CV: Raphael Blumenfeld

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- Nationality: UK, Israel
- Address: Gonville and Caius College, Trinity Street, Cambridge CB2 1TA, UK
- Affiliations:
  1. Earth Science and Engineering, Imperial College London, London SW7 2AZ, UK
  2. Physics, College of Science, National University of Defense Technology, Changsha, Hunan, China
  3. Cavendish Laboratory, JJ Thomson Avenue, Cambridge CB3 0HE, UK
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Education

- 1989 - Ph.D., Physics - Tel Aviv University
  Random systems - Nonlinear conductivity and distributions
  Supervisors: Profs. Amnon Aharony and David J. Bergman, **Summa cum Laude**.
- 1986 - M.Sc., Physics - Tel Aviv University
  Nonlinear random resistor networks, topological problems and fluctuations
  Supervisor: Prof. Amnon Aharony, **Summa cum Laude**.
- 1984 - B.Sc., Physics - Tel Aviv University
  Distinction (equivalent to a UK high First).
- 1973 - B.Tech. Diploma, Practical Mechanical Engineering - Ort Technikum Givatayim, Israel.

Languages

- English: Speaking - excellent; Reading - excellent; Writing - excellent
- Hebrew: Speaking - excellent; Reading - excellent; Writing - excellent
- Romanian: Speaking - excellent; Reading - excellent; Writing - satisfactory

Appointments

- 2014-present Distinguished Professor, College of Science, National University of Defense Technology, Changsha, Hunan, China
- 2013-present Editor, Granular Matter Journal, Springer
- 2012-present College Lecturer, Gonville and Caius College, Cambridge, UK
- 2010-12 Senior Visiting Fellow, Inst. of Shock Physics, Imperial College London, UK
- 2009-12 College Lecturer, Gonville and Caius College, Cambridge, UK
- 2005-present Research Fellow, Earth Science and Engineering, Imperial College London, UK
- 1997-present Long-Term Associate member, Cavendish Laboratory, Cambridge University, UK
- 2000-01 Research Associate, Physics Dept., University of Warwick, UK

- 1997-8 Project Leader, Mesoscale group, R & D, Molecular Simulations Inc (now Accelrys), Cambridge, UK
- 1996-7 Research Scientist, Cambridge Hydrodynamics Inc (led by Prof S.A. Orszag), Princeton, NJ, USA
- 1993-6 Director's Fellow, Los Alamos National Laboratory, NM, USA
- 1992-3 Research Associate, Princeton University, NJ, USA
- 1989-92 Research Associate, Cavendish Laboratory, Cambridge University, UK
- 1987 Visiting Research Scientist, IBM (with Prof B. B. Mandelbrot), Yorktown Heights, USA

Honors / Awards / Grants

- 2016 BP-ICAM grant
- 2015 Awardee of the 1000-Talent Plan, China
- 2014-present Distinguished Professor, NUDT, Hunan, China
- 2013-2016 Alan Howard PhD Student Scholarship
- 2012 Bye-Fellow and College Lecturer, Gonville and Caius College, Cambridge, UK
- 2011 Nuffield Undergraduate Research Bursary URB/39915
- 2010-2014 EPSRC Grant EP/H051716/1
- 2010 Visiting Grant, Tsukuba University, Japan
- 2008-11 Alan Howard phd Student Scholarship
- 2008-9 EOARD Grant 083046
- 2008 StatoilHydro Grant
- 2007-12 Member of the Room, Gonville and Caius College, Cambridge, UK
- 2005-8 EPSRC Grant GR/T28959/01
- 1993-6 Director's Fellowship, Los Alamos National Laboratory
- 1990-2 Leo Baeck Lodge Award
- 1989 Weiler Foundation Scholarship Award
- 1985, 1988-9 Distinction Award, Tel Aviv University
- 1982-8 Scholarship, Tel Aviv University

Organisation / Professional Activities

- 2017 Session Chair, *From supercooled liquids to glasses: Current challenges for amorphous materials*, Kavli Inst., Beijing, China, August 7 - 18
- 2017 Organiser, International conference, *Second Edwards Symposium: Challenges and Opportunities in Soft Matter*, Isaac Newton Inst., Cambridge, UK, September 6 - 8
- 2017 Organiser, *The Second International Granular Flow Workshop*, Guiyang, China, August 21 - 24
- 2017 Session Chair, *The 10th International Conference on Soft Matter and Biophysics*, Xiamen, China, March 25 - 28
- 2016 Member, core team of the Edwards Centre for Soft Matter, Cambridge University

- 2016 Session Chair and Moderator, *BP-ICAM Annual Conference 2016*, Manchester, UK, October 31 - November 2
- 2016 Session Chair, *3rd International Conference on Packing Problems*, Jiao Tong University, Shanghai, China, August 29 - September 1
- 2016 Organiser, International conference, *Soft Matter - Theoretical and Industrial Challenges, Celebrating the Pioneering Work of Sir Sam Edwards*, Isaac Newton Inst., Cambridge, UK, September 7 - 9
- 2016 Organiser, *3rd International Workshop on Soft and Granular Matter in Ambient and Extreme Conditions 2016*, Changsha, Hunan, China, August 22 - 25
- 2015 Member of the Granular Materials Committee, Engineering Mechanics Institute
- 2015-present Member of the APS Topical Group on Statistical and Nonlinear Physics
- 2015-present Member of the APS Topical Group on Soft Matter
- 2015-present Member of the American Physical Society
- 2015 Organiser, *2nd International Workshop on Soft and Granular Matter in Ambient and Extreme Conditions 2015*, Changsha, Hunan, China, 31 August - 4 September
- 2015 Session Chair, *Beijing Soft Matter Workshop*, Beijing, China, 17 April
- 2015 Sole organiser, Workshop on *Computational methods in flow dynamics and granular science*, Changsha, Hunan, China, 14 April
- 2014 Organiser, International Workshop on *Soft and granular matter in ambient and extreme conditions*, Changsha, Hunan, China, 15-18 September
- 2014 Conference Scientific Committee member, *International Symposium on Energy Challenges and Mechanics*, Aberdeen, UK, 10-14 July
- 2012 Session Chair, in *8th European Solid Mechanics Conference*, Graz, Austria, 9-13 July
- 2011 Session Chair, in *Workshop: Complexity in the Oil Industry*, Natal, Brazil, 14-18 November
- 2008 Session Chair and Discussion Leader, *Structure and Packing* in *Gordon Conference on Granular and Granular-Fluid Flow*, Waterville, Maine, US, 22-26 July
- 2007 Session Chair, *Reservoir Simulation* in *Universities Forum on Reservoir Description and Simulation (UFORDS)*, Scarborough, UK, 2-6 September
- 2007 Organiser and chairman, *Workshop on Fractures*, *Complexity in the Oil Industry*, Natal, Brasil, 5-9 August
- 2007 Discussion leader on *Slow dynamics of granular materials and modelling quasi-statics*, in Workshop on **Jamming**, Aspen Center for Physics, Aspen, CO, USA, 20 June - 3 August
- 2007 Discussion leader on *Stress transmission and isostaticity theory*, in Workshop on **Jamming**, Aspen Center for Physics, Aspen, CO, USA, 20 June - 3 August
- 2004-6 Organiser and Chairman, *Working Group on Dimensional Reduction in many-variable systems*, EU COST action P10 *Physics of Risk*
- 2004 Programme Committee, SPIE conference *Fluctuation and Noise, FaN2004*, Maspalomas, Gran Canaria, Spain, 25-28 May
- 2003 Chairman, *Statics and Dynamics of Systems of Rigid Particles*, Isaac Newton Institute, Cambridge, UK 10 December
- 2003 Organising Committee, SPIE conference *Fluctuation and Noise, FaN2003*, Santa Fe, NM, USA, 1-4 June
- 1999-2001 Specialist Subject Reviewer, Quality Assurance Agency (QAA) for Higher Education, UK
- 2000 Organising Committee Member, MESOMECHANICS2000, China

- 1995 Organiser and Chairman, Workshop on *Fractal Analysis and Modelling of Materials*, Los Alamos National Laboratory, USA
- 1994-6 Organiser and Chairman, *Working Group on Protein Dynamics*, CNLS, Los Alamos National Laboratory, USA

Students

Undergraduates:

- 1990-2, 99-present: Supervision / tutorials: Parts I (2nd year), II (3rd year) Physics students, Cambridge University.

Graduates:

- 1995 Yi Jiang, Los Alamos National Laboratory, PhD (summer Projects) - 1. Growth of planar Laplacian surfaces; 2. Parameter flow in coarse-graining of disordered systems.
- 1994-5 Rudolph Held, Los Alamos National Laboratory, MSc (summer Project) - Characterization of, and flow in, porous media.
- 2007 Arutchelvi Harichandran, Imperial College London, Part III (MSc) - Distribution of heights on top of a granular pack.
- 2007 Ian Hewett, Cavendish Laboratory, Part II - A Study of Gas Permeation Through Granular Beds.
- 2007 Michael Peyton-Jones, Cavendish Laboratory, Sixth Form summer Project - Quantitative analysis of contact forces in a two-dimensional poly-distributed particle bed using photoelastic methods.
- 2007 Golnaz Alipour, Stanford University, US, PhD - Analysis and numerical simulations of stress propagation in granular materials (joint advisor with Prof. M. Gerritsen)
- 2008 Joe Jordan, Cavendish Laboratory, Part III (MSci) - Statistics of force chain networks in granular systems.
- 2008 Anna Timoshina, Cavendish Laboratory, Part III (MSci) - Statistics of force chain networks in granular systems - skeletonisation.
- 2008 Hannah Davies, Cavendish Laboratory, Part III (MSci) - Shaken not Stirred: conductivity of shaken graphite particles.
- 2008 Phil Tooke, Cavendish Laboratory, Part III (MSci) - Structural analysis of deposited particles in two dimensions.
- 2009 Lauri Toikka, Cavendish Laboratory, Part III (MSci) - The famous particle packing problem.
- 2009-13 Rebecca Hihinashvili, Imperial College, PhD - Morphological characterisation of porous materials for fuel cell technology.
- 2010 Zilvinas Rimas, Cavendish Laboratory, Part II (Summer Project) - Characterisation of force chain networks.
- 2010 Christopher Revell, Cavendish Laboratory, Part II (Summer Project) - Characterisation of packing of ellipses.
- 2010 Imbert Wang, Cavendish Laboratory, Part II (Summer Project) - Coarse-graining the fabric tensor of the Isostaticity stress field equations.
- 2010-4 Joseph F.P. Jordan, Imperial College, PhD - Computing entropy and ordering of granular materials: From description to prediction.
- 2010 Finn Grimwood, Cavendish Laboratory, Part III (MSci) - Gravitational Flow of a DaVinci Fluid.
- 2010 Harry R. Kennard, Cavendish Laboratory, Part III (MSci) - The famous packing problem ellipses.
- 2010 Simon Nathan, Cavendish Laboratory, Part III (MSci) - Couette Flow of a da Vinci Fluid.

- 2011 William Handley, Cavendish Laboratory, Part II (Summer Project) - Stress equations in isostatic and granular systems: hyperbolic or elliptic?
- 2011 Yipei Guo, Cavendish Laboratory, Part III (MSc) - Oscillatory shear flow of da Vinci fluids.
- 2011 Harrison Steggles, Cavendish Laboratory, Part III (MSci) - Dynamics of planar fractures in disordered media.
- 2011 Julian Ma, Cavendish Laboratory, Part III (MSci) - Stress transmission in disc-like granular systems.
- 2011 Christopher Revell, Cavendish Laboratory, Part III (MSci) - Shear flow of da Vinci fluids.
- 2012-5 Christopher Revell, Cavendish Laboratory, PhD - Stem cell sorting in mammalian embryos as a self-organising physical process.
- 2012 Giovanni Camisasca, Cavendish Laboratory, Part III (MSci) - Loop forces and mechanical equilibrium of 2D granular structures.
- 2012 Andrew Gibbons, Cavendish Laboratory, Part III (MSci) - Development of a systematic method to describe shapes of 3D objects.
- 2013 Alan Bowman, Cavendish Laboratory, Part III (MSci) - Ribbon dynamics in 3D.
- 2013 Reuven Shirazi, Cavendish Laboratory, Part III (MSci) - The Calderon problem in random resistor networks.
- 2013 Marise Westbroek, Cavendish Laboratory, Part III (MSci) - Dynamics of director fields in 2D.
- 2013-6 Shahar Amitai, Imperial College, PhD - Predictive model for the design of porous media with application to fuel cells.
- 2014 Louis Bortolozzo, Cavendish Laboratory, Part III (MSci) - Development of a continuous stress field theory for 3D isostatic systems.
- 2014 Ling Huang (Walter), Physics Dept., NUDT, Hunan, China (MSc) - Dynamics and effects of penetrators into granular materials
- 2015 Zheng-Yu Yong, Physics Dept., NUDT, Hunan, China (MSc) - Structural evolution of granular materials
- 2015 David King, Cavendish Laboratory, Part II (Summer Project) - Derivation of equations and solutions for the stresses in a layered elastic-isostatic medium
- 2016 Nikoletta Prastiti, Imperial College, MSC - Fractures in weakly consolidated media - stress and the process zone
- 2016 David A. King, Cavendish Laboratory, Part III (MSci) - Toward an effective medium stress theory of stato-elastic media.
- 2017 Liu Ping, College of Science, NUDT, Hunan, China (PhD) - Active objects in granular materials
- 2017 Do V. A. Nguyen, Cavendish Laboratory, Part II (Summer Project) - Understanding plastic deformation in particulate systems

Publications

Summary

- 92 papers in primary peer reviewed journals
- 27 contributions to Symposia and compiled volumes
- 1976 citations, H Index - 24, i10 Index - 47, April 2017
(Source: Google Scholar - Raphael Blumenfeld: Google Scholar citations)

I. Refereed and submitted papers in primary journals

95. W. Kang, Y. Feng, C. Liu and R. Blumenfeld, *Archimedes law explains penetration of solids into granular media: modelling and experimental support*, Nature Comm., submitted (2017);
(also http://lanl.arxiv.org/abs/1706.???)

94. S. Amitai, A. Bertei and R. Blumenfeld, *Theory-based design of sintered granular composites triples three-phase boundary in fuel cells*, Phys. Rev. **E**, submitted (2017);
(also http://lanl.arxiv.org/abs/1706.05974)

93. S. Amitai and R. Blumenfeld, *Affine and topological structural entropies in granular statistical mechanics: explicit calculations and equation of state*, Phys. Rev. **E 95**, 052905 (2017);
(also http://arxiv.org/pdf/1701.05860.pdf)

92. R. Blumenfeld, S. Amitai, J.F. Jordan and R. Hihinashvili, *Reply to comment on "On the failure of the volume function in granular statistical mechanics and an alternative formulation"*, Phys. Rev. Lett., **119**, 039802 (2017)

91. M. Schwartz and R. Blumenfeld, *Stress Tensor for Dense Granular Flow in Plug-Free Regions*, Phys. Rev. **E**, submitted;
(also http://arxiv.org/abs/1608.01708)

90. R. Blumenfeld, *Statistical mechanics of dense granular fluids - contacts as quasi-particles*, Phys. Rev. Lett., submitted (2016);
(also http://arxiv.org/abs/1603.02015)

89. R. Blumenfeld, *Structural evolution of granular systems: Theory*, Phys. Rev. Lett., submitted (2015);
(also http://arxiv.org/pdf/1412.6933v1.pdf)

88. T. Matsushima and R. Blumenfeld, *Fundamental structural characteristics of planar granular assemblies: self-organisation and scaling away friction and initial state*, Phys. Rev.**E 95**, 032905 (2017);
(also http://arxiv.org/pdf/1207.2988.pdf)

87. R. Blumenfeld and J. Ma, *Bending back stress chains and unique behaviour of granular matter in cylindrical geometries*, Gran. Matt. **19**:29 (2017);
(also http://arxiv.org/abs/1606.06484)

86. R. Blumenfeld, M.E.Cates and M. Warner, *Report on International workshop: Soft Matter - Theoretical and Industrial Challenges, celebrating the pioneering work of Sir Sam Edwards*, Applied Rheology, **27**, 46 (2017)

85. S. Amitai and R. Blumenfeld, *Modifying continuous-time random walks to model finite-size particle diffusion in granular porous media*, J. Gran. Matt.**19**, 1-9 (2017); DOI 10.1007/s10035-016-0694-1;
(also http://arxiv.org/pdf/1501.03998v2.pdf)

84. L. Huang, X. Ran and R. Blumenfeld, *Vertical dynamics of a horizontally-oscillating active object in a 2D granular medium*, Phys. Rev. **E 94**, 062906 (2016);
(also http://arxiv.org/abs/1609.01457)

83. R. Blumenfeld, S. Amitai, J.F. Jordan and R. Hihinashvili, *On the failure of the volume function in granular statistical mechanics and an alternative formulation*, Phys. Rev. Lett., **116**, 148001 (2016);
(also http://arxiv.org/pdf/1507.03779v2.pdf)

82. M. Schwartz and R. Blumenfeld, *Flow equations for dense granular fluids: New insight from a first-principles derivation*, submitted;
(also http://arxiv.org/pdf/1310.0983.pdf)

81. R. Blumenfeld and S. F. Edwards, *Granular statistical mechanics - a personal perspective*, Euro. Phys. J. **223**, 2189-2204 (2014); DOI: 10.1140/epjst/e2014-02258-y

80. T. Matsushima and R. Blumenfeld, *On universal structural characteristics of granular packs*, Phys. Rev. Lett. **112**, 098003 (2014);
(also http://arxiv.org/pdf/1305.6093.pdf)

79. R. Blumenfeld, J. F. Jordan and Sam F. Edwards, *Inter-dependence of the volume and stress ensembles and equipartition in statistical mechanics of granular systems*, Phys. Rev. Lett. **109**, 238001 (2012);
(also http://arxiv.org/pdf/1204.2977.pdf)

78. R. Hihinashvili and R. Blumenfeld, *Structural-entropic characteristics of dense planar granular systems*, Granular Matter **14**, 277-282 (2012); DOI: 10.1007/s10035-012-0332-5.

77. R. Blumenfeld and Sam F. Edwards, *Theory of strains in auxetic materials*, J. Superconductivity and Novel Magnetism **25**, 565-571 (2012); DOI: 10.1007/s10948-012-1464-x;
(also http://arxiv.org/abs/1111.6684)

76. M. Schwartz and R. Blumenfeld, *Plug flow formation and growth in da Vinci Fluids*, Granular Matter **13**, 241-245 (2011) (DOI 10.1007/s10035-011-0248-5)

75. R. Blumenfeld, M. Schwartz and S. F. Edwards, *The flow equations and catch-up dynamics of da Vinci Fluids*, Eur. Phys. J. **E 32**, 333-338 (2010)

74. G. Frenkel, R. Blumenfeld, P. King and M. Blunt, *Topological Analysis of Foams and Tetrahedral Structures*, Adv. Eng. Mat. **11**, 169-176 (2009)

73. R. Blumenfeld and S. F. Edwards, *On granular stress statistics: compactivity, angoricity and some open issues*, J. Phys. Chem. **B 113**, 3981 (2009)

72. M. Gerritsen, G. Kreiss, R. Blumenfeld, *Analysis of stresses in two-dimensional isostatic granular systems*, Physica **A 387**, 6263 (2008)

71. M. Gerritsen, G. Kreiss, R. Blumenfeld, *Stress chain solutions in two-dimensional isostatic granular systems: fabric-dependent paths, leakage and branching*, Phys. Rev. Lett. **101**, 098001 (2008)

70. G. Frenkel, R. Blumenfeld, Z. Grof, P. R. King, *The structure and statistics of 2D granular systems*, Phys.Rev. **E 77**, 041304 (2008)

69. R. Blumenfeld and S. F. Edwards, *Blumenfeld and Edwards Reply to Comment on "Granular Entropy: Explicit Calculations for Planar Assemblies"*, Phys. Rev. Lett., **99**, 089402 (2007)

68. R. Blumenfeld, *Stresses in two-dimensional isostatic granular systems: Exact solutions*, New Journal of Physics **9**, 160 (2007)

67. R. Blumenfeld, *Isostaticity and action at a distance in the cytoskeleton - A model awaiting experimental evidence*, Biophysical Journal, **91**, 1970 (2006)

66. R. Blumenfeld and S. F. Edwards, *Geometric partition functions of cellular systems: Explicit calculation of the entropy in two and three dimensions*, EuroPhys. J. **E 19**, 23 (2006)

65. R. Blumenfeld, *Auxetic strains - insight from iso-auxetic materials*, Molecular Simulations **31**, 867 (2005)

64. R. Blumenfeld, S. F. Edwards and R. C. Ball, *Granular matter and the marginal rigidity state*, J. Phys.: Cond. Mat. **17**, S2481 (2005);
(also http://arxiv.org/abs/cond-mat/0105348)

63. R. Blumenfeld, *Stresses in isostatic granular systems and emergence of force chains*, Phys. Rev. Lett., **93**, 118301 (2004);
(also http://arxiv.org/abs/cond-mat/0402556)

62. R. Blumenfeld, *Stress in planar cellular solids: Coarse-graining the constitutive equation*, Physica **A 336**, 361 (2004)

61. R. C. Ball and R. Blumenfeld, *From Plasticity to a renormalisation group*, Phil. Trans. R. Soc. Lond. 360 , 731 (2003);
(also http://arxiv.org/abs/cond-mat/0301562)

60. R. Blumenfeld and S. F. Edwards, *Granular entropy: Explicit calculations for planar assemblies*, Phys. Rev. Lett. **90**, 114303 (2003);
(also http://arxiv.org/abs/cond-mat/0303418)

59. R. Blumenfeld, *Stress transmission in planar disordered solid foams*, J. Phys. A: Math. Gen., **36**, 2399-2411 (2003);
(also http://arxiv.org/abs/cond-mat/0210336)

58. R. C. Ball and R. Blumenfeld, *The stress field in granular systems: Loop forces and potential formulation*, Phys. Rev. Lett. **88**, 115505 (2002);
(also http://arxiv.org/abs/cond-mat/0008127)

57. R. Blumenfeld, *Dynamics of twists on antiferromagnetic spin chains: Theory*, Eur. Phys. J. **B 29**, 261 (2002)

56. R. Blumenfeld *Strange dynamics of domain walls and periodic stripes on antiferromagnetic chains*, http://arxiv.org/abs/cond-mat/0108470 (2001)

55. R. Blumenfeld and R. Balakrishnan *Exact multi-twist solutions for the Belavin-Polyakov equation and application to magnetic systems*, J. Phys. **A 33**, 2459 (2000)

54. R. Blumenfeld, *Pulling a chain's leg: The pullout dynamics of entangled chain*, Macromolecules, **32**, 1082 (2000)

53. R. Blumenfeld *Hierarchical structure of domain walls in magnetic layers*, Phase Transitions, **69**, 237 (1999)

52. R. Blumenfeld *Dynamics of fracture prpagation in the mesoscale: Theory*, Theor. And Appl. Frac. Mech. **30**, 209 (1998)

51. R. Balakrishnan and R. Blumenfeld *On the twist excitations in a classical anisotropic antiferromagnetic chain*, Phys. Lett. **A 237**, 69 (1997)

50. A.E. Garcia, R. Blumenfeld, G. Hummer and J. A. Krumhansl, *Multi-Basin Dynamics of a Protein in a Crystal Environment*, Physica **D 107**, 225, (1997)

49. R. Balakrishnan and R. Blumenfeld *Transformation of general curve evolution to a modified Belavin-Polyakov equation*, J. Math. Phys. **38**, 5878 (1997)

48. R. Blumenfeld and Benoit B. Mandelbrot *Mass fractal lacunarity, Lévy dusts, Mittag-Leffler statistics, and perceived dimension*, Phys. Rev. **E 56**, 112 (1997)

47. R. Blumenfeld *Planar curve representation of many-body systems and dynamics*, Phys. Rev. Lett., **78**, 1203 (1997)

46. B. L. Holian, R. Blumenfeld and P. Gumbsch *An Einstein model of brittle crack propagation*, Phys. Rev. Lett. **78**, 78 (1997)

45. R. Blumenfeld and D. J. Bergman *Strongly nonlinear composite dielectrics: a method for exact solution for the potential field and effective bulk properties - Addition*, Phys. Rev. **B 54**, 9555 (1996)

44. R. Blumenfeld *Nonequilibrium brittle fracture propagation: Steady state, oscillations and intermittency*, Phys. Rev. Lett. **76**, 3703 (1996)

43. R. Blumenfeld *Pattern formation in Laplacian growth: Theory*, Center for Nonlinear Studies Newsletter **112**, April (1995);
(also http://arxiv.org/abs/cond-mat/9505116)

42. R. Blumenfeld and R. C. Ball *Two dimensional Laplacian growth as a system of creating and annihilating particles*, Phys. Rev. **E 51**, 3434 (1995);
(also http://arxiv.org/abs/cond-mat/9401068)

41. R. Blumenfeld *Formulating a first-principles statistical theory of growing surfaces in two-dimensional Laplacian fields*, Phys. Rev. **E 50**, 2952 (1994);
(also http://arxiv.org/abs/cond-mat/9408039)

40. V. Milman, N. A. Stelmashenko and R. Blumenfeld *Fracture surfaces: A critical review and a morphological analysis of scanning tunneling microscopy measurements*, Progress in Materials Science **38**, 425-474 (1994)

39. R. Blumenfeld *Two dimensional Laplacian growth can be mapped onto Hamiltonian dynamics*, Phys. Lett. **A 186**, 317-322 (1994)

38. R. Blumenfeld and R. C. Ball *Quantifying morphology of scale-invariant structures beyond the fractal dimension*, Fractals **1**, 985-991 (1993)

37. R. Blumenfeld and S. Torquato *A coarse-graining procedure to generate and analyze heterogeneous materials: Theory*, Phys. Rev. **E 48**, 4492-4500 (1993)

36. V. Milman, R. Blumenfeld, N. A. Stelmashenko and R. C. Ball *Experimental measurements of the roughness of brittle cracks*, Phys. Rev. Lett. **71**, 204 (1993)

35. R. Blumenfeld *Explicitly exact solutions for waves in a family of nonlinear media*, Physica **D 66**, 7-13 (1993)

34. R. Blumenfeld and R. C. Ball *A probe for morphology and hierarchical correlations in scale invariant structures*, Phys. Rev. **E 47**, 2298-2302 (1993)

33. J. Adler, A. Aharony, R. Blumenfeld, A. B. Harris and Y. Meir *The distribution of the logarithms of currents in percolating resistor networks, II. Series expansion*, Phys. Rev. **B 47**, 5770-5782 (1993)

32. A. Aharony, R. Blumenfeld and A. B. Harris *The distribution of the logarithms of currents in percolating resistor networks, I. Theory*, Phys. Rev. **B 47**, 5756-5769 (1993)

31. C. Bowen, D. L. Hunter, R. Blumenfeld and N. Jan *Magnetism and high Tc superconductors*, J. Physique I France **3**, 83-92 (1993)

30. R. C. Ball and R. Blumenfeld *Universal scaling of the stress field at the vicinity of a wedge crack in two dimensions and oscillatory self-similar corrections to scaling*, Phys. Rev. Lett. **68**, 2254 (1992)

29. E. Duering, R. Blumenfeld, D. J. Bergman, A. Aharony and M. Murat *Current distributions in a two-dimensional random-resistor-network*, J. Stat. Phys. **67**, 113-121 (1992)

28. R. Blumenfeld, *An exact solution for electromagnetic waves in strongly nonlinear media*, J. Phys. **A**: Math. Gen. **25**, L275-L282 (1992)

27. R. Blumenfeld and R. C. Ball *Onset of scaling behaviour in 2D slow cracking*, Modern Phys. Lett. **B 5**, 1567-1573 (1991)

26. R. Blumenfeld and D. J. Bergman *Strongly nonlinear composite dielectrics: a method for exact solution for the potential field and effective bulk properties*, Phys. Rev. **B 44**, 7378-7386 (1991)

25. R. Blumenfeld and R. C. Ball *Onset of scale-invariant pattern in growth processes: The cracking problem*, Physica **A 177**, 407-415 (1991)

24. R. C. Ball, P. W. H. Barker and R. Blumenfeld *Sidebranch selection in fractal growth*, EuroPhys. Lett. **16**, 47-52 (1991)

23. R. Blumenfeld *The functional form of the $T_c(x)$ line in the phase diagram of high temperature superconductors*, Physica **C 178**, 119-124 (1991)

22. R. C. Ball and R. Blumenfeld *Exact results on exponential screening in two-dimensional diffusion limited aggregation*, Phys. Rev. **A 44**, R828-R831 (1991)

21. R. Blumenfeld and D. J. Bergman *Nonlinear susceptibilities of granular matter*, Phys. Rev. **B 43**, 13682-13683 (1991)

20. R. Blumenfeld *Geometrical correlations and the origin of x values at the maximum and intersects of $T_c(x)$ in $La_{2-x}Sr_xCuO_4$*, J. de Physique **1**, 159-166 (1991)

19. G. Corsten, C. Liem, R. Blumenfeld and N. Jan *Pairing of holes via vortex/antivortex attraction in doped* $La_{2-x}Sr_xCuO_4$, J. de Physique **51**, 2229-2233 (1990)

18. R. Blumenfeld and A. Aharony *Reply to Comment on "Breakdown of multifractal behaviour in diffusion limited aggregates"*, Phys. Rev. Lett. **64**, 1843 (1990)

17. R. C. Ball and R. Blumenfeld *Universal scaling of the stress field at the vicinity of a wedge crack in two dimensions and oscillatory self-similar corrections to scaling*, Phys. Rev. Lett. **65**, 1784-1787 (1990)

16. R. Blumenfeld *Phase coherence oscillation of holes in* $La_{2-x}Sr_xCuO_4$*, dynamics of single holes in the CuO plane and the typical pairing time*, Physica **A 168**, 705-713 (1990); (Erratum) Physica **A 180**, 462 (1991)

15. R. Blumenfeld *Novel flux solutions in nonlinear continuum systems with negative dynamic resistance*, Physica **A 168**, 697-704 (1990)

14. O. Entin-Wohlman, U. Sivan, R. Blumenfeld and Y. Meir *Dynamic structure factor of fractals*, Physica **D 38**, 93-97 (1989)

13. R. Blumenfeld and D. J. Bergman *Exact calculation to second order of the effective dielectric constant of a strongly nonlinear composite*, Phys. Rev. **B 40**, (Rapid Comm.) 1987-1989 (1989)

12. R. Blumenfeld *Universality and superuniversality of multifractals in nonlinear networks*, J. Stat. Phys. **56**, 233-241 (1989)

11. R. Blumenfeld and A. Aharony *Breakdown of multifractal behaviour in diffusion limited aggregates*, Phys. Rev. Lett. **62**, 2977-2980 (1989)

10. R. Blumenfeld and D. J. Bergman *Nonlinear dielectrics: electrostatics of random media and propagation of waves in a homogeneous slab*, Physica **A 157**, 428-436 (1989)

9. A. Aharony, R. Blumenfeld, P. Breton, B. Fourcade, A. B. Harris, Y. Meir and A. -M. S. Tremblay *Negative moments of currents in percolating resistor networks*, Phys. Rev. **B 40**, (Brief Report) 7318 (1989)

8. U. Sivan, R. Blumenfeld, Y. Meir and O. Entin-Wohlman *Dynamic structure factor of a deterministic fractal*, Europhys. Lett. **7**, 249-253 (1988)

7. R. Blumenfeld *Probability densities of homogeneous functions: Explicit approximation and applications to percolating networks*, J. Phys. A: Math. Gen. **21**, 815-825 (1988)

6. Y. Meir, R. Blumenfeld, A. B. Harris and A. Aharony *Series analysis of randomly diluted nonlinear networks with negative nonlinearity exponent*, Phys. Rev. **B 36**, 3950-3952 (1987)

5. R. Blumenfeld and D. J. Bergman *Fluid flow in a random porous medium: A network model and effective medium approximation*, J. Appl. Phys. **62**, 1616-1621 (1987)

4. R. Blumenfeld, Y. Meir, A. Aharony and A. B. Harris *Resistance fluctuations in randomly diluted networks*, Phys. Rev. **B 35**, 3524-3535 (1987)

3. Y. Meir, R. Blumenfeld, A. Aharony and A. B. Harris *Series analysis of randomly diluted nonlinear resistor networks*, Phys. Rev. **B 34**, 3424-3428 (1986)

2. R. Blumenfeld, Y. Meir, A. B. Harris and A. Aharony *Infinite set of exponents describing physics on fractal networks*, J. Phys. A: Math. Gen. **19**, L791-L796 (1986)

1. R. Blumenfeld and A. Aharony *Nonlinear resistor fractal networks, topological distances, singly connected bonds and fluctuations*, J. Phys. A: Math. Gen. **18**, L443-L448 (1985)

II. Refereed contributions to symposia and compiled volumes

27. R. Blumenfeld, *Obituary: Professor Sir Sam F. Edwards FLSW FRS FIMA (19282015)*, Mathematics TODAY, August issue (2015).

26. R. Blumenfeld, S. F. Edwards and S. M. Walley, *Physics of granular systems*, in "The Oxford Handbook of Soft Condensed Matter", eds. E.M Terentjev, D.A. Weitz, (Oxford University Press, Oxford, UK 2015); ISBN-13: 978-0-19-966792-5.

25. T. Matsushima and R. Blumenfeld, *Microstructural characteristics of planar granular solids*, 7th International Conference on Micromechanics of Granular Media (Powders and Grains 2013), AMER INST PHYSICS, 325-328, doi: 10.1063/1.4811933.

24. R. Blumenfeld, J. F. Jordan and S. F. Edwards, *Granular statistical mechanics: volume-stress phase space, equipartition and equations of state*, 7th International Conference on Micromechanics of Granular Media (Powders and Grains 2013), AMER INST PHYSICS, Pages:1186-1189, doi: 10.1063/1.4812149.

23. R. Hihinashvili and R. Blumenfeld, *Structural characterisation of porous and granular materials*, in Proceedings of 16th European Symposium on Improved Oil Recovery 2011, Cambridge, UK.

22. R. Hihinashvili and R. Blumenfeld, *Structural characterisation of porous and granular materials*, in XVIII International conference on water resources, CMWR 2010, J. Carrera (Ed), CIMNE, Barcelona (2010).

21. R. Blumenfeld, *Stress Transmission and Incipient Yield Flow in Dense Granular Materials*, in IUTAM-ISIMM Symposium on Mathematical Modeling and Physical Instances of Granular Flows, pp 167-182, eds. J. Goddard, P. Giovine and J. Jenkins (AIP Publications, Melville New York, 2010,)

20. R. Blumenfeld, *On entropic characterization of granular materials*, in Lecture Notes in Complex Systems Vol. **8**: *Granular and Complex Materials*, pp 43-53, eds. T. Aste, A. Tordesillas and T. D. Matteo (World Scientific Singapore, 2007)

19. G. Frenkel, R. Blumenfeld, P. R. King and M. Blunt, *Topological Analysis of Foams and Tetrahedral Structures*, in Proceedings of MetFoam 2007 - Conference on Porous Metals and Metallic Foams, Montreal, Canada

18. R. Blumenfeld and P. King, *Entropy-mediated structure-permeability relations in skeletal porous materials*, in Proceedings of CMWR XVI 2006 - Computational Methods in Water Resources XVI International Conference, Copenhagen, Denmark

17. S. F. Edwards and R. Blumenfeld, *Thermodynamics of granular materials*, in Physics of Granular Materials, ed. A. Mehta (Cambridge University Press, Cambridge 2007)

16. R. Blumenfeld, *Stress transmission and isostatic states of non-rigid particulate systems*, IMA Volumes in Mathematics and its Applications, Vol. **141**: *Modeling of Soft Matter*, eds. M-.C.T. Calderer and E. M. Terentjev, (Springer-Verlag, New York 2005);
(also: arXiv:cond-mat/0501700 [cond-mat.soft])

15. R. Blumenfeld, *Dynamics of twists on antiferromagnetic spin chains: Theory*, International conference on geometry, nonlinearity, and integrability in condensed matter and soft condensed matter physics, Bansko, Bulgaria

14. R. Blumenfeld *Dynamics of fracture propagation in the mesoscale: Theory* MESOMECHANICS98, Tel Aviv, Israel

13. A. E. Garcia, R. Blumenfeld, G. Hummer and J. Sobehart *Diffusion of a protein in configuration space* in Proceedings of the 9th Conversation in Biomolecular Stereodynamics, Eds. R.H. Sarma and M.H. Sarma (Adenine Press, Schenectady, NY 1996)

12. S. Zhou, R. Blumenfeld, B. Holian and P. S. Lomdahl *Study of fiber composite failure criterion* in 1996 MRS Proceedings **V409** *Fracture-instability dynamics, scaling, and ductile/brittle behavior*, Eds. R. L. Blumberg Selinger et al.

11. R. Blumenfeld and Robin C. Ball *Characterization of fractal and hierarchical morphologies beyond the fractal dimension* in 1995 MRS General Meeting, Boston, MA, USA

10. R. Blumenfeld *A theory for growing interfaces in Laplacian fields: a many-body formulation and statistical analysis* in 1994 MRS General Meeting, Boston, MA, USA

9. R. Blumenfeld *A theory for the morphology of Laplacian growths from statistics of equivalent many-body systems* in Fractal Reviews in the Natural and Applied Sciences, Ed. M.M. Novak (Chapman-Hill, 1995)

8. R. Blumenfeld *A morphological theory for Laplacian nonlinear growth processes via statistics of equivalent many-body systems* in Nonlinear Evolution Equations and Dynamical Systems (NEEDS94), Eds. V.G. Makhankov, A.R. Bishop, and D.D. Holm (World Scientific, 1995)

7. R. Blumenfeld *Towards a theory of growing surfaces: Mapping Laplacian growth onto Hamiltonian dynamics and statistics* in Fluctuations and Order: The New Synthesis, Ed. M. M. Millonas (Springer-Verlag, 1995); cond-mat/9401069

6. R. Blumenfeld *Novel flux solutions in nonlinear conducting continuum systems with negative dynamic resistance* in Proceedings of the EPS-8 meeting "Trends in Physics", Ed. F. Pleiter (1990)

5. R. Blumenfeld, N. Jan, G. Corsten and C. Liem *Evidence for vortex/antivortex mediated pairing of holes in doped $La_{2-x}Sr_xCuO_4$ and a possible mechanism for the holes movement* in Proceedings of the EPS-8 meeting "Trends in Physics", Ed. F. Pleiter (1990)

4. R. C. Ball and R. Blumenfeld *Universal scaling of the stress field generated by a two dimensional wedge crack and periodic self-similar corrections to scaling* in Proceedings of the EPS-8 meeting "Trends in Physics", Ed. F. Pleiter (1990)

3. G. Corsten, C. Liem, R. Blumenfeld, N. Jan and C. Bowen *Vortex-antivortex pairing of holes in frustrated XY spin systems* in Correlations and connectivity, Eds. H. E. Stanley and N. Ostrowsky (Kluwer Academic Publishers, Dordrecht, 1990) pp. 121-130

2. R. Blumenfeld and R. C. Ball *Universally correlated scale-invariant sidebranching in propagation of a two-dimensional cracking growth* in Correlations and connectivity, Eds. H. E. Stanley and N. Ostrowsky (Kluwer Academic Publishers, Dordrecht, 1990) pp. 313-316

1. R. Blumenfeld and A. Aharony *Nolinear resistor fractal networks* in Scaling phenomena in disordered systems, Eds. R. Pynn and A Skjeltorp (Plenum, 1985)

Invited colloquia and departmental seminars

- 2016 Yukawa Inst., Kyoto University, Japan *Progress in statistical mechanics of a-thermal particulate systems*
- 2016 Engineering, Tsukuba University, Japan *Bending back and rich behaviour of stress chains in isostatic annuli*
- 2016 Aerospace Engineering, Peking University, Beijing, China *Towards a stress theory for real granular materials*
- 2016 Aerospace Engineering, Peking University, Beijing, China *Statistical mechanics of granular materials*
- 2016 Phyiscs, Beihang University, Beijing, China *Theory of stress in granular materials*
- 2015 Physics, Jiao Tong University, Shanghai, China *Towards a stress theory for real granular materials*
- 2015 Engineering, Tsukuba University, Tsukuba, Japan *Towards a fundamental stress theory for real granular materials*
- 2015 Engineering, Tsukuba University, Tsukuba, Japan *A local morphological descriptor of granular materials and its uses*
- 2014 College of Civil Engineering, Tongji University, Shanghai, China *Fracture propagation in geo-materials The single fracture dynamics*
- 2014 Inst. of Theoretical Physics, Chinese Academy of Science, Beijing, China *Structural characterisation and statistical mechanics of granular and porous systems: A systematic method to derive structure-property relation and equations of state*
- 2014 Center of soft matter physics and its applications, Beihang University, Beijing, China *Towards a fundamental stress theory for real granular materials*
- 2013 Dept. of physics, University of Cambridge, UK *Recent perspectives in the science of granular matter*
- 2013 Graduate Lecture, Dept. of physics, University of Cambridge, UK *The science of granular matter*
- 2013 Dept. of chemical and environmental engineering, University of Nottingham, UK *Structural Characterization and Statistical Mechanics of Granular Matter*
- 2012 Physics Dept., University of Kent, Canterbury, UK *From statistical mechanics of granular, cellular and porous materials to structure-property relations a systematic approach*
- 2012 Dept. of Mathematics, Open University, Norwich, UK *Statistical mechanics of granular, cellular and porous media and structure-property relations – a systematic approach*
- 2011 Institut fur Experimentelle Physik, Universitat Ulm, Ulm, Germany, *Controlled force mediation in the cytoskeleton: A dream model awaiting experimental verification*
- 2010 School of Physics and Astronomy, Tel Aviv University, Tel Aviv, Israel, *Colloquium: Da Vinci Fluid - a minimal model for flow of dense granular materials*
- 2010 School of Physics and Astronomy, Tel Aviv University, Tel Aviv, Israel, *From pore-scale structural characterization to macro-scale structure-property predictions*
- 2010 Department of Environmental Sciences, ETH, Zurich, Switzerland, *Da Vinci Fluid model for flow of dense granular materials*
- 2010 Engineering Dept, Tokyo University, Japan, *Understanding stress transmission in dense granular materials*
- 2010 Lecture course: Engineering Dept, Kyoto University, Japan, *1. Stress transmission in granular packs why do conventional theories struggle? 2. Stress transmission in granular packs isostaticity theory and beyond; 3. Entropic formalism for the statistics of granular packs; 4. Stresses and force chains in granular materials: misconceptions and new directions*
- 2009 Civil Engineering Dept, Sydney University, Australia, *Systematic derivation of structure-property relations in porous and cellular materials*

- 2009 Civil Engineering Dept, Sydney University, Australia, *Stress transmission and incipient yield flow in dense granular materials*
- 2008 Mathematics Dept, Brunel University, UK, *A Stresses in Granular Systems: A paradigm of Complexity*
- 2008 ICP, Stuttgart University, Germany, *Stresses in granular systems*
- 2008 Earth Sciences and Engineering, PERM Seminar, Imperial College London, UK, *The Rich Dynamics of Process Zone Limited Fracture Propagation in Heterogeneous Materials*
- 2008 DAMTP, Cambridge University, UK, *Stresses in granular systems and yield flow*
- 2008 Applied Modelling and Computation Group (AMCG), Earth Sciences and Engineering, Imperial College London, *Microstructural characterization of porous media and systematic derivation of transport properties*
- 2008 Earth Sciences and Energy Research, Weizmann Inst., Rehovot, Israel, *Structural-entropic characterization of porous media and flow properties*
- 2008 Physics Department, Tel Aviv University, Israel, *Stresses in isostatic systems and applications to granular materials*
- 2007 Physics Department, North Carolina State University, NC, USA, *Exact solutions to the isostaticity stresses equations in disordered 2d granular materials*
- 2007 Physics Department, Duke University, NC, USA, *Exact solutions to the isostaticity stresses equations in disordered 2d granular materials*
- 2006 Physics Department, Bar Ilan University, Tel Aviv, Israel, *Propagation of stresses in granular porous materials: between elasticity and isostaticity*
- 2006 Biology Department, Bar Ilan University, Tel Aviv, Israel, *Controlled force mediation in the cytoskeleton: A dream model awaiting experimental verification*
- 2006 Physics Department, University of Manchester, Manchester, UK, *Stresses in granular materials: between elasticity and isostaticity*
- 2006 Laboratoire de Physique Thorique, Ecole Normale Suprieure, Paris, Frances, *Propagation of stresses in granular porous materials: between elasticity and isostaticity*
- 2004 Applied Mathematics, Bristol University, UK, *Stress field equations in granular solids: A shift of paradigm*
- 2004 Institute of Physics of Geological Processes, Oslo, Norway, *Stress transmission in granular materials: Between elasticity and isostaticity*
- 2004 Cavendish Laboratory, Cambridge, *Stress transmission in granular materials: Between elasticity and isostaticity*
- 2003 Cavendish Laboratory, Cambridge, *Stress transmission in cellular solids: beyond elasticity.*
- 2003 Isaac Newton Institute, *Granular piles and marginal rigidity.*
- 2002 Kings College London, *Mechanics of cellular systems.*
- 2001 Leeds University, UK, *Pulling single chains and implications to rheology of dense polymers near the glass transition.*
- 2000 Max Planck Institute, Golm, *Chilling out polymer dynamics: Fluctuating disentanglement forces and rheological implications.*
- 1997 Max Planck Institute, Stuttgart, *Nonequilibrium mesoscale fracture propagation: Noise-free and noise-driven steady states, oscillations and intermittency.*
- 1996 Wake Forest University, North Carolina, *A new theoretical approach to surface growth: The Laplacian growth paradigm.*
- 1996 University of New Mexico, Albuquerque, *Growth of complex interfaces: Theory.*

- 1995 Santa Fe Institute, Santa Fe, *Theorizing on patterns of evolving interfaces: The Laplacian growth paradigm.*
- 1995 University of Texas, El Paso, *Statistics of interfaces in Laplacian growth.*
- 1995 New Mexico State University, Las Cruces, *A first-principles theory for Laplacian growth.*
- 1994 Emory University, Atlanta, Georgia, *Formulation of a first-principles theory for growing surfaces.*
- 1994 Arizona State University, *Characterization and analysis of morphologies of scale-invariant patterns and hierarchical structures beyond simple scaling.*
- 1993 Clarkson University, *Onset of scale-invariant side-branching in cracking patterns and comparison with diffusion-limited-aggregation.*

Invited presentations in conferences

- 2017 **The 2nd International Granular Flow Workshop**, Guiyang, China, August 21 - 24: *Granular statistical mechanics: different structural entropy sources, exact calculations, and the origin of N!*
- 2017 **From supercooled liquids to glasses: Current challenges for amorphous materials**, Kavli Inst. of Theoretical Science, Beijing, August 7 - 18: *Entropy in disordered particulate systems*
- 2017 **The 10th International Conference on Soft Matter and Biophysics**, Xiamen, China, March 25 - 28: *Self-organisation of structural characteristics in packing of granular materials in 2D and implications*
- 2016 **The 3rd International conference on Packing: across length scales**, Shanghai, China, August 29 - September 1: *Self-organisation of structural characteristics in packing of granular materials in 2D*
- 2016 **The 3rd International workshop on Soft and Granular Matter in Ambient and Extreme Conditions**, Changsha, Hunan, China, August 22 - 25
- 2016 **The American Physical Society March Meeting**, Baltimore, MD, USA, March 14 - 18: *Granular statistical mechanics – Building on the legacy of Sir Sam Edwards*
- 2016 **Dynamic Days**, Durham, NC, USA, January 7 - 10: *Granular statistical mechanics*
- 2015 **The 2nd International Workshop on Soft and granular matter in ambient and extreme conditions 2015**, Changsha, Hunan, China, 31 August - 4 September: *1. Statistical mechanics of Granular matter - I; 2. Statistical mechanics of Granular matter - II*
- 2015 **The Annual Meeting of Thermodynamic and Statistical Mechanics Education and Research Association of China 2015**, Changsha, Hunan, China, 12-15 July *A three-lecture series: 1. Statistical mechanics of athermal systems; 2. Statistical mechanics of granular, porous and cellular materials; 3. Discussion: Necessary curriculum for physics undergraduates*
- 2015 **EMI 2015**, Stanford, USA, 16-19 June: *Two talks: 1. Structural evolution of 2D granular solid under shear deformation; 2. From local structural characterisation of porous materials to structure-property relations: a systematic approach*
- 2015 **Beijing Soft Matter Workshop**, Beijing, China, 17 April *A local morphological descriptor of granular materials and its uses*
- 2014 **Avalanches in Functional Materials and Geophysics**, Cambridge, UK, 4-8 December *Local structural characterisation and statistical mechanics of porous and cellular media*
- 2014 **International Workshop on Soft and granular matter in ambient and extreme conditions**, Changsha, Hunan, China, 15-18 September *1. Stress transmission in dense granular materials; 2. Granular statistical mechanics*
- 2014 **International Symposium on Geomechanics from Micro to Macro**, Cambridge, UK, 1-3 September *Structural characterisation and understanding stress transmission in dense granular materials*
- 2014 **Dynamic Systems: From Statistical Mechanics to Engineering Applications**, Zurich, Switzerland, 9-10 January *Flow of dense granular fluids - a first-principle approach*

- 2014 **International Winter School and Symposium on Statistical Mechanics and Simulation of Nonlinear Dynamics**, Changsha, China, 3-7 Jan - *A six-lecture series: 1. Stress transmission in granular packs why do conventional theories fail; 2. Isostaticity theory as a baseline model for stress transmission in granular assemblies; 3. Extension of isostaticity theory for real granular matter stato-elasticity theory; 4. Statistical mechanics of granular media (i) the Edwards formalism; 5. Statistical mechanics of granular media (ii) the volume-stress ensemble; 6. Fracture propagation in heterogenous media process zone statistics and rich dynamics*
- 2013 **Powders and Grains 2013 Conference**, Sydney, Australia, 7-13 July *Statistical Mechanical Characteristics of Dense Planar Granular Matter*
- 2012 **8th European Solid Mechanics Conference**, Graz, Austria, 9-13 July *Statistical Mechanical Characteristics of Dense Planar Granular Matter*
- 2012 **8th European Solid Mechanics Conference**, Graz, Austria, 9-13 July *Elementary Volumes Distribution and Cell Structural Stability in 2D Granular Assemblies*
- 2012 **Petroleum Engineering and Rock Mechanics (PERM) Affiliates Meeting**, London, UK, 11 June *A systematic programme for predicting fracture network characteristics*
- 2011 **Workshop: Complexity in the Oil Industry**, Inst. of Physics, Natal, Brazil, 14-18 November *From characterization of porous media to macroscale structure-property relations - A systematic approach*
- 2011 **Workshop: Fluctuations and Response in Active Materials: From Driven Granular Systems to Swarming Bacteria**, Lorentz Center, Leiden, The Netherlands, 20-24 June *Driven dense granular matter as a da Vinci fluid*
- 2011 **Pore-Scale Modelling Consortium meeting**, Imperial College London, London, UK, 11 January *Failure and flow of granular matter from yield rheology to da Vinci fluid*
- 2010 **Gordon Conference on Flow and Transport in Permeable Media**, Lewiston, ME, USA 11-16 July: *Systematic derivation of structure-property relations in porous and cellular materials*
- 2010 **Gordon Conference on Granular and Granular Flow** , Waterville, ME, USA 20-25 June: *Da Vinci fluid as a possible model for dense granular flow*
- 2010 **Mini-symposium on fractured reservoirs**, Delft, Nethrelands 10 June: *A model for dynamic fractures in inhomogeneous media*
- 2010 **PERM Affiliates meeting**, Imperial College London, UK 7 June: *Stress theory and fragility of granular matter*
- 2010 **Workshop - Particulate Matter: Does Dimensionality Matter?**, Dresden, Germany 30 May - 4 June: *Effects of dimensionality on statistical mechanics of granular matter*
- 2010 **Workshop on granular materials**, Tsukuba, Japan 4 March: *Continuum stress theory for large statically determinant structures and implications for granular materials*
- 2009 **IUTAM-ISIMM Symposium on Mathematical Modeling and Physical Instances of Granular Flows**, Reggio Calabria, Italy, 14-18 Sept.: *Stress transmission and yield flow of dense Granular materials*
- 2009 Workshop on **Statistical mechanics of static granular media**, Lorentz centre, Leiden, 6-10 July: Plenary talk, *Compactivity, Angoricity, and Open Issues in Granular Statistics*
- 2009 **Meeting of the PERM consortium**, London, 22 June: *Systematic characterization and analysis of pore space*
- 2008 Workshop on **Flow in Porous Media**, Brasilia, Brazil, 18-24 Oct: *Structural characteristics of porous media and systematic predictions of transport properties*
- 2008 Conference on **Granular Gases: Beyond the Dilute Limit**, Thurnau, Germany, 7-12 Sept: *Stress transmission in granular systems and incipient yield flow*
- 2008 **The BPI-Cavendish workshop**, BPI Inst, Cambridge University, UK, *Stresses in granular systems and yield flow*

- 2008 Petroleum Engineering and Rock Mechanics (PERM) Affiliates Meeting on **Pore-scale modelling**, London, UK, 16 June: *Microstructural characterization of porous media and systematic derivation of transport properties*
- 2008 IOP Meeting on **Condensed Matter and Materials Physics 2008**, London, UK, 26-28 March: *Granular matter as two-phase composites: Critical behaviour, stato-elasticity and new stress solutions*
- 2008 Air Force Office for Scientific Research and Air Force Research Lab Meeting on **Particulate Mechanics in Extreme Environments**, Eglin Florida, USA, 29-31 January: *Effects of formation dynamics on structural characteristics of grain assemblies*
- 2007 Meeting of the Society for Natural Philosophy on **The Interface Between Atomistic and Continuum Theories**, Houston Texas, US, 26-28 October: *Stress equations in statically determinate systems - a unique coarse-graining problem and solutions*
- 2007 **Universities Forum on Reservoir Description and Simulation (UFORDS)**, Scarborough, UK, 2-6 September: *Process zone driven fracture propagation - a first-principles equation and rich dynamics*
- 2007 **Universities Forum on Reservoir Description and Simulation (UFORDS)**, Scarborough, UK, 2-6 September: *Structural-entropic characterization of porous media and derivation of local permeability*
- 2007 Conference on **Complexity in the Oil Industry**, Natal, Brasil, 5-9 August *Process zone limited fracture propagation a first-principles equation and rich dynamics*
- 2007 Conference on **Complexity in the Oil Industry**, Natal, Brasil, 5-9 August *Force chains in granular porous media: emergent self-organized networks and criticality*
- 2007 StatPhys Satellite meeting on **Statics and Dynamics of Granular Media and Colloidal Suspensions**, Naples, Italy: *Entropic description of granular and cellular structures*
- 2007 Petroleum Engineering and Rock mechanics (PERM) Affiliates Meeting, Imperial College London: *Structural - entropic characterization of porous media and systematic derivation of transport properties*
- 2007 USAF Workshop on **Particulate Mechanics in Extreme Environments**, University of Florida, Florida, US 23-25 January: **Isostaticity theory and modelling propagation of stresses in granular materials**
- 2006 20th Canberra International Physics Summer School on **Granular Matter**, The Australian National University, Canberra, Australia: **Structural-entropic characterization of porous media and systematic derivation of transport properties**
- 2005 Summer School on **Econophysics and complexity**, Academy of Economics Studies, Bucharest, Romania: **Rational modelling of multi-agent systems**
- 2004 Summer School on **Bridging between economists and physicists**, Academy of Economics Studies, Bucharest, Romania: **Dimensional reduction in economic systems**
- 2004 IMA Workshop on **Modeling of Soft Matter**, Institute for Mathematics and its Applications (IMA), Minneapolis, US: **Stress field equations in granular solids: A shift of paradigm**
- 2004 IChemE meeting on the **Behaviour of Structured Granular Materials Across Length Scales**, Leeds, UK: **Stresses and yield in granular materials**
- 2004 **Physics of Risk**, Nyborg, Denmark: **Econo-string theory: Representation of many-agent systems as planar strings**,
- 2003 **Flow Regimes, Transitions and Segregation in Granular and Particle-laden Flows**, Cambridge, UK: (i) *Granular piles and marginal rigidity*; (ii) *Stress transmission in granular systems.*
- 2001 **International conference on geometry, nonlinearity, and integrability in condensed matter and soft condensed matter physics**, Bansko, Bulgaria: *Domain wall dynamics on antiferromagnetic chains: Interactions, conservation laws and stable lattice solutions.*
- 1998 **The Polymer Consortium Annual Meeting**, Cambridge, UK: *Mesoscale polymer modeling: The fracture case study.*

- 1997 **77th Statistical Mechanics Conference**, Rutgers Univ., USA: *Why fractal patterns: A first-principles approach.*
- 1997 **Workshop on Nonlinear Phenomena in Transforming Solids**, Penn State Univ., USA: *Hierarchical structure of domains in magnetic layers.*
- 1996 **Workshop on Fracture, Friction and Deformation**, Los Alamos, USA: *Nonequilibrium fracture propagation: Steady-state, periodicity and intermittency.*
- 1996 **Workshop on Nonequilibrium Phase Transformations**, Santa Fe, USA: *Domain Wall Textures in 2D Ferromagnets.*
- 1995 **FRACTALS 95**, Marseilles, France: *A theory for the morphology of Laplacian growth via statistics of equivalent many-body systems.*
- 1995 **MRS Fall Meeting**, Boston, USA: *Review of analyses of fracture roughness.*
- 1994 **Gordon conference** on **Fractals**, San Miniato, Italy: *Formulaing a First-principles theory for stochastic Laplacian growth.*
- 1994 **Nonlinear Evolution Equations and Dynamical Systems** (NEEDS94), Los Alamos, NM, USA: *A morphological theory for Laplacian nonlinear growth processes via statistics of equivalent many-body systems.*
- 1994 **MRS General Meeting**, Boston, USA: *On a first-principles theory for growing interfaces in Laplacian fields: A many-body formulation and statistical analysis.*
- 1993 **Fractals in Natural Sciences**, Budapest, Hungary: *Quantifying morphology of scale-invariant strucrures beyond the fractal dimension.*
- 1992 Forum in **Compaction Forming Operations**, Aston University, Birmingham, UK: *Percolation as a model for disordered systems.*
- 1990 **NATO ASI Summer school** on **Propagation of Correlations in Constrained Systems**, Institute d'Etudes Scientifiques de Cargese, Corsica, France: 1) *Universally correlated scale-invariant sidebranching in propagation of a two-dimensinal cracking growth*; 2) *Vortex-antivortex pairing of holes in frustrated XY spin system.*