinman)
2. Zonenraich, B., 1993, "Statistical approach to the fracture of ceramic materials"
(Jointly with Prof. M. Perl)
3. Khen, R., 1994, "Micromechanic Models for fatigue".
4. Herszage, A., 1995, "Micromechanic of Deformation and Failure".
5. Konstantino, E., 2000, "Mechanical properties of Laser surface treatment"
(Shwartz award)
6. Nakash, R., 2002, "Mechanics of stochastically anisotropic beams"
(Pnueli's award)
7. Glikman, Z., 2005, "Embedded Fiber-Optic behavior in composite materials
8. Givli, S., 2005, "Strength of Heterogeneous Microbeams"
(Wolf award, Applied Materials prize)
9. Totry, E., 2005, "Buckling of Heterogeneous microstructures"
(Vatat Award)

10. Saffury, J., 2010, "Optimization of heterogeneous viscoelastic beams for cutting tools"
11. Bar-On B., 2010, "Surface effects of heterogeneous nano-beams"

c. M.Sc. Graduate students (completed):

1. Dorogoy, A., 1985, "Three-Dimensional Analysis of Delamination in a Bonded Structure".
2. Haber, O., 1985, "Engineering Failure Envelope for a Bonded Structure". (Jointly with Prof. J. Tirosh)
3. Drive, Y., 1987, "Failure of Composites Subjected to Biaxial Loading". (Jointly with Prof. P. Bar Yoseph)
4. Bagizada, Y., 1990, "Failure Mechanisms of Filament Wound Composite Tubes".
5. Herszage, A., 1990, "2-D Analysis of a Cohesive Micromechanical Fatigue Model".
6. Bergerson, E., 1990, "Mechano-Chemical Fatigue Model for Hybrid Composites".
7. Yifrach, Y., 1991, "A New Method for Evaluating Fracture Toughness of Ceramics", (Jointly with Prof. J. Tirosh)
8. Levy, H., 1991, "Failure of Cylinders made from Woven Fiber Composite" (Jointly with Prof. O. Ishai)
9. Raz, S., 1992, "Delamination Fatigue Threshold of Composite Laminates".
10. Ashkenazi A., 1992, "Radial cracking of a thick walled cylinder due to internal thermal shock". (Jointly with Prof. M. Perl)
11. Shenhar, Y., 1993, "Bending and Failure of Composite Sandwich Beams". (Jointly with Prof. S. Frostig)
12. Kisin, A., 1994, "Effect of coating on the fatigue resistance of polymers"
13. Konstantino, E., 1996, "Improving Fatigue resistance by a laser surface treatment"
14. Lalazar, R., 1998, "Micromechanics of fatigue of chopped fiber Composites"
15. Refaeli, Z., 1999, "Dynamic properties of piezoelectric materials"
16. Glikman, A., 2001, "Morphology characterization of composites"
17. Abedsalah, S., 2002, "Fatigue resistance of Shape Memory Alloys"
18. Gerstman, Z., 2004, "Micromechanic modeling of multilevel Fatigue Failure"
19. Betman R., 2006, "Vibration of composite, nonhomogeneous plates"
20. Saffury, J., 2006, "Limit analysis of heterogeneous elasto-plastic structures"
21. Nachum, S., 2007, "Vibrations of heterogeneous structures"
22. Pagi G., 2007, "Air-Polymer analogy for air flow in rubber-metal interface"
23. Zarrouk D., 2008, "Accuracy of the Functional Perturbation Method"
24. Fruchter N., 2008, "Hygrothermal failure of Phenolic composites"
25. Kirikov M., 2009, "Semi-Analytical Optimization for structural buckling"
26. Azulay C., 2009, "Morphology for extreme local stresses"
27. Ben Atia A., 2009, "Morphology geometry and loading interaction in stochastic heterogeneous structures"
28. Rajovitsky E., 2010, "Micromechanics of Fatigue Modelling", (transferred to direct PhD program)
29. Eitan N., 2010, "Micromechanical properties of powders"
30. Nissenbaum O., 2011, "Exact stochastic averages of buckling loads"
31. Eichenbaum A., 2011, "Heterogeneity estimates from surface response based on atomistic models"
33. Greenberg R., 2011, "Dynamic-stochastic response of nonuniform beams"
34. Israel I., 2011, "FPM for boundary effects"

35. Shani E., 2011, "small probability cases in stochastically heterogeneous structures"
6. Arie G., 2011, "Fatigue Crack Initiation study by AFM morphology analysis"

M.E.

1. Goldman A., 2001, "Analysis of geometrical structures by morphological tools"
2. Ben-Ari, T., 2004, "Thermal damage of Fiber Composites"
3. Walich E., 2006, "Strength analysis of composite pipes"
4. Sagie Shual 2006, "Stress waves in stochastically composite structure"
5. Vecsler I., 2006, "Mechanical failure of helicopter joint"
6. Rubinov E., 2007, "Morphology aspects of heterogeneous beams"
7. Shindler Z., 2009, "Effect of emersion of Atzetel in low reactant solution on its strength"

d. Graduate students (in progress):

Ph.D.

1. Rajovitsky E., (transferred to direct PhD program) "Micromechanics of Fatigue Modelling"
2. Kirikov M.,

M.Sc.

1. Voronov A.,

RESEARCH GRANTS

- 2006 - "Viscoelastic properties and micromechanics of propellant materials", IMI annual 12K\$
- 2006 – 2011 "Modelling and prediction of hygrothermal failure by edge effects", IMI (35K\$), with Prof. Ishai
- 2006 – 2009 "Improvement of the dynamic response of cutting tools", ISCAR (45K\$)
- 2003 – 2006 "Nanotechnology and quantum mechanics" (PI, with Prof. S. Hoz, Bar Ilan U), MAFAT, (20K\$ annually)
- 2003 – 2004 "Improving strength analysis of composite nozzles" IMI, \$25K (PI)
- 2003 – 2006 "Hygrothermal failure analysis of Carbon-Phenolic composites", IMI, \$45K (with O.Ishai. (PI))
- 2002 - 2006 "Microstresses in thin films", 4 years, \$22K annually, Israel Science Foundation, (PI)
- 1998 - 2002 "Fatigue properties of Magnesium alloys", (PI) ~\$45K annually - Consortium Magnesium (with M. Weiss)
- 1989 - 1991 "Toughness measurement of brittle materials by a new compressive test specimen" (PI). ~\$20K ann. - Ministry of Science and Technology (with J. Tirosh).
- 1983 - 1985 "Structural Performance of Hybrid Composite Materials" ~\$20K annual - Ministry of defense, Israel (with O. Ishai, J. Lifshitz)

- 1981- 1983 "Fracture Mechanics Evaluation of Bonded Structures",
ONR, Washington, D.C., (Jointly with J. Tirosh)
- 1981-1983 "Durability of Structural Adhesively Bonded Systems",
U.S. Army, (with O. Ishai)

CONSULTING

Consultation for outside institutions or companies through the Technion Institute for Research and Development:

a. Recent:

- 2005- - "Vibration resistance of cutting tool holders", ISCAR
- 2003 - "Technological evaluation of a non lethal weapon"- "Rochesh
- 2002- - "Fatigue failure of cutting tools" – "Iscar"
- 2001 - Fatigue failure of Stirling cooler - "Ricor"
- 2000 - "Thermal cycling failure of composite glass" - "Shellcase"
- 2000-3- "Failure of viscoelastic polymer foams".- (IMI)
- 2000 - "Failure of a submarine subsystem under pressure" - Israeli Navy
- 1999 - "Strength of Conveyor belts" - Rotem Negev Ltd
- 1999 - "Failure of Brom container" - Brom Compounds Ltd
- 1999 - "Fatigue Failure of central conveyor" - Haifa Chemicals
- 1999 - "Fatigue of underwater pipeline" - Petroleum & Energy Infrastructures
- 1999 - "Strength of ceramic adhesives" - Nanomotion
- 1998 - "Fatigue failure of welded structures" - Haifa Chemicals
- 1996-7- "Size effect of ceramics under fatigue" - "Microswiss"
- 1995 - "Fatigue failure of welded structures", - Israeli Electricity Co.

b. Previous (not detailed)

- 1991-3 - IDF (Israel Defense Ministry)
- 1991-3 - IMI (Israel Military Industry)
- 1983-7- IAI (Israel Aeronautical Industries)
- 1978 - Mesco (Failure of steel structures)
- 1977 - Ziklag (Composite Material Analysis)

PUBLICATIONS

a. Theses:

1. M.Sc., Technion, 1976 (with distinction): "Fracture Mechanics Study in Fiber Reinforced Materials by Acoustic Emission Technique"
2. D.Sc., Technion, 1979 (with distinction): "Prediction of Strength for a Fiber Reinforced Multilayer Composite Laminates"

b. **Refereed papers in Professional Journals** (graduates or post-doc are underlined):

1. Altus, E., Rotem, A., 1977, "The Characteristics of Acoustic Emission from Fiber Reinforced Composite", Israel J. of Technology, 15:79-87
2. Rotem, A., Altus, E., 1979, "Fracture Modes and Acoustic Emission of Composite Materials", ASTM J. of Testing and Evaluation, 7:33-40
3. Altus, E., Rotem, A., Shmueli, M., 1980, "Free Edge Effect in Angle Ply Laminates -A 3-D Finite Difference Numerical Solution", J. Composite Materials, 14:21-31.
4. Altus, E., Rotem, A., 1981, "A 3-D Fracture Mechanics Approach to the Strength of Composite Materials", Int. J. of Engineering Fracture Mechanics, 14:637-644
5. Altus, E., 1982, "On the Plastic Deformation During Stable Crack Growth", J. of Computers and Structures, 15:61-70
6. Altus, E., Bar-Yoseph, P., 1983, "A 3-D Finite Difference Solution for Orthotropic Laminated Composites Using Curvilinear Coordinates", J. of Computers and Structures, 17:573-578
7. Altus, E., 1984, "The Finite Difference Technique for Solving Crack Problems", J. of Eng. Fracture Mechanics, 19:747-757
8. Altus, E., 1985, "3-Dimensional Singularities in Double Lap Joints", J. of Eng. Fracture Mechanics, 21:1097-1112
9. Altus, E., Ishai, O., 1986, "Transverse Cracking and Delamination Interaction in the Failure Process of Composite Materials", Int. J. of Composite Science and Technology, 26:59-79.
10. Altus, E., Haber, O. and Tirosh, J., 1986, "An Engineering Failure Envelope for Adhesive Joints", J. of Experimental Mechanics, 26:267-274.
11. Unger, W., Ko, H., Altus, E., Hansen, J.S., 1988, "Healing of Fiber Reinforced Thermoplastic Structures", Can. Aero. & Space J., 34:233-238
12. Altus, E., Dorogoy, A., 1989, "A Three Dimensional Study of Delamination", Eng. Fract. Mech., 33:1-19

13. Altus, E., 1989, "A Global-Local Interactive Method for Fast Convergence of Iterative Finite Difference Solution of PDE", *Int. J. Comput. & Struct.*, 33:915-921
14. Altus, E., Ishai, O., 1990, "The Effect of Soft Interleaved Layers on the Combined Transverse Cracking/Delamination Mechanisms in Composite Laminates", *J. Comp. Sci. Tech.*, 39:13-27
15. Altus, E., 1991, "Fatigue, Fractals and a Modified Miner's Rule", *J. App. Mech.*, 58:37-42
16. Altus, E., 1991, "A cohesive micromechanic fatigue model: Part I: Basic mechanisms", *Mechanics of Materials*, 11:271-280
17. Altus, E., 1991, "A cohesive micromechanic fatigue model: Part II: Fatigue creep interaction and Goodman diagram", *Mechanics of Materials*, 11:281-293
18. Altus, E., Bergerson, E., 1991, "Fatigue of hybrid Composites by a micromechanic Model", *Mechanics of Materials* 12:219-228
19. Altus, E., Ishai, O., 1992, "Delamination Buckling Criterion for Composite Laminates: A Macro Approach", *Eng. Fracture Mech.*, 41(5):737-751
20. Tirosh, J., Altus, E., Yifrach, Y., 1992, "A new method for evaluating fracture toughness of brittle materials", *Int. J. Fracture* 58:211-222
21. Sheinman, I., Adan, M., Altus, E., 1993, "On the role of the displacement function in Nonlinear Analysis of Beams on Elastic Foundation", *Thin Walled Structures*, 15:109-125
22. Sheinman, I., Adan, M., Altus, E., 1993, "Post-buckling analysis of Multiply Delaminated Laminates", *Int. J. Solids Structures*, 30(10):1289-1300
23. Ishai I., Livneh, M., Kief, O., Altus E., 1993, "Experimental and Analytical Model for the Role of Reinforced Asphaltic Membranes in Retardation of Reflection Cracking", *Int. J. Asphalt Paving and Technology*, 62
24. Adan, M., Sheinman, I., Altus, E., 1994, "Buckling of Multiply Delaminated Beams", *J. Composite Materials* 28(1):77-90
25. Adan, M., Sheinman, I. & Altus, E., 1994, "Post buckling behavior of beams under contact constrain", *J. Applied Mechanics*, 61:764-772
26. Khen, R., Altus, E., 1995, "Micro-Macro relations for fatigue crack growth", *J. Mechanics of Materials*, 19:89-101
27. Altus, E., Herszage, A., 1995, "Two-Dimensional Study of a Cohesive Micromechanic Fatigue Model", *J. Mechanics of Materials*, 20:209-223
28. Levy, H., Ishai, O., Altus, E., 1995 "Mechanical performance of thin walled tubular composite elements under uniaxial loading", Part I: Tensile behavior, *J. Composite Structures*, 31:163-170.

29. Levy, H., Ishai, O., Altus, E., 1995 "Mechanical performance of thin walled tubular composite elements under uniaxial loading Part II: compression loading", *J. Composite Structures*, 31:171-175
30. Khen, R., Altus, E., 1995, "Effect of a brittle mode on a unified micromechanic fatigue model", *J. Mechanics of Materials*, 21:169-189
31. Schajer, G.S., Altus, E., 1996, "Stress Calculation Error Bounds for Incremental Hole Drilling Residual Stress Measurements", *ASME J. Engineering Materials and Technology*, 118(1):120-126
32. Shenhar, Y., Frostig, Y., Altus, E., 1996, "Stresses and failure patterns in the bending of sandwich beams with transversely flexible cores and laminated composite skins" *Composite Structures*, 35:143-152
33. Konstantino, E., Altus, E., 1999, "Fatigue Life Enhancement by Laser Surface Treatment", *Surface Engineering*, 15(2):1-3
34. Golubchick, A., Altus, E., 1999, "A semi analytical method for elastodynamic problems in Semi-Infinite Medium", *J. Computational Mechanics*, 24(4):268-272
35. Rubin, M. B., Altus, E., 2000, "An Alternative method for Teaching Dynamics", *Int. J. of Eng. Education*, 16(5):447-456
36. Altus, E., Konstantino, E., 2001, "Optimum laser surface treatment of fatigue damaged Ti-6Al-4V alloy", *Material Science and Engineering A302*:100-105
37. Altus, E., 2001, "Statistical Modeling of Heterogeneous Microbeams", *Int. J. Solids & Structures*, 38:5915-5934
38. Altus, E., 2002, "Nonlinear differential equation for fatigue damage evolution by a micromechanic model ", *Int. J. Mechanics Of Materials*, 34(5):257-266
39. Altus, E., Gerstman, Z., Golubchick, A., 2002 (invited paper), "Two Level Fatigue Loading (H-L) of Mg Alloys: Micromechanic Modeling vs. Experiments", *Metallurgical Science and Technology*, 20(2):3-8
40. Altus, E., Givli, S., 2003, "Strength reliability of statistically heterogeneous microbeams", *Int. J. Solids & Structures*, 40(9):2069-2083
41. Altus, E., 2003, "On springs and matrices", *Int. J. Mechanical Engineering Education*, 31(3):215-225
42. Altus, E., Totry, E., 2003, "Buckling of stochastically heterogeneous beams, using a functional perturbation method", *Int. J. Solids & Structures* 40(23):6547-6565
43. Givli, S., Altus, E., 2003, "Effect of strength-modulus correlation on reliability of randomly heterogeneous beams", *Int. J. Solids & Structures* 40(24):6703-6722

44. Altus, E., 2003, "Analysis of Bernoulli beams with 3D stochastic heterogeneity", Probabilistic Engineering Mechanics 18(4):301-314
45. Totry, E., Altus, E., 2004, "Buckling design of stochastically heterogeneous beams", J. Mech. Behavior of Materials 14(6):339-354
46. Abu Salih, S., Altus, E., 2004, "One-dimensional constitutive behavior for pseudoelasticity effect in shape memory alloys", J. Mech. Behavior of Materials 14(6):397-412
47. Altus, E., Proskura, A., Givli, S., 2005, "A new Functional Perturbation Method for linear heterogeneous materials", Int. J. Solids and Structures, 42(5-6):1577-1595
48. Altus, E., Givli, S., 2004, "Fracture mechanics of stochastically heterogeneous double cantilever beam", Int. J. Fracture, 130:743 –763
49. Altus, E., Totry, E., Givli, S., 2005, "Optimized Functional Perturbation Method and Morphology Based Effective Properties of Randomly Heterogeneous Beams", Int. J. Solids and Structures, 42(8):2435-2449
50. Varenberg, M., Etsion I., Altus E., 2005, "Theoretical Substantiation of the Slip Index Approach to Fretting", Tribology Letters 19(4):263-264
51. Altus, E., 2005, "Size effect of micro-damage growth and its relation to fatigue life", ASTM STP 1461
52. Itzhaki L, Altus E, Basch H, Hoz S., "Harder than diamond: determining the cross sectional area and young's modulus of molecular rods" Angewandte Chemie-International Edition 44 (45): 7432-7435 2005
53. Givli, S., Altus, E., 2006, "Relation between Stochastic Failure Location and Strength in Brittle Materials", J. of Applied Mechanics, 73:698-701
54. Givli, S., Altus, E., 2006, "Optimized Functional Perturbation Method for the Strength-Reliability of Randomly Heterogeneous Beams", Structural Safety, 28:378-391
55. Altus, E., 2006, "Microstress estimate of stochastically heterogeneous structures by the Functional Perturbation Method", Probabilistic Engineering Mechanics, 21:434-441
56. Nakash, R., Altus, E., 2006, "Effect of Stochastically Anisotropic Morphology on the Mechanical Behavior of Microbeams", Probabilistic Engineering Mechanics, 21:352-365
57. Nahum, S., Altus E., 2006, "Natural Frequencies and Mode Shapes of Deterministic and Stochastic Non-Homogeneous Rods", Applied Mechanics and Materials, vols. 5-6, 207-215
58. Hoz S., Altus E., Pour N., 2006, "Auxetics at the Molecular Level: A Negative Poisson's Ratio in Molecular Rods", Angewandte Chemie-International Edition, 46 : 7432-7435

59. Totry, E., Altus, E., Proskura, A., 2007, "Buckling of non-uniform Beams by a Generalized Functional Perturbation Method", Int. J. Solids and Structures
60. Nahum S., Altus E., 2007, "Natural Frequencies and Mode Shapes of Deterministic and Stochastic Non-Homogeneous Rods and Beams", J. Sound and Vibrations 302:903 – 924
61. Itzhaki L, Altus E, Basch H, et al., 2008, "Non-bonded interactions: A hardening factor in nanomolecular rods" Journal Of Physical Chemistry C , 112 (6): 1925-1928
62. Totry EM, Altus E, Proskura A, 2008, "A novel application of the FPM to the buckling differential equation of non-uniform beams", Probabilistic Engineering Mechanics (23(2-3): 339-346
63. Itzhaki L, Rozental E, Altus E, et al., 2008, "Conjugation in Polyynes: To What Extent Is Charge Delocalization Coupled to Geometrical Changes?", J Physical Chemistry A, 112(50):12812-12815
64. Glikman Z., Altus E., 2008, "Mechanical behavior of fiber optics embedded in heterogeneous matrix, Part I: Theory and Modeling", Zach Glikman and Eli Altus, AES Technical Reviews International Journal Series, Part B: International Journal of Advances in Mechanics and Applications of Industrial Materials (IJAMAIM), 1 (1):11-26, ISSN 1718-5505.
65. Hoz, S., Basch, H., Altus, E., Pour, N., 2009, "The Origin of the Auxetic Effect in Prismanes: Bowtie Structure and the Mechanical Properties of Biprismanes." The Journal of Physical Chemistry,
66. Saffury J., Altus E., 2009, "Optimized chatter resistance of viscoelastic turning bars", J. of Sound and Vibration, 324(1-2):26-39
67. Bar-On B., Altus E., 2009, "Stochastic surface effects in nano-beam sensors", Probabilistic Engineering mechanics, 25(2):228-234
68. Bar-On B., Altus E., Tadmor E., 2010, "Surface effects in non-uniform nanobeams: continuum vs. atomistic modeling", IJSS, 47(9):1243-1252
69. Saffury J., Altus E., 2010, "Chatter resistance of non-uniform turning bars with attached dynamic absorber - analytical approach", Journal of Sound and Vibration, 329(11):2029-2043
70. Pour, N, Altus, E., Basch, H., Hoz S., 2010, "Silicon vs. Carbon in Prismanes: Reversal of a Mechanical Property by Fluorine Substitution", Journal of Physical Chemistry C. 114(23):10386-10389
71. Itzhaki L., Altus E., Basch H., Hoz S., 2010, "Mechanical aspects of molecular rods", Journal of Molecular Structure: THEOCHEM 953:98–102
72. Kirikov M., Altus E., 2011, "Functional gradient as a tool for semi-analytical optimization for structural buckling", J. Computer and Structures, 89: 1563–1573

73. Rejovitzky E., Altus E., 2011, "A Micromechanical Fatigue Model with Damage Morphology", *International Journal of Fatigue*, **33**:1235 – 1243

74. Bar-On B., Altus E., 2011, "Effect of local surface residual stresses on the near resonance vibrations of nano-beams", *Journal of Sound and Vibration*

c. Accepted for publication:

75. Bar-On B., Altus E., 2011, "Clamped nano-beams as adsorption induced sensors: Linear and non-linear effects", *Probabilistic Engineering Mechanics*

76. Rejovitzky E., Altus E., 2001, "Non-commutative damage accumulation by material heterogeneity", *International Journal of Fatigue*, ACCEPTED (2011)

d. Submitted for publication:

Rejovitzky E., Altus E., "On Single Damage Variable Models for Fatigue", *International Journal of Damage Mechanics*, (2011)

Givli, S., Altus, E., "A unified perturbation method for linear heterogeneous materials"

Glikman Z., Altus E., "Mechanical behavior of fiber optics embedded in heterogeneous materials", Part II,

e. In Preparation

Azulay H., Altus E., "Effect of Neighbor Morphology on Local Stresses in Heterogeneous Materials"

f. Books / Chapters in books:

Altus E., Givli S., "Analysis of non-uniform materials and structures by the Functional Perturbation Method", in writing.

Altus, E., 2003, "Fatigue of Magnesium alloys: from micromechanic modeling to macro experiments", pp. 99-121, in *Magnesium alloys*, E. Aghion ed., The Consortium for the development of Magnesium Technology, S. Neeman Inst., Technion, Israel

g. Selected paper in composites

Paper #3 was selected in the book *Delamination in advanced composites*, 1991, Newaz G. M., ed., pp.85-94, Technomic Pub. The purpose of the book as stated in the preface is:

"...to provide a focal point for the significant research contribution in the subject area of delamination in advanced composites over the past twenty years..."

h. Textbooks and teaching manuals:

1. Altus, E., 1989, *Mechanics of Composite Materials - An Introductory Course*, Ontario Center for Material Research ISBN 0-919482-10-4, Book Review: Appl. Mech. Rev., 43 (6):B139, 1990, Toronto University press
2. Rubin, M. B., Altus, E., 1993, "Dynamics", "Strength of materials", Faculty of Mechanical Engineering

i. Selected research Reports:

1. Altus, E., Ishai, O., "Analysis and Design of Composite Materials Associated with Non-Destructive Testing". IDM-Contract No. 593/9748/9101, Technion Aug. 1987
2. Altus, E., "Foundation of a Mechano-Chemical Fatigue Theory", UTIAS Report No. 330, University of Toronto, 1988
3. Bar Yoseph, P., Altus, E., (May 1991) "Stress analysis of a lifting structure for helicopters", Research project for IDF, Israel
4. Altus, E., Bar Yoseph P., (May 1991) "Dynamic response of a rigid vehicle moving on a bridge" Research project to IMI, Israel
5. Altus, E., Yifrach, Y., (Sep.1991) "Effect of a soft layer on the stress intensity factor of a transverse crack caused by a vertical compression", (Part of a research for PAZCAR, for designing fatigue resisting materials of pavements)
6. Altus, E., (1993), "Fatigue strength of a welded structure", Rep. 722/240/93 for the Israeli Electrical Company
7. Altus, E., Weiss, M., (1999, 2000), "Fatigue of Magnesium Alloys", pp.24-29, Pub. Of The Neeman Institute For advanced studies in Science and Technologies (Consortium Magnesium)

CONFERENCES

a. Invited Papers:

1. Altus, E., 1994, "Improving Fracture and Fatigue resistance by Flexible Coatings: Experimental study of Basic Mechanisms", Int. Conf. Comp. Eng. (ICCE/1): 609-610
2. Altus, E., 1996, "Uncertainty parameters in a fatigue failure model: different measures on different scales", *Uncertainty: Models and measures*, Lambrecht, Germany, Natke & Ben Haim, eds., Math. Research vol.99, Akademic Verlag 207-217

3. Altus, E., 2003, "Analysis of stochastically heterogeneous microbeams by a functional perturbation method", 10th Inter. Symposium on Continuum Models and Discrete Systems, Bergman D.J., Inan E., Markov K.Z., eds. , 261-268, Kluwer 2004.
4. Altus, E., 2004, "Microstress estimates for heterogeneous media", Int. Conf. Heterogeneous Materials Mechanics (ICHMM-4), China
5. Altus, E., 2005, 9th International Conference on structural safety and reliability, Rome, Italy, "*Surphase Mechanics*"

b. Keynote lectures:

1. Altus, E., 2003, "Esthetics as a tool for teaching mechanics", 29th Israeli Conf. Mech. Eng., Israel

c. Selected Refereed papers in international conference proceedings (Graduates are underlined):

1. Altus, E., 1984, "An Assessment of the Relative Efficiency of Laminated Composite Materials for In-Plane Loading", 26th Israel Annual Conference on Aviation & Astronautics, pp. 27-30
2. Altus, E., 1985, "Three-Dimensional Singularities in Double-Lap Joints", the 3rd International Conference on Composite Structures, Scotland.
3. Ishai, O., Altus, E., 1986, "Hygrothermal Effects on Transverse Cracking Process of Multidirectional Hybrid Laminates", International Symposium on Composite Materials and Structures, Beijing, China.
4. Ishai, O., Bagizada, Y., Altus, E., 1989, "Failure Process in Filament Wound Kevlar/Epoxy Tubes Subjected to Internal Pressure", Proc. ASME PVP, 174:179-183
5. Katz, Y., Haftka, T.R., Altus, E., 1989, "Optimization of Fiber Directions For Increased Failure Load of a Plate With a Hole", Proc. American Society of Composites, 4th Technical Conference, Blacksburg VPI-SU, pp.62-71
6. Raz S., Altus, E., Sela, N, 1992, "Experimental study of Mode I Delamination of Carbon fiber Composites", 24rd Israel conference of mechanical Engineering, pp. 284-287.
7. Shenhar, Y., Frostig Y., Altus, E., 1992, "High order behavior of sandwich beam with a transverse flexible core and laminated composite skins", 24th Israel conference of Mechanical Engineering, p. 382-386
8. Khen, R., Altus, E., 1992, "Microcracks interaction in Fatigue by a one Dimensional Micromechanic model", 24th Israel conference of mechanical Engineering, p. 532-537

9. Kief, O., Livneh, M., Ishai, I., Altus, E., 1994, "Experimental and Analytical approaches for Analyzing Reflection Cracks Retardation", 5th Int. Conf. on Geotextiles, Geomembranes and related products, Singapore, pp. 250-253
10. Altus, E., Kisin, A., 1994, "Surface Crack Growth delay by a Flexible Coating", 25th Israel conference on Mechanical Engineering, pp.112-114
11. Altus, E., Golubchik, A., 1998, "A PZT system for Fatigue Loading of Small Ceramic Parts", 27th Israeli conference on Mechanical Engineering, pp. 686-688
12. Konstantino, E., Altus, E., 1998, "Fatigue life enhancement by a laser surface treatment", 27th Israel Conference on Mechanical Engineering
13. Altus, E., 2000, "Relation between Fractal Dimension of Damage Morphology and Fatigue Limit by a Micromechanic Statistic Model", 14th Eng. Mech. Conf., J.L. Tassoulas ed., Austin, TX, pp. 1-7 (on Disc).
14. Altus, E., Jeulin, D., 2000, "Fractal dimension Damage Growth by a statistical micromechanic Fatigue Model", 6th European conference On Advanced Materials and Processes 2000, Tours, France; Miannay, Costa, Francois, Pineau eds., pp.759-764
15. Altus, E., Gerstman, Z., Golubchick A., 2001, "Two level fatigue loading of Mg. Alloys: Micromechanic modeling vs. Experiments", 7th European conference On Advanced Mater. & Processes, Rimini, Italy, ISBN 88-85298-39-7, cdEuomat\Testi\742.doc
16. Altus, E., 2001, "Mechanics of Statistically Heterogeneous Microbeams", Mechanics and Materials Conference, San Diego, CA.
17. Altus, E., Givli, S., 2002, "Effects of Mesoscale size on strength and reliability of statistically heterogeneous microbeams", Proc. Int. Conf. On New challenges in Mesomechanics, Aalborg U., Denmark, pp.187-193
18. Altus, E., 2002, "Relation between endurance limit, morphology and local failure probability using a micromechanical fatigue model", Int. Conf. On Fatigue damage of structural materials, Sept., MA, USA
19. Nakash, R., Altus, E., 2002, "Effect of microstructure on the mechanical behavior of polysilicon microbeams", ASCE Engineering Mechanics Conference, Columbia U., NY (on disk).
20. Altus, E., 2002, "Relation between endurance limit, damage morphology and local failure probability using a micromechanical fatigue model", Fatigue Damage of Structural materials IV, MA, USA
21. Altus, E., 2003, "Two-level fatigue prediction by a micromechanic statistical model", 4th EIS Conf., Cambridge, UK in Fatigue 2003, Bache et al, eds., Eng. Integrity Society pub., pp. 463-475
22. Altus, E., 2003, "Prediction of residual fatigue endurance by a micromechanic statistical model", ICM9, Geneva, Switzerland

23. Givli, S., Altus E., 2003, "Strength reliability and size effect of heterogeneous beams", ICSMA, Budapest, Hungary
24. Altus, E., Givli, S., 2004, "Morphology effects on the fracture energy of randomly heterogeneous double cantilever beam", Mesomechanics 2004, Greece,
25. Totry, E., Givli, S., Altus, E., 2004, "Morphology based optimization in calculating the buckling load of randomly heterogeneous beams" The 17th Engineering Mechanics ASCE Conference, 14-17 June, Newark, Delaware, USA
26. Altus, E., Ishai, O., Alon, G., 2004, "Hygrothermal effects on interlaminar strength and cracking of thick Graphite Phenolic Laminates", ECCM11, Greece
27. Glikman Z., Altus E., 2005 "Mechanical Behavior of Fiber Optics Embedded in a Heterogeneous Matrix", Materials For Safety and Health, Proceedings of the Seventh International Conference on Mesomechanics, Montreal, Canada, August 1-4, Page 156, ISBN 2-921145-53-7.
28. Saffury J., Altus E., 2006, "Limit loads of stochastically heterogeneous structures", paper 078, 3rd ASRANet International Colloquium, 10-12 July, The University of Strathclyde, Glasgow, UK.
29. Sarig N., Altus E., 2006, "Analytical solutions of natural frequencies and mode shapes for non-homogeneous rods", Bath, England
30. Betman R., Altus E., 2006, "Dynamic behavior of a populated circuit card assemblies", EPTC-IEEE, December 6-8, Singapur
31. Totry, E., Altus, E., Proskura, A. 2006, "A Novel Application of the FPM to the Buckling Differential Equation of Non-Uniform Beams", 5th Computational Stochastic Mechanics Conference, 21-23 June, Rhodes, Greece
32. Ishai O., Altus E., Levy H., 2007, "Interlaminar strength and cracking of thick graphite phenolic laminates exposed to a dry environment", SAMPE07, Baltimore
33. Nahum S., Altus E., 2006, "Natural Frequencies and Mode Shapes of Deterministic and Stochastic Non-Homogeneous Rods September 2006", 6th International Conference on Modern Practice in Stress and Vibration Analysis, University of Bath. Also in Journal: Applied Mechanics and Materials Vols. 5-6:207-215.
34. Pagi G., Altus E., 2007, "A novel air-polymer analogy for modeling air flow through rubber-metal interface", WSEAS, Proceedings of the 5th IASME/WSEAS International Conference on Fluid Mechanics and Aerodynamics (FMA'07), 195-201
35. Reichenberg Y., Altus E., "Simulation of Erythrocyte's Deformation Using Conformational Changes in the Cytoskeleton", Proceedings of the 3rd WSEAS International Conference on Cellular And Molecular Biology, Biophysics And Bioengineering (BIO'07), 72-78
36. Zarrouk D., Altus E., "Improved solutions of stochastically heterogeneous microbeams by utilizing two point data in higher order functional perturbation method", Ninth U.S. National Congress on Computational Mechanics, USNCCM9, July 22-26,2007, San Francisco, California

37. Saffury J., Altus E., 2009, ""
38. Rejovitzky E., Altus E., 2009, "Anticrack morphology for micromechanical Fatigue model", ESMC2009
39. Bar-On B., Altus E., 2010, "Stochastic effects in adsorption induced nano beam sensors ", 6th Int. Conf. Comp. Stochastic Mechanics, Rhodes, Greece.
40. Kirikov M., Altus E., 2010, "Shape Optimization of Beams and Plates for Structural Buckling", IV European Conference on Computational Mechanics, ECCM, May Paris, France
41. Rejovitzky E., Altus E., 2011, "Micromechanical Fatigue Modeling: From Uniform to Random Loading", "EUROMAT 2011, Montpellier, France
42. Altus E., Rejovitzky E., "From generic towards a micromechanical fatigue model", ICM11, Milano, Italy, *Procedia Engineering*, 10 (2011), 1121-1126

PARTICIPATING IN ORGANIZING CONFERENCES COMMITTEES

- 1994 - Editorial chairman, 25th Israel Conference on Mechanical Eng.
1996 - ICCI-VI (Int. Conf. on Composite Interfaces) - organizing committee

SPECIAL PROFESSIONAL ACTIVITIES:

1. Altus, E., "Computer Interactive Study (CIS) - A Self-Studying Computer Program for University Courses", Technion, Faculty of Mechanical Eng., 1987-91.
2. A New Undergraduate program for the Faculty of Mechanical Engineering, 1995-1998