

TECHNION – Israel Institute of Technology

James H. Belfer Memorial Symposium

Nonlinear Wave Phenomena:

From weak nonlinearity to sonic vacuum

Monday, January 13, 2014

Faculty of Mechanical Engineering, Lady Davis Bldg., Room 250, Technion

Organizers: **Prof. Yuli Starosvetsky** and **Prof. Oleg Gendelman**
Faculty of Mechanical Engineering – Technion

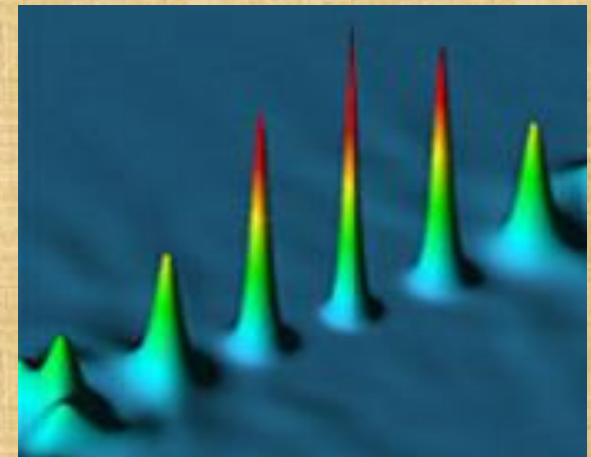
Keynote Speakers:

Prof. Sergej Flach (Massey University, New Zealand)

Prof. Guillaume James (Institut National Polytechnique de Grenoble, France)

General Scope:

In this workshop speakers will present their recent theoretical and experimental activity outlining the current frontiers in the field of nonlinear waves in discrete and continuous media with the emphasize to the possible applications in the real life physical systems. Special emphasize will be given to application of advanced analytical and state-of-the-art numerical methods to study the diverse nonlinear wave phenomena, emerging in various branches of nonlinear physics.





Program:

8:30 – 9:00 Registration

9:00 – 9:15 Welcome Addresses

Session 1 (Chairman: Y. Starosvetsky)

9:15-10:05 – **Keynote Lecture by S. Flach**
Nonlinear Lattice Waves in Complex Systems

10:05-10:35 – **L. Freidland**
Autoresonant Wave Dynamics in Vlasov-Poisson Systems

10:35-11:05 – **O. Gendelman**
Exact solutions and stability for forced-damped discrete breathers

11:05-11:35 – **A. Soffer**
Quantum and Dispersive wave analysis via Hydrodynamics

11:35-12:05 – Coffee Break

Session 2 (Chairman: O. Gottlieb)

12:05-12:35 – **I. Procaccia**
*Analytic Solution of the Approach of Quantum Vortices
Towards Reconnection*

12:35-13:05 – **S. Fishman**
*Effects of Anharmonicity on Dynamics of Trapped Cold Atoms:
Dynamic Phase Space Localization, Echoes and Revivals*

13:05-13:35 – **V. Fleurov,**
Dynamics of fluctuations in an optical Laval nozzle

13:35-14:05 – **E. Bouchbinder**
Weakly nonlinear theory of fracture and dynamic instabilities

14:05 – 15:05 - Lunch

Session 3 (Chairman: O. Gendelman)

15:05-15:55 – **Keynote Lecture by G. James**
Localized waves in granular crystals

15:55-16:25 – **Y. Starosvetsky**
*Control of localized excitations emerging in nonlinear lattices
in the state of sonic vacuum*

16:25-16:55 – **A. Nepomnyashchy**
Onset of Marangoni convection in binary solutions

16:55-17:25 – **A. Oron**
Compactons induced by a non-convex advection

17:25-17:50 – Coffee Break

Session 4 (Chairman: A. Oron)

17:50-18:20 – **S. Krylov**
*Microcantilevers parametrically excited by fringing electrostatic
fields*

18:20-18:50 – **O. Gottlieb**
*Nonlinear dynamics bifurcations and chaos of thermo-visco-elastic
cantilever sensors in a high vacuum environment*

18:50-19:20 – **A. Novick-Cohen**
Mobility measurements for grain growth: the grim reaper solution

19:20-19:50 – **M. Kovaleva**
*Non-conventional synchronization in systems of coupled auto-
generators*