Unsolved Problems of Noise and fluctuations in physics, biology, and high technology (UPoN4-2005)
June 6-June 10, 2005
Congress Center, Grand Hotel Costa Brada - Gallipoli, Lecce-Italy

SCIENTIFIC PROGRAM (FINAL)

Sunday 5

17:00–20:00 **Registration and welcome party**

Adjourn

Monday 6

8:00-8:30 **Registration**
8:30 -8:45 **Welcome** (Lino Reggiani)
8:45-9:00 **Opening** (Academic Authorities)

M1 - Enhanced and Suppressed Shot Noise (I) (C. Glattli, Chair)

9:05-9:45 **Peculiar properties of fractionally charged quasiparticles determined by shot noise measurements,** Mordehai Heiblum (plenary)
9:45-10:15 **Quantum shot noise and orbital entanglement,** Markus Buttiker (keynote)
10:15-10:35 **Shot noise suppression as indicator of coherent tunneling in resonant diodes,** Vladimir Aleshkin (invited)
10:35-1055 **Enhanced shot noise in diffusive S/N/S junctions,** Francois Lefloch (invited)

10:55-11:20 Coffee Break

M2 - Enhanced and Suppressed Shot Noise (II) (M. Buttiker, Chair)

11:20-11:50 **High frequency quantum shot noise: can quiet electrons generate sub-poissonian photons?,** Christian Glattli (keynote)
11:50-12:10 **Discussion of shot noise suppression in cascades mesoscopic cavities,** Massimo Macucci (invited)
12:10-12:30 **Shot noise in mesoscopic systems within the first quantization formalism: a de Broglie-Bohm wave-particle description,** Xavier Oriols (invited)
12:30-12:50 **Shot noise suppression and enhancement in 2D hopping and single-electron arrays,** Viktor Sverdlov (invited)

12:50-15:30 Lunch

M3 -Noise in Biological Systems (I) (S. Bezrukov, Chair)

15:30-16:00 **"Fatal scream" of bacteria infected by phages: nanoscale detection of bacteriophage triggered ion cascade,** Maria King (keynote)
16:00-16:20 **Background processes and the generation of the flicker noise in nanochannel transport,** Ilona Kosinska (invited)
16:20-16:40 **Signal processing problems of neurocardiological fluctuations**, Zoltan Gingl (invited)
16:40-17:00 **Non-linear Dynamics and Noise in rather realistic α-Helix Models, simulation results**, Per-Anker Lindgard (invited)
17:00-17:15 **Fluctuations of the single photon response in visual transduction,** Daniele Andreucci (oral)

17:15-17:35 Coffee Break

M4 - Noise in Devices (I) (L. Varani, Chair)

17:35-18:05 **TeraHertz emission and noise spectra in HEMTs,** Javier Mateos (keynote)
18:05-18:25 **1/f and RTS Noise in submicron devices: Faster is noisier,** Lode Vandamme (invited)
18:25-18:45 **Noise and Charge Transport in Carbon Nanotube Devices**, Gijs Bosman (invited)
18:45-19:05 **Key issues in trap-assisted low-frequency device noise simulation in nonlinear large-signal conditions,** Fabrizio Bonani (invited)
19:05-19:20 **Simulating noise performance of advanced devices down to cryogenic Temperature,** Francesco Catalfamo (oral)

Adjourn

Tuesday 7

T1 -Theoretical Frontiers on Noise and Fluctuations (I) (N. VanKampen, Chair)

8:50-9:20 **Extinction times for birth-death processes and the failure of the Fokker-Planck approximation**, Charlie Doering (keynote)
9:20-9:40 **Paradoxes in probability, information and entropy**, Derek Abbott (invited)
9:40-10:00 **Applications of Stochastic Differential Equations in Circuit Analysis,** Andrew Allison (invited)
10:00-10:20 **Full counting statistics of mesoscopic electron transport,** Wolfang Belzig (invited)
10:20-10:40 **The role of quantum noise in quantum key distribution**, Janos Bergou (invited)
10:40-11:00 **Classical and quantum probability and noise: the history and problems,** Leon Cohen (invited)

11:00-11:25 Coffee Break

T2 - Experimental frontiers on noise and fluctuations (G. Bosman, Chair)

11:25-11:55 **Low frequency noise in non-Ohmic regimes in disordered systems,** Kamal K. Bardhan (keynote)
11:55-12:25 **Noise activated switching in a driven , nonlinear micromechanical oscillator,** Ho Bu Chan (keynote)
12:25-12:45 **Random telegraph signal in Si n-MOSFETs: a way toward single spin resonance detection,** Marco Fanciulli (invited)
12:45-13:00 **High frequency noise in AlGaN/GaN heterostructures,** Svetlana Vitusevich (oral)

13:00-15:30 Lunch

T3- Noise and Chaos (L. Kish, Chair)

15:30-16:00 **Emergent oscillations in a system of coupled overdamped bistable elements subject to noise floor,** Adi Bulsara (keynote)
16:00-16:20 **Quantum irreversibility and Chaos in mesoscopic devices,** Florentino R. Borondo (invited)
16:20-16:40 **Langevin processes describing clustering of tracers,** Michael Wilkinson (invited)
16:40-16:55 **Microscopic theory for the quantum to classical crossover in chaotic transport,** Philippe Jacquod (oral)
16:55-17:10 **Chaos and noise-driven emergence of order from disorder?,** Mattia Frasca (oral)
17:10-17:25 **Divergence of the chaotic layer width and diffusion rate adiabatic limit**, (oral) Slava Soskin

17:25-17:45 Coffee Break

T4 - Noise and Coherence (M. Heiblum, Chair)

17:45-18:15 **Do all correlated emission laser produce amplified entangled light?** Suhail Zubairy (keynote)
18:15-18:35 **Absolutely secure data encription with classical information?** Laszlo Kish (invited)
18:35-18:55 **Can self-sustaining currents be induced in a system of mesoscopic cylinders?** Jurek Luczka (invited)

19:30 Meeting and Dinner of the Scientific Committee

Adjourn

Wednesday 8

W1 - Noise in Devices (II) (J. Mateos, Chair)

8:50-9:20 **Unsolved problems of low frequency noise in GaN-based HFETs,** Sergey Rumyantsev (keynote)
9:20-9:40 **Mesoscopic modelling of depletion forces**, Peter Kotelenez (invited)
9:40-10:00 **Upconversion as universal mechanism of noise transformation,** Jevgenij Starikov (invited)
10:00-10:20 **On a semiclassical theory of noise in Quantum Well Infrared Photodetectors, with a discrete set of recombination centers,** Anna Carbone (invited)
10:20-10:40 **Is it possible to suppress noise by noise in semiconductors?,** Luca Varani (invited)
10:40-10:55 **Noise simulation in MOSFETs under microwave irradiation ,** Enrico Prati (oral)
10:55-11:10 **Noise in adaptable systems,** Rogerio Enriquez Caldera (oral)

11:10-11:25 Coffee Break

W2 - Theoretical Frontiers on Noise and Fluctuations (II) (C. Doering , Chair)

11:25-11:55 **Discussion on the validity of Langevin equation,** Nico Van Kampen (keynote)
11:55-12:15 **The uphill turtle race; how do nucleation rates depend on time?** Henk Van Beijeren (invited)
12:15-12:35 **Transport and diffusion on crystalline surfaces under external forces,** Katja Lindenberg (invited)
12:35-12:55 **Charge transport fluctuations in NEMS,** Antti-Pekka Jauho (invited)
12:55-13:10 **How does one describe a time-varying statistical spectrum:transforming random differential equations into phase-space** Lorenzo Galleani (oral)

W3P - 13:10-15:15 Poster Session with Lunch Buffet

P1 – Topic - 8 **Fluctuation models of irregular impedance networks,** Akimov Vladimir

P2 - Topic - 8 **Thermal Fluctuations of G Protein-Coupled Receptors: a Two Force-Constant Random Model,** Alfinito Eleonora

P3 - Topic - 8 **Noise properties of single open ion channels: a first principle based computational approach,** Brunetti Rossella

P4 - Topic - 9 **Transverse velocity fluctuations of hot electrons in n-type GaAs in crossed electric and magnetic fields by Monte Carlo methods,** Ciccarello Francesco

P5 - Topic - 10 **Abnormally low current noise in the NdFeBC nanostructured ceramics,** Gerashchenko Oleg

P6 - Topic - 8 **Noise-induced synchronization and desynchronization of self-sustained oscillators,** Goldobin Denis

P7 - Topic – 7 **How to measure a subdiffusion coefficient and a subdiffusion parameter,** Kosztolowicz Tadeusz

P8 - Topic - 9 **Transverse-mode noise simulation for isolation transformes,** Marin Doina

P9 - Topic – 1 **Multi-channel active noise control systems based on H control,** Nasiri Alireza

P10 - Topic – 9 **Investigation of longitudinal velocity fluctuations in MOSFETs by means of ensemble Monte Carlo simulation,** Rengel Raoul

P11 - Topic - 3 **The puzzle of shot noise suppression in a series of N tunnel barriers,** Rosini Marcello

P12 - Topic - 8 **Noise-Driven Switching between Limit Cycles and Adaptability in a Small-dimensional Excitable Network with Balanced Coupling,** Safonov Leonid

P13 - Topic - 9 **Shot noise spectrum cutt-off in Schottky-barrier diodes,** Shiktorov Pavel

P14 - Topic - 1 **Non-exotic theory of 1/f noise as a trace of infralow-frequency fluctuations,** Shulman Alexander

P15 - Topic - 9 **Effect of non-equilibrium term in two-particle correlation function on electron-phonon collision integrals,** Shulman Alexander

P16 - Topic- 8 **Brownian simulations and uni-direfctional flux in diffusion,** Singer Amit

P17 - Topic- 9 **Noise in epitaxial HgCdTe films,** Virt I.

P18 - Topic- 4 **Strange dynamics of a non-isolated spin: resonances, Berry phase and geometric dephasing,** Whitney Robert

15:45 Departure to Lecce:
City Tour
Social Dinner

Adjourn

Thursday 9

Th1 - Constructive Role of Noise (D. Abbott, Chair)

9:20-9:50 **Attention excludes noise. Does it excludes stochastic resonance?** Lawrence Ward (keynote)
9:50-10:10 **Chemical peristalsis,** Dean Astumian (invited)
10:10-10:30 **Switching of driven systems: activation or tunneling?,** Mark Dykman (invited)
10:30-10:50 **Activation energies for noise-induced transitions in overdamped systems on finite times: exact general solution,** Riccardo Mannella (invited)

10:50-11:15 **Coffee Break**

Th2 - Noise in Complex Systems and Non-Gaussian Fluctuations (I) (C. Pennetta, Chair)

11:15-11:35 **Large deviation functions in dissipative stationary states,** Jean Farago (invited)
11:35-11:55 **Nonlinear stochastic systems driven by Levy noise**, Joseph Klafter (invited)
11:55-12:15 **Large deviation techniques applied to systems with long-range interactions** Stefano Ruffo (invited)
12:15-12:30 **Effect of non-Gaussian noise in small Josephson junctions,** Rene Lindell (oral)
12:30-12:45 **1/f Fluctuations at nonequilibrium phase transitions in heat and mass transfer transitions,** Viatcheslav Skokov (oral)

12:45-15:30 **Lunch**

Th3 -Noise in Complex Systems and Non-Gaussian Fluctuations (II) (S. Ruffo, Chair)

15:30-16:00 **Experimental results on the fluctuations in out of equilibrium systems,** Sergio Ciliberto (keynote)
16:00-16:20 **Attention predicting dynamics of complex stochastic systems** , Vadim Smelyanskiy (invited)
16:20-16:40 **Distribution of return periods of rare events in correlated time series,** Cecilia Pennetta (invited)
16:40-17:00 **Stochastic dynamics of anaesthesia,** Peter McClintock (invited)
17:00-17:20 **Absolute stability margin of nonequilibrium stationary systems,** Andrew Snarskii (invited)

17:20-17:40 **Coffee Break**

Th4 - Noise in Biological Systems (II) (M. King, Chair)

17:40-18:10 **Can electrical vestibular noise be used for the treatment of brain deseases?** Yoshiharu Yamamoto (keynote)
18:10-18:30 **Why doing zig-zag?,** Udo Erdman (invited)
18:30-18:50 **Are mean turning angles selected for survival of zooplankton?**, Frank Moss (invited)
18:50-19:10 **Inter-scale fluctuations in biological systems.** Hans Liljenstrom (invited)
19:10-19:25 **Role of noise in complex networks of Fitz-Hugh Nagumo neurons**, Manuela LaRosa (oral)
19:25-19:40 **Robustness vs redundancy in biological systems,** Enrico Capobianco (oral)

Adjourn

Friday 10

F1 - Theoretical Frontiers on Noise and Fluctuations (III) (J. Bergou, Chair)

8:50-9:10 **Fluctuations in electrohydrodynamic instabilities,** Leone Fronzoni (invited)
9:10-9:30 **Fluctuation-dissipation relations in systems with external drive**, Giuseppe Gonnella (invited)
9:30-9:50 **Why noise can serve as precursor of catastrophes,** Pavel Shiktorov (invited)
9:50-10:05 **Renewal, modulation and bliking quantum dots,** Paolo Paradisi (oral)

10:05-10:20 **Noisy harmonic oscillator: from Einstein till now,** Moshe Gitterman (oral)

F2 - Noise in Biological Systems (III) (M. Tacano, Chair)

10:20-10:40 **Memory, feedback, and noise, in neural systems,** Benjamin Lindner (invited)
10:40-11:00 **Single-molecule biochemical analysis using channel current cheminformatics,** Stephen Winters-Hilt (invited)
11:00-11:20 **Functional sub-conformations of protein molecules: Lessons from single channel experiments,** Lisen Kullman (invited)

11:20-11:35 **Coffee Break**

F3 - Noise in Biological Systems (IV) (Y. Yamamoto, Chair)

11:35-11:55 **1/f spectra: noise, chaotic dynamics, or phase coupled oscillators?,** Aneta Stefanovska (invited)
11:55-12:15 **Rhythm analysis of melodies used to win women marathon gold medal,** Munecazu Tacano (invited)
12:15-12:30 **Informative essence of chaos,** Serge Timashev (oral)
12:30-12:45 **Subdiffusion in a single protein molecule–generalized Langevin equation with fractional Gaussian noise,** Samuel Kou (oral)
12:45-13:00 **Randomness of amoeba mouvements,** Hasiguchi Sumihisa (oral)

13:00-13:15 **Closing and Remarks**