**Tenth International Symposium on** 

## Continuum Models and Discrete Systems (CMDS10)

NATO Advanced Research Workshop & Research Workshop of The Israel Science Foundation



### Shoresh, Israel, 30 June – 4 July 2003

### **CONFERENCE PROGRAM**

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### The Sackler Institute for Solid State Physics

### FINAL SCIENTIFIC PROGRAM for the

#### 10'th International Scientific Workshop on Continuum Models and Discrete Systems (CMDS10)

#### Shoresh Holiday Complex, Shoresh, Israel, 30 June – 4 July 2003

#### To be displayed during the entire workshop

P1:	<b>Mikhail A. Belogolovskii:</b> Continuum field model of defect induced heterogeneities in a strained thin layer
P2:	Doron Bar: A fractal model for the sea state bias in radar altimetry
P3:	<b>Victor Tigoiu:</b> On the approximation theorem for functionals and the asymptotic stability for some classes of polynomial fluids
P4:	D. V. Yevdokymov: Boundary element method application to some multiphase flows
P5:	<b>Ramiz A. Hasanov:</b> <i>Dispersive durable systems: The technology of synthesis with given properties</i>
P6:	Vladimir N. Damgov: Phenomenon of "discrete" ("quantized") oscillation excitation
P7:	<b>Ulmas Gafurov:</b> Molecular model of rupture of a stressed macromolecular chain of an oriented crystalline polymer
P8:	<b>Huseyin Goksu:</b> An information theoretical sliding window optimization method applied to discretization of continuous signals
P9:	<b>Dmitry Golovaty:</b> Transport properties of densely packed fluid/solid and solid/solid composites: Effect of shapes and spacings of inclusions
P10:	Ergun Turker: Computation of ground bearing capacity from shear wave velocity
P11:	Xiangting Li: Three-constituent percolating networks with widely different bond conductances
P12:	<b>Israel Cohen:</b> Clausius-Mossotti-type approximation for elastic stiffnesses of a cubic array of spheres
P13:	Leon Mishnaevsky: Computational mesomechanics of materials: Virtual testing of
	microstructures and possibilities of materials optimization
P14:	<b>Maxim Zhenirovskyy:</b> The effective properties of macroscopically inhomogeneous ferromagnetic composites
P15:	<b>Thomas M. Michelitsch:</b> Solution of the inhomogeneous Helmholtz equation for an ellipsoidal source region

#### Sunday 29 June:

17:00 - 19:00	Registration at the Conference Registration Desk in Shoresh Hotel (also
	possible during 08:00 – 08:30 on Monday – Friday)
19:00 - 21:00	Dinner buffet and "get together" reception for conference participants and
	consorts at Shoresh Hotel

<u>Talks:</u>		"long talks" are 50 minutes each, including discussion;		
		"regular talks" are 25 minutes each, including discussion		
<u>1st day</u> :	(Monday 30 June)	a.m: Conference Opening		
	08:30 - 09:00	Special welcoming remerks by Professor Shimon Vankielowicz, Postor of Tal		
		A sin University		
		Aviv University		
		Opening remarks by conference organizers		
		a my Nonlinger phonomena, methomatical modelling,		
		<i>Chair:</i> David I Bergman		
	00.00 00.50	Long talk by Shlama Ta'asan: Evan discrete to continuum: Bridging scales using		
	07.00 - 07.50	numerical simulations		
	00.50 10.40	Long talk by Itamar Processia: Dynamical instabilities of quasi static crack		
	09.30 - 10.40	nuonagation under thermal stress		
	10.40 11.00	propagation under inermal stress		
	10:40 - 11:00	Collee Dreak		
	11:00 – 12:15 Esin Inc	5 regular tarks: Chair: Smolloo 1 a asan		
	Esin ina	<b>n:</b> Integral representation for the solution of some non-classical, one-almensional,		
	pseudo-p	urabolic problems		
		: Analysis of stochastically neterogeneous micro-beams by a functional perturbation		
	meinoa			
	Alexand	er A. Nepomnyasneny: Convective Cann-Hilliara models		
	12:15 - 15:50	Lunch Break		
		n m: Compositor: parcelation: dislocations: transport		
	13.30 - 15.10	A regular talks on dislocations: <i>Chair:</i> Avadis Hacinlivan		
	13.30 – 13.10 Victor F	A regular tarks on distocations. Chair. Avails frachingan		
	Victor F	Argement Power law coarsening of dislocation froth patterns in two dimensions		
	Dan Mor	<b>A gaman.</b> Tower taw coursening of associations in Conner: A molecular dynamics and an		
		<b>uchai.</b> The dynamics of screw distocutions in Copper. A molecular dynamics and an		
	Elusiic-co Sanda C	minuum suuy		
	diatuihaati	icja- i igotu. Etasto-plastic models of crystalline materials with continuous		
	<i>uistribuii</i> 15.10 15.20	Coffee breek		
	15:10 - 15:30 15:20 - 17:35	Collee Dreak		
	15:50 - 17:55	5 regular tarks on composites, percolation, and transport: <i>Chair</i> . Nathan Arganian		
	Y akov IV	I. Streiniker: Exact relations between macroscopic moduli of composite media in n		
	Yuriy K.	<b>Tovbin:</b> The lattice-gas model in micro-aero-hydrodynamic problems: Application		
	to molect	liar flows in narrow pores and contact line motions on open surfaces		
	David J.	Bergman: Exact relations between critical behaviour of percolating elastic and		
	conductio	ig networks		
	Gregory	Surdutovich: Local fields and optical susceptibility of composite discrete media		
	Avadis F	<b>Laciniiyan:</b> Transforming to chaos using normal forms		

18:30 – 19:30 Dinner

<u>2nd day</u> : (Tuesday 1 July)	a.m:	Biological systems; comp	posites; rheology: Chair: V	Valery M. Levin
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- **08:30 09:20** Long talk by Herbert Levine: Noisy reaction-diffusion models and their biological implications
  - 09:20 10:10 Long talk by Eshel Ben- Jacob: Bio-inspired engineered self-organization
  - 10:10 10:30 Coffee break
  - 10:30 12:10 4 regular talks on composites: Chair: Herbert Levine

**Sergey K. Kanaoun:** Effective properties of matrix composite materials with high volume concentrations of inclusions (effective field approach)

Valery M. Levin: On the effective constants of inhomogeneous poroelastic medium Shmulik P. Friedman: The effects of particle shape, orientation, and size distribution on the static electrical properties of granular media Shmuel Assouline: Modeling infiltration during soil seal formation: Effects of seal nonuniformity in depth and soil heterogeneity in space

12:10 – 13:30 Lunch break

#### p.m: Composite media; fracture: Chair: Elisabeth Bouchaud

13:30 – 14:20 2 regular talks:

Andrew Snarskii: Effective characteristics of nonlinear inhomogeneous media: Method of local linearization

**Isaac Balberg:** The special electrical properties and the corresponding applications of carbon black - polymer composites

- **14:20 15:10** Long talk by Jay Fineberg: The micro-branching instability and dynamic fracture of brittle materials
- 15:10 15:30 Coffee break
- 15:30 17:35 5 regular talks: Chair: Isaac Balberg

Elisabeth Bouchaud: Damage mechanisms and fracture of glass at the nanometer scale Eugene O. Kamenetskii: Artificial "magnetic atoms" for microwave composite materials Mehmet Ali Tasdemir: Inclusion based modelling of concrete with various aggregate volume fractions

**Bikas K. Chakrabarti:** Dynamic critical phenomena in plastic deformation and failure of the random fiber bundle model

Michael Golosovsky: Energy and symmetry of self assembled 2D dipole clusters

#### 18:30 – 19:30 Dinner

20:00 – 21:00 (times are approximate) Hartmut Hahn: History and archaeological sites in Israel

3rd day: (Wednesday 2 July	a.m: Granular and composite media: Chair: Dov Levine
08:30 - 09:20	Long talk by Hans Herrmann: Restructuring of force networks
09:20 - 10:10	Long talk by Isaac Goldhirsch: Force chains, microelasticity, and macroelasticity
10:10 - 10:30	Coffee break
10:30 - 12:10	4 regular talks: Chair: Hans Herrmann
Dov Levi	ne: Force chains and stress in granular materials
Einat Ah	aronov: What controls the rheology of granular materials?
Evgeniy 1	Khain: Hydrodynamics of "thermal" granular convection
Michael	Ryvkin: Non-homogenization approach to the analysis of periodic continua:
Applicatio	ons to fracture mechanics and topological optimization
12:10 - 18:30	Lunch break and conference excursion; Tour guide: Hartmut Hahn

18:30 – 19:30 Dinner

<u>4th day</u> : (Thursday 3 July	) a.m: Mathematical modelling: Chair: David Kinderlehrer
08:30 -	09:20 Long talk by Leonid Berlyand: Discrete network
approxi	mation for effective properties of high contrast, random highly packed, solid
and flui	d composites
09:20 - 10:10	2 regular talks:
Natasha	a V. Movchan: Mathematical modelling of two-dimensional phononic crystals
Len Pis	men: Pattern formation, reconstruction, and roughening on a catalytic surface
10:10 - 10:30	Coffee break
10:30 - 12:10	4 regular talks: Chair: Natasha V. Movchan
Amy No	ovick-Cohen: A phase field model with memory
David H	Kinderlehrer: Diffusion mediated transport and the Brownian motor
Emmar	uil M. Baskin: Diffusion equation with fractional time derivative: Physical sense and
practica	<i>I realization</i>
Vladim	ir A. Dobrynskiy: Lyapunov exponents, and stability and
bifurcat	ions of chaotic attractors in coupled tent and logistic maps
12:10 - 13:30	Lunch break
12.20 14.20	p.m: Phase transitions and composites: Chair: Andrey Sarychev
13:30 - 14:20	Long talk by Steve Lipson: Pattern formation in thin water films
14:20 – 15:10 Niliita I	2 regular taiks:
NIKITA I Obad I	viorozov: Solia mechanics methoas in nano-technological problems
Ullau L 15.10 15.20	Coffee breek
15:10 - 15:50	Conce break
15.30 - 16.20	Long talk by Voir Zermi: Diversity of vegetation natterns and desertification
16:20 - 17:10	2 regular talks.
10.20 – 17.10 Asok K	<b>umar Sen</b> : Variable-range honning conduction and the RRTN model of
nercola	tion in the presence of tunneling
Andrey	<b>K. Sarvchev:</b> <i>Plasmonic nano-antennas</i>
18:30 - 21:30	Conference banquet
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<u>5th day</u> : (Friday 4 July)	a.m Discrete vs. continuum models; noise: Chair: Dominique Jeulin
08:30 - 09:20	Long talk by Bernard Coleman: Theory of a naturally discrete model for DNA
	elasticity that accounts for the dependence of the mechanical properties of DNA on
	nucleotide sequence
09:20 - 10:10	Long talk by Kamal Bardhan: Noise in non-Ohmic regimes of disordered systems
10:10 - 10:30	Coffee break

Chair: Kamal Bardhan

10:30 - 11:20Long talk by Sorin Solomon: How faithful are continuum models to discrete<br/>systems? Some strange rigorous results and their obvious real life applications11:20 - 12:102 regular talks:

Nadav Shnerb: Adaptation of autocatalytic reactants to discrete catalysts Dominique Jeulin: Representative volume element: A statistical point of view

12:10 – 13:30 Lunch break; end of conference

Friday 4 July 14:00 - Sunday 6 July 19:00: Post-conference tour to the northern parts of Israel