

# THE BIOLOGICAL PHYSICIST

The Newsletter of the Division of Biological Physics of the American Physical Society

Vol 8 No 2 Jun 2008

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### SPECIAL DBP ANNOUNCEMENT

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Here is the summer edition of THE BIOLOGICAL PHYSICIST. This issue brings you PRE and PRL Highlights, as well as job ads and an announcement about APS Elections from Secretary-Treasurer Thomas Nordlund. Stay tuned for the August issue, with exciting feature articles and important DBP updates.

– SB

## SPECIAL DBP ANNOUNCEMENT

# ***ELECTION REMINDER***

In your summer activities, please remember ongoing and upcoming elections in the APS and DBP, in addition to national and local elections. Online voting is now in progress for APS Vice President, Chair-Elect of the Nominating Committee, and two General Councillors. Check your email for instructions. Division elections for several offices (Members-at-Large, Division Councillor, Vice-Chair) will take place in the fall.

**Dr. Thomas Nordlund**  
*Secretary-Treasurer*  
*Division of Biological Physics*

# PRL HIGHLIGHTS

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

**Physical Review Letters**

**4 April 2008**

**Vol 100, Number 13, Articles (13xxxx)**  
**Articles published 29 Mar - 4 Apr 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=13>

**Shear Banding in Biphasic Liquid-Liquid Systems**

Sergio Caserta, Marino Simeone, and Stefano Guido

Published 3 April 2008  
137801

**Spontaneous Formation of Complex Micelles from a Homogeneous Solution**

Xuehao He and Friederike Schmid

Published 4 April 2008

137802

See Also: Phys. Rev. Focus

**Time-Resolved Diffuse Reflectance Using Small Source-Detector Separation and Fast Single-Photon Gating**

Antonio Pifferi, Alessandro Torricelli, Lorenzo Spinelli, Davide Contini, Rinaldo Cubeddu,

Fabrizio Martelli, Giovanni Zaccanti, Alberto Tosi, Alberto Dalla Mora, Franco Zappa, and Sergio Cova  
Published 31 March 2008  
138101

**Hydration-Dependent Dynamical Transition in Protein: Protein Interactions at 240 K**

Vandana Kurkal-Siebert, Ritesh Agarwal, and Jeremy C. Smith  
Published 3 April 2008  
138102

**Viscous Friction in Foams and Concentrated Emulsions under Steady Shear**

N. D. Denkov, S. Tcholakova, K. Golemanov, K. P. Ananthapadmanabhan, and A. Lips  
Published 3 April 2008  
138301

**Unified Model of Dynamic Forced Barrier Crossing in Single Molecules**

Raymond W. Friddle  
Published 3 April 2008  
138302

**Bicomponents and the Robustness of Networks to Failure**

M. E. J. Newman and Gourab Ghoshal  
Published 31 March 2008  
138701

**Modeling Urban Street Patterns**

Marc Barthélemy and Alessandro Flammini  
Published 2 April 2008  
138702

**11 April 2008**

**Vol 100, Number 14, Articles (14xxxx)  
Articles published 5 Apr - 11 Apr 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=14>

**Melting of Branched RNA Molecules**

Ralf Bundschuh and Robijn Bruinsma  
Published 7 April 2008  
148101

**Shape Deformation of Ternary Vesicles Coupled with Phase Separation**

Miho Yanagisawa, Masayuki Imai, and Takashi Taniguchi

Published 8 April 2008  
148102

**Abrupt Buckling Transition Observed during the Plectoneme Formation of Individual DNA Molecules**

Scott Forth, Christopher Deufel, Maxim Y. Sheinin, Bryan Daniels, James P. Sethna, and Michelle D. Wang  
Published 8 April 2008  
148301

**Scroll Wave Instabilities in an Excitable Chemical Medium**

Chaiya Luengviriyaya, Ulrich Storb, Gert Lindner, Stefan C. Müller, Markus Bär, and Marcus J. B. Hauser  
Published 9 April 2008  
148302

**Hierarchical Assembly of Nanoparticle Superstructures from Block Copolymer-Nanoparticle Composites**

Huiman Kang, François A. Detcheverry, Andrew N. Mangham, Mark P. Stoykovich, Kostas Ch. Daoulas, Robert J. Hamers, Marcus Müller, Juan J. de Pablo, and Paul F. Nealey  
Published 9 April 2008  
148303

**Colloidal Assembly on Magnetically Vibrated Stripes**

Pietro Tierno, Thomas M. Fischer, Tom H. Johansen, and Francesc Sagués  
Published 11 April 2008  
148304

**Stochastic Contributions to Global Temperature Changes**

Robert K. Adair  
Published 9 April 2008  
148501

**Routes to Thermodynamic Limit on Scale-Free Networks**

Claudio Castellano and Romualdo Pastor-Satorras  
Published 8 April 2008  
148701

**18 April 2008**

**Vol 100, Number 15, Articles (15xxxx)  
Articles published 12 Apr - 18 Apr 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=15>

**Heating Mechanism Affects  
Equipartition in a Binary Granular  
System**

Hong-Qiang Wang and Narayanan Menon  
Published 16 April 2008  
158001

**Direct Observation of Medium-Range  
Crystalline Order in Granular Liquids  
Near the Glass Transition**

Keiji Watanabe and Hajime Tanaka  
Published 16 April 2008  
158002

**Acoustic Probing of the Jamming  
Transition in an Unconsolidated  
Granular Medium**

X. Jacob, V. Aleshin, V. Tournat, P. Leclaire,  
W. Lauriks, and V. E. Gusev  
Published 17 April 2008  
158003

**Symbolic Transfer Entropy**

Matthäus Staniek and Klaus Lehnertz  
Published 14 April 2008  
158101

**Kinetic Limitations of Cooperativity-  
Based Drug Delivery Systems**

Nicholas A. Licata and Alexei V. Tkachenko  
Published 17 April 2008  
158102

**Polymer-Induced Tubulation in Lipid  
Vesicles**

F. Campelo and A. Hernández-Machado  
Published 17 April 2008  
158103

**Mechanical Unfolding and Refolding  
Pathways of Ubiquitin**

A. Imparato and A. Pelizzola  
Published 18 April 2008  
158104

**Directed Motion of Proteins along  
Tethered Polyelectrolytes**

Katja Henzler, Sabine Rosenfeldt, Alexander  
Witte mann, Ludger Harnau, Stephanie Finet,  
Theyencheri Narayanan, and Matthias  
Ballauff  
Published 14 April 2008  
158301

**Dynamics of Polyelectrolyte Transport  
through a Protein Channel as a Function  
of Applied Voltage**

L. Brun, M. Pastoriza-Gallego, G. Oukhaled,  
J. Mathé, L. Bacri, L. Auvray, and J. Pelta  
Published 17 April 2008  
158302

**Osmotic Propulsion: The Osmotic Motor**

Ubaldo M. Córdoba-Figueroa and John F.  
Brady  
Published 17 April 2008  
158303

**Who's Talking First? Consensus or Lack  
Thereof in Coevolving Opinion  
Formation Models**

Cecilia Nardini, Balázs Kozma, and Alain  
Barrat  
Published 18 April 2008  
158701

**25 April 2008**

**Vol 100, Number 16, Articles (16xxxx)  
Articles published 19 Apr - 25 Apr 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=16>

**Energy Landscape, Antiplasticization,  
and Polydispersity Induced Crossover  
of Heterogeneity in Supercooled  
Polydisperse Liquids**

Sneha Elizabeth Abraham, Sarika Maitra  
Bhattacharrya, and Biman Bagchi  
Published 22 April 2008  
167801

**Dynamics of a Bouncing Droplet onto a  
Vertically Vibrated Interface**

T. Gilet, D. Terwagne, N. Vandewalle, and S.  
Dorbolo  
Published 23 April 2008  
167802

**Visible Fluorescence Spectroscopy of  
Single Proteins at Liquid-Helium  
Temperature**

Satoru Fujiyoshi, Masanori Fujiwara, and Michio Matsushita  
Published 22 April 2008  
168101  
See Also: Publisher's Note

**Interactions of Multiple Strain Pathogen Diseases in the Presence of Coinfection, Cross Immunity, and Arbitrary Strain Diversity**

L. J. Abu-Raddad, B. I. S. van der Ventel, and N. M. Ferguson  
Published 23 April 2008  
168102

**Dynamics and Steady States in Excitable Mobile Agent Systems**

Fernando Peruani and Gustavo J. Sibona  
Published 23 April 2008  
168103

**Analysis of DNA Elasticity**

R. P. Linna and K. Kaski  
Published 23 April 2008  
168104

**Narrow-Escape Time Problem: Time Needed for a Particle to Exit a Confining Domain through a Small Window**

O. Bénichou and R. Voituriez  
Published 23 April 2008  
168105

**Hexagonal Order in Crystalline and Columnar Phases of Hard Rods**

Eric Grelet  
Published 24 April 2008  
168301

**2 May 2008**

**Vol 100, Number 17, Articles (17xxxx)**

**Articles published 26 Apr - 2 May 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=17>

**Proton Momentum Distribution of Liquid Water from Room Temperature to the Supercritical Phase**

C. Pantalei, A. Pietropaolo, R. Senesi, S. Imberti, C. Andreani, J. Mayers, C. Burnham, and G. Reiter  
Published 2 May 2008  
177801

**Statistical Thermodynamics of the Stability of Multivalent Ligand-Receptor Complexes**

D. J. Diestler and E. W. Knapp  
Published 28 April 2008  
178101

**Domain Formation in the Plasma Membrane: Roles of Nonequilibrium Lipid Transport and Membrane Proteins**

Jun Fan, Maria Sammalkorpi, and Mikko Haataja  
Published 28 April 2008  
178102

**Instabilities and Pattern Formation in Active Particle Suspensions: Kinetic Theory and Continuum Simulations**

David Saintillan and Michael J. Shelley  
Published 29 April 2008  
178103

**Viscoelastic Thin Polymer Films under Transient Residual Stresses: Two-Stage Dewetting on Soft Substrates**

S. Al Akhrass, G. Reiter, S. Y. Hou, M. H. Yang, Y. L. Chang, F. C. Chang, C. F. Wang, and A. C.-M. Yang  
Published 28 April 2008  
178301

**Role of External Flow and Frame Invariance in Stochastic Thermodynamics**

Thomas Speck, Jakob Mehl, and Udo Seifert  
Published 28 April 2008  
178302

**Magic Angles and Cross-Hatching Instability in Hydrogel Fracture**

T. Baumberger, C. Caroli, D. Martina, and O. Ronsin  
Published 1 May 2008  
178303

**Density Dependent Interactions and Structure of Charged Colloidal Dispersions in the Weak Screening Regime**

L. F. Rojas-Ochoa, R. Castañeda-Priego, V. Lobaskin, A. Stradner, F. Scheffold, and P. Schurtenberger  
Published 2 May 2008

178304

**Fluctuation Forces and Wetting Layers in Colloid-Polymer Mixtures**

Y. Hennequin, D. G. A. L. Aarts, J. O. Indekeu, H. N. W. Lekkerkerker, and D. Bonn

Published 2 May 2008

178305

**9 May 2008**

**Volu 100, Number 18, Articles (18xxxx) Articles published 3 May - 9 May 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=18>

**Out-of-Equilibrium Dynamics of Gene Expression and the Jarzynski Equality**

Johannes Berg

Published 5 May 2008

188101

**Differential Dynamic Microscopy: Probing Wave Vector Dependent Dynamics with a Microscope**

Roberto Cerbino and Veronique Trappe

Published 5 May 2008

188102

**Subdiffusion in Peptides Originates from the Fractal-Like Structure of Configuration Space**

Thomas Neusius, Isabella Daidone, Igor M. Sokolov, and Jeremy C. Smith

Published 6 May 2008

188103

**Mutual Voronoi Tessellation in Spoke Pattern Convection**

Stefano Mazzoni, Fabio Giavazzi, Roberto Cerbino, Marzio Giglio, and Alberto Vailati

Published 6 May 2008

188104

**Phase Transition to Bundles of Flexible Supramolecular Polymers**

B. A. H. Huisman, P. G. Bolhuis, and A. Fasolino

Published 5 May 2008

188301

**Analytic Expressions for the Statistics of the Primitive-Path Length in Entangled Polymers**

Renat N. Khaliullin and Jay D. Schieber

Published 5 May 2008

188302

**Reversible Phase Transition of Colloids in a Binary Liquid Solvent**

Hua Guo, Theyencheri Narayanan, Michael Sztuchi, Peter Schall, and Gerard H.

Wegdam

Published 6 May 2008

188303

**Nonequilibrium Accumulation of Surface Species and Triboelectric Charging in Single Component Particulate Systems**

Daniel J. Lacks, Nathan Duff, and Sanat K.

Kumar

Published 8 May 2008

188305

**16 May 2008**

**Vol 100, Number 19, Articles (19xxxx) Articles published 10 - 16 May 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=19>

**Thin-Thick Coexistence Behavior of 8CB Liquid Crystalline Films on Silicon**

R. Garcia, E. Subashi, and M. Fukuto

Published 14 May 2008

197801

**Controlling Surface Defect Valence in Colloids**

G. Skačej and C. Zannoni

Published 14 May 2008

197802

**Bifurcations to Diversify Geometrical Patterns of Shear Bands on Granular Material**

Kiyohiro Ikeda, Yuki Yamakawa, Jacques

Desrues, and Kazuo Murota

Published 14 May 2008

198001

**Role of Secondary Low-Energy Electrons in the Concomitant Chemoradiation Therapy of Cancer**

Yi Zheng, Darel J. Hunting, Patrick Ayotte, and Léon Sanche

Published 14 May 2008

198101

**Radial Distribution of RNA Genomes Packaged inside Spherical Viruses**

Se Il Lee and Toan T. Nguyen  
Published 15 May 2008  
198102

**Cholesterol Perturbs Lipid Bilayers Nonuniversally**

Jianjun Pan, Thalia T. Mills, Stephanie Tristram-Nagle, and John F. Nagle  
Published 15 May 2008  
198103

**Asymptotic Strength Limit of Hydrogen-Bond Assemblies in Proteins at Vanishing Pulling Rates**

Sinan Keten and Markus J. Buehler  
Published 12 May 2008  
198301

**Direct Measurements of Critical Stresses and Cracking in Thin Films of Colloid Dispersions**

Weining Man and William B. Russel  
Published 13 May 2008  
198302

**Statistical Model for Intermolecular Adhesion in  $\pi$ -Conjugated Polymers**

Jeremy D. Schmit and Alex J. Levine  
Published 14 May 2008  
198303

**Inward Propagating Chemical Waves in a Single-Phase Reaction-Diffusion System**

Xin Shao, Yabi Wu, Jinzhong Zhang, Hongli Wang, and Qi Ouyang  
Published 15 May 2008  
198304

**23 May 2008**

**Vol 100, Number 20, Articles (20xxxx)**  
**Articles published 17 - 23 May 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=20>

**Proteins: Coexistence of Stability and Flexibility**

Shlomi Reuveni, Rony Granek, and Joseph Klafter  
Published 19 May 2008  
208101

**Rheology of Steady-State Draining Foams**

Raenell Soller and Stephan A. Koehler  
Published 19 May 2008  
208301

**Experimental Measures of Affine and Nonaffine Deformation in Granular Shear**

Brian Utter and R. P. Behringer  
Published 20 May 2008  
208302

**Scaling Breakdown in Flow Fluctuations on Complex Networks**

Sandro Meloni, Jesús Gómez-Gardeñes, Vito Latora, and Yamir Moreno  
Published 20 May 2008  
208701

**Using the Memories of Multiscale Machines to Characterize Complex Systems**

Nick S. Jones  
Published 22 May 2008  
208702

**30 May 2008**

**Vol 100, Number 21, Articles (21xxxx)**  
**Articles published 24 - 30 May 2008**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=21>

**Inelastic Electron Tunneling Spectroscopy of an Alkanethiol Self-Assembled Monolayer Using Scanning Tunneling Microscopy**

Norio Okabayashi, Youhei Konda, and Tadahiro Komeda  
Published 27 May 2008  
217801

**Measurement of the Continuous Lehmann Rotation of Cholesteric Droplets Subjected to a Temperature Gradient**

Patrick Oswald and Alain Dequidt  
Published 30 May 2008  
217802

**2D Interactions and Binary Crystals of Dipolar and Quadrupolar Nematic Colloids**

U. Ognysta, A. Nych, V. Nazarenko, I. Muševič, M. Škarabot, M. Ravnik, S. Žumer, I. Poberaj, and D. Babič  
Published 30 May 2008  
217803

**Capillarylike Fluctuations at the Interface of Falling Granular Jets**

Yacine Amarouchene, Jean-François Boudet, and Hamid Kellay  
Published 27 May 2008  
218001

**Fractal Substructure of a Nanopowder**

Thomas Schwager, Dietrich E. Wolf, and Thorsten Pöschel  
Published 29 May 2008  
218002

**Negative Filament Tension at High Excitability in a Model of Cardiac Tissue**

Sergio Alonso and Alexander V. Panfilov  
Published 28 May 2008  
218101

**Ferromagnetic Microswimmers**

Feodor Y. Ogrin, Peter G. Petrov, and C. Peter Winlove

Published 28 May 2008  
218102

**Statistical Mechanics of Interacting Run-and-Tumble Bacteria**

J. Tailleur and M. E. Cates  
Published 29 May 2008  
218103

**Detection of Elementary Charges on Colloidal Particles**

Filip Strubbe, Filip Beunis, and Kristiaan Neyts  
Published 29 May 2008  
218301

**Passive Imaging in Nondiffuse Acoustic Wavefields**

Francesco Mulargia and Silvia Castellaro  
Published 29 May 2008  
218501

**Transient Dynamics Increasing Network Vulnerability to Cascading Failures**

Ingve Simonsen, Lubos Buzna, Karsten Peters, Stefan Bornholdt, and Dirk Helbing  
Published 28 May 2008  
218701

# PRE HIGHLIGHTS

Biological Physics Articles from  
**Physical Review E**

**April 2008**

**Vol 77, Number 4, Articles (04xxxx)**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PLLEE8&Volume=77&Issue=4>

**RAPID COMMUNICATIONS**

**Molecular motors interacting with their own tracks**

Max N. Artyomov, Alexander Yu. Morozov, and Anatoly B. Kolomeisky  
Published 17 April 2008 (4 pages)  
040901(R)

**ARTICLES**

**Two-state approach to stochastic hair bundle dynamics**

Diana Clausznitzer, Benjamin Lindner, Frank Jülicher, and Pascal Martin  
Published 1 April 2008 (13 pages)  
041901

**Modeling of the damage dynamics of nanospheres exposed to x-ray free-electron-laser radiation**

Stefan P. Hau-Riege and Henry N. Chapman  
Published 1 April 2008 (4 pages)  
041902

**Optimizing the readout of morphogen gradients**

Eldon Emberly

Published 8 April 2008 (5 pages)

041903

**Dynamic states of cells adhering in shear flow: From slipping to rolling**

C. B. Korn and U. S. Schwarz

Published 10 April 2008 (17 pages)

041904

**Contact-mediated cell-assisted cell proliferation in a model eukaryotic single-cell organism: An explanation for the lag phase in shaken cell culture**

Carl Franck, Wui Ip, Albert Bae, Nathan Franck, Elijah Bogart, and Thanhbinh Thi Le

Published 11 April 2008 (8 pages)

041905

**Anomalous diffusion of a tethered membrane: A Monte Carlo investigation**

Hristina Popova and Andrey Milchev

Published 15 April 2008 (6 pages)

041906

**Effects of kink and flexible hinge defects on mechanical responses of short double-stranded DNA molecules**

Hu Chen and Jie Yan

Published 15 April 2008 (8 pages)

041907

**Structural property of regulatory elements in human promoters**

Xiao-Qin Cao, Jia Zeng, and Hong Yan

Published 15 April 2008 (7 pages)

041908

**Optimal placement of multiple morphogen sources**

Y. Morishita and Y. Iwasa

Published 16 April 2008 (9 pages)

041909

**Interactions between comoving magnetic microswimmers**

Eric E. Keaveny and Martin R. Maxey

Published 16 April 2008 (9 pages)

041910

**Stochastic analysis of a pulse-type prey-predator model**

Y. Wu and W. Q. Zhu

Published 17 April 2008 (9 pages)

041911

**Tortuosity and anomalous diffusion in the neuromuscular junction**

Daniel J. Lacks

Published 17 April 2008 (8 pages)

041912

**Method to calculate the moments of the membrane voltage in a model neuron driven by multiplicative filtered shot noise**

Lars Wolff and Benjamin Lindner

Published 17 April 2008 (12 pages)

041913

**Measuring interdependences in dissipative dynamical systems with estimated Fokker-Planck coefficients**

Jens Prusseit and Klaus Lehnertz

Published 18 April 2008 (10 pages)

041914

**Kinetic theory for neuronal networks with fast and slow excitatory conductances driven by the same spike train**

Aaditya V. Rangan, Gregor Kovačič, and David Cai

Published 18 April 2008 (13 pages)

041915

**Conditions for self-consistent aggregation by chemotactic particles**

Masayo Inoue and Kunihiro Kaneko

Published 21 April 2008 (4 pages)

041916

**Exact probabilistic solution of spatial-dependent stochastics and associated spatial potential landscape for the bicoid protein**

David Lepzelter and Jin Wang

Published 22 April 2008 (6 pages)

041917

**Class-II neurons display a higher degree of stochastic synchronization than class-I neurons**

Sashi Marella and G. Bard Ermentrout  
Published 29 April 2008 (12 pages)  
041918

**Self-organizing patterns maintained by competing associations in a six-species predator-prey model**

György Szabó, Attila Szolnoki, and István Borsos  
Published 29 April 2008 (6 pages)  
041919

**BRIEF REPORTS**

**Effect of mutators on adaptability in time-varying fitness landscapes**

Pavel Gorodetsky and Emmanuel Tannenbaum  
Published 10 April 2008 (4 pages)  
042901

**Chaotic pulse transmission and spiral formation in a calcium oscillation model**

H. Sakaguchi and P. Wofo  
Published 23 April 2008 (4 pages)  
042902

**May 2008**

**Vol 77, Number 5, Articles (05xxxx)**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PLFFF8&Volume=77&Issue=5>

**RAPID COMMUNICATIONS**

**Mesoscale modeling of molecular machines: Cyclic dynamics and hydrodynamical fluctuations**

Andrew Cressman, Yuichi Togashi, Alexander S. Mikhailov, and Raymond Kapral  
Published 7 May 2008 (4 pages)  
050901(R)

**Traffic of single-headed motor proteins KIF1A: Effects of lane changing**

Debashish Chowdhury, Ashok Garai, and Jian-Sheng Wang  
Published 12 May 2008 (4 pages)  
050902(R)

**Two-pathway four-state kinetic model of thioredoxin-catalyzed reduction of single forced disulfide bonds**

Xiaochuan Xue, Linchen Gong, Fei Liu, and Zhong-can Ou-Yang

Published 20 May 2008 (4 pages)  
050903(R)

**Discovery of a diamond-based photonic crystal structure in beetle scales**

Jeremy W. Galusha, Lauren R. Richey, John S. Gardner, Jennifer N. Cha, and Michael H. Bartl  
Published 29 May 2008 (4 pages)  
050904(R)

**Dynamic small-world behavior in functional brain networks unveiled by an event-related networks approach**

M. Valencia, J. Martinerie, S. Dupont, and M. Chavez  
Published 30 May 2008 (4 pages)  
050905(R)

**ARTICLES**

**Domain formation in membranes caused by lipid wetting of protein**

Sergey A. Akimov, Vladimir A. J. Frolov, Peter I. Kuzmin, Joshua Zimmerberg, Yuri A. Chizmadzhev, and Fredric S. Cohen  
Published 1 May 2008 (17 pages)  
051901

**Tilable nature of virus capsids and the role of topological constraints in natural capsid design**

Ranjan V. Mannige and Charles L. Brooks, III  
Published 1 May 2008 (8 pages)  
051902  
See Also: Phys. Rev. Focus

**Effect of external stress on the thermal melting of DNA**

Joseph Rudnick and Tatiana Kuriabova  
Published 5 May 2008 (13 pages)  
051903

**Controlling viral capsid assembly with templating**

Michael F. Hagan  
Published 8 May 2008 (11 pages)  
051904

**Simulation studies of self-organization of microtubules and molecular motors**

Zhiyuan Jia, Dmitry Karpeev, Igor S. Aranson, and Peter W. Bates  
Published 8 May 2008 (8 pages)  
051905

**Attractive membrane domains control lateral diffusion**

Martin B. Forstner, Douglas S. Martin, Florian Ruckerl, Josef A. Käs, and Carsten Selle  
Published 9 May 2008 (7 pages)  
051906

**Molecular motion in cell membranes: Analytic study of fence-hindered random walks**

V. M. Kenkre, L. Giuggioli, and Z. Kalay  
Published 13 May 2008 (10 pages)  
051907

**Dryland ecosystems: The coupled stochastic dynamics of soil water and vegetation and the role of rainfall seasonality**

R. Vezzoli, C. De Michele, H. Pavlopoulos, and R. J. Scholes  
Published 13 May 2008 (9 pages)  
051908

**Interplay between a phase response curve and spike-timing-dependent plasticity leading to wireless clustering**

Hideyuki Câteau, Katsunori Kitano, and Tomoki Fukai  
Published 13 May 2008 (6 pages)  
051909

**Properties of contact matrices induced by pairwise interactions in proteins**

Sanzo Miyazawa and Akira R. Kinjo  
Published 14 May 2008 (10 pages)  
051910

**Deterministic excitable media under Poisson drive: Power law responses, spiral waves, and dynamic range**

Tiago L. Ribeiro and Mauro Copelli  
Published 14 May 2008 (9 pages)  
051911

**During vertebrate development, arteries exert a morphological control over the venous pattern through physical factors**

Alia Al-Kilani, Sylvie Lorthois, Thi-Hanh Nguyen, Ferdinand Le Noble, Annemiek Cornelissen, Mathieu Unbekandt, Olena Boryskina, Loïc Leroy, and Vincent Fleury  
Published 15 May 2008 (16 pages)  
051912

**Strain hardening, avalanches, and strain softening in dense cross-linked actin networks**

Jan A. Åström, P. B. Sunil Kumar, Ilpo Vattulainen, and Mikko Karttunen  
Published 16 May 2008 (6 pages)  
051913

**Controlling limit-cycle behaviors of brain activity**

J. W. Kim and P. A. Robinson  
Published 19 May 2008 (4 pages)  
051914

**Instability-induced hierarchy in bipedal locomotion**

Kunishige Ohgane and Kei-Ichi Ueda  
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**Model for the unidirectional motion of a dynein molecule**

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**Geometry of the energy landscape and folding transition in a simple model of a protein**

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**Bursting regimes in map-based neuron models coupled through fast threshold modulation**

Borja Ibarz, Hongjun Cao, and Miguel A. F. Sanjuán  
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## **JOB AD**

# **Postdoctoral Position Insect Neurobiology and Aerodynamics**

A postdoctoral position is available in the laboratory of Dr. Fabrizio Gabbiani at Baylor College of Medicine in Houston, Texas. The lab studies mechanisms of visually guided collision avoidance at the cellular, systems, and computational level using a variety of techniques (intra-/extra-cellular recordings, calcium imaging, pharmacology, behavior using high-speed video, compartmental modeling). The goal of the current project is to investigate how flight control and collision avoidance maneuvers are generated in freely flying animals. The postdoctoral fellow will have access to state-of-the art facilities for his/her project, and will be part of an international team based in the US and Europe. Further information about the lab can be found on our web site (<http://glab.bcm.tmc.edu>) and about the project by contacting Dr. Gabbiani (see below).

Applicants should have a strong work ethic, a theoretical/computational background and/or experience with electrophysiology from a neuroethological perspective.

Please send CV, statement of interests and the email addresses of at least two referees to Dr. Fabrizio Gabbiani ([gabbiani@bcm.edu](mailto:gabbiani@bcm.edu)).

## **JOB AD**

### **Postdoctoral Positions in Cartilage Imaging**

Postdoctoral research positions are available in cartilage imaging. Recent PhD graduates with the following expertise/background are encouraged to apply: (1) Biomechanics of soft tissue; (2) Fourier-transform infrared spectroscopy/imaging; (3) Nuclear magnetic resonance imaging and spectroscopy; and (4) Connective tissue biology/chemistry. These positions are funded by two 5-year grants from the National Institutes of Health (NIH).

The ideal candidates should have solid research experience in one of the modern spectroscopy and imaging (MRI, NMR, FT-IRI, PLM). Background in connective tissue would be advantageous but not necessary. Working skills in imaging hardware and image analysis software could significantly facilitate the research. These positions require a PhD or equivalent in physics, biophysics, bioengineering, biomedical sciences, or a related field.

The successful candidates will join an active research lab where we aim to determine a set of multidisciplinary molecular parameters that describe the load-induced structural changes in osteoarthritic cartilage in animals at microscopic resolution. We use multidisciplinary techniques, including microscopic magnetic resonance imaging ( $\mu$ MRI), polarized light microscopy (PLM), Fourier-transform infrared imaging (FT-IRI), biomechanics, and histochemistry. Our lab instrumentation includes a new  $\mu$ MRI system (Bruker AVANCE II NMR Console with a 7T superconducting magnet), a mechanical system (EnduraTec ELF 3200), a quantitative PLM system (Leica DM RXP with two digital imaging systems), a modern FT-IRI system (PerkinElmer Spotlight 300), and a number of histology and analytical chemistry equipment. Our web site contains more information regarding our lab and some of our recently completed projects.

Interested individuals should send their CV and the contact information for at least three references to:

Professor Yang Xia

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Tel: 248-370-3420; Fax: 248-370-3408; E-mail: [xia@oakland.edu](mailto:xia@oakland.edu)

Web: [http://www.oakland.edu/~xia/XiaLab\\_index.html](http://www.oakland.edu/~xia/XiaLab_index.html)