

THE BIOLOGICAL PHYSICIST

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

Vol 7 No 4 Oct 2007

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**The October issue of THE BIOLOGICAL
PHYSICIST brings you a special feature: an
introduction to the NSF Division of Materials
Research from Program Officer David A. Brant. We
also bring you the usual suspects: PRE and PRL
Highlights, and a slew of autumn job ads, for both
faculty and postdoctoral positions. And turn to page
15 for a Call for Nominations from the DBP.**

– SB

The National Science Foundation

Division of Materials Research

Biomaterials Program

by Program Officer David A. Brant

Program Initiation

The NSF Division of Materials Research (DMR) has long supported work in biomaterials through its programs in Condensed Matter Physics, Condensed Matter and Materials Theory, Solid State and Materials Chemistry, Ceramics, Metals, and Polymers. Given a steady increase in bio-related proposals submitted to DMR, the Division initiated a new program in Biomaterials (BMAT) in 2006 to collect and review together those proposals focused on materials of biological origin, materials inspired by materials of biological origin, and materials, whether or not of biological origin, intended for applications requiring compatibility with biological systems. The initial funding base was established in late 2006 by transferring to BMAT approximately two dozen bio-related awards made earlier by other DMR Programs. As these awards expire, monies will be released to fund new BMAT proposals, some of which may, in effect, be renewals of existing awards. To the resource base established by these transferred awards was added an approximately equal amount of new money to enable additional awards to be made in 2007. It should be observed that DMR also provides substantial additional research support to the biomaterials community through its funding of 29 [Materials Research Science and Engineering Centers \(MRSEC\)](#)¹ and funding that it provides for a number of [large research facilities](#)², e.g., the National High Magnetic Field Laboratory, the Center for High Resolution Neutron Scattering, and various high intensity light sources.

Intellectual Scope of the BMAT Program

BMAT is a core DMR program and not based on any special solicitation. Its web-based program

¹<http://www.mrsec.org/>

²http://nsf.gov/funding/pgm_summ.jsp?pims_id=5359&org=DMR&from=home

announcement carries the following program synopsis:

The focus of the Biomaterials Program is the study of biologically related materials and associated phenomena, including biological pathways to new materials. The materials and systems of interest include biomolecules, biomolecular assemblies, biomolecular systems (vesicles, membranes, and various other assemblies and networks of biomolecules), and biomimetic, bioinspired, or biocompatible materials. The methods of materials research may be applied to biological systems to discover or understand phenomena and to create or optimize materials. Consistent with DMR's mission, awards will be in the general areas of biological condensed matter physics and chemistry and biologically related materials science. Materials-focused proposals for research and education in these areas are encouraged.

This statement attempts to define the scope of the BMAT program. It is useful to observe that the term "biomaterials" has no canonical definition. Perhaps it is more accurate to say that it has several definitions. For example, the announcement for a forthcoming professional society symposium states that "biomaterials are synthetic materials developed to replace, restore, or augment biological materials." Biomaterials, thus defined, are differentiated in the same announcement from "biological materials" which are said to "comprise the inorganic and organic constituents of biological systems." In this scheme inorganic phosphate and acetic acid are biological materials, although these substances are not what are typically understood as materials, while polyurethane is a biomaterial because of its application, for example, as a

synthetic material with favorable properties for contact with blood.

The point to be made here is that for DMR the intellectual scope of the Biomaterials program is quite inclusive. Naturally occurring biological materials and those non-natural materials inspired by or designed to mimic naturally occurring biological materials are encompassed, including those synthetic materials defined as biomaterials in the preceding paragraph. Likewise, studies of the synthesis and properties of biomaterials and phenomena associated with them are candidates for support by BMAT.

Because materials research exists on a continuum with the basic sciences at one end and engineering at the other, it is important to understand what, if any, jurisdictional boundaries the BMAT program may have. The continuum in question encompasses many disciplines and is characterized by active feedback moving along it in both directions. As a subset of materials research, biomaterials research is inherently interdisciplinary and is probably more consistently so even than the broader parent field. Recognizing the well-established role of DMR in supporting research in experimental condensed matter physics, polymers, ceramics, electronic materials, metals, and solid state and materials chemistry, the Biomaterials program supports work in these areas related to biomaterials. The Biomaterials program does not entertain proposals that are strictly theoretical or computational; those continue to go to the Condensed Matter and Materials Theory (CMMT) program even if the subject is biomaterials. At the opposite end of the continuum, proposals that focus on materials testing and design and/or construction of devices generally lie outside the domain of the Biomaterials program.

Creation of the Biomaterials program has attracted and will attract proposals from members of the

research community who, because of their biological or biomedical affiliations, would not previously have sought support from DMR. Awakening of this group to DMR as a funding source modifies the complexion of the DMR client community and will help to shape the expectations of that community about what BMAT should be supporting. The intellectual scope of the BMAT program, and a well articulated vision for its future directions, will emerge from several rounds of interaction with the biomaterials community—through submission and review of proposals and participation of the Program Officers with the community in its meetings and workshops.

Inaugural Round of Reviews

Investigator initiated proposals are accepted by DMR during an annual window that opens on the third Monday in September and closes on the first Friday in November. The initial batch of BMAT proposals was received during the fall 2006 window for processing in federal fiscal year 2007. The program was managed in 2007 by Program Officers David A. Brant and Joseph A. Akkara. (In 2008 Dr. Brant will manage the program with part time assistance from Dr. Akkara and Dr. Satyendra Kumar.)

In the course of the 2007 review cycle, BMAT reviewed 170 research proposals including those from individual investigators and small collaborations (IND), the CAREER program, and the Materials World Network (MWN) international collaboration program. Of these, 30 (18%) were funded. In addition, the program entertained, and funded, two proposals for Research Experiences for Undergraduates (REU) Supplements and three Symposium proposals. One Workshop proposal and two Small Grants for Exploratory Research (SGER) proposals were declined. If these additional proposals are counted with the Research proposals, the overall success rate in 2007 was 19%. All proposals compete for support from

	IND	CAREER	MWN	Totals
No. Reviewed	134	23	13	170
No. Funded	22	6	2	30
% Funded	16%	26%	15%	18%
Mean Annual Award	\$121,000	\$96,000	\$120,000	\$116,000

Table 1. 2007 Review Results

essentially the same funding pool, except that the EPSCoR program may co-fund strong proposals from EPSCoR states. The outcome of the review of the 170 research proposals is shown in Table 1 above.

The 170 research proposals were reviewed in seven panels supplemented by mail reviews as needed to ensure informed reviews for all proposals. Each of the five IND panels was assigned proposals grouped around a common theme. Given the breadth of topics and methodologies proposed, however, no simple set of mutually exclusive categories appears possible. Categories based on a dominant physicochemical characteristic of the material under study or development have been tentatively selected for the 2008 BMAT IND panels. Placing each of the 170 research proposals from 2007 into just one of these 2008 categories provides one approach to describing the distribution of topics represented among the 2007 BMAT proposals. The results are shown in Figure 1, where the distributions of proposals and awards are both given. The categories are MV (Membranes and Vesicles), SI (Surfaces and Interfaces), MA (Molecular Assemblies), GN (Gels

and Networks), and MC (Minerals and Composites). It is evident that the 2007 panels gave high ratings to proposals in categories SI and MA with a frequency that exceeds the frequency with which such proposals occurred in the general population of proposals.

Many proposals are suitable for assignment to more than one of these arbitrary categories. This provides the Program Officers the latitude needed to ensure that panelists are well matched to the proposals assigned to each panel; supplemental mail reviews will also be used as needed. Each panel category encompasses many possible topics. For example, the category MV may include proposals on carrier and delivery systems, pore-based sensor systems, encapsulation systems, polymersomes, membrane biomechanics, and functional supported membranes. In category MC one might expect proposals on characterization of natural mineralized structures and composites, discovery of natural mineralization processes, biomimetic routes to mineralized structures, cartilage and bone tissue culture and regeneration, crystalline and glassy biomaterials, and studies of the origins of biological color (biophotonics).

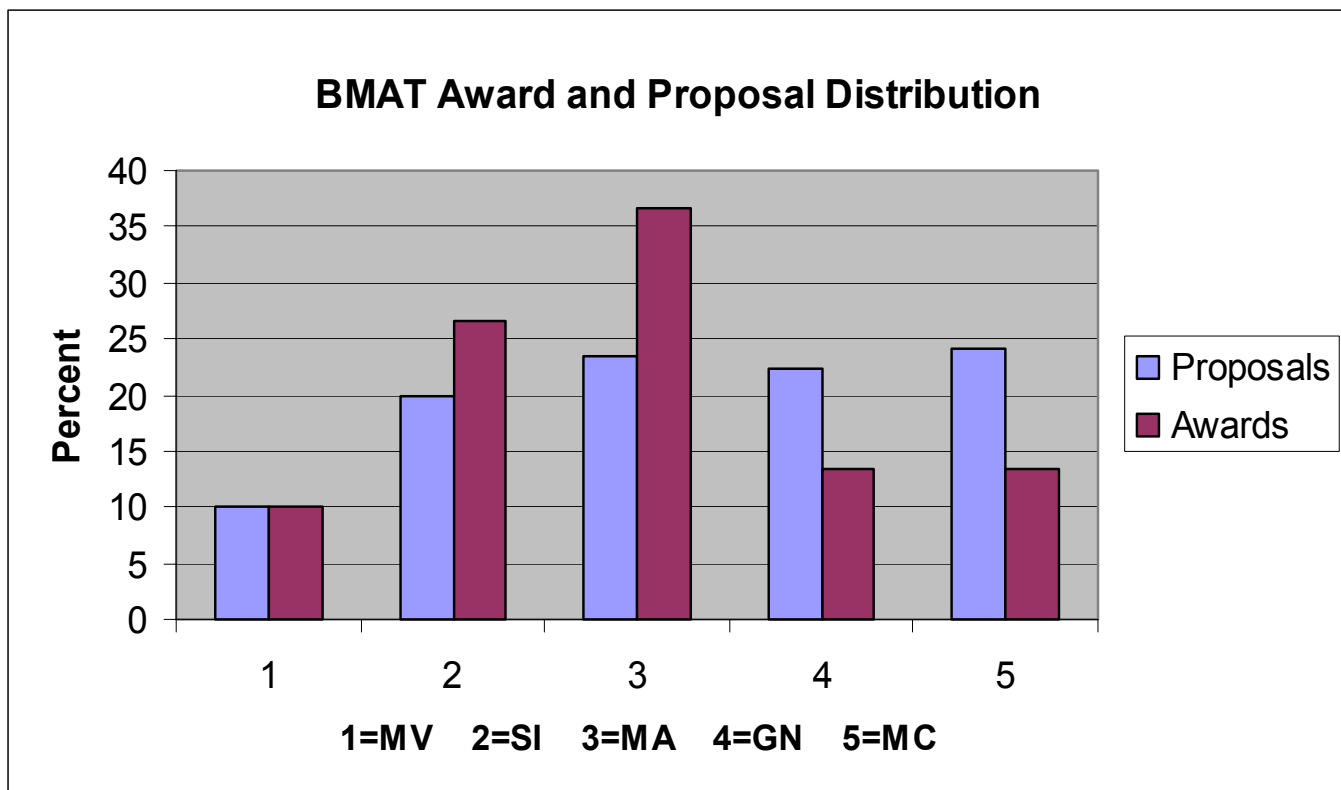


Figure 1. Distributions of Awards and Proposals

Broadening Participation

NSF is committed to broadening participation in science, engineering, and technology to achieve representations of women, underrepresented minority groups, and underserved geographic areas that approximate their representations in the general US population. Among the 30 research awards made by BMAT in 2007, female PIs received 8 (27%) while 2 (7%) went to PIs from underrepresented minorities. Of the five awards made for Symposia and REU supplements, four went to female PIs or co-PIs. An analysis of these 170 research proposals shows that 46 (27%) came from female PIs and 2 (1%) from underrepresented minority PIs. Thus, the percentage of female awardees matches exactly the percentage of female PIs in the pool of applicants, whereas all (both) minority applicants were funded. Female and minority participation in the panel review process tracked female and minority representation in the pool of awardees almost exactly. In terms of success in broadening geographic participation, four of the 30 research awards went to EPSCoR states (Delaware, Kentucky, South Carolina, and Wyoming). One of the BMAT CAREER awardees has been nominated for a Presidential Early Career Award for Scientists and Engineers (PECASE) award, in part because of the unusual program of outreach to handicapped students.

Broader Impacts

Broadening Participation is one of the several categories listed under the NSF Broader Impacts merit review criterion. Proposal writers are often uncertain about how much emphasis to give to addressing the NSF Broader Impacts criterion. The serious attention given to Broader Impacts by most BMAT panelists in 2007 suggests that the community recognizes the importance placed by NSF on this criterion. It was evident during the panel review process that proposals that gave credible attention to this criterion benefited in the final rankings of proposals by the panels. At least one award was made to a proposal at the margins on the basis of the exceptionally strong educational outreach program presented by the female PI. The recently revised (July 2007) NSF statement [Merit Review Broader Impacts](#)

[Criterion: Representative Activities](#)³ provides excellent guidance for those preparing proposals.

Proposal Submissions

The indispensable guide to preparation of any NSF proposal is the [Grant Proposal Guide \(GPG\)](#)⁴, incorporated since June 2007 in the NSF [Proposal and Award Policies and Procedures Guide](#)⁵. Never embark on writing an NSF proposal without careful attention to the detailed instructions in the *GPG*. Proposals that are not compliant with those instructions are subject to being returned without review. Researchers seeking information about the kinds of awards that are currently supported by BMAT are advised to review the Abstracts of Recent Awards available through a link near the bottom of the [BMAT](#)⁶ homepage. Note that DMR supports collaborative research among investigators within an institution through the [Focused Research Group](#)⁷ mechanism. International collaborations are supported through the [Materials World Network](#)⁸ program.

Service as a BMAT Reviewer

Persons wishing to volunteer for service as a reviewer or panelist for BMAT proposals should send an email to Program Officer David Brant (dbrant@nsf.gov) with a brief statement of research interests and a recent CV.

³ <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>

⁴ http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg_index.jsp

⁵ http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/index.jsp

⁶ http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13699&org=DMR&from=home

⁷ <http://www.nsf.gov/mps/dmr/awards/frgs.jsp>

⁸ http://nsf.gov/funding/pgm_summ.jsp?pims_id=12820&org=DMR&from=home

PRL HIGHLIGHTS

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

3 August 2007

Vol 99, Number 5, Articles (05xxxx)
Articles published 28 Jul - 3 Aug 2007
<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=5>

Surface Triple Points and Multiple-Layer Transitions Observed by Tuning the Surface Field at Smectic Liquid-Crystal-Water Interfaces

Ch. Bahr
Published 31 July 2007
057801

Spontaneous Separation of Charged Grains

Amit Mehrotra, Fernando J. Muzzio, and Troy Shinbrot
Published 31 July 2007
058001

Period-Doubling Bifurcation to Alternans in Paced Cardiac Tissue: Crossover from Smooth to Border-Collision Characteristics

Carolyn M. Berger, Xiaopeng Zhao, David G. Schaeffer, Hana M. Dobrovolny, Wanda Krassowska, and Daniel J. Gauthier
Published 30 July 2007
058101

Orientational Order and Instabilities in Suspensions of Self-Locomoting Rods

David Saintillan and Michael J. Shelley
Published 30 July 2007
058102

Branching, Capping, and Severing in Dynamic Actin Structures

Ajay Gopinathan, Kun-Chun Lee, J. M. Schwarz, and Andrea J. Liu
Published 2 August 2007

058103

Solvent Effects on Charge Spatial Extent in DNA and Implications for Transfer

Yves A. Mantz, Francesco Luigi Gervasio, Teodoro Laino, and Michele Parrinello
Published 2 August 2007
058104

Peeling and Sliding in Nucleosome Repositioning

Tom Chou
Published 3 August 2007
058105

Ranking Knots of Random, Globular Polymer Rings

M. Baiesi, E. Orlandini, and A. L. Stella
Published 1 August 2007
058301

Nanoconfinement-Enhanced Conformational Response of Single DNA Molecules to Changes in Ionic Environment

Walter Reisner, Jason P. Beech, Niels B. Larsen, Henrik Flyvbjerg, Anders Kristensen, and Jonas O. Tegenfeldt
Published 1 August 2007
058302

Stretch-Coil Transition and Transport of Fibers in Cellular Flows

Y.-N. Young and Michael J. Shelley
Published 2 August 2007
058303

Experimental Growth Law for Bubbles in a Moderately "Wet" 3D Liquid Foam

Jérôme Lambert, Isabelle Cantat, Renaud Delannay, Rajmund Mokso, Peter Cloetens, James A. Glazier, and François Graner
Published 2 August 2007
058304

10 August 2007

Vol 99, Number 6, Articles (06xxxx)
Articles published 4 Aug - 10 Aug 2007

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=6>

Flexoelectric Blue Phases

G. P. Alexander and J. M. Yeomans
Published 6 August 2007
067801

Granular Fingers on Jammed Systems: New Fluidlike Patterns Arising in Grain-Grain Invasion Experiments

S. F. Pinto, M. S. Couto, A. P. F. Atman, S. G. Alves, A. T. Bernardes, H. F. V. de Resende, and E. C. Souza
Published 6 August 2007
068001

Rheology and Contact Lifetimes in Dense Granular Flows

Leonardo E. Silbert, Gary S. Grest, Robert Brewster, and Alex J. Levine
Published 9 August 2007
068002

Washboard Road: The Dynamics of Granular Ripples Formed by Rolling Wheels

Nicolas Taberlet, Stephen W. Morris, and Jim N. McElwaine
Published 10 August 2007
068003

Experimental Free Energy Surface Reconstruction from Single-Molecule Force Spectroscopy using Jarzynski's Equality

Nolan C. Harris, Yang Song, and Ching-Hwa Kiang
Published 6 August 2007
068101

Corticothalamic Projections Control Synchronization in Locally Coupled Bistable Thalamic Oscillators

Jörg Mayer, Heinz Georg Schuster, Jens Christian Claussen, and Matthias Mölle
Published 8 August 2007
068102

Counterion-Induced Abnormal Slowdown of F-Actin Diffusion across

the Isotropic-to-Nematic Phase Transition

Jun He, Jorge Viamontes, and Jay X. Tang
Published 9 August 2007
068103

Minimum-Risk Path Finding by an Adaptive Amoebal Network

Toshiyuki Nakagaki, Makoto Iima, Tetsuo Ueda, Yasumasa Nishiura, Tetsu Saigusa, Atsushi Tero, Ryo Kobayashi, and Kenneth Showalter
Published 10 August 2007
068104

Surface Diffusion Dynamics of a Single Polymer Chain in Dilute Solution

Hu-Jun Qian, Li-Jun Chen, Zhong-Yuan Lu, and Ze-Sheng Li
Published 6 August 2007
068301

Broad Bandwidth Optical and Mechanical Rheometry of Wormlike Micelle Solutions

N. Willenbacher, C. Oelschlaeger, M. Schopferer, P. Fischer, F. Cardinaux, and F. Scheffold
Published 10 August 2007
068302

17 August 2007

Vol 99, Number 7, Articles (07xxxx)
Articles published 11 Aug - 17 Aug 2007

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=7>

Dipolar Poisson-Boltzmann Equation: Ions and Dipoles Close to Charge Interfaces

Ariel Abrashkin, David Andelman, and Henri Orland
Published 17 August 2007
077801

Unique Pitch Evolution in the Smectic-C Phase

Z. Q. Liu, B. K. McCoy, S. T. Wang, R. Pindak, W. Caliebe, P. Barois, P. Fernandes, H. T. Nguyen, C. S. Hsu, Shun Wang, and C. C. Huang
Published 17 August 2007
077802

Transport and Aggregation of Self-Propelled Particles in Fluid Flows

Colin Torney and Zoltán Neufeld
Published 13 August 2007
078101

Direct Imaging of Dynamical Heterogeneities near the Colloid-Gel Transition

Y. Gao and M. L. Kilfoil
Published 15 August 2007
078301

Distinct Water Species Confined at the Interface of a Phospholipid Membrane

Victor V. Volkov, D. Jason Palmer, and Roberto Righini
Published 15 August 2007
078302

24 August 2007

Vol 99, Number 8, Articles (08xxxx)
Articles published 18 Aug - 24 Aug 2007
<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=8>

Model for Curvature-Driven Pearling Instability in Membranes

F. Campelo and A. Hernández-Machado
Published 21 August 2007
088101

Mechanics of Bundled Semiflexible Polymer Networks

O. Lieleg, M. M. A. E. Claessens, C. Heussinger, E. Frey, and A. R. Bausch
Published 22 August 2007
088102

Thermal Denaturation of Fluctuating DNA Driven by Bending Entropy

J. Palmeri, M. Manghi, and N. Destainville
Published 24 August 2007
088103

31 August 2007

Vol 99, Number 9, Articles (09xxxx)
Articles published 25 Aug - 31 Aug 2007
<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=9>

Chirality and Equilibrium Biopolymer Bundles

Gregory M. Grason and Robijn F. Bruinsma
Published 28 August 2007

098101

Synchronization of Plant Circadian Oscillators with a Phase Delay Effect of the Vein Network

Hirokazu Fukuda, Norihito Nakamichi, Mihoe Hisatsune, Haruhiko Murase, and Takeshi Mizuno
Published 29 August 2007
098102

Lensless Diffractive Imaging Using Tabletop Coherent High-Harmonic Soft-X-Ray Beams

Richard L. Sandberg, Ariel Paul, Daisy A. Raymondson, Steffen Hadrach, David M. Gaudiosi, Jim Holtsnider, Ra'anana I. Tobey, Oren Cohen, Margaret M. Murnane, Henry C. Kapteyn, Changyong Song, Jianwei Miao, Yanwei Liu, and Farhad Salmassi
Published 29 August 2007
098103

"Sticky" Hard Spheres: Equation of State, Phase Diagram, and Metastable Gels

Stefano Buzzaccaro, Roberto Rusconi, and Roberto Piazza
Published 27 August 2007
098301

Coupling of Transverse and Longitudinal Response in Stiff Polymers

Benedikt Obermayer and Oskar Hallatschek
Published 31 August 2007
098302

Localization Transition of Biased Random Walks on Random Networks

Vishal Sood and Peter Grassberger
Published 31 August 2007
098701

7 September 2007

Vol 99, Number 10, Articles (10xxxx)
Articles published 1 Sept - 7 Sept 2007
<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=10>

Diffusion and Relaxation Dynamics in Cluster Crystals

Angel J. Moreno and Christos N. Likos
Published 7 September 2007
107801

Duality, Thermodynamics, and the Linear Programming Problem in Constraint-Based Models of Metabolism

Patrick B. Warren and Janette L. Jones
Published 7 September 2007
108101

Model for Self-Propulsive Helical Filaments: Kink-Pair Propagation

Hirofumi Wada and Roland R. Netz
Published 7 September 2007
108102

Symmetry and Stochastic Gene Regulation

Alexandre F. Ramos and José E. M. Hornos
Published 7 September 2007
108103

14 September 2007

**Vol 99, Number 11, Articles (11xxxx)
Articles published 8 Sept - 14 Sept 2007**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=11>

Strain Hardening in Polymer Glasses: Limitations of Network Models

Robert S. Hoy and Mark O. Robbins
Published 14 September 2007
117801

Dispersion of Refractoriness and Induction of Reentry due to Chaos Synchronization in a Model of Cardiac Tissue

Yuanfang Xie, Gang Hu, Daisuke Sato, James N. Weiss, Alan Garfinkel, and Zhilin Qu
Published 12 September 2007
118101

Quantitative Protein Dynamics from Dominant Folding Pathways

M. Sega, P. Faccioli, F. Pederiva, G. Garberoglio, and H. Orland
Published 12 September 2007
118102

Interplay between Spinodal Decomposition and Glass Formation in Proteins Exhibiting Short-Range Attractions

Frédéric Cardinaux, Thomas Gibaud, Anna Stradner, and Peter Schurtenberger

Published 13 September 2007
118301

Charge Renormalization for Effective Interactions of Colloids at Water Interfaces

Derek Frydel, S. Dietrich, and Martin Oettel
Published 14 September 2007
118302

21 September 2007

**Vol 99, Number 12, Articles (12xxxx)
Articles published 15 - 21 Sept 2007**

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=12>

Percolation Transition in Fluids: Scaling Behavior of the Spanning Probability Functions

Jiří Škvor, Ivo Nezbeda, Ivan Brovchenko, and Alla Oleinikova
Published 20 September 2007
127801

Levitation, Lift, and Bidirectional Motion of Colloidal Particles in an Electrically Driven Nematic Liquid Crystal

O. P. Pishnyak, S. Tang, J. R. Kelly, S. V. Shiyakovskii, and O. D. Lavrentovich
Published 21 September 2007
127802

Solvation of Proteins: Linking Thermodynamics to Geometry

Hendrik Hansen-Goos, Roland Roth, Klaus Mecke, and S. Dietrich
Published 17 September 2007
128101

Aggregates of Two-Dimensional Vesicles: Rouleaux, Sheets, and Convergent Extension

P. Zihler
Published 21 September 2007
128102

Amplified Signal Response in Scale-Free Networks by Collaborative Signaling

Juan A. Acebrón, Sergi Lozano, and Alex Arenas
Published 20 September 2007
128701

28 September 2007

Vol 99, Number 13, Articles (13xxxx)
Articles published 22 - 28 Sept 2007

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=99&Issue=13>

Flory Theorem for Structurally Asymmetric Mixtures

Frank C. Sun, Andrey V. Dobrynin, David Shirvanyants, Hyung-Il Lee, Krzysztof Matyjaszewski, Gregory J. Rubinstein, Michael Rubinstein, and Sergei S. Sheiko
Published 24 September 2007
137801

Depletion Interactions: A New Control Parameter for the Self-Assembly of Diblock Copolymer Micelles

Sayed Abbas and Timothy P. Lodge
Published 28 September 2007
137802

Lattice Dynamics of a Protein Crystal

Lars Meinhold, Franci Merzel, and Jeremy C. Smith
Published 25 September 2007
138101

Nonequilibrium Statistical Mechanics of Dividing Cell Populations

Naama Brenner and Yair Shokef
Published 27 September 2007
138102

Universal Scaling Law in Human Behavioral Organization

Toru Nakamura, Ken Kiyono, Kazuhiro Yoshiuchi, Rika Nakahara, Zbigniew R.

Struzik, and Yoshiharu Yamamoto
Published 28 September 2007
138103

Molecular Clock on a Neutral Network

Alpan Raval
Published 28 September 2007
138104
See Also: Phys. Rev. Focus

Semiclassical Wave Packet Treatment of Scattering Resonances: Application to the Delta Zero-Point Energy Effect in Recombination Reactions

Evgeny Vetoshkin and Dmitri Babikov
Published 24 September 2007
138301

Polyelectrolyte Condensation Induced by Linear Cations

Camilo Guáqueta and Erik Luijten
Published 26 September 2007
138302

Asymmetry in Colloidal Diffusion near a Rigid Wall

Mauricio D. Carbajal-Tinoco, Ricardo Lopez-Fernandez, and José Luis Arauz-Lara
Published 28 September 2007
138303

Scaling and Universality in Proportional Elections

Santo Fortunato and Claudio Castellano
Published 25 September 2007
138701

PRE HIGHLIGHTS

Biological Physics Articles from
Physical Review E

August 2007

Volume 76, Number 2, Articles (02xxxx)

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PLEEE8&Volume=76&Issue=2>

RAPID COMMUNICATIONS

Quantized cycling time in artificial gene networks induced by noise and intercell communication

Aneta Koseska, Evgenii Volkov, Alexei Zaikin, and Jürgen Kurths

Published 23 August 2007 (*4 pages*)
020901(R)

ARTICLES

Effects of sequence disorder on DNA looping and cyclization

Yuri O. Popov and Alexei V. Tkachenko
Published 1 August 2007 (*8 pages*)
021901

Universal power law behaviors in genomic sequences and evolutionary models

Loredana Martignetti and Michele Caselle
Published 2 August 2007 (*6 pages*)
021902

Steady-state probe-partitioning fluorescence resonance energy transfer: A simple and robust tool for the study of membrane phase behavior

Jeffrey T. Buboltz
Published 3 August 2007 (*7 pages*)
021903

Response and fluctuations of a two-state signaling module with feedback

Manoj Gopalakrishnan, Peter Borowski, Frank Jülicher, and Martin Zapotocky
Published 7 August 2007 (*18 pages*)
021904

Active self-polarization of contractile cells in asymmetrically shaped domains

A. Zemel and S. A. Safran
Published 7 August 2007 (*11 pages*)
021905

Critical fronts in initiation of excitation waves

I. Idris and V. N. Biktashev
Published 7 August 2007 (*6 pages*)
021906

Flexibility of single microvilli on live neutrophils and lymphocytes

Da-Kang Yao and Jin-Yu Shao
Published 7 August 2007 (*6 pages*)
021907

Response clustering in transient stochastic synchronization and

desynchronization of coupled neuronal bursters

Alexander B. Neiman, David F. Russell, Tatyana A. Yakusheva, Andrew DiLullo, and Peter A. Tass
Published 8 August 2007 (*10 pages*)
021908

Asexual and sexual replication in sporulating organisms

Bohyun Lee and Emmanuel Tannenbaum
Published 8 August 2007 (*9 pages*)
021909

Kinetics of cell division in epidermal maintenance

Allon M. Klein, David P. Doupé, Phillip H. Jones, and Benjamin D. Simons
Published 9 August 2007 (*13 pages*)
021910

First-contact time to a patch in a multidimensional potential well

Le Yang, David Sept, and A. E. Carlsson
Published 9 August 2007 (*9 pages*)
021911

Thermal diffusion by Brownian-motion-induced fluid stress

Jennifer Kreft and Yeng-Long Chen
Published 10 August 2007 (*6 pages*)
021912

Role of molecular tilt in thermal fluctuations of lipid membranes

Eric R. May, Atul Narang, and Dmitry I. Kopelevich
Published 10 August 2007 (*6 pages*)
021913

Equilibrium shape degeneracy in starfish vesicles

Xavier Michalet
Published 10 August 2007 (*7 pages*)
021914

Transition dipole strength of eumelanin

J. J. Riesz, J. B. Gilmore, Ross H. McKenzie, B. J. Powell, M. R. Pederson, and P. Meredith
Published 15 August 2007 (*10 pages*)
021915

Direct measurements of the stabilization of single-stranded DNA under tension by single-stranded binding proteins

K. Hatch, C. Danilowicz, V. Coljee, and M. Prentiss

Published 16 August 2007 (5 pages)
021916

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DBP ANNOUNCEMENT

CALL FOR NOMINATIONS

Dear DBP Members,

It is time to start the election process to fill four positions for the 2008 Executive Committee of DBP: one Vice-Chair, one Secretary-Treasurer, and two Members-at-Large.

The Vice-Chair shall serve for one year beginning in March 2008, then for one year as the Chair-Elect in 2009, then for one year as the Chair in 2010, and finally for one year as the Past Chair in 2011. The Secretary-Treasurer shall serve four years beginning in March 2008. The Members-at-Large shall serve three years beginning in March 2008. Two candidates will be selected to run for the Vice-Chair, two candidates for the Secretary-Treasurer, and four candidates for the Members-at-Large.

On behalf of the Nomination Committee, I am inviting you to suggest eligible and qualified candidates (who could be yourself) (minimal 2 years of DBP membership required) to the Nomination Committee for further consideration. The Nomination Committee Members are listed on the DBP website: <http://www.aps.org/units/dbp/govern.cfm>. Please submit possible candidates for any of the openings with a brief statement why you think certain individual is a good candidate for the respective position to the Committee Chair, Dr. Marilyn Gunner, at gunner@sci.ccnycuny.edu. If you have any questions, for example, the responsibilities, please direct them to Marilyn Gunner and Shirley Chan, our current S-T.

This invitation is open until Oct. 19, 2007, though late nominations may be accepted. The final slate of candidates will be assembled by the Committee after Oct. 20 and hopefully the elections will take place early December.

Dr. Marilyn Gunner
Nomination Committee Chair
Past Chair, DBP

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

Tenure Track Assistant/Associate Professor

The University of Miami (UM) invites applications for a tenure-track Assistant or Associate Professor position in Biological Physics, as part of its current drive to develop novel research collaborations at the frontiers of Physics, the Life Sciences and Medicine. This position provides a unique opportunity for the successful candidate to develop novel experimental work within Physics, while helping the Department to strengthen its connections to UM's internationally-leading activities across the Life and Medical Sciences.

Candidates must have a Ph.D. in Physics or a similar field, postdoctoral experience, a demonstrated record of research, and a strong commitment to quality undergraduate teaching. The Physics Department is located within the university's highly attractive Coral Gables campus in the greater Miami area, and has wide-ranging research expertise as well as an established PhD program. UM is a young and vibrant private institution, and an equal opportunity/affirmative action employer.

Applications should arrange for a CV, a statement of research interests, and three letters of recommendation, to reach the following address by October 31, 2007: Prof. Neil Johnson, Search Committee Chair for Biological Physics, Department of Physics, University of Miami, Knight Physics Building, Coral Gables, FL 33124.

Email: njohnson@physics.miami.edu.

JOB AD

Tenure Track Faculty Position / UCLA

The Department of Biomathematics at the David Geffen School of Medicine at UCLA invites applications for a tenure-track assistant professorship starting July 2008 in the area of theoretical, mathematical, or computational biology. Exceptional senior applicants will also be considered for appointment at the tenured level.

The Department seeks strong theoreticians/modelers whose research complements existing strengths in mathematical genetics, systems biology, biophysical modeling, imaging, and pharmacokinetics. Special areas of interest include, but are not limited to, the neurosciences, physiological modeling, biophysical modeling at the cellular and molecular level, and theoretical systems biology. We desire applicants with applied interests in biology or biomedicine and who have a potential for innovative interdisciplinary research furthering these interactions. A Ph.D. degree in areas such as applied mathematics, theoretical biophysics, theoretical physical chemistry, or the engineering sciences, and evidence for effective teaching and communication are required, as is a track record of publication in biology or medicine.

Applications will be screened beginning November 15, 2007, and accepted until the position is filled. Applicants should submit: a curriculum vitae; a summary of research and teaching accomplishments and goals; and names and addresses of at least three individuals for letters of recommendation. Submit applications by e-mail to faculty-search@biomath.ucla.edu, or through <http://www.Mathjobs.org>

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

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

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

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.

