Contents

vii Conference Committee

ix Origins of randomness in statistical and quantum mechanics (Plenary Paper) [6600-500]
M. B. Weissman, Univ. of Illinois at Urbana-Champaign (USA)

xix Thermal noise informatics: totally secure communication via a wire, zero-power communication, and thermal noise driven computing (Plenary Paper) [6600-501]
L. B. Kish, Texas A&M Univ. (USA); R. Mingesz, Z. Gingl, Univ. of Szeged (Hungary)

SINGLE MOLECULES

6602 06 A new model for myosin dimeric motors incorporating Brownian ratchet and powerstroke mechanisms (Invited Paper) [6602-02]
B. Geislinger, R. Kawai, Univ. of Alabama at Birmingham (USA)

6602 08 Understanding the role of thermal fluctuations in DNA looping (Invited Paper) [6602-04]
D. P. Wilson, T. Lillian, Univ. of Michigan (USA); S. Goyal, Univ. of Michigan (USA) and Woods Hole Oceanographic Institute (USA); A. V. Tkachenko, N. C. Perkins, J.-C. Meiners, Univ. of Michigan (USA)

6602 09 Computational characterization of the mutation impact on domain C5 of Myosin Binding Protein C [6602-05]
C. Guardiani, Ctr. Interdipartimentale per lo Studio delle Dinamiche Complesse (Italy); F. Cecconi, Istituto die Sistemi Complessi ISC-CNR (Italy); R. Livi, Univ. di Firenze (Italy)

ION CHANNELS AND PUMPS

6602 08 Analytical study of a flashing molecular pump (Invited Paper) [6602-07]
J. M. Sancho, A. Gomez-Marín, Univ. de Barcelona (Spain)

6602 0C Effect of noise on a particle moving in a periodic potential (Invited Paper) [6602-08]
M. Gitterman, Bar-Ilan Univ. (Israel)

6602 0D On selectivity and gating of ionic channels (Invited Paper) [6602-09]
D. G. Luchinsky, Lancaster Univ. (United Kingdom) and Ames Research Ctr. (USA); R. Tindjong, P. V. E. McClintock, Lancaster Univ. (United Kingdom); I. Kaufman, The Russian Research Institute for Metrological Service (Russia); R. S. Eisenberg, Rush Medical College (USA)

6602 0E Self-consistent analytic solution for the current and access resistance in open ionic channels [6602-10]
D. G. Luchinsky, Lancaster Univ. (United Kingdom) and Ames Research Ctr. (USA); R. Tindjong, P. V. E. McClintock, Lancaster Univ. (United Kingdom); I. Kaufman, The Russian Research Institute for Metrological Service (Russia); R. S. Eisenberg, Rush Medical College (USA)
6602 OF  Surprising features of particle dynamics in channel-facilitated transport [6602-11]
A. M. Berezhkovskii, S. M. Bezrukov, National Institutes of Health (USA)

SENSORY SYSTEMS

6602 OG  Fluctuations in speech (Invited Paper) [6602-12]
S. Umesh, Indian Institute of Technology (India); L. Cohen, City Univ. of New York (USA);
D. Nelson, U.S. Dept. of Defense (USA)

6602 OH  A hierarchy of phase transitions in optimal neuronal coding: from binary to m-ary discrete
optimal codes [6602-13]
A. Nikitin, N. G. Stocks, Univ. of Warwick (United Kingdom); R. P. Morse, Univ. of Aston
(United Kingdom)

SIGNAL ANALYSIS

6602 OI  Liposome characterization with fluorescence cumulant analysis [6602-14]
J. E. Reiner, A. Jahn, L. E. Locascio, M. Gaitan, J. J. Kaskanowicz, National Institute of
Standards and Technology (USA)

NETWORKS, CELLS, POPULATION DYNAMICS I

6602 OJ  Stochastic trigger for clathrin-coated vesicle biogenesis (Keynote Paper) [6602-15]
R. Nossal, National Institutes of Health (USA)

6602 OM  Mechanism of intracellular Ca^{2+} oscillations and interspike interval distributions (Invited
Paper) [6602-18]
M. Falcke, Hahn Meitner Institut (Germany)

NETWORKS, CELLS, POPULATION DYNAMICS II

6602 OO  White noise and synchronization shaping the age structure of the human population
[6602-20]
S. Cebrat, P. Biecek, K. Bonkowska, M. Kula, Wroclaw Univ. (Poland)

6602 OP  Pandemics and immune memory in the noisy Penna model [6602-21]
S. Cebrat, K. Bonkowska, P. Biecek, Wroclaw Univ. (Poland)

NOISE EFFECTS AND STOCHASTIC RESONANCE

6602 OQ  Coherence resonance in an autapse neuron model with time delay (Invited Paper)
[6602-22]
G. C. Sethia, Institute for Plasma Research (India); J. Kurths, Univ. of Potsdam (Germany);
A. Sen, Institute for Plasma Research (India)
Optimal coding of a random stimulus by a population of parallel neuron models (Invited Paper) [6602-23]
M. D. McDonnell, The Univ. of Adelaide (Australia); N. G. Stocks, The Univ. of Warwick (United Kingdom); D. Abbott, The Univ. of Adelaide (Australia)

Pooling networks for a discrimination task: noise-enhanced detection (Invited Paper) [6602-24]
P.-O. Amblard, S. Zozor, GIPSA-lab, CNRS (France); M. D. McDonnell, The Univ. of Adelaide (Australia); N. G. Stocks, The Univ. of Warwick (United Kingdom)

Endogenous neural noise and stochastic resonance (Invited Paper) [6602-25]
L. Emberson, Cornell Univ. (USA); K. Kitajo, RIKEN Brain Science Institute (Japan); L. M. Ward, Univ. of British Columbia (Canada)

Stochastic beamforming for cochlear implant coding (Invited Paper) [6602-26]
R. P. Morse, S. D. Holmes, Aston Univ. (United Kingdom); B. Shulgin, A. Nikitin, N. G. Stocks, Univ. of Warwick (United Kingdom)

Fluctuation in the retina: noise-enhanced processing via random sampling and microaccades? [6602-27]
S. Zozor, P.-O. Amblard, C. Duchêne, GIPSA-Lab., CNRS (France)

CARDIOVASCULAR SYSTEMS I

On some problems encountered in inference of causality from time series (Invited Paper) [6602-29]
M. Paluš, Institute of Computer Science (Czech Republic)

The cardiorespiratory interaction: a nonlinear stochastic model and its synchronization properties (Invited Paper) [6602-30]
A. Bahaminasab, D. Kenwright, A. Stefanovska, P. V. E. McClintock, Lancaster Univ. (United Kingdom)

Fluctuations in a coupled-oscillator model of the cardiovascular system (Invited Paper) [6602-31]
J. A. González, Venezuela Institute for Scientific Research (Venezuela); J. J. Suárez-Vargas, A. Stefanovska, P. V. E. McClintock, Lancaster Univ. (United Kingdom)

CARDIOVASCULAR SYSTEMS II

A simple model for 1/f spectra in heart rate variability (Invited Paper) [6602-32]
J. P. Gleeson, Univ. College Cork (Ireland); A. Stefanovska, Lancaster Univ. (United Kingdom)

Phenomenological analysis of medical time series with regular and stochastic components [6602-33]
S. F. Timashev, Karpov Institute of Physical Chemistry (Russia); Y. S. Polyakov, USPolyResearch (USA)
Noisy unmaskers of multistability of periodic rhythms in a model of the ventricular cardiac action potential [6602-34]
E. Surkovatina, R. Egorchenkov, Space Research Institute (Russia); G. Ivanov, Moscow Medical Academy (Russia)

Suppression of global oscillations via time-delayed feedback in a net of neural elements [6602-47]
M. Gassel, E. Glatt, F. Kaiser, Darmstadt Univ. of Technology (Germany)

BRAIN AND NEURONAL NETWORKS

Complexity, information loss, and model building: from neuro- to cognitive dynamics (Invited Paper) [6602-36]
F. T. Areccchi, Univ. di Firenze (Italy)

Living ordered neural networks as model systems for signal processing (Invited Paper) [6602-37]
C. Villard, Institute Néel, CNRS, and Univ. Joseph Fourier (France); P. O. Amblard, G. Becq, GIPSA-Lab. (France); S. Gory-Fauré, J. Brocard, CEA-Grenoble (France); S. Roth, CNRS and Univ. Joseph Fourier (France)

Physical/physiological meaning of frequency modulation in brain wave with/without photostimulation [6602-40]
H. Konno, Univ. of Tsukuba (Japan); H. Chatani, Univ. of Tsukuba (Japan) and Kyushu Univ. (Japan); Y. Takahashi, Univ. of Tsukuba (Japan); A. Sakata, S. Tobimatsu, Kyushu Univ. (Japan)

NEURONAL NETWORKS

Bayesian inferential framework for diagnostic of non-stationary systems [6602-42]
V. N. Smelyanskiy, D. G. Luchinsky, NASA Ames Research Ctr. (USA); A. Duggento, P. V. E. McClintock, Lancaster Univ. (United Kingdom)

E VOLUTION: GENETICS

Stochastic simulations of fatty-acid proto-cell models (Invited Paper) [6602-43]
F. Mavelli, Univ. of Bari (Italy); K. Ruiz-Mirazo, Univ. of the Basque Country (Spain)

POSTER SESSION

Moment neuronal networks: stochastic computation in neuronal systems [6602-46]
J. Feng, Warwick Univ. (United Kingdom); Y. Deng, Hunan Univ. (China); E. Rossoni, Warwick Univ. (United Kingdom)

Pattern formation in subexcitatable media: interplay of noise and variability [6602-48]
E. Glatt, M. Gassel, F. Kaiser, Darmstadt Univ. of Technology (Germany)

Author Index