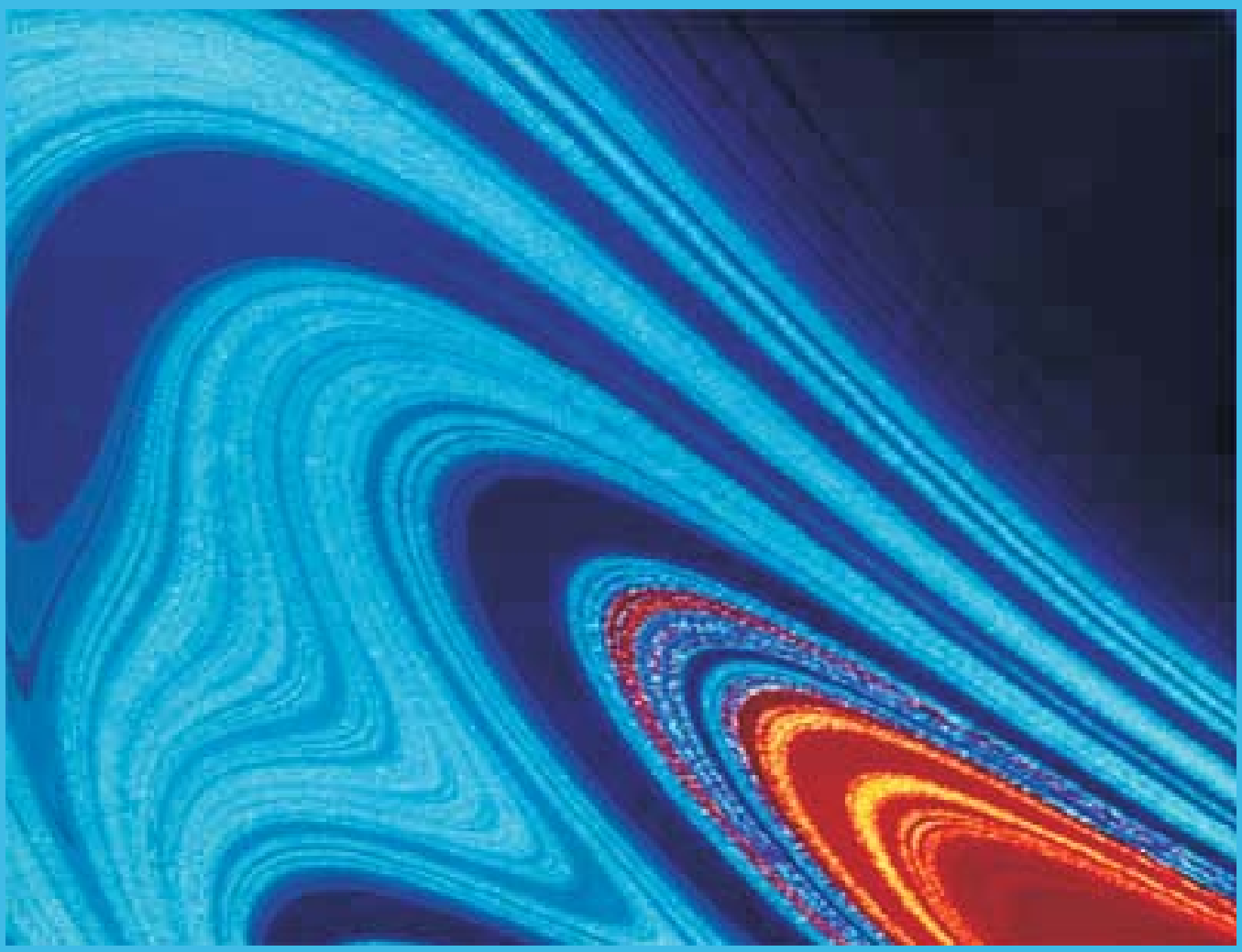
NATO Advanced Research Workshop

Recent Advances in Nonlinear Dynamics And Complex System Physics: *From Natural to Social Sciences and Security*

6-11 October, 2008 Tashkent, Uzbekistan



Supported and Organized by
The NATO Science for Peace and Security Programme
Heat Physics Department of the Uzbek Academy of Sciences
Uzbekistan Physical Society

Tashkent - 2008

SCIENTIFIC PROGRAMME

Day 1, October 6

10:00-11:00 *Registration and coffee*

11:00-11:30 *Opening Ceremony: Acad. P.K. Khabibullaev, Prof. G. Casati.*
Welcome speech: Acad. Sh.I. Salikhov, President of the Uzbek Academy of Sciences.

Morning Session

Disaster Modeling and Forecasting. Self-organized Criticality. Pattern Formation. Chair: Joachim Burgdoerfer (10:40-13:00)

11:30-12:10 Michael Berry. *Tsunami Asymptotics.*

11:15-12:55 Theo Geisel. *New Approaches to the Modelling and Forecast of Epidemics in a Globalized World.*

13:00-13:20 Abdulla Rakhimov. *Instability of homogeneous Bose–Einstein condensate at zero temperature: HFB approximation.*

Lunch (13:30-14:30)

Afternoon Session

Quantum Information. Chair: Michael Berry (14:30-18:00)

14:30-15:10 Eugene Polzik. *Quantum interface between light and matter.*

15:15-15:55 Barry Sanders. *Algorithms for Quantum Simulation.*

Coffee Break (16:00-16:30)

16:30-17:10 Saverio Pascazio. *Statistical mechanics of multipartite entanglement.*

17:15-17:55 Bertrand Georgeot. *Quantum chaos in quantum information and cold atoms physics: from entanglement of random vectors to time reversal of matter waves.*

Dinner (18:30-20:00)

Day 2, October 7

Morning Session

Classical and Quantum Nonequilibrium Systems.

Chair: François Peeters (9:00-13:00)

9:00-9:40 Marko Robnik. *Exact analysis of the adiabatic invariants in time-dependent harmonic oscillator.*

9:45-10:25 Shavkat Ayupov. *Operator algebras and quantum dynamics.*

Coffee Break (10:30-11:00)

11:00-11:40 Tomaz Prosen. *Third quantization: a general method to solve master equations for quadratic open Fermi systems.*

11:45-12:05 Kazue Kudo. *Spin dynamics and quantum transport in quantum spin chainsunder an oscillating field.*

12:10-12:30 David Novoa. *Supersolitons, a novel kind of solitonic excitations in atomic soliton chains.*

12:35-12:55 Florian Koch. *Dynamical trapping and chaotic scattering of the harmonically driven barrier.*

Lunch (13:00-14:30)

Afternoon Session

Cold Atom Physics. Chair: Marko Robnik (14:30:-18:00)

14:30-15:10 Joachim Burgdoerfer. *Diffractive paths in the semiclassical and quantum mechanics of billiards.*

15:15-15:55 Tania Monteiro. *Quantum kicked rotors with cold atoms and spin chains.*

Coffee Break (16:00-16:30)

16:30-17:10 Almas Sadreev. *Vortices in ground state of spinor Bose-Einstein condenstates.*

17:15-17:55 Rodolfo Jalabert. *Time reversal of quantum states and classical waves: a semiclassical approach.*

Dinner (18:30-20:00)

Day 3, October 8

Morning Session

Cold Atom Physics. Chair: Theo Geisel (9:00-13:00)

9:00-9:40 Mark Fromhold. *Controlling Bose-Einstein condensates with semiconductor surfaces and devices.*

9:45-10:25 Dominique Delande. *Experimental observation of the Anderson transition with atomic matter waves.*

Coffee Break (10:30-11:00)

11:00-11:40 Katsuhiro Nakamura. *Nonlinear Dynamics and Chaos of Wave Packets and Vortices in Multi-Component Bose-Einstein Condensates.*

11:45-12:25 Humberto Michinel. *Light and anti-light in a nonlinear liquid of photons.*

12:30-12:50 Hiroki Tutu. *Stochastic Landau-Lifshitz-Gilbert equation with delayed feedback field: Efficiency for maintaining UPO.*

Lunch (13:00-14:30)

Afternoon Session

Econophysics, Nanophysics. Chair: Katsuhiro Nakamura (14:30-18:00)

14:30-15:10 Anna Carbone. *Detrending Moving Average Algorithm (DMA).*

15:15-15:55 Sebastian Schmidt. *Mesoscopic interplay of superconductivity and ferromagnetism in ultrasmall metallic grains.*

Coffee Break (16:00-16:30)

16:30-16:50 Takaaki Monnai. *Nonequilibrium diffusion induced by an external force and a spatio-temporal correlated noise.*

16:55-17:15 Nigora Turaeva. *Statistic theory of MEG in quantum dots based solar cells.*

17:20-17:40 Eduard Tsoy. *Statistical characteristics of the gap soliton dynamics in random media.*

17:45-18:05 Khayotullo Ismatullaev. *Dissipative Bose Einstein condensate under vibration of harmonic trap position.*

Dinner (18:30-20:00)

Day 4, October 9

Morning Session

Nanophysics. Chair: Giulio Casati (9:00-13:00)

9:00-9:40 Peter Schmelcher. *Mesoscopic Physics with Ultracold Atoms: From Confined-Induced Transparency to One-Dimensional Rydberg Gases*.

9:45-10:25 François Peeters. *Tuning the superconducting properties of nanomaterials.*

Coffee Break (10:30-11:00)

11:00-11:40 Denis Ullmo. *Many-body physics and quantum chaos in mesoscopic systems.*

11:45-12:25 Bekir Kandemir. *Phonons and electron-phonon interactions in single-walled achiral carbon nanotubes.*

12:30-12:50 Shumpei Masuda. *Fast-Forward Problem in Quantum Mechanics.*

Lunch (13:00-14:30)

Afternoon Session

Nanophysics. Chair: Peter Schmelcher (14:30-18:00)

14:30-15:10 Martina Hentschel. *Quantum Chaos and Non-Hamiltonian Dynamics in Optical Microcavities.*

15:15-15:55 Davron Matrasulov. *Quantum time-dependent billiards.*

Coffee Break (16:00-16:30)

16:30-16:50 Tomoshige Miyaguchi. *Nonlinear responses in Hard disk gases.*

16:55-17:15 Florian Lenz. *Fermi acceleration in the driven elliptical billiard.*

17:20-17:40 Uktam Salomov. *Classical Dynamics in kicked billiards.*

17:45-18:05 Hammid Yusupov. *Time-dependent neutrino billiards.*

Dinner (18:30-20:00)

Day 5, October 10

Morning Session

Nanophysics. Chair: Eugene Polzik (9:00-13:00)

9:00-9:40 Giulio Casati. *Classical and quantum transport: from Fourier law to thermoelectric efficiency.*

9:45-10:25 Florian Marquardt. *Dispersive optomechanics: a membrane inside a cavity.*

Coffee Break (10:30-11:00)

11:00-11:20 Ayumu Sugita. *Thermal conduction in a quantum system: universality and it origins.*

11:25-11:45 Davran Otajanov. *Nonlinear dynamics in cavity QED: The role of finite- temperature effects.*

11:50-12:10 Shavkat Mamatkulov. *Optimized ion force fields based on thermodynamic properties.*

12:15-12:35 G'olibjon Berdiyorov *Pattern formation process in the intermediate state of mesoscopic type-I superconductors.*

12:40-13:00 Bakhtiyar Baizakov. *Generation of Sound Waves in Two-Component Bose-Einstein Condensates.*

Lunch (13:00-14:30)

Afternoon Session

Nanophysics. Chair: Dominique Delande (14:30-18:00)

14:30-14:50 Ravil Galimzyanov. *Soliton dynamics at interface between uniform medium and nonlinear optical lattice.*

14:55-15:15 Sanat Avazbaev. *Extraction partial waves for the hydrogen atom in a strong magnetic field.*

15:20-15:40 Atabek Atamuratov. *Modelling of quantum sized wires in the interface layer of the semiconductor-oxide structures with charge built in oxide.*

15:45-16:05 Vadzim Piatrou. *Chaotic instantons and exponential widening of the ground quasienergy doublet in kicked double well potential.*

16:10-16:30 Mikhail Kremkov. *Quantum photoelectron effects in the eyes retina and coloured vision theory development.*

Coffee Break (16:35-17:05)

Round Table (17:10-18:10) Giulio Casati, Michael Berry, Marko Robnik, Peter Schmelcher, Theo Geisel, Eugene Polzik, Katsuhiro Nakamura, Barry Sanders.

Dinner (18:30-20:00)

Day 6, October 11

Tour in the Tashkent city (10:00-13:00)