THE BIOLOGICAL PHYSICIST

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

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In this Issue

This issue of THE BIOLOGICAL PHYSICIST brings you a special news feature on the recent APS statement on climate change. We bring you the announcement of the 2008 Max Delbrück Prize in Biological Physics, and welcome new APS fellows who have made significant contributions to biological physics, as well as job ads and a call for letters of intent from the Human Frontier Science Program. Enjoy!

– SB

NEWS FEATURE

APS STATEMENT ON CLIMATE CHANGE

S. Bahar

As the scientific and political issues of climate change grow ever more difficult to ignore, the American Physical Society has stepped into the fray, issuing a statement on the issue which is at once clear, terse, decisive, and scientifically objective. The statement, formally adopted by the APS Council on November 18, 2007 and available at http://www.aps.org/policy/statements/07_1.cfm, reads:

Emissions of greenhouse gases from human activities are changing the atmosphere in ways that affect the Earth's climate. Greenhouse gases include carbon dioxide as well as methane, nitrous oxide and other gases. They are emitted from fossil fuel combustion and a range of industrial and agricultural processes.

The evidence is incontrovertible: Global warming is occurring. If no mitigating actions are taken, significant disruptions in the Earth's physical and ecological systems, social systems, security and human health are likely to occur. We must reduce emissions of greenhouse gases beginning now.

Because the complexity of the climate makes accurate prediction difficult, the APS urges an enhanced effort to understand the effects of human activity on the Earth's climate, and to provide the technological options for meeting the climate challenge in the near and longer terms. The APS also urges governments, universities, national laboratories and its membership to support policies and actions that will reduce the emission of greenhouse gases.

THE BIOLOGICAL PHYSICIST spoke by telephone with Dr. Robert Eisenstein, chair of the APS's Panel on Public Affairs (POPA, http://www.aps.org/about/governance/committees/popa), about the process of crafting the statement.

A year ago, Eisenstein said, POPA was asked to advise the APS Council on whether APS should sign on to the American Association for the Advancement of Science (AAAS) statement on climate change. They looked at the AAAS statement and "thought that it was too assumptive about what the future was going to hold." POPA concluded that the APS needed to write its own statement rather than simply signing on to that of the AAAS.

The resulting APS statement revolves around the following points: (1) most scientists believe global warming is happening, and that this conclusion is data-driven; (2) most, but perhaps not all, scientists would say that this warming is driven by human activity, especially since 90% of the rise has occurred since 1900; and (3) there is major controversy about what the future holds. "Our understanding of what the future may bring depends on models," says Eisenstein, "and many people feel that present-day models are not up to the job of making stable, reliable long-term predictions. That is why POPA felt

it was important to endorse the statement that global warming is occurring, to endorse the position that this is likely due to human activity, and to encourage more study and significantly improved modeling as guidance to what further action would be appropriate."

Once POPA had completed its draft, the panel submitted the statement to the APS Executive Board and Council. After careful consideration and some editing, the statement was approved.

Eisenstein says that he had not studied the issue of global warming in depth before working on the APS statement with POPA. He says his opinions about the issue have not changed substantially as a result of working on the issue. He feels that the clearest way to state the issue of global warming is in the words of Dan Schrag, a climatologist and geophysicist at Harvard, who has described the situation as one in which we are doing an experiment on the earth, and we don't know the outcome. Eisenstein remarked that this way of looking at the issue has great clarity. In his opinion, the risks of inaction are far too great. But knowing what actions to take is what is so difficult.

What has struck Eisenstein most deeply during his work on the statement, he says, is that, while there have been many variations and changes in the geophysical history of the earth, these changes have been slow; what is most dangerous, and what leaves the result of this "experiment" most unpredictable, is the suddenness of the change we are presently experiencing.

Eisenstein feels that Al Gore's film *An Inconvenient Truth*, as well as Gore's receipt, along with the International Panel on Climate Change, of the 2007 Nobel Peace Prize, have done an "enormous service by getting people to think about [the issue] more." He says he is "totally convinced" that the US would not have been as willing to be even as mildly proactive as it has been if not for Gore and the IPCC. Speaking of *An Inconvenient Truth*, Eisenstein says that the movie "may be provocative, but maybe that's a good thing. One of the things I find upsetting about arguments of the United States, China, and India, is that they are making arguments about the economic future, with no thought at all about how to sustain economic growth without ecological damage. This is dangerous short term thinking. But the fact that the US participated in the Bali talks is a positive thing."

As for the science, there is a long road to travel, and current climate models have what Eisenstein calls "major holes". For a long time, he explains, the models didn't even couple the atmosphere to the ocean. "It's a very hard problem and very intensive computationally. Until recently, the largest computer in the open (non-defense) world was the Earth Simulator in Japan. That's an example of how hard a problem it is."

As scientists, we have a special responsibility to act based on reliable observation, testing, and theoretical modeling. Modeling may not ultimately be as reliable as we might wish to believe, and predictions are not certainties. However, the issue of prediction cuts both ways: "Business people say you are going to do so much damage to the economy [by trying to decrease global warming]. They don't know that either, by the way!"

PRL HIGHLIGHTS

Soft Matter, Biological, &
Inter-disciplinary Physics Articles from
Physical Review Letters

5 October 2007

Vol 99, Number 14, Articles (14xxxx)
Articles published 29 Sept - 5 Oct 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=14

Eliminating Segregation in Free-Surface Flows of Particles
Deliang Shi, Adetola A. Abatan, Watson L. Vargas, and J. J. McCarthy
Published 4 October 2007
148001

Effect of Forewing and Hindwing Interactions on Aerodynamic Forces and Power in Hovering Dragonfly Flight
Z. Jane Wang and David Russell
Published 1 October 2007
148101

Influence of Polymer-Pore Interactions on Translocation
Kaifu Luo, Tapio Ala-Nissila, See-Chen Ying, and Aniket Bhattacharya
Published 1 October 2007
148102

Multistability and Clustering in a Population of Synthetic Genetic Oscillators via Phase-Repulsive Cell-to-Cell Communication
Ekkehard Ullner, Alexei Zaikin, Evgenii I. Volkov, and Jordi García-Ojalvo
Published 2 October 2007
148103

Extension of a DNA Molecule by Local Heating with a Laser
Masatoshi Ichikawa, Hiroki Ichikawa, Kenichi Yoshikawa, and Yasuyuki Kimura
Published 5 October 2007
148104

Observation of Immobilized Water Molecules around Hydrophobic Groups
Y. L. A. Rezus and H. J. Bakker
Published 1 October 2007
148301
See Also: Phys. Rev. Focus

Fluctuations and Rheology in Active Bacterial Suspensions
D. T. N. Chen, A. W. C. Lau, L. A. Hough, M. F. Islam, M. Goulian, T. C. Lubensky, and A. G. Yodh
Published 3 October 2007
148302

Dynamic Transition in the Structure of an Energetic Crystal during Chemical Reactions at Shock Front Prior to Detonation
Ken-ichi Nomura, Rajiv K. Kalia, Aiichiro Nakano, Priya Vashishta, Adri C. T. van Duin, and William A. Goddard III
Published 5 October 2007
148303

Polydispersity-Induced Macrophase Separation in Diblock Copolymer Melts
M. W. Matsen
Published 5 October 2007
148304

Invasion Threshold in Heterogeneous Metapopulation Networks
Vittoria Colizza and Alessandro Vespignani
Published 5 October 2007
148701

12 October 2007

Vol 99, Number 15, Articles (15xxxx)
Articles published 6 Oct - 12 Oct 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=15

Novel Defect Structures in Nematic Liquid Crystal Shells

A. Fernández-Nieves, V. Vitelli, A. S. Utada, D. R. Link, M. Márquez, D. R. Nelson, and D. A. Weitz
Published 9 October 2007
157801

Patch Coalescence as a Mechanism for Eukaryotic Directional Sensing
A. Gamba, I. Kolokolov, V. Lebedev, and G. Ortenzi
Published 8 October 2007
158101

Nonequilibrium Fluctuations and Mechanochemical Couplings of a Molecular Motor
A. W. C. Lau, D. Lacoste, and K. Mallick
Published 8 October 2007
158102

Curve Encirclement and Protein Structure
Patrick Kessler and Oliver M. O'Reilly
Published 9 October 2007
158103

Plasma and Cavitation Dynamics during Pulsed Laser Microsurgery in vivo
M. Shane Hutson and Xiaoyan Ma
Published 10 October 2007
158104

Cross-Linker Unbinding and Self-Similarity in Bundled Cytoskeletal Networks
O. Lieleg and A. R. Bausch
Published 12 October 2007
158105

Driven Magnetic Particles on a Fluid Surface: Pattern Assisted Surface Flows
M. Belkin, A. Snezhko, I. S. Aranson, and W.-K. Kwok
Published 9 October 2007
158301

Alternating Vorticity Bands in a Solution of Wormlike Micelles
Vishweshwara Herle, Joachim Kohlbrecher, Bruno Pfister, Peter Fischer, and Erich J Windhab
Published 10 October 2007
158302

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Vol 99, Number 16, Articles (16xxxx)
Articles published 13 Oct - 19 Oct 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=16

Inelastic Neutron Scattering and Molecular Dynamics Determination of the Interaction Potential in Liquid CD4
E. Guarini, M. Sampoli, G. Venturi, U. Bafile, and F. Barocchi
Published 19 October 2007
167801

Rigidity Percolation in Particle-Laden Foams
Sylvie Cohen-Addad, Marcel Krzan, Reinhard Höhler, and Benjamin Herzhaft
Published 16 October 2007
168001

Reconstructing the Free-Energy Landscape of a Mechanically Unfolded Model Protein
Alberto Imparato, Stefano Luccioli, and Alessandro Torcini
Published 15 October 2007
168101

Continuous Macroscopic Limit of a Discrete Stochastic Model for Interaction of Living Cells
Mark Alber, Nan Chen, Pavel M. Lushnikov, and Stuart A. Newman
Published 19 October 2007
168102

Nonequilibrium Dynamic Mechanism for Allosteric Effect
Jianhua Xing
Published 16 October 2007
168103

Covariant Stringlike Dynamics of Scroll Wave Filaments in Anisotropic Cardiac Tissue
Henri Verschelde, Hans Dierckx, and Olivier Bernus
Published 18 October 2007
168104

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Vol 99, Number 17, Articles (17xxxx)
Articles published 20 Oct - 26 Oct 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=17

Critical Scaling of Shear Viscosity at the Jamming Transition
Peter Olsson and S. Teitel
Published 26 October 2007
178001

Optimal Flexibility for Conformational Transitions in Macromolecules
Richard A. Neher, Wolfram Möbius, Erwin Frey, and Ulrich Gerland
Published 22 October 2007
178101

Vesicle Dynamics in Time-Dependent Elongation Flow: Wrinkling Instability
Vasiliy Kantsler, Enrico Segre, and Victor Steinberg
Published 26 October 2007
178102

Chemotaxis of Nonbiological Colloidal Rods
Yiying Hong, Nicole M. K. Blackman, Nathaniel D. Kopp, Ayusman Sen, and Darrell Velegol
Published 26 October 2007
178103

Importance of Metastable States in the Free Energy Landscapes of Polypeptide Chains
Stefan Auer, Mark A. Miller, Sergei V. Krivov, Christopher M. Dobson, Martin Karplus, and Michele Vendruscolo
Published 26 October 2007
178104

Charged Colloidal Particles and Small Mobile Ions near the Oil-Water Interface: Destruction of Colloidal Double Layer and Ionic Charge Separation
Jos Zwanikken and René van Roij
Published 26 October 2007
178301

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Vol 99, Number 18, Articles (18xxxx)
Articles published 27 Oct - 2 Nov 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=18

Anomalous Phase Sequences in Lyotropic Liquid Crystals
Won Bo Lee, Raffaele Mezzenga, and Glenn H Fredrickson
Published 31 October 2007
187801

Resonance-Enhanced Optical Reorientation of Molecules in Liquids via Intermolecular Interaction
Thai V. Truong and Y. R. Shen
Published 2 November 2007
187802

Collective Behavior in a Granular Jet: Emergence of a Liquid with Zero Surface Tension
Xiang Cheng, German Varas, Daniel Citron, Heinrich M. Jaeger, and Sidney R. Nagel
Published 1 November 2007
188001

Dissolution Arrest and Stability of Particle-Covered Bubbles
Manouk Abkarian, Anand Bala Subramaniam, Shin-Hyun Kim, Ryan J. Larsen, Seung-Man Yang, and Howard A. Stone
Published 31 October 2007
188301

Slippery or Sticky Boundary Conditions: Control of Wrinkling in Metal-Capped Thin Polymer Films by Selective Adhesion to Substrates
Hugues Vandeparre, Julien Léopoldès, Christophe Poulard, Sylvain Desprez, Gwennaelle Derue, Cyprien Gay, and Pascal Damman
Published 31 October 2007
188302

Limited Path Percolation in Complex Networks
Eduardo López, Roni Parshani, Reuven Cohen, Shai Carmi, and Shlomo Havlin
Published 29 October 2007
188701

See Also: Phys. Rev. Focus

Scale-Free Distribution of Avian Influenza Outbreaks
Michael Small, David M. Walker, and Chi Kong Tse
Published 30 October 2007
188702

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Vol 99, Number 19, Articles (19xxxx)
Articles published 3 Nov - 9 Nov 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=19

Criticality Controlled by Cross-Linking Density in Liquid Single-Crystal Elastomers
George Cordoyiannis, Andrija Lebar, Boštjan Zalar, Slobodan Žumer, Heino Finkelmann, and Zdravko Kutnjak
Published 7 November 2007
197801

Self-Diffusion of Rodlike Viruses through Smectic Layers
M. Paul Lettinga and Eric Grelet
Published 8 November 2007
197802

Quantifying Intrinsic Specificity: A Potential Complement to Affinity in Drug Screening
Jin Wang, Xiliang Zheng, Yongliang Yang, Dale Drueckhammer, Wei Yang, Gennardy Verkhivker, and Erkang Wang
Published 6 November 2007
198101

Shapes of Semiflexible Polymer Rings
Karen Alim and Erwin Frey
Published 7 November 2007
198102

New Insight into Cataract Formation: Enhanced Stability through Mutual Attraction
A. Stradner, G. Foffi, N. Dorsaz, G. Thurston, and P. Schurtenberger
Published 9 November 2007
198103
See Also: Phys. Rev. Focus

Anisotropic Random Networks of Semiflexible Polymers
Panayotis Benetatos and Annette Zippelius
Published 9 November 2007
198301

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Vol 99, Number 20, Articles (20xxxx)
Articles published 10 Nov - 16 Nov 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=20

Role of Molecular Shape on Bent-Core Liquid-Crystal Structures
C. Bailey and A. Jákli
Published 16 November 2007
207801

Wave Emission from Heterogeneities Opens a Way to Controlling Chaos in the Heart
A. Pumir, V. Nikolski, M. Hörning, A. Isomura, K. Agladze, K. Yoshikawa, R. Gilmour, E. Bodenschatz, and V. Krinsky
Published 13 November 2007
208101

Equalization of Synaptic Efficacy by Synchronous Neural Activity
Myoung Won Cho and M. Y. Choi
Published 13 November 2007
208102

Three-Dimensional Cross-Linked F-Actin Networks: Relation between Network Architecture and Mechanical Behavior
E. M. Huisman, T. van Dillen, P. R. Onck, and E. Van der Giessen
Published 14 November 2007
208103

Rouse Dynamics of Colloids Bound to Polymer Networks
Joris Sprakel, Jasper van der Gucht, Martien A. Cohen Stuart, and Nicolaas A. M. Besseling
Published 15 November 2007
208301

Photon Statistics for Single-Molecule Nonlinear Spectroscopy
F. Shikerman and E. Barkai
Published 15 November 2007
208302

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Vol 99, Number 21, Articles (21xxxx)
Articles published 17 Nov - 23 Nov 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=21

Metastable Tight Knots in a Wormlike Polymer
Alexander Y. Grosberg and Yitzhak Rabin
Published 20 November 2007
217801

Dynamics of Nearly Spherical Vesicles in an External Flow
V. V. Lebedev, K. S. Turitsyn, and S. S. Vergeles
Published 20 November 2007
218101

Motor Driven Microtubule Shape Fluctuations: Force from within the Lattice
Hervé Mohrbach and Igor M. Kulić
Published 21 November 2007
218102

Experiments Confirm the Influence of Genome Long-Range Correlations on Nucleosome Positioning
C. Vaillant, B. Audit, and A. Arneodo
Published 21 November 2007
218103

Quasipatterns in a Model for Chemical Oscillations Forced at Multiple Resonance Frequencies
Jessica M. Conway and Hermann Riecke
Published 21 November 2007
218301

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Articles published 24 Nov - 30 Nov 2007
http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=22

Elastic Breakup in Uniaxial Extension of Entangled Polymer Melts
Yangyang Wang, Pouyan Boukany, Shi-Qing Wang, and Xiaorong Wang
Published 7 December 2007
237801

Dynamic Evolution of Topological Defects around Drops and Bubbles Rising in a Nematic Liquid Crystal
Siddharth Khullar, Chunfeng Zhou, and James J. Feng
Published 7 December 2007
237802

Microscale Swimming: The Molecular Dynamics Approach
D. C. Rapaport
Published 6 December 2007
238101

Relaxation of Stretched DNA in Slitlike Confinement
A. Balducci, C.-C. Hsieh, and P. S. Doyle
Published 6 December 2007
238102

Anomalous Diffusion in Folding Dynamics of Minimalist Protein Landscape
Yasuhiro Matsunaga, Chun-Biu Li, and Tamiki Komatsuzaki
Published 6 December 2007
238103

Discrete Breathers in Nonlinear Network Models of Proteins
B. Juanico, Y.-H. Sanejouand, F. Piazza, and P. De Los Rios
Published 7 December 2007
238104

Noise and Correlations in a Spatial Population Model with Cyclic Competition
Tobias Reichenbach, Mauro Mobilia, and Erwin Frey
Published 7 December 2007
238105

Temporal Decorrelation of Collective Oscillations in Neural Networks with Local Inhibition and Long-Range Excitation
Demian Battaglia, Nicolas Brunel, and David Hansel
Published 7 December 2007
238106

Polymers in a Vacuum
J. M. Deutsch
Published 3 December 2007
238301

Surface-Induced First-Order Transition in Athermal Polymer-Nanoparticle Blends
E. S. McGarrity, A. L. Frischknecht, L. J. D. Frink, and M. E. Mackay
Published 7 December 2007
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Biological Physics Articles from
Physical Review E

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Vol 76, Number 4, Articles (04xxxx)
http://scitation.aip.org/dbt/dbt.jsp?KEY=PLEEE8&Volume=76&Issue=4

RAPID COMMUNICATIONS

Correlated phenotypic transitions to competence in bacterial colonies
Inbal Hecht, Eshel Ben-Jacob, and Herbert Levine
Published 2 October 2007 *(4 pages)*
040901(R)

How the excluded volume architecture influences ion-mediated forces between proteins
V. Dahirel, M. Jardat, J.-F. Dufrêche, and P. Turq
Published 4 October 2007 *(4 pages)*
040902(R)

Effect of disorder on DNA electrophoresis in a microfluidic array of obstacles
Aruna Mohan and Patrick S. Doyle
Published 24 October 2007 *(4 pages)*
040903(R)

ARTICLES

Out-of-equilibrium dynamics in the cytoskeleton of the living cell
Guillaume Lenormand, Predrag Bursac, James P. Butler, and Jeffrey J. Fredberg
Published 1 October 2007 *(10 pages)*
041901

Effects of chemical synapses on the enhancement of signal propagation in coupled neurons near the canard regime
Xiumin Li, Jiang Wang, and Wuhua Hu
Published 4 October 2007 *(6 pages)*
041902

Constitutive model for fiber-reinforced materials with deformable matrices
J. Planas, G. V. Guinea, and M. Elices
Published 4 October 2007 *(9 pages)*
041903

Modeling molecular interactions to understand spatial crowding effects on heterodimer formations
K. M. Puskar, A. Parisi-Amon, S. Ta'asan, R. Schwartz, and P. R. LeDuc
Published 8 October 2007 *(6 pages)*
041904

Dynamics and rheology of a dilute suspension of vesicles: Higher-order theory
Gerrit Danker, Thierry Biben, Thomas Podgorski, Claude Verdier, and Chaouqi Misbah
Published 9 October 2007 *(10 pages)*
041905

Parameters of stochastic diffusion processes estimated from observations of first-hitting times: Application to the leaky integrate-and-fire neuronal model

BRIEF REPORTS

Paulo R. Guimarães, Jr., Márcio Argollo de Menezes, Robin W. Baird, David Lusseau, Paulo Guimarães, and Sérgio F. dos Reis
Published 16 October 2007 *(4 pages)*
042901

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ARTICLES

Modeling electrocortical activity through improved local approximations of integral neural field equations
S. Coombes, N. A. Venkov, L. Shiau, I. Bojak, D. T. J. Liley, and C. R. Laing
Published 1 November 2007 *(8 pages)*
051901

Numerical study of the effect of the noseleaf on biosonar beamforming in a horseshoe bat
Qiao Zhuang and Rolf Müller
Published 5 November 2007 *(11 pages)*
051902

Mapping and assessment of epileptogenic foci using frequency-entropy templates
Eshel Ben-Jacob, Itai Doron, Tomer Gazit, Eden Rephaeli, Oren Sagher, and Vernon L. Towle
Published 5 November 2007 *(8 pages)*
051903

Lattice model for parallel and orthogonal sheets using hydrogenlike bonding
J. Krawczyk, A. L. Owczarek, T. Prellberg, and A. Rechnitzer
Published 6 November 2007 *(5 pages)*
051904

Interactions of semiflexible filaments and molecular motors
Dmitry Karpeev, Igor S. Aranson, Lev S. Tsimring, and Hans G. Kaper
Published 6 November 2007 *(12 pages)*
051905

Fragility and mechanosensing in a thermalized cytoskeleton model with forced protein unfolding
Brenton D. Hoffman, Gladys Massiera, and John C. Crocker
Published 7 November 2007 *(6 pages)*
051906

Towards a thermodynamically consistent picture of the phase-field model of vesicles: Local membrane incompressibility
D. Jamet and C. Misbah
Published 7 November 2007 *(7 pages)*
051907

Reverberating activity in a neural network with distributed signal transmission delays
Takahiro Omi and Shigeru Shinomoto
Published 8 November 2007 *(7 pages)*
051908

How a protein searches for its specific site on DNA: The role of intersegment transfer
Tao Hu and B. I. Shklovskii
Published 9 November 2007 *(8 pages)*
051909

Fluctuations of coupled fluid and solid membranes with application to red blood cells
Thorsten Auth, S. A. Safran, and Nir S. Gov
Published 12 November 2007 *(18 pages)*
051910

Amplitude equation approach to spatiotemporal dynamics of cardiac alternans
Blas Echebarria and Alain Karma
Published 12 November 2007 *(23 pages)*
051911

Temporal evolution of self-organization of gelatin molecules and clusters on quartz surface
Amar Nath Gupta and H. B. Bohidar
Published 14 November 2007 *(6 pages)*
051912

BRIEF REPORTS

SPECIAL DBP ANNOUNCEMENT

The Max Delbrück Prize

in Biological Physics

for 2008

has been awarded to

Steven M. Block

of Stanford University

For his originality in the direct measurement of forces and motions in single biomolecular complexes undergoing the nucleoside triphosphate hydrolysis reactions that drive intracellular transport, cell motility, and DNA and RNA replication.

Congratulations to Dr. Block
From all his colleagues in the Division of Biological Physics!

The prize will be officially awarded during the 2008 March Meeting.

SPECIAL DBP ANNOUNCEMENT

DBP WELCOMES NEW APS FELLOWS

The following biological physicists have just been elected Fellows of the American Physical Society. Please join DBP to celebrate their achievement at the DBP Business Meeting at the 2008 APS March Meeting in New Orleans.

Gang Bao

Georgia Institute of Technology
Citation: For pioneering contributions in the field of molecular biomechanics and seminal impacts in developing molecular sensors for diagnosis of cellular functions
Nominated by: Biological Physics (DBP)

Dante Chialvo

Northwestern University
Citation: For advances in the understanding of physiological mechanisms using the methods of nonlinear dynamics, in particular of the bifurcations leading to cardiac sudden death and the constructive role of noise in neural coding of information.
Nominated by: Biological Physics (DBP)

James De Yoreo

Lawrence Livermore National Laboratory
Citation: For his pioneering work using in situ force microscopy to understand the physical principles underlying biocrystallization, particularly the control of biomolecules and other modifiers on energy landscapes, step dynamics and morphological evolution during crystal formation.
Nominated by: Biological Physics (DBP)

Marilyn Gunner

City College of New York
Citation: For her work in both experimental and theoretical studies of electron and proton transfer processes in proteins, in particular for her beautiful work coupling the theory of electrostatic interactions to the dynamics of charge transfer in photosynthetic reaction centers, and in recognition of her service to the Division of Biological Physics.
Nominated by: Biological Physics (DBP)

Carol Hall

North Carolina State University
Citation: For creating a new paradigm to simulate protein aggregation through a combination of intermediate-resolution molecular models and the discontinuous molecular dynamics method.
Nominated by: Biological Physics (DBP)

Jianpeng Ma

Baylor College of Medicine
Citation: For outstanding contributions to the field of biophysics are in developing novel computational methods that have substantially expanded one's ability to simulate, model and refine flexible biomolecular systems based on experimental data at low to intermediate resolutions. He is one of the pioneers and leading experts in the field.
Nominated by: Biological Physics (DBP)

Thomas Nordlund

University of Alabama, Birmingham
Citation: In recognition of his pioneering work in protein dynamics, DNA dynamics and service to the biological physics community.
Nominated by: Biological Physics (DBP)

Attila Szabo

National Institutes of Health

Citation: For development of the model-independent theoretical analysis of nuclear magnetic resonance relaxation experiments, development of powerful methods to analyze and interpret a range of single molecule experiments, and for major contributions to the theory of diffusion-influenced reactions.

Nominated by: Biological Physics (DBP)

And special congratulations to

APS General Fellow

Britton Chance

University of Pennsylvania

Citation: For prodigious contributions to biological optics over more than seventy years, and for the use of physical methods in fundamental discoveries concerning cell metabolism.

Nominated by: APS

SPECIAL DBP ANNOUNCEMENT

STUDENT TRAVEL GRANTS AVAILABLE FOR 2008 MARCH MEETING

The Division of Biological Physics will award several travel grants of up to $400 each to student first authors of contributed papers (talks or posters) in sessions sponsored by DBP at the March Meeting. Applicants will be chosen on the basis of the quality of their work as evidenced by the abstract of the paper, a letter of support from their thesis advisor and the travel distances.

Both student and advisor, domestic or foreign, must be members of the DBP, not just of the APS. New members can sign up at http://www.aps.org/membership/join.cfm, and are encouraged to do so before Dec. 31, 2007 for verification purposes.

No more than 2 students from one advisor may apply. Please include (1) applicant's name, (2) institute affiliate, (3) the abstract, (4) the assigned session number (available online after mid-January), APS membership numbers of (5) the applicant and (6) the advisor, (7) applicant's home address, (8) for domestic applicant, the social security number (which will be kept confidential and used only if an award is made), and (9) a short letter of recommendation from the advisor.

Submit all applications via email (absolutely no attachments) to the Secretary-Treasurer, Dr. Shirley Chan, at ChanShirley@mailaps.org . (Only applications with **all required information included in ONE EMAIL** will be considered. Incomplete applications will be returned for resubmission in entirety.) Please personalize the subject of the application email by "DBP-STG 2008, From (last name)." **The DEADLINE is February 1, 2008**. Decisions for the awards will be sent by email to the applicants before the Meeting with instructions on how to receive the checks.

Dr. Dean Astumian, Chair
Dr. Shirley Chan, Secretary-Treasurer
DBP

SPECIAL DBP ANNOUNCEMENT

5th APS WORKSHOP ON OPPORTUNITIES IN BIOLOGICAL PHYSICS

Sunday, March 9, 2008

Marriott Hotel
New Orleans, Louisiana
Organized by APS Division of Biological Physics

Life provides a wellspring of opportunities for physical analysis. This workshop will introduce two exciting areas in biological physics: biomechanics and genetic networks. Topics will include motion science, the physics of walking, artificial hands, the physics of cell shape, the dynamics and noise in genetic and signal transduction networks. Speakers from academia and industry will provide extensive tutorial overviews, accessible to non-specialists. There will be ample time for participants to discuss their current and future scientific and career directions with the speakers. The workshop is aimed at all physicists who are curious about the interface between physics and biology, especially graduate students and post-docs who are eager to apply their expertise in novel ways in the life sciences.

The workshop will start at 9:00 AM and run until approximately 4:30 PM. The pre-registration deadline is February 11, 2008. Pre-registration fees are $50 for students, $75 for postdoctoral researchers and $100 for all others. Workshop's pre-registration may be submitted separately after the pre-registration for March Meeting has been submitted, by faxing or mailing the same form to the APS. The fee includes continental breakfast and a box lunch. Limited on-site registrations will be allowed with a late fee ($25) for each category and cash payment only (no credit card), but availability of box lunches is not guaranteed for late registrants.

CONFIRMED SPEAKERS:

- K. C. Huang, Princeton University, "The Biophysical Origins of Spatio-temporal Network Dynamics"
- Art Kuo, University of Michigan, "Mechanics and Control of Human Locomotion: Let your Physics do the Walking?"
- John Milton, Claremont McKenna College, "Motion Science: A New Frontier for Physicists"
- Gurol Suel, UT Southwestern, "Cellular Differentiation: Noisy and Dynamic, but Tunable"
- Yuhai Tu, I.B.M. Watson Research, "From Molecules to Behavior: A Single Cell's Memory, Computation and Taxis"
- Francisco Valero-Cuevas, U.S.C., "Why Haven't We Made Better Artificial Hands?"

Steering Committee:

Chair:

Stephen Quake (quake@stanford.edu)
Vice-Chair, DBP

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Shirley Chan (ChanShirley@mailaps.org)
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John Milton (jmilton@jsd.claremont.edu)
Member-at-Large, DBP

Chao Tang (chao.tang@ucsf.edu)
Member-at-Large, DBP

Speakers' biosketches, abstracts and program schedule are posted at:
http://www.aps.org/units/dbp/meetings.cfm
and also appear on pages 17-19 below.

For information on past workshops, see:
http://www.aps.org/units/dbp/links/index.cfm

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Morning Session: BIOMECHANICS

John Milton

"Motion science: A new frontier for physicists"

Abstract:
Insights into the interplay between the neural control of movement and its mechanical aspects can be obtained in the settings of play and sports. A case in point is human stick balancing at the fingertip. Despite the fact that the upright position of an inverted pendulum with delayed feedback can be stable, experimental observations indicate that the dynamical system is tuned near the edge of stability and that uncontrolled random perturbations ("noise") play an essential role in control. These observations support the hypothesis that the control of movement of biological organisms involves both active aspects related to neural activations regulated by a motor program and passive aspects related to the biomechanical properties of the body and its interactions with the environment. This new frontier for physics is expected to translate into the design of novel strategies that address many of the mobility problems of our aging population, including the prevention of falling and the restoration of movement to those who have lost this ability due to disease or trauma.

Biosketch:
John Milton is the William R. Kenan, Jr Chair in computational neuroscience at The Claremont Colleges in Claremont, CA. His current research focuses on the development of expertise in motor control by the human nervous system. He received his BSc in Biology (1971) and PhD in physical chemistry (1975) from McGill University. After completing post-doctoral fellowships in mathematical biology (Kyoto University, 1974-76) and blood platelet biophysics (McGill, 1976-78), he entered medical school and received his MDCM (McGill) in 1982 and his neurology fellowship (Montreal Neurological Institute) in 1987. He co-directed the adult epilepsy center at The University of Chicago from 1989-2003 before moving to The Claremont Colleges to develop novel educational programs to prepare students to work at the interface between physics, mathematics, and biotechnology. He was a founding member of the McGill Center in Nonlinear Dynamics and in 2006 was elected a fellow of the American Physical Society.

Francisco Valero-Cuevas

"Why haven't we made better artificial hands?"

Abstract:
The hand is a complex, multipurpose organ capable of not only grasping objects with forces exceeding 445 N, but also of manipulating objects as delicate as a spider thread and making the rapid and complex finger movements required to play a concerto on the piano. The development of an artificial hand requires the elucidation of the fundamental principles of neuromuscular versatility in the control of dexterous manipulation of the human finger. To accomplish this goal, experimental techniques using electromyographic recordings, psychophysical experiments, custom-made virtual reality modules, instrumented objects, multimodal functional brain imaging and anatomical dissections are combined with theoretical work that characterizes neuromuscular function through detailed neuromuscular computer models, computational techniques, and nonlinear systems analysis. The scope of this inquiry is not limited to understanding normal musculo-skeletal function but also extends to the clinical realm, in particular to the rehabilitation of dexterous finger manipulation post-injury or in neurological diseases. The lessons learned elucidate the best paths engineers should follow to create comparably versatile robotic systems.

Biosketch:
Francisco Valero-Cuevas is an Associate Professor in the Department of Biomedical Engineering and Division of Kinesiology & Physical Therapy at The University of Southern California. His inter-disciplinary research focuses on combining engineering, robotics, mathematics and neuroscience for understanding organismal and robotic systems for basic science, engineering and clinical applications. He received is BS in engineering from Swarthmore College (1988) and a MS and PhD in mechanical engineering from Queen's University in Kingston, Ontario, Canada (1991) and Stanford University (1997), respectively. He has received numerous research awards including the Alexander von Humboldt Foundation fellowship (2005), the post-doctoral young scientist award from the American Society of Biomechanics (2003), the faculty Early Career Development program CAREER Award from the National Science Foundation (2003), the Innovation Prize from the State of Tyrol, Austria (1999), and the Thomas J. Watson Foundation fellowship (1988). He was elected as an associate member of the scientific research society Sigma-Xi in 1988, presently serves as an associate editor for IEEE Transactions on Biomedical Engineering and is a member of the Motor Function, Speech and Rehabilitation study section for the Center for Scientific Review at the National Institutes of Health.

Art Kuo

"Mechanics and control of human locomotion: Let your physics do the walking?"

Abstract:
Human walking requires considerable coordination, with the central nervous system orchestrating the activity of many muscles in the upper and lower body. The body expends effort both to control the motion and to provide energy. But just how much control is needed, and where does the energy go? To answer these questions we might consider just how little control and energy are needed. Passive walking machines are two-legged mechanisms that can walk down a gentle slope with no control whatsoever and no external energy input. With a very small amount of power, these machines can also walk on level ground. Their movements look surprisingly human, and in fact it appears that humans harness the passive dynamic properties of the limbs when they walk, just as the machines do. Humans need to exert some control, but make best use of physics to minimize their effort. We will use simple minimization principles to interpret theoretical and experimental evidence that indicates that humans really heavily on the physics to the walking.

Biosketch:
Art Kuo is Associate Professor of the Department of Mechanical Engineering at the University of Michigan. His present research focuses on understanding the role of the mechanical constraints of the body which influence the coordination of human walking and the maintenance of balance. His past research has ranged from a study of the orthopedic biomechanics and morphology of bone tissue to the development of computational models of sensorimotor integration. He received his BS in Electrical Engineering from the University of Illinois at Urbana-Champaign (1987) and his PhD in Mechanical Engineering from Stanford University (1993). He then moved to the R.S. Dow Neurological Sciences Institute in Portland, Oregon, where he worked in the Center for Vestibular Research, which was established to encourage interdisciplinary research involving neurophysiologists and engineers. At the University of Michigan he also serves as an Adjunct Professor in the Department of Biomedical Engineering and a Faculty Associate in the Institute of Gerontology.

Afternoon Session: GENETIC NETWORKS

K. C. Huang

"The biophysical aspects of spatiotemporal network dynamics"

Abstract:
Without organelles to spatially compartmentalize the cytoplasm, bacteria were classically viewed as "well-stirred reactors" of uniform concentration. However, in the past decade, fluorescence microscopy has fashioned a new appreciation for the diversity of ways in which proteins organize and segregate within bacteria. How does a nanometer-scale molecule like a protein "find" a specific location within a micron-scale cell? Though one possibility is through targeting an already localized anchor, cellular symmetry breaking ultimately requires components that self-organize. How some bacteria find their middle during cell division is one example of self-organized polar localization. The remarkable accuracy of cell division in the rod-shaped bacterium *E. coli* is partially regulated by the Min-protein system, which prevents division near the cell ends by oscillating spatially from pole to pole. In this tutorial, we will utilize genetic and biochemical evidence for interactions between the Min proteins to infer a minimal model of the Min-protein network that accurately reproduces the observed oscillations. The reaction-diffusion network generates oscillations via a linear instability with a preferred wavelength that can be used to understand the patterns of oscillation in other cell shapes as well. In particular, we will show that Min-protein oscillations can select the long axis in nearly round cells, a potentially important factor in division-plane selection in round bacteria such as *Neisseria gonnorhoeae*. In branched cells, the branch lengths dictate a specific pattern of Min oscillations that restores a wild-type rod shape after a few cell divisions. These results suggest that oscillations may provide a general mechanism by which proteins can localize in response to features of cell geometry.

Biosketch:
KC was a Page Boy at Caltech, graduating with a B.S. in Physics and Mathematics at Caltech. He spent one year as a Churchill Scholar at Cambridge University as an M.Phil. student with Dr. Guna Rajagopal working on Quantum Monte Carlo calculations of hydrogen-bond energies in water clusters. He received his Ph.D. from MIT working with Prof. John Joannopoulos on electromagnetic flux localization in photonic crystals and the control of melting at semiconductor surfaces using nanoscale coatings. During a summer internship at NEC Research Labs, he became interested in biological self-organization, and is currently a postdoctoral fellow with Prof. Ned Wingreen at Princeton trying to understand physical mechanisms behind the localization of proteins and lipids in bacterial membranes. Starting summer of 2008, he will move to Stanford as an Assistant Professor of Bioengineering, where he intends to study how bacteria detect, determine, and maintain their cell shape.

Gorel Suel

"Cellular differentiation: Noisy and dynamic, but tunable"

Abstract:
How do interactions between genes and proteins conspire to regulate almost every biological process in the cell? For example, diverse organisms ranging from bacteria to mammalian stem cells undergo pluripotent differentiation where a single cell can commit to one out of several cell fates. How do underlying genetic circuits formed by interactions between genes and proteins allow cells to "choose" a specific cell fate and execute the appropriate differentiation program? To address this complex question we investigate a simple bacterial differentiation system. Due to the large number of interactions and highly nonlinear dynamics, utilization of mathematical modeling becomes necessary to develop a comprehensive understanding of the system. In addition, it is critical to obtain quantitative single cell measurements that can constrain and test theoretical models. In particular, we are using quantitative fluorescence time-lapse microscopy at the single cell level to measure the dynamics of interactions between circuit components. Such data can provide insight into stochastic fluctuations within genetic circuits and their functional roles. Thus the goal is to elucidate the significance of circuit dynamics and stochastic behavior during cellular differentiation.

Biosketch:
Dr. Süel attended the Middle East Technical University in Ankara-Turkey, graduating with a B.S. in Biological Sciences. Following that, he received his M.S. in Biotechnology also at the Middle East Technical University in Ankara-Turkey. He then received his Ph.D. in Molecular Biophysics at the University of Texas Southwestern Medical Center in Dallas. His thesis work was titled "The structural pathway and dynamics of allosteric signaling in the G-protein coupled receptor rhodopsin". After earning his Ph.D., Dr. Süel moved to the California Institute of Technology where he worked in the laboratory of Michael Elowitz as a
Postdoctoral Fellow of the Center for Biological Circuit Design. There, he identified a core genetic circuit in B. subtilis that comprised an excitable system, giving rise to probabilistic and transient cellular differentiation. He further showed a biologically functional role for stochastic fluctuations within this circuit by demonstrating that cellular noise triggered differentiation. Recently, Dr. Süel has joint the Green Center for Systems Biology and the Department of Pharmacology at the University of Texas Southwestern Medical Center as an Assistant Professor. Dr. Süel retains his research interests in identifying design principles of genetic circuits and further exploring the functional roles of stochastic fluctuations in pluripotent differentiation.

Yuhai Tu

"From molecules to behavior: a single cell's memory, computation and taxis"

Abstract:
Biological systems often exhibit fascinating, complex behaviors. Over the last half century, great progress has been made in identifying the key molecules (DNA, RNA, Proteins) responsible for various biological functions. One of the main challenge (and opportunity) in biology now is to understand the system-level behavior from these molecular level knowledge of the cell. We believe computational biology, in particular quantitative modeling similar to those commonly used in physics, can play a major role in meeting this challenge. As an example, I will present our recent work in trying to understand bacterial chemotaxis by using quantitative modeling approach. Based on molecular level knowledge of the E. coli chemotaxis pathway, we will address several interesting, important system-level questions: 1) Does E. coli have memory? How long does it take the cell to forget? 2) What kind of computation is the cell doing in response to stimulus? 3) How does the cell use its memory and computation capability to sense and respond to a minute chemical gradient (food or poison) among a wide range of background.

Biosketch:
After he graduated in Physics from the University of Science and Technology in China (USTC) in 1987, Yuhai Tu came to US under the CUSPEA program for his graduate study. He got his Ph. D in Physics from UCSD with Prof. Herbert Levine in 1991. After three years as the Division Prize Fellow at Caltech (working mostly with Prof. Mike Cross), in 1994 he joined IBM T. J. Watson Research Center at Yorktown Heights, where he has been a Research Staff Member since. Dr. Tu's background is in statistical physics, nonlinear dynamics and computational physics. His research work covers a wide range of areas, including pattern formation in fluids; critical phenomena in non-equilibrium systems; interface physics; and most recently quantitative biology. Dr. Tu is currently the head of the theory and computational physics group at IBM Watson Research Center (since 2003) and he has been a Fellow of the APS since 2004.

JOB AD

Assistant Professor in Experimental Biological Physics

Department of Physics
Arizona State University Tempe, AZ

The Department of Physics at Arizona State University seeks applications for a tenure-track assistant professorship in experimental biological physics. Applicants must have a Ph.D. degree in physics or a closely related scientific discipline by time of appointment, an outstanding record of research accomplishments with a clear potential to establish a vigorous externally funded research program and will show a strong commitment to excellence in teaching. Ideal candidates will also show strong overlap with biological sciences beyond biological physics. Demonstrated experience in a collaborative, multidisciplinary environment is desired. Arizona State University is placing great emphasis on interdisciplinary biosciences, as evidenced by major investment in the Biodesign Institute and the Center for Biological Physics. Exceptional applicants may be considered for a more senior appointment. The appointment will begin in August 2008.

Complete applications will include a cover letter, curriculum vitae, statement of research and teaching plans, and contact information for three references (postal and email address and phone number). Materials should be submitted electronically at http://physics.asu.edu/employment.php. Applications will be considered beginning November 28, 2007, with further review of completed files every two weeks until the search is closed.

Please direct questions to biophysics-search@asu.edu.

Arizona State University is an affirmative action, equal opportunity employer committed to excellence through diversity.

JOB AD

University of California, Irvine
TENURED AND TENURE-TRACK FACULTY POSITIONS IN SYSTEMS BIOLOGY

The University of California, Irvine has embarked on a recruiting initiative in Systems Biology intended to fill seven faculty positions over three years. Three positions are available this year, for which candidates will be considered from all areas of Systems Biology, including biological networks, regulatory dynamics and control, spatial dynamics and morphogenesis, synthetic biology, and mathematical and computational biology.

Applications are being solicited at the Assistant, Associate and Full Professor level, and appointments can be made in any of several departments, including Developmental and Cell Biology, Molecular Biology and Biochemistry, Ecology and Evolutionary Biology, Biomedical Engineering, Mathematics, Physics and Astronomy, Computer Science, and Statistics.

The successful applicant is expected to conduct a strong research program and to contribute to the teaching of undergraduate and graduate students. Systems Biology research and training at UCI is fostered by several interdisciplinary research units, an NIGMS National Center for Systems Biology, and Ph.D. training programs in Bioinformatics, and Mathematical and Computational Biology (for more information, see http://ccbs.bio.uci.edu).

Applicants should submit a letter of application, curriculum vitae, bibliography, three letters of reference, and statements of research and teaching interests using the on-line recruitment system (see instructions at http://ccbs.bio.uci.edu or https://recruit.ap.uci.edu). To receive full consideration, material should be received by January 1, 2008.

The University of California, Irvine is an equal opportunity employer committed to excellence through diversity, and strongly encourages applications from all qualified applicants, including women and minorities.

UCI is responsive to the needs of dual career couples, is dedicated to work-life balance through an array of family-friendly policies, and is the recipient of an NSF ADVANCE Award for gender equity.

JOB AD

BIOLOGICAL PHYSICS
TENURE-TRACK POSITION
UNIVERSITY OF OTTAWA, CANADA

The Department of Physics of the University of Ottawa invites applications for a tenure-track position **in biological physics, with a preference for experimental approaches**. The appointments will normally be at the Assistant Professor level, but applications for higher ranks will also be considered. The Department continues to build its strength in areas such as, but not limited to, condensed matter physics, photonics, and biological physics.

The successful applicants must have a Ph.D. and postdoctoral experience, demonstrated excellence and exceptional promise in research, and a strong commitment to teaching. The individuals will be part of a growing contingent of interdisciplinary researchers distributed across the University of Ottawa and its affiliated centers and institutes (such as the Ottawa Health Research Institutes, Ottawa Institute of Systems Biology, Heart Institute, Sprott Stem Cell Center, Center for Research in Photonics, and Center for Neural Dynamics).

As Canada's National Capital, Ottawa is a vibrant and attractive city, well served for national and international travel. It has numerous cultural amenities and offers easy access to several summer and winter outdoor activities. It also has a high concentration of research laboratories both governmental and industrial.

All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. Equity is a University of Ottawa policy; women, aboriginal peoples, members of visible minorities and persons with disabilities are encouraged to apply.

The University of Ottawa has a proud tradition of 150 years of bilingualism. At the time of tenure, professors are expected to have the ability to function in a bilingual setting.

Start date: July 1, 2008

Applications will be reviewed starting in December 2007 and until the position is filled. Applicants are requested to send a curriculum vitae, the names of at least three referees, and a statement of research interests to:

Search Committee: BP
Department of Physics
University of Ottawa
150 Louis Pasteur
Ottawa, Ont.
Canada K1N 6N5

contact: Prof. Andre Longtin
alongtin@uottawa.ca

JOB AD

EXPERIMENTAL BIOPHYSICS POSTDOCTORAL POSITION

The University of California, Irvine anticipates the availability of a postdoctoral position in experimental biophysics. The successful candidate will do in vitro (and in vivo) experiments on molecular motors, looking at a variety of issues related to how multiple motors function together. While a strong background in biology is not required, the successful applicant will be expected to have an interest in understanding biology, and will need to learn a great deal of biology to be successful. Experimentally, some knowledge of optics, electronics, and computer control of instrumentation is important, since the project involves optical traps and advanced instrumentation. Because the project will be multi-disciplinary, a desire to learn new approaches is critical. The applicant will be expected to work well as part of a group, and collaborate with theorists. The minimum qualification is a Ph.D in physics, biomedical engineering, chemistry, or a closely related field. Applications (including a CV, list of publications, and three reference letters) should be sent to

Prof. Steven Gross, Department of Dev. and Cell Biology, University of California, Irvine, CA 92697.

For full consideration, applications should be submitted by January 15, 2008.
UCI is an equal opportunity employer committed to excellence through diversity.

JOB AD

THEORETICAL BIOLOGICAL PHYSICS POSTDOCTORAL POSITION

The University of California, Irvine anticipates the availability of 1 or 2 postdoctoral positions in theoretical biological physics. The successful candidate will model intracellular transport, e.g., motor proteins carrying cargos along filaments. The successful applicant will have a strong theoretical physics background and computer skills, as well as an interest in understanding biology. Further, they must work well with others, as significant collaboration with experimentalists will be necessary. Experience with Monte Carlo simulations and C++ is useful. The minimum qualification is a Ph.D in physics or a closely related field. Applications (including a CV, list of publications, and three reference letters) should be sent to

Prof. Clare Yu, Department of Physics and Astronomy, University of California, Irvine, CA 92697-4575.

For full consideration, applications should be submitted by January 15, 2008.
UCI is an equal opportunity employer committed to excellence through diversity.

JOB AD

Two Postdoctoral Positions
Oakland University

Two postdoctoral positions will soon be available in an active lab where we study articular cartilage using multidisciplinary techniques, including microscopic magnetic resonance imaging (μMRI), polarized light microscopy (PLM), transmission electron microscopy (TEM), Fourier-transform infrared imaging (FTIRI), histology, biochemical treatment and mechanical characterization. The goal of this work is to determine a set of multidisciplinary parameters that describe the load-induced changes in osteoarthritic cartilage from animals at microscopic resolutions. Other research opportunities may be available depending upon the interests and background of the successful candidate.

The successful candidate for the postdoctoral position should have a PhD or equivalent in biomedical sciences, biophysics, bioengineering, or a related field. A solid background and previous experience in cartilage or other connective tissue is preferred. Working knowledge and skills with microscopic imaging instrument and image analysis will be an asset.

Oakland University is located in suburban Rochester, Michigan, in north Oakland County, which boasts one of the most picturesque campuses in the country. Our state-of-art lab instrumentation includes a μMRI system (Bruker AVANCE II NMR Console with a 7T wide-bore superconducting magnet and microimaging accessories), a mechanical system (EnduraTec ELF 3200), a PLM system (Leica DM RXP interfaced with two digital imaging systems), a FTIRI system (PerkinElmer Spotlight 300), and a number of histology and analytical chemistry equipments. Our web site contains more information regarding our lab and some of the recently completed cartilage projects.

Interested individuals should send their CV, statements of research experience and research interest, and the names, telephone numbers, and e-mail addresses of at least three references to:

Professor Yang Xia
Dept of Physics,
Oakland University,
Rochester, MI 48309, USA
Tel: 248-370-3420; **Fax:** 248-370-3408; **E-mail:** xia@oakland.edu
Web: http://www.oakland.edu/~xia/XiaLab_index.html.

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HUMAN FRONTIER SCIENCE PROGRAM (HFSP)

12 quai Saint-Jean, 67080 STRASBOURG Cedex, FRANCE

CALL FOR LETTERS OF INTENT FOR INTERDISCIPLINARY RESEARCH GRANTS: AWARD YEAR 2009

The Human Frontier Science Program supports **international** preferably **intercontinental** collaborations in basic life science research with emphasis placed on *novel*, **innovative** and **interdisciplinary** approaches to fundamental investigations. Applications are invited for grants to support new approaches to understanding **complex mechanisms of living organisms** involving biologists collaborating with scientists from disciplines such as chemistry, physics, mathematics, computational biology, nanoscience and engineering. Preliminary results are not required. Applicants are expected to develop new lines of research distinct from their ongoing research.

There are two types of Grant: Young Investigators' Grants are for teams of scientists who are **all** within 5 years of establishing an independent laboratory and within 10 years of obtaining their PhDs. **Program Grants** are for independent scientists at all stages of their careers, although the participation of younger scientists is especially encouraged.

Grants provide 3 years support for 2 – 4 member teams, with not more than one member from any one country, unless critical for the interdisciplinary nature of the project, which is an essential selection criterion. Applicants may establish a local or national **interdisciplinary** collaboration as a component of an international team but will be considered as 1.5 team members for budgetary purposes. Awards are dependent upon team size and successful teams will receive up to $450,000 per year. The principal applicant must be located in one of the member countries (Australia, Canada, the European Union, France, Germany, India, Italy, Japan, New Zealand, the Republic of Korea, Switzerland, the United Kingdom and the United States) but co-investigators may be located in any country.

Guidelines and further instructions are available on the HFSP web site (http://www.hfsp.org). International teams of scientists must first submit a letter of intent online via the web site. Specific enquiries: grant@hfsp.org

Deadlines :

Compulsory pre-registration for password, via the web site: 21 MARCH 2008

Submission of Letters of Intent: 02 APRIL 2008