# THE BIOLOGICAL PHYSICIST

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This issue of THE BIOLOGICAL PHYSICIST brings you coverage of the highly successful Workshop on Opportunities in Biological Physics from the March Meeting, as well as some important announcements, and a March Meeting Photo Album!

**-- SB**

FEATURE

# Division of Biological Physics Workshop Presents Research Opportunities

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By Ernie Tretkoff

Physicists can make a substantial contribution to many rapidly advancing areas of biology, according to information presented at a workshop held Sunday before the March Meeting in Baltimore.

The workshop was aimed at physicists, especially graduate students and postdocs, who were curious about how a background in physics can provide a unique perspective on biological systems.

The program consisted of eight talks, which focused on the exciting research at the interface between physics and biology, and how physicists can work in those areas. Speakers covered a range of biophysics topics, including physical tools for biology research, molecular motors, computation in biophysics, and physics and brain research.

The speakers were William Bialek (Princeton), Robijn Bruinsma (UCLA), Hans Frauenfelder (Los Alamos), Klaus Lehnertz (Bonn), Yale Goldman (Penn), Charles Stevens (Salk Institute), Zuzanna Siwy (Irvine), and Sunney Xie (Harvard).

The workshop was inspired by two previous standalone conferences on opportunities in biology for physicists that were sponsored by the APS. The first was held in Boston, in September 2002, and the second in San Diego in January 2004. This year the Division of Biological Physics decided to hold the workshop with the March Meeting, to draw on the large pool of March Meeting attendees, attracting physicists who might not otherwise have attended the biological physics workshop.

Some of the approximately 200 people who attended the workshop already work in biophysics or closely related fields, while others work in other areas of physics but were interested in the topics. The attendees were a mix of graduate students, postdocs, and more senior physicists.

Participant response to the workshop was generally quite positive, said Clare Yu, one the workshop organizers. Attendees said they enjoyed the talks, though many commented that they would have appreciated more time for networking, and/or the inclusion of some informal or panel discussion in the program. DBP will try to incorporate those suggestions in next year's workshop, which will be held with the 2007 March Meeting.

*[This article was reprinted from APS News.]*

FEATURE

# Opportunities in Biological Physics Workshop: An Organizer's Perspective

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By Clare Yu

The 2006 APS Workshop on Opportunities in Biological Physics, attended by about 200 participants on March 12, was a one-day event before the March Meeting in Baltimore. About 1/2 the attendees were graduate students and 1/4 were post-docs. I was struck, but not surprised, by the tremendous interest in biophysics that there is among young physicists. The main goal of the workshop was to help graduate students and postdocs enter the field of biophysics, and to show them how a background in physics can provide a unique perspective on biological systems by giving specific examples. We also wanted the participants to leave the conference room in Baltimore with a feeling that physicists and biologists working together can do amazing science by answering crucial questions in biology and medicine.

Because biology is a very broad field, the physics of biology can be very broad too. There were eight speakers spanning a wide range of topics, but it was by no means comprehensive. The speakers provided only a glimpse of the current issues or questions in biology which physicists could explore experimentally or theoretically. Any attempt to tackle such areas would require a genuine collaboration between physicists and biologists. The opportunities are there and wide open to be pursued. Here is a brief summary of the talks in the order in which they were given.

**Hans Frauenfelder** talked about protein dynamics and the analogies to glassy systems and energy landscapes. But he also pointed out that, unlike glasses, one must relate structure to function.

**Sunney Xie** talked about how experimental tools developed by physicists can be used to probe biological systems. He gave some very impressive examples from his own lab such as imaging of single proteins as they were being translated from messenger RNA. He also showed how Coherent Anti-Stokes Raman Scattering (CARS) could be used to image live cells and living tissue.

**Yale Goldman** talked about the motor protein myosin which is responsible for muscle movement as well as for the transportation of vesicles along actin filaments inside cells. Actin filaments and microtubules are like roads, and motor proteins can haul cargo along these roads. He explained that these motor proteins walk much as we do, putting one foot in front of the other, or hand-over-hand, like a child going across monkey bars.

**Zuzanna Siwy** talked about ion channels, starting with the history of how Hodgkin and Huxley discovered how signals travel down nerve cells. Ion channels are important for letting ions in and out through the cell membrane. Channels can be highly selective, in that, for example, they might let in potassium ions – but not sodium ions – even

though sodium ions are smaller. She gave examples from her own work of how artificial ion channels can be fabricated and can preferentially let current flow one way but not the other, like a diode.

**Robijn Bruinsma** gave examples of opportunities for theory in biological physics by describing 5 problems in biology that needed explanation. **Bill Bialek** talked about searching for principles. Among the examples raised by both Bruinsma and Bialek was the question of how biological systems can function reliably in the presence of noise and fluctuations. Examples include transcribing DNA into messenger RNA as well as translating messenger RNA into proteins. Bruinsma mentioned that Steve Chu determined that there must be 2 proofreading steps in the translation of RNA into protein, but we only know how one of these steps works. Bialek pointed out that spatial correlations are important in determining how an embryo develops and differentiates. The embryo decides where its head and tail will be, based on concentration gradients of chemicals called *morphogens*. But how does the system overcome inaccuracies due to spatial fluctuations? The cells in the embryo could average the signal over time, but that would take too long compared to the time it takes for a fruit fly embryo to develop. More generally, one can ask how a biological system produces the correct output, given a noisy input?

**Chuck Stevens'** talk was perhaps the favorite, according to the limited number of survey responses. One of the problems mentioned by the participants was that many of the attendees knew no biology and so were lost in some of the talks that assumed some basic knowledge of biology. Stevens didn't assume any prior knowledge of biology. He started by explaining that physics-style theory could be very useful in biology, though physicists are not used to considering the importance of function in biological systems. He then proceeded to use an electronic writing tablet to sketch a neuron and explain some basic facts. Then he gave an example of how simple considerations could lead one to conclude that 3/5 of the volume of the brain was taken up by wiring (axons and dendrites). This prediction turned out to be true, although neuroscientists had never even asked the question.

After taking a break due to the fire alarm forcing us to leave the convention center, we returned to hear the last talk which was given by **Klaus Lehnertz**. His talk was different from the others in that it had more of a medical physics flavor. He talked about relating structure and function in terms of the architecture of the brain. He showed different ways of doing functional imaging of the brain using x-rays, PET, CT, MRI, EEG, and SPECT.

Some of the survey respondents liked Stevens' talk best, while others placed all the last three talks at the top of their list (Bialek, Stevens, Lehnertz). The first two talks were plagued by technical problems: the microphone was not working properly. The morning session also suffered from the projector not working properly; but these problems were eventually fixed. I found all the talks very good and interesting. We provided the attendees with a sort of smorgasbord of topics, which hopefully gave a good sampling of the many ways in which physicists can work at the forefront of biology and biological physics.

The workshop was sponsored by the National Science Foundation, the UC Irvine branch of the Institute for Complex Adaptive Matter (UCI ICAM), the International Institute for Complex Adaptive Matter (I2CAM), and the Institute of Physics (IOP).

*Shirley Chan and Zuzanna Siwy also contributed material to this article.*

# PRL HIGHLIGHTS

Soft Matter, Biological, &
Inter-disciplinary Physics Articles from

## Physical Review Letters

## 10 February 2006

**Volume 96, Number 5, Articles (05xxxx)**
**Articles published 4 Feb- 10 Feb 2006**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=96&Issue=5

**Democratic Particle Motion for Metabasin Transitions in Simple Glass Formers**
G. A. Appignanesi, J. A. Rodríguez Fris, R. A. Montani, and W. Kob
Published 8 February 2006
057801

**Super-Arrhenius Diffusion in an Undercooled Binary Lennard-Jones Liquid Results from a Quantifiable Correlation Effect**
Vanessa K. de Souza and David J. Wales
Published 8 February 2006
057802

**Relation between Rotational and Translational Dynamic Heterogeneities in Water**
Marco G. Mazza, Nicolas Giovambattista, Francis W. Starr, and H. Eugene Stanley
Published 9 February 2006
057803

**Granular Species Segregation under Vertical Tapping: Effects of Size, Density, Friction, and Shaking Amplitude**
Massimo Pica Ciamarra, Maria Domenica De Vizia, Annalisa Fierro, Marco Tarzia, Antonio Coniglio, and Mario Nicodemi
Published 8 February 2006
058001

**Energy Trapping and Shock Disintegration in a Composite Granular Medium**
C. Daraio, V. F. Nesterenko, E. B. Herbold, and S. Jin
Published 9 February 2006
058002

**Exact Solution of the One-Dimensional Deterministic Fixed-Energy Sandpile**
Luca Dall'Asta
Published 10 February 2006
058003

**Relation between Single Neuron and Population Spiking Statistics and Effects on Network Activity**
Hideyuki Câteau and Alex D. Reyes
Published 6 February 2006
058101

**Hydrodynamic Flow Patterns and Synchronization of Beating Cilia**
Andrej Vilfan and Frank Jülicher
Published 6 February 2006
058102

**Nonlinear Model Predicts Diverse Respiratory Patterns of Birdsong**
Marcos A. Trevisan, Gabriel B. Mindlin, and Franz Goller
Published 6 February 2006
058103

**Flow Correlated Percolation during Vascular Remodeling in Growing**

**Tumors**
D.-S. Lee, H. Rieger, and K. Bartha
Published 7 February 2006
058104

**Hidden Stochastic Nature of a Single Bacterial Motor**
Ekaterina A. Korobkova, Thierry Emonet, Heungwon Park, and Philippe Cluzel
Published 7 February 2006
058105

**Protein Folding Dynamics via Quantification of Kinematic Energy Landscape**
Sëma Kachalo, Hsiao-Mei Lu, and Jie Liang
Published 8 February 2006
058106

**Capillary Aging of the Contacts between Glass Spheres and a Quartz Resonator Surface**
J. N. D'Amour, J. J. R. Stålgren, K. K. Kanazawa, C. W. Frank, M. Rodahl, and D. Johannsmann
Published 7 February 2006
058301

**Evidence for Interfacial-Storage Anomaly in Nanocomposites for Lithium Batteries from First-Principles Simulations**
Yuri F. Zhukovskii, Palani Balaya, Eugene A. Kotomin, and Joachim Maier
Published 9 February 2006
058302

**COMMENTS**

**Comment on "Sequencing-Independent Delocalization in a DNA-Like Double Chain with Base Pairing"**
A. Sedrakyan and F. Domínguez-Adame
Published 10 February 2006
059703

**Caetano and Schulz Reply:**
R. A. Caetano and P. A. Schulz
Published 10 February 2006
059704

## 17 February 2006

**Volume 96, Number 6, Articles (06xxxx)**
**Articles published 11 Feb - 17 Feb 2006**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=96&Issue=6

**Structure of Dense Liquid Water by Neutron Scattering to 6.5 GPa and 670 K**
Th. Strässle, A. M. Saitta, Y. Le Godec, G. Hamel, S. Klotz, J. S. Loveday, and R. J. Nelmes
Published 13 February 2006
067801

**Electric-Field-Induced Chirality Flipping in Smectic Liquid Crystals: The Role of Anisotropic Viscosity**
M. Nakata, R.-F. Shao, J. E. Maclennan, W. Weissflog, and N. A. Clark
Published 16 February 2006
067802

**Propulsion with a Rotating Elastic Nanorod**
Manoel Manghi, Xaver Schlagberger, and Roland R. Netz
Published 15 February 2006
068101

**Observation of Bistability and Hysteresis in Optical Binding of Two Dielectric Spheres**
N. K. Metzger, K. Dholakia, and E. M. Wright
Published 16 February 2006
068102

**Detecting Electronic Coherence in Excited-State Electron Transfer in Fluorinated Benzenes**
S. A. Kovalenko, A. L. Dobryakov, and V. Farztdinov

Published 14 February 2006
068301

**Logarithmic Chain-Exchange Kinetics of Diblock Copolymer Micelles**
Reidar Lund, Lutz Willner, Jörg Stellbrink, Peter Lindner, and Dieter Richter
Published 15 February 2006
068302

**Criticality and Phase Transition in Stock-Price Fluctuations**
Ken Kiyono, Zbigniew R. Struzik, and Yoshiharu Yamamoto
Published 13 February 2006
068701
See Also: Physics News Update

**Universal Behavior of Optimal Paths in Weighted Networks with General Disorder**
Yiping Chen, Eduardo López, Shlomo Havlin, and H. Eugene Stanley
Published 16 February 2006
068702

## 24 February 2006

**Volume 96, Number 7, Articles (07xxxx)**
**Articles published 18 Feb - 24 Feb 2006**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=96&Issue=7

**The Frozen State in the Liquid Phase of Side-Chain Liquid-Crystal Polymers**
H. Mendil, L. Noirez, P. Baroni, and I. Grillo
Published 24 February 2006
077801

**Glassy Conformations in Wrinkled Membranes**
Sahraoui Chaieb, Vinay K. Natrajan, and Ahmed Abd El-rahman
Published 21 February 2006
078101

**Continuum Theory of Retroviral Capsids**
T. T. Nguyen, R. F. Bruinsma, and W. M. Gelbart
Published 21 February 2006
078102

**Effective Potentials for Folding Proteins**
Nan-Yow Chen, Zheng-Yao Su, and Chung-Yu Mou
Published 22 February 2006
078103

**Functional Modes of Proteins Are among the Most Robust**
S. Nicolay and Y.-H. Sanejouand
Published 24 February 2006
078104

**Mean Chain Length of Adsorbed Supramolecular Polymers**
Henk J. A. Zweistra and N. A. M. Besseling
Published 21 February 2006
078301

**Surface Wave Assisted Self-Assembly of Multidomain Magnetic Structures**
A. Snezhko, I. S. Aranson, and W.-K. Kwok
Published 21 February 2006
078701

## 3 March 2006

**Volume 96, Number 8, Articles (08xxxx)**
**Articles published 25 Feb - 3 Mar 2006**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=96&Issue=8

**Velocity Autocorrelation Functions of Hard-Sphere Fluids: Long-Time Tails upon Undercooling**
Stephen R. Williams, G. Bryant, I. K. Snook, and W. van Megen
Published 28 February 2006
087801

**Coupling Hydrophobicity, Dispersion, and Electrostatics in Continuum Solvent Models**
J. Dzubiella, J. M. J. Swanson, and J. A. McCammon
Published 3 March 2006
087802

**Light Scattering and Phase Behavior of Lysozyme-Poly(Ethylene Glycol) Mixtures**
J. Bloustine, T. Virmani, G. M. Thurston, and S. Fraden
Published 3 March 2006
087803

**Anomalous Vibrational Dispersion in Holographically Trapped Colloidal Arrays**
Marco Polin, David G. Grier, and Stephen R. Quake
Published 1 March 2006
088101

**Stress-Dependent Elasticity of Composite Actin Networks as a Model for Cell Behavior**
M. L. Gardel, F. Nakamura, J. Hartwig, J. C. Crocker, T. P. Stossel, and D. A. Weitz
Published 3 March 2006
088102

**Interface Instability in Shear-Banding Flow**
S. Lerouge, M. Argentina, and J. P. Decruppe
Published 28 February 2006
088301

**Optimal Cell Approach to Osmotic Properties of Finite Stiff-Chain Polyelectrolytes**
Dmytro Antypov and Christian Holm
Published 2 March 2006
088302

**Cyclic Motion of a Grafted Polymer under Shear Flow**
Rafael Delgado-Buscalioni
Published 2 March 2006
088303

**Transmission Electron Microscopy Imaging of Individual Functional Groups of Fullerene Derivatives**
Zheng Liu, Masanori Koshino, Kazu Suenaga, Aleš Mrzel, Hiromichi Kataura, and Sumio Iijima
Published 2 March 2006
088304

**Phase Separation in the Wake of Moving Fronts**
Péter Hantz and István Biró
Published 3 March 2006
088305

**Volume-Exclusion Effects in Tethered-Particle Experiments: Bead Size Matters**
Darren E. Segall, Philip C. Nelson, and Rob Phillips
Published 3 March 2006
088306

**Cochlea's Graded Curvature Effect on Low Frequency Waves**
D. Manoussaki, E. K. Dimitriadis, and R. S. Chadwick
Published 2 March 2006
088701
See Also: Phys. Rev. Focus

**System of Mobile Agents to Model Social Networks**
Marta C. González, Pedro G. Lind, and Hans J. Herrmann
Published 3 March 2006
088702

**COMMENTS**

**Comment on "Intrinsic Low Temperature Paramagnetism in B-DNA"**
Kenji Mizoguchi, Shunsuke Tanaka, and Hirokazu Sakamoto

Published 3 March 2006
089801

**Nakamae *et al.* Reply:**
S. Nakamae, M. Cazayous, A. Sacuto, P. Monod, and H. Bouchiat
Published 3 March 2006
089802

## 10 March 2006

**Volume 96, Number 9, Articles (09xxxx)**
**Articles published 4 Mar - 10 Mar 2006**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=96&Issue=9

**Optical and Resonant X-Ray Diffraction Studies Confirm a Sm$C_{FI2}^{*}$-Sm$C^{*}$ Liquid Crystal Phase Sequence Reversal**
S. T. Wang, Z. Q. Liu, B. K. McCoy, R. Pindak, W. Caliebe, H. T. Nguyen, and C. C. Huang
Published 6 March 2006
097801

**Sheared Force Networks: Anisotropies, Yielding, and Geometry**
Jacco H. Snoeijer, Wouter G. Ellenbroek, Thijs J. H. Vlugt, and Martin van Hecke
Published 9 March 2006
098001

**Phase Diagram of a Ternary Mixture of Cholesterol and Saturated and Unsaturated Lipids Calculated from a Microscopic Model**
R. Elliott, I. Szleifer, and M. Schick
Published 6 March 2006
098101

**Physical Nature of Bacterial Cytoplasm**
Ido Golding and Edward C. Cox
Published 10 March 2006
098102

**Neuronal Growth: A Bistable Stochastic Process**
Timo Betz, Daryl Lim, and Josef A. Käs
Published 10 March 2006
098103

**Nonequilibrium Ribbon Model of Twisted Scroll Waves**
Blas Echebarria, Vincent Hakim, and Hervé Henry
Published 7 March 2006
098301

**Adhesion-Induced DNA Naturation**
A. E. Allahverdyan, Zh. S. Gevorkian, Chin-Kun Hu, and Th. M. Nieuwenhuizen
Published 9 March 2006
098302

**Quasiperiodic Events in an Earthquake Model**
O. Ramos, E. Altshuler, and K. J. Måløy
Published 6 March 2006
098501

**Controlled Irradiative Formation of Penitentes**
Vance Bergeron, Charles Berger, and M. D. Betterton
Published 7 March 2006
098502
See Also: Phys. Rev. Focus

**Dynamics of Networking Agents Competing for High Centrality and Low Degree**
Petter Holme and Gourab Ghoshal
Published 7 March 2006
098701

## 17 March 2006

**Vol. 96, Number 10, Articles (10xxxx)**
**Articles published 11 Mar - 17 Mar 2006**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=96&Issue=10

**Segment Distributions of End-Tethered Polymers in a Good Solvent**
R. Lehner, J. Koota, G. Maret, and T. Gisler

Published 13 March 2006
107801

**Dynamics of Chain Molecules in Disordered Materials**
Rakwoo Chang and Arun Yethiraj
Published 14 March 2006
107802

**Intrinsic Rates and Activation Free Energies from Single-Molecule Pulling Experiments**
Olga K. Dudko, Gerhard Hummer, and Attila Szabo
Published 15 March 2006
108101

**Dynamics of Structural Transformations between Lamellar and Inverse Bicontinuous Cubic Lyotropic Phases**
Charlotte E. Conn, Oscar Ces, Xavier Mulet, Stephanie Finet, Roland Winter, John M. Seddon, and Richard H. Templer
Published 16 March 2006
108102

**Intermittency Route to Rheochaos in Wormlike Micelles with Flow-Concentration Coupling**
Rajesh Ganapathy and A. K. Sood
Published 14 March 2006
108301

**Proactive Robustness Control of Heterogeneously Loaded Networks**
Mirko Schäfer, Jan Scholz, and Martin Greiner
Published 14 March 2006
108701

## 24 March 2006

**Vol. 96, Number 11, Articles (11xxxx)**
**Articles published 18 Mar - 24 Mar. 2006**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=96&Issue=11

**Core Precession and Global Modes in Granular Bulk Flow**
Denis Fenistein, Jan-Willem van de Meent, and Martin van Hecke
Published 21 March 2006
118001

**Brownian Forces in Sheared Granular Matter**
A. Baldassarri, F. Dalton, A. Petri, S. Zapperi, G. Pontuale, and L. Pietronero
Published 23 March 2006
118002

**Hydrodynamic Damping of Membrane Thermal Fluctuations near Surfaces Imaged by Fluorescence Interference Microscopy**
Yoshihisa Kaizuka and Jay T. Groves
Published 20 March 2006
118101

**Single Molecule Unzipping of Coiled Coils: Sequence Resolved Stability Profiles**
Thomas Bornschlögl and Matthias Rief
Published 20 March 2006
118102

**Dynamics of Polymer Translocation through Nanopores: Theory Meets Experiment**
Silvina Matysiak, Alberto Montesi, Matteo Pasquali, Anatoly B. Kolomeisky, and Cecilia Clementi
Published 22 March 2006
118103

**Microrheology Probes Length Scale Dependent Rheology**
J. Liu, M. L. Gardel, K. Kroy, E. Frey, B. D. Hoffman, J. C. Crocker, A. R. Bausch, and D. A. Weitz
Published 23 March 2006
118104

**Condensation Transition in DNA-Polyaminoamide Dendrimer Fibers Studied Using Optical Tweezers**
F. Ritort, S. Mihardja, S. B. Smith, and

C. Bustamante
Published 22 March 2006
118301

**Overembedding Method for Modeling Nonstationary Systems**
P. F. Verdes, P. M. Granitto, and H. A. Ceccatto
Published 24 March 2006
118701

## 31 March 2006

**Vol. 96, Number 12, Articles (12xxxx)**
**Articles published 25 Mar - 31 Mar 2006**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=96&Issue=12

**Scale Dependence of Branching in Arterial and Bronchial Trees**
Juan G. Restrepo, Edward Ott, and Brian R. Hunt
Published 27 March 2006
128101

**Inference of DNA Sequences from Mechanical Unzipping: An Ideal-Case Study**
V. Baldazzi, S. Cocco, E. Marinari, and R. Monasson
Published 30 March 2006
128102

**Ion Complexation: A Route to Enhanced Block Copolymer Alignment with Electric Fields**
Jia-Yu Wang, Ting Xu, Julie M. Leiston-Belanger, Suresh Gupta, and Thomas P. Russell
Published 28 March 2006
128301

**Multiscale Coarse Graining of Diblock Copolymer Self-Assembly: From Monomers to Ordered Micelles**
Carlo Pierleoni, Chris Addison, Jean-Pierre Hansen, and Vincent Krakoviack
Published 31 March 2006
128302

**Clustering of Polarity Reversals of the Geomagnetic Field**
V. Carbone, L. Sorriso-Valvo, A. Vecchio, F. Lepreti, P. Veltri, P. Harabaglia, and I. Guerra
Published 30 March 2006
128501

# PRE HIGHLIGHTS

Biological Physics Articles from
## Physical Review E

## February 2006
**Volume 73, Number 2, Articles (02xxxx)**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PLEEE8&Volume=73&Issue=2

### RAPID COMMUNICATIONS

**Substrate specificity of peptide adsorption: A model study**
Michael Bachmann and Wolfhard Janke
Published 17 February 2006 (*4 pages*)
020901(R)

**Stochastic models for tumoral growth**
Carlos Escudero
Published 24 February 2006 (*4 pages*)
020902(R)
See Also: Publisher's Note

**Long-range interactions and evolutionary stability in a predator-prey system**
Erik M. Rauch and Yaneer Bar-Yam

Published 27 February 2006 (*4 pages*)
020903(R)

## ARTICLES

**Theoretical analysis of destabilization resonances in time-delayed stochastic second-order dynamical systems and some implications for human motor control**
K. Patanarapeelert, T. D. Frank, R. Friedrich, P. J. Beek, and I. M. Tang
Published 6 February 2006 (*17 pages*)
021901

**Voltage dependence of the carrier-mediated ion transport**
Wei Chen
Published 7 February 2006 (*7 pages*)
021902

**Meshless membrane model based on the moving least-squares method**
Hiroshi Noguchi and Gerhard Gompper
Published 10 February 2006 (*12 pages*)
021903
See Also: Publisher's Note

**Min-protein oscillations in *Escherichia coli* with spontaneous formation of two-stranded filaments in a three-dimensional stochastic reaction-diffusion model**
Nenad Pavin, Hana Čipčić Paljetak, and Vladimir Krstić
Published 13 February 2006 (*5 pages*)
021904

**Single-molecule unzippering experiments on DNA and Peyrard-Bishop-Dauxois model**
Slobodan Zdravković and Miljko V. Satarić
Published 14 February 2006 (*11 pages*)
021905

**Effects of distributed transmission speeds on propagating activity in neural populations**
Axel Hutt and Fatihcan M. Atay
Published 14 February 2006 (*5 pages*)
021906

**Fronts with continuous waiting-time distributions: Theory and application to virus infections**
J. Fort, J. Pérez, E. Ubeda, and F. J. García
Published 16 February 2006 (*8 pages*)
021907

**Standing waves in the FitzHugh-Nagumo model of cardiac electrical activity**
P. C. Dauby, Th. Desaive, H. Croisier, and Ph. Kolh
Published 16 February 2006 (*5 pages*)
021908

**Energetics of rotational gating mechanisms of an ion channel induced by membrane deformation**
Kong-Ju-Bock Lee
Published 17 February 2006 (*9 pages*)
021909

**Lag synchrony measures dynamical processes underlying progression of seizure states**
Benjamin H. Singer, Miron Derchansky, Peter L. Carlen, and Michał Żochowski
Published 17 February 2006 (*7 pages*)
021910

**Orientation of optically trapped nonspherical birefringent particles**
Wolfgang Singer, Timo A. Nieminen, Ursula J. Gibson, Norman R. Heckenberg, and Halina Rubinsztein-Dunlop
Published 21 February 2006 (*5 pages*)
021911

**Hybrid grammar-based approach to nonlinear dynamical system identification from biological time series**

B. A. McKinney, J. E. Crowe, Jr., H. U. Voss, P. S. Crooke, N. Barney, and J. H. Moore
Published 22 February 2006 (*7 pages*)
021912

**Self-organized packs selection in predator-prey ecosystems**
Andrzej Pçkalski and Michel Droz
Published 23 February 2006 (*7 pages*)
021913

**Structural origin of the colored reflections from the black-billed magpie feathers**
Jean Pol Vigneron, Jean-François Colomer, Marie Rassart, Abigail L. Ingram, and Virginie Lousse
Published 27 February 2006 (*7 pages*)
021914

**Comparative all-atomic study of unfolding pathways for proteins chymotrypsin inhibitor 2 and barnase**
Yuebiao Sheng and Wei Wang
Published 27 February 2006 (*10 pages*)
021915

***Ab initio* study of alanine polypeptide chain twisting**
Ilia A. Solov'yov, Alexander V. Yakubovich, Andrey V. Solov'yov, and Walter Greiner
Published 28 February 2006 (*10 pages*)
021916

## BRIEF REPORTS

**Superposition of many independent spike trains is generally not a Poisson process**
Benjamin Lindner
Published 23 February 2006 (*4 pages*)
022901

# March 2006

**Volume 73, Number 3, Articles (03xxxx)**
http://scitation.aip.org/dbt/dbt.jsp?KEY=PLEEE8&Volume=73&Issue=3

## RAPID COMMUNICATIONS

**Reversal of bacterial locomotion at an obstacle**
Luis Cisneros, Christopher Dombrowski, Raymond E. Goldstein, and John O. Kessler
Published 14 March 2006 (*4 pages*)
030901(R)

**Intermediate phase in DNA melting**
Richard A. Neher and Ulrich Gerland
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**SPECIAL ANNOUNCEMENT**

# DBP & the Biophsyical Society Joint Symposia at 2007 Meetings

## *by Bob Eisenberg*

The American Biophysical Society will have a Symposium at its 2007 annual meeting (Baltimore MD, March 3-7) sponsored by the Division of Biological Physics of the APS. The goal of the Symposium is to present biophysical systems that can be analyzed in the physical tradition to help design useful experiments.

The DBP will have a Symposium at the APS 2007 March Meeting (Denver CO, March 5-9) sponsored by the American Biophysical Society. The goal of the Symposium is to present biophysical systems that are so well know experimentally that they are ripe for analysis in the physical tradition.

The proposed symposium for the 2007 Biophysical Society Meeting in Baltimore MD will be titled **Modeling as a Tool in Biophysics.** The preliminary program will be as follows:

Submitted by Bob Eisenberg, Councilor of the Division of Biological Physics of the American Physical Society with the most useful help and advice of Barry Lentz, President-Elect of the (American) Biophysical Society.

We propose a symposium to show how mathematical methods can help the understanding of four important biological processes. We will not provide a compendium of mathematical methods. Rather we will show how modeling can help biophysicists examine biological mechanism: a good model is one that shows how it itself can be tested and extended by new experiments.

1] Robert Eisenberg. Molecular Biophysics & Physiology, Rush University Medical Center. "How can a channel tell $Ca^{++}$ from $Na^{+}$?"

2] H. Eugene Stanley. Physics Department, Boston University. "Mechanism of Amyloid β-Protein Aggregation as Revealed by *Ab initio* Discrete Molecular Dynamics."

3] Fred Salisbury. Physics Department. Wake Forest University. "Computational Modeling of DNA Repair Enzyme."

4] Dean Astumian. Physics Department, University of Maine. "Mechanisms of Biological Motors Modeled by Stochastic Resonance."

*The preliminary program and list of speakers for the Symposium to be held at the APS March Meeting is not yet available.*

**SPECIAL DBP ANNOUNCEMENT:**

# 2006-2007 DBP Committee Appointments

## 2006 DBP Executive Committee

Chair: **Marilyn Gunner** (1-year term, expires March 2007)
Chair-Elect: **Dean Astumian** (1-year term, expires March 2007)
Vice Chair: **James Glazier** (1-year term, expires March 2007)
Immediate Past Chair: **Peter Jung** (1-year term, expires March 2007)
Secretary/Treasurer: **Shirley Chan** (4-year term, expires March 2008)
APS Councilor: **Bob Eisenberg** (4-year term, expires December 2008)
At-Large Members:
**Lois Pollack** (3-year term, expires March 2007)
**Stephen Quake** (3-year term, expires March 2007)
**Stephen J. Hagen** (3-year term, expires March 2008)
**Chao Tang** (3-year term, expires March 2008)
**Réka Albert** (3-year term, expires March 2009)
**Brian Salzberg** (3-year term, expires March 2009)

## 2006 DBP Program Committee

Chair: **Dean Astumian** (1-year term, expires March 2007)
Co-Chair: **Marilyn Gunner** (1-year term, expires March 2007)
Tutorial Chair: **James Glazier** (1-year term, expires March 2007)
Committee Members:
**Shirley Chan** (4-year term, expires March 2008)
**Lois Pollack** (1-year term, expires March 2007)
**Stephen Quake** (2-year term, expires March 2007)
**Chao Tang** (3-year term, expires March 2008)
**Réka Albert** (3-year term, expires March 2009)

## 2006 DBP Fellowship Committee

Committee Chair:
**James Glazier** (1-year term, expires March 2007)
Committee Members:
**Partha Mitra** (1-year term, expires March 2007)
**Jin Wang** (1-year term, expires March 2007)
**Mark Williams** (1-year term, expires March 2007)
**Ned Wingreen** (1-year term, expires March 2007)

## Education Liaison

**Stephen Hagen** (1-year term, expires March 2007)

## Fundraising Committee for Biological Physics Prize

**Peter Jung** (1-year term, expires March 2007)
**Stephen Quake** (1-year term, expires March 2007)
**Jin Wang** (1-year term, expires March 2007)

## DBP-BPS Contributing Symposium Committee

**Robert Eisenberg** (1-year term, expires March 2007)
**Brian Salzberg** (1-year term, expires March 2007)

# A DBP Photo Album

## Snapshots from the Business Meeting

### APS March Meeting, Baltimore, March 14, 2006

*Outgoing DBP Chair Peter Jung presents Eshel Ben-Jacob with an APS Fellowship.*

*DBP Executive Committee Member Stephen J. Hagen.*

*Center, Eugenie Milczarek, Hans Frauenfelder and Eli Greenbaum. At the far right of the row behind Eugenie Milczarek is Margaret Foster of Physical Review E.*

*DBP Secretary-Treasurer Shirley Chan discusses the division's finances…*

*Incoming DBP Chair Marilyn Gunner talks with Secretary-Treasurer Shirley Chan.*

*Flavio Fenton and Elizabeth Cherry of Cornell University.*

*Outgoing DBP Chair Peter Jung talks with Kamal Shukla, NSF Program Director for Molecular Biophysics.*


*Alfred G. Redfield, winner of the 2005 Biological Physics Prize, accepts his award.*

*APS Fellow J. Leo Van Hemmen, taken by surprise!*

*Stephen J. Schiff receives an APS Fellowship form outgoing DBP chair Peter Jung.*