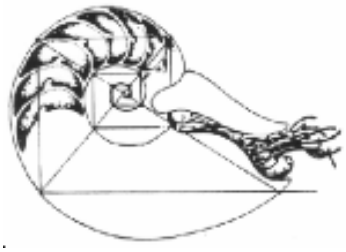

Mathematical Biology Newsletter

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We need your input!!

We are always accepting announcements, conference reports, calls for collaboration, news, and other materials. Submit materials for publication in the Newsletter on or before the following dates: 12/7, 4/7, and 8/7 to editor@smb.org.

Biomathematics meeting within the 28th CNMAC

Coraci P. Malta

A group with interest in Mathematical Biology was created within the Brazilian Society for Applied and Computational Science (SBMAC) in 2001. The CNMAC (Congresso Nacional de Matemática Aplicada e Computacional) is the annual meeting organized by SBMAC. The 28th CNMAC took place in São Paulo, Brazil, 12-15 September 2005, at the campus Santo Amaro of the Centro Universitario, SENAC. At this meeting there were many activities in the field of biomathematics including a minicourse, a minisymposium, six technical sessions and a poster session. Prof. Sally Blower (UCLA) and Prof. Khashayar Pakdaman (CNRS and Université Paris 6 and 7) gave the plenary talks. Prof. Blower gave a very good talk about HIV in Africa, and Prof. Pakdaman gave a talk about the determinant role of nonlinearity in neuronal dynamics.

The meeting was a great success, and the meeting program is available at http://www.sp.senac.br/cnmac2005 (follow the link to the 29th CNMAC). The American Consulate in Sao Paulo sponsored the participation of Prof. Sally Blower including simultaneous translation. FAPESP (a Brazilian research agency) sponsored Prof. Pakdaman plus another 25 Brazilian senior researchers. The SMB has provided a financial support that made possible the participation of graduate and undergraduate students as well as young scientists working in Biomathematics.

Report on SMB Annual Meeting/SIAM LS06

Charlie Smith

553 people gathered in Raleigh, NC, at the Brownestone Hotel next to North Carolina State University (NCSU) for the SMB Annual Meeting July 31-August 4, 2006. The meeting was joint with the SIAM Life Sciences activity group. The weather and scientific program were both quite hot.

There were eight plenary sessions on a diverse set of research areas spanning the conference themes: Otso Ovaskainen, University of Helsinki, "Quantifying Dispersal in Heterogeneous Landscapes"; Jeffrey Saltzman, Merck & Co., Inc., "Industrial and Applied Mathematics in The Pharmaceutical Industry"; Brian Smith, Arizona State University, "Spatiotemporal Codes and Plasticity: How the Nervous System Identifies and Interprets Odors"; John Tyson, Virginia Tech, "Network Dynamics and Cell Physiology"; Ioannis Kevrekidis, Princeton University, "An Equation-free Approach to Complex System Modeling"; Ivet Bahar, University of Pittsburgh, "Cooperative Dynamics of Biomolecular Systems: Insights from Network Models"; Gaudenz Danuser, The Scripps Research Institute, "The Mechanics of Cell Migration"; Kirk Jordan, IBM Corporation, "What is Systems Biology – an Opportunity for Computational Science, Math and Engineering".

Over 300 people attended the banquet, which began with a welcome by Dan Solomon, NCSU Dean of Physical and Mathematical Sciences, and was followed by a heartfelt, inspiring tribute to Lee Segel by Avidan Neumann from the US NIH and Bar-Ilan University. SMB President Mark Chaplain introduced the President of SIAM, Marty Golubitsky, who gave the after-dinner talk on "Examples of Symmetry in Neuroscience", along with rodeo video of the missing class of gait symmetry.

The conference themes were also echoed in the 60 minisymposia, 12 contributed papers sessions, and over 100 poster presentations. Abstracts of all presentations are available online at http://www.siam.org/meetings/ls06/. Five of the minisymposia formed an Air Force sponsored workshop organized by Daniel Forger, University of Michigan, on "Modeling Circadian Rhythmicity, Sleep Regulation and Neurobehavioural Function". Robert Miura, NJIT, organized and chaired the Lee Segel Forum on Non-Academic Careers for Mathematical Life Scientists with a panel discussion by Rory Conolly, Environmental Protection Agency, Kirk Jordan, IBM Corporation, Scott Lett, Bioanalytics Group, Russell Thomas, Chemical Industry Institute of Toxicology, and Frank Tobin, GlaxoSmithKline. The SMB Education Committee organized two sessions and a well attended luncheon on Tuesday. The mentoring program chaired by Gerda De Vries had wide participation by mentors and mentees. The Landahl Award Committee chaired by Artie Sherman supported travel for a number of graduate students, postdocs and junior faculty.

Support for the conference came through NSF, EPA and Merck grants via SIAM and through GlaxoSmithKline via SMB. In addition there were several prizes awarded for paper and poster presentations. The winners include: Sheta A. Bansal, Yulia Timofeeva, Sharmila Venugopal, Ludguier D. Montejo, Leonard Gordon, Pamela Reitsma, Odalys Colon-Rentas, Tracy M. Backes, Russell Latterman, Stephen A. Small, Julia L. Moore, Kelly R. Koser and Cheryl L. Zapata. Please see the article on pages 4-5 for more details on these winners.

The co-chairs (Tim Elston, Charlie Smith and Steve Cox) thank all who attended for making the meeting a success despite sizzling temperatures. The co-chairs especially offer their thanks to the Organizing Committee (Steve Ellner, Alun Lloyd, Alex Mogilner, Artie Sherman, David Terman, Frank Tobin and Mary Lou Zeeman) for their many thoughtful suggestions and comments.

Discount on Taylor & Francis Journals for SMB Members

Taylor & Francis is pleased to announce that individual members of the SMB are eligible for substantially discounted print only personal subscriptions to the following journals.

- Computational and Mathematical Methods in Medicine (formerly Journal of Theoretical Medicine) – US $68/GB £41 – This journal seeks to promote genuine interdisciplinary collaboration between those interested in the theoretical and clinical aspects of medicine and to foster and encourage the application of mathematics to problems arising from the biomedical sciences.
- Dynamical Systems: An International Journal – US $85/GB £50 – The primary goal of this journal is to act as a forum for communication across all branches of modern dynamical systems, and especially to facilitate interaction between theory and applications.
- Journal of Difference Equations and Applications – US $125/GB £75 – This journals presents state-of-the-art papers on difference equations and the academic, pure and applied problems in which they arise.

To take out a discounted subscription please visit the journal homepages and fill out the online order form in the 'Offers' section or write to the following address stating the name of the journal you would like to subscribe to and that you are a member of SMB: Katie Chandler, STM Journals Editorial, Taylor & Francis, 4 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN, UK.
Email: Katie.chandler@tandf.co.uk.

Call-for-papers: Special Issue on Drug Delivery Automation for the IEEE Transactions on Automation Science and Engineering

Drug delivery has attracted many researchers in recent years from the medical and engineering communities. The goal of drug delivery is to control the delivery, speed, and release of a drug without harming other tissues. This requires consideration of drug side-effects as well as dynamics and stability of the drug, which may be affected by delivery devices and systems. Approaches for drug delivery have advanced from traditional approaches to many new methods using novel materials and new physical or chemical effects. Recently, the focus of drug delivery system research has been moving towards the micro-/nano-scale. Automation is essential for this new phase of drug delivery, and requires efficient integration of automation principles with medical practices. The central theme of this Special Issue is recent progress in automation for drug delivery. This special issue aims to publish original, significant and visionary automation papers describing scientific methods and technologies that improve efficiency, productivity, quality and reliability of drug delivery. Special attention will be paid to papers focusing on integrating automation science with biological and medical principles, and to solve practical drug delivery problems, such as MEMS and NEMS based systems for drug delivery, distributed systems for drug delivery, and sensor-network-based systems for drug delivery. Submissions of scientific results from experts in academia and industry worldwide are strongly encouraged.

Important Dates:
January 1, 2007: paper submission deadline;
May 1, 2007: completion of first round review;
September 1, 2007: completion of second round review;
December 1, 2007: final manuscripts due;
April 2008: tentative publication date.

Guest Editors include Mingjun Zhang, Liwei Lin, Channing Robertson, Chiming Wei, T. C. Yih, Babak Ziaie

All papers are to be submitted through the IEEE's Manuscript Central for Transactions on Automation Science and Engineering http://mc.manuscriptcentral.com/tase. Please select "Special Issue" under Manuscript Category of your submission. All manuscripts must be prepared according to publication guidelines http://www.engr.uconn.edu/~ieeetase/. All papers will be reviewed following the standard IEEE T-ASE review process. Please address inquiries to mingjunzhang@ieee.org.

Louis J. Gross wins 2006 American Institute of Biological Sciences (AIBS) Distinguished Scientist Award

Louis J. Gross is Professor of Ecology and Evolutionary Biology and Mathematics and Director of The Institute for Environmental Modeling at The University of Tennessee, Knoxville. He has led the effort to develop an across trophic level modeling framework to assess the biotic impacts of alternative water planning for the Everglades of Florida. He is also well known for service on editorial boards of a variety of journals and being the organizer of over twenty conferences of professional societies. He is currently Past-President of the Society for Mathematical Biology and served as Chair of the National Research Council Committee on Education in Biocomplexity Research. He has served as Chair of the Theoretical Ecology Section of the Ecological Society of America. He has co-directed several Courses and Workshops in Mathematical Ecology at the International Centre for Theoretical Physics in Trieste, Italy, has edited or co-edited four books, including Individual- Based Models and Approaches in Ecology and Some Mathematical Questions in Biology: Plant Biology. In addition to his research in computational ecology, he has ongoing research projects in photosynthetic dynamics, landscape ecology, and the development of quantitative curricula for life science undergraduates. He has been a leader in promoting the interaction of scientists and educators in envisioning the future of biology education. He is a long-time volunteer for Jubilee Community Arts and Community Shares, has hosted and produced folk music programs for WUOT-FM since 1983, and serves as House Sound Engineer for concerts at the Laurel Theatre in Knoxville.

Since 1972, the AIBS Distinguished Scientist Award (previously named the Distinguished Service Award) has been presented annually to individuals who have made significant scientific contributions to the biological sciences, integrative and organismal biology in particular. The award is presented at the AIBS Annual Meeting and consists of a plaque and lifetime membership in AIBS.

Prizes Awarded at SMB Annual Meeting/SIAM LS06

There were several prizes awarded at the SMB/SIAM-Life Science Group Annual meeting in Raleigh, NC, July 31-Aug 4th.

The winner of the best epidemiology paper award of $300, sponsored by the Research Triangle Institute, RTP, NC, was Sheta A. Bansal of the University of Texas at Austin for the paper "Using Contact Network Models for the Spread and Control of Influenza".

The Taylor & Francis award of $250 for best postdoc poster went to Yulia Timofeeva, University of Nottingham for “A Spiny Branched Dendritic Tree and its Spatio-Temporal Filtering Properties” with co-authors Stephen Coombes, University of Nottingham and Gabriel J. Lord, Heriot-Watt University.

The Taylor & Francis award of $250 for a graduate student poster went to Sharmila Venugopal, The Ohio State University for "A Computational Model for Motor Pattern Switching Between Taste-Induced Ingestion and Rejection Oromotor Behaviors" with co-authors David Terman and Joseph Travers, The Ohio State University.

The Research Triangle Institute and the SMB sponsored two undergraduate research presentation prizes, each of $200.

The winner for the Arizona State University Mathematical and Theoretical Biology Institute (MTBI) Summer Program was "The Impact of the Sleeper Effect and Relapse on the Dynamics of Cigarette Smoking Among Adolescents" with students Ludguier D. Montejo, Leonard Gordon, Pamela Reitsma, and Odalys Colon-Rentas and faculty advisors Baojun Song, Fabio Sanchez, and Carlos Castillo-Chavez.

For the NC State Modeling and Industrial Applied Mathematics Research Experience for Undergraduates (REU) there was a tie for first place between two groups:

- Group 1, "Cell Based Model of Convergent Extension in the Ascidian Notochord" with students Tracy M. Backes, Russell Latterman and Stephen A. Small, and faculty advisor Sharon Lubkin; and
- Group 2, **"**Blood pressure and blood flow variation during postural change from sitting to standing: model reduction and improvement" with students Julia L. Moore, Kelly R. Koser, Cheryl L. Zapata, and faculty advisor Mette Olufsen.

Open Positions

PhD Position, Ghent University

A PhD position is available at Ghent University (Belgium) studying computational methods for modeling the cell cycle as a nonlinear process. The PhD position is open from January 1, 2007 on. It is funded for four years. Information at http://users.ugent.be/~wgovarts/PhDPosition or by contacting Prof. Willy Govaerts (Willy.Govaerts@UGent.be) or Prof. Martin Kuiper (Martin.Kuiper@psb.ugent.be).

Postdoctoral Position, Computational Biology, Tufts University

A post-doctoral position in computational biology is available immediately in the laboratory of Professor Aurélie Edwards in the Chemical and Biological Department at Tufts University. Work involves computational modeling of transport processes in the renal medulla, with a particular focus on the vasoactive effects of nitric oxide and blood flow regulation. Applicants should submit a curriculum vitae, a description of research interests, and a list of three references to Prof. Edwards at aurelie.edwards@tufts.edu also please see: http://ase.tufts.edu/chemical/facEdwards.htm.

Postdoctoral Positions, CSBL, University of Georgia

The Computational Systems Biology Lab (CSBL) of the University of Georgia is seeking postdoc candidates for microbial pathway/network modeling and simulation. The potential research directions include metabolic pathway and gene regulatory network modeling and simulation, protein interaction network prediction and analysis. Interested candidates should send an updated CV electronically to Prof. Ying Xu (xyn@bmb.uga.edu).

Postdoctoral Position, Applied Statistics, Lafayette, Louisiana

The USGS is seeking a Post-doctoral individual to work on projects dealing with the analysis of complex ecological/environmental problems. Our Statistical Modeling Group is currently involved in a large number of projects involving the analysis of complex systems behavior and multivariate data. Current approaches emphasize structural equation modeling to develop and evaluate multivariate hypotheses and to analyze complex data. The group anticipates continuing this avenue of work and evaluating the utility of additional procedures, including Bayesian estimation. Please note that this is not a US Federal position but the hire will be made through an on-site contract company, IAP World Services. Check out http://www.nwrc.gov. For further information, contact Jim_Grace@usgs.gov.

PhD Studentship: Analyzing Functional Genomics Data

As part of the European SABRETRAIN program (funded by the Marie Curie Early Stage Training Programme) there will be a PhD studentship available at the Danish Institute of Agricultural Sciences, Department of Genetics and Biotechnology to be started soon. This PhD program aims to develop a range of statistical and mathematical tools to incorporate the current knowledge on gene interactions into the analysis of large experimental data. Applications including a full CV and the names and addresses (including e-mail) of two academic referees should be sent electronically before September 15th 2006. See http://gbi.agrsci.dk/~rsl/PhDStatisticalFunctionalGenomicsSABRETRAIN for further details.

Postdoc position in Bayesian Methods in Bioinformatics (UK)

A 2 year postdoc position is available starting asap for the development and application of Bayesian statistical machine learning methods in Bioinformatics and Systems Biology. Applications include the inference of gene regulatory networks from high throughput data sources (such as microarray data) and protein structure prediction. Scientific details can be found at http://www2.warwick.ac.uk/fac/sci/systemsbiology/staff/david_wild/. For informal discussions, please contact Prof. David Wild (D.L.Wild@warwick.ac.uk).

Postdoc, Systems Biology: Modeling of Stress Response in E. coli

Helix, the bioinformatics and biological modeling group at INRIA Rhône-Alpes (Grenoble, France), is looking for a post-doctoral researcher to work on the modeling of the stress response in the enterobacterium, Escherichia coli. We are offering a two-year position, starting at the end of 2006 or the beginning of 2007. The post-doc will participate in the project "ECMOAN: Scalable modeling and analysis techniques to study emergent cell behavior: Understanding the E. coli stress response", which is funded by the European Commission (6FP, NEST Pathfinder) and is expected to start in December 2006. The post-doc will have his or her base at INRIA Rhône-Alpes, while closely collaborating with the biologists at the Université Joseph Fourier (Grenoble) and other participating laboratories. Candidates are invited to send a CV and the address of two references to: Delphine Ropers Delphine.Ropers@inrialpes.fr and Hidde de Jong Hidde.de-Jong@inrialpes.fr

Postdoctoral Positions, Epidemiology and Public Health, Yale

Post-doctoral positions are available at Yale Medical School in the Department of Epidemiology and Public Health to develop and analyze socioeconomic models of infectious disease epidemiology. This position will require an independent and motivated individual who has published in epidemiology, population biology and/or economics. Funding is available for three years. Open until filled. To apply please send CV, brief statement of research interests and contact information for two academic references to alison.galvani@yale.edu

Postdoctoral Fellow, Biostatistics / Stochastic Modeling

Seeking a Postdoctoral Fellow with a PhD in Biostatistics, Statistics, Operations Research or related field to work with an academic team on building a stochastic model that simulates cancer progression and cancer screening protocols. The researcher will develop and validate mathematical models that describe the natural history of cancer and apply these models toward analyzing cancer incidence and mortality trends, analyzing cancer screening trials and evaluating the cost-effectiveness of new screening technologies, such as MRI and CT. Applicants should submit a cover letter, CV and 3 references to Sylvia Plevritis, PhD, Department of Radiology, Stanford University via email: plevriti@stanford.edu.

Postdoc, Mathematical Evolutionary Theory, Texas Tech University

A post-doctoral position is available in Sean Rice's lab at Texas Tech University as part of an NSF funded project to study the mathematical foundations of evolutionary theory. This is a two year position and the starting date is negotiable. The specific research subject is flexible. The overall goal of the funded project is to show how all mechanistic evolutionary theory; including population genetics (both deterministic and stochastic), quantitative genetics, and game theory, can be derived from a few basic mathematical principles and biological observations. To apply: send, via email (as PDF or .doc files), a CV, a statement of research interests, some reprints or preprints, and the names and contact information for 2 references. Applications and inquiries should be sent to Sean Rice at sean.h.rice@ttu.edu. To insure full consideration, applications should be received by Sep 30, 2006.

Postdoctoral Position, Rutgers University/sanofi-aventis

A Postdoctoral position is available for the purpose of using dynamical models of signaling pathways in order to understand mechanisms of drug action. This position is a one-year appointment, and can be started immediately. The individual in this position will be supervised both by Dr. Eduardo Sontag (Department of Mathematics and BioMaPS, Rutgers University) and Dr. Robert Dinerstein (Drug Discovery, sanofi-aventis). Applicants should provide their curriculum vitae, a short letter indicating prior research and future research goals, a link to a web page which contains additional information about the candidate as well as preprints and reprints of work (if available), and the names and email addresses of at least two individuals who can be contacted for recommendations. Please send this information by electronic mail only to: rutgerssanof@gmail.com.

Postdoctoral Positions, Cancer Systems Biology

The newly established Center for Cancer Systems Biology at Caritas St. Elizabeth's Medical Center, Tufts Univ. School of Medicine, seeks motivated individuals seasoned in mathematical analysis or radiation biology/physics who are interested in modeling aspects of cancer development and therapeutic response, including angiogenesis, inter-tissue interactions, gene network logic, DNA damage and matrix remodeling. Two-year positions are available immediately, renewable upon performance. Please submit a letter of intent, curriculum vitae and the names and addresses of two references to: Dr. Philip J. Hahnfeldt, Email: Philip.Hahnfeldt@tufts.edu

Photos from the Joint SIAM-SMB Conference on the Life Sciences
(Courtesy of the Society for Industrial and Applied Mathematics)