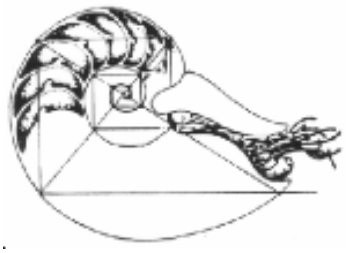

Mathematical Biology Newsletter

Volume 20 #1 – January 2007

The Society for Mathematical Biology
http://www.smb.org

Edited by: Holly Gaff

Table of Contents

SMB/JSMB 07 SanJose, California July 31-August 3, 2007

The Joint Annual Meetings of the Society for Mathematical Biology and the Japanese Society for Mathematical Biology will take place at the Fairmont Hotel, San Jose, California, USA, from the morning of July 31 to the evening of August 3, 2007. See http://www.smb.org/meetings/annual.shtml for more information. Minisymposium proposals are being accepted until January 31, 2007.

The themes for the meeting will include:

- Ecology
- Evolution
- Conservation Biology
- Resource Management
- Epidemiology
- Developmental Biology
- Pattern Formation
- Tumor growth and cancer therapy
- Cell dynamics
- Mathematical Biology Undergraduate Education

Plenary Speakers will include H.T. Banks, North Carolina State University; Helen Byrne, University of Nottingham; Carlos Castillo-Chavez, Arizona State University; Louis Gross, University of Tennessee; Alan Hastings, University of California, Davis; Akira Sasaki, Kyushu University; and Yasuhiro Takeuchi, Shizuoka University.

Letter from the President

Dear SMB Colleagues,

Welcome once again to the "New Year" issue of the Newsletter. Here in the University of Dundee it has been a year of change. With the approach of "new challenges" on the academic horizon, our Principal and Vice-Chancellor proposed that the university "restructure" in order to better cope with these changes. The entire institution has therefore undergone a restructuring with the transformation of 7 Faculties into 4 Colleges. This has meant a lot of hard work at all levels of the university with, perhaps unsurprisingly, an end result of a new layer of bureaucracy in the system. What has struck me personally in all of this is that at the end of the day the university still has (more or less) the same staff that it started with. The restructuring may prove a success, but it will be down to the efforts and hard work of the individual members of staff in the university. No doubt SMB will also be facing "new challenges" on the horizon and may have to "change" in order to deal with these. For example, one particular item that is already being looked into is an online method of payment for collecting the annual dues which we are aiming to have ready for 2008.

However, whatever challenges the Society is presented with, the hard work and dedication of its individual members are ultimately more important than its "structures". With this in mind, I would to thank our Treasurer, Torcom Chorbajian, once again for his tireless efforts during the past year on behalf of the Society (and perhaps especially at this time of the year when Torcom deals single-handedly with the mailing of letters and processing of payments for the annual dues). Special thanks are also due to BMB editor-in-chief Philip Maini and Achi Dosanjh of Springer who have worked very hard this year to get the backlog of papers cleared. By early 2007, thanks to the effort and patience of Philip and Achi, everything will be "back to normal". We have received many comments concerning how good the "new look" BMB is and we trust that you will continue to support the Society's journal by submitting your research papers there.

It remains for me to wish you all a peaceful and prosperous year in 2007 in all your research, teaching and other academic and societal duties.

SMB President

US-Africa Advanced Studies Institute on Mathematical Modeling of Infectious Diseases in Africa

In Summer 2007, DIMACS-SACEMA-AIMS will hold an Advanced Study Institute on Mathematical Modeling of Infectious Diseases in Africa for students interested in this field. The institute will be followed by a research workshop that will serve as a capstone. The institute will be held at the African Institute for Mathematical Sciences (AIMS), Capetown, South Africa. The dates are June 11 - 22, 2007 with a follow-up workshop in nearby Stellenbosch June 25-27, 2007. Participants travel and local expenses will be covered through funds provided by DIMACS, SACEMA, AIMS, and the US National Science Foundation. See the institute website http://dimacs.rutgers.edu/Workshops/AIMS to apply on line, check application deadline and get the most current information.

Send additional questions to asi2007@dimacs.rutgers.edu, or telephone at (732) 445-4449.

Report from BIOMAT 2006

Raymond Mejía, Jaime Mena-Lorca, Lisa Sattenspiel and Jorge Velasco-Hernandez

The International Symposium on Mathematical and Computational Biology, VI Brazilian Symposium on Mathematical and Computational Biology was held at the Federal University of Amazonas (UFAM) and the Northern University Centre UNINORTE in Manaus from 25 - 30 November, http://www.biomat.org/biomat6/abertura.html for details.

Tutorials were held on Mathematical Modelling and Optimal Pest Control (M. Rafikov, UNIJUI), Protein Folds, Knots and Tangles and Replication of RNA World (W. Taylor, NIMR, UK), Consequences of some Ecological Phenomena on the Dynamics of Prediction Models (E. González-Olivares, PUC, Valparaiso), and Realistic Population Dynamics Models: Demography Cycles, Chaos and Resources (R. Dilão, UT Lisbon).

A lecture on Ecology: History or Physics? - Grand Unified Theory of Ecology (J. Harte, UC Berkeley) opened the Symposium, and topics included: epidemiology and immunology (L. Sattenspiel, A. Perelson, R. Ribeiro, F. Figueiredo, A.P. Wyse, M. Or-Guil, C. Colijn); protein structure and folding (C. Floudas, A. Finkelstein, W. Taylor); pattern formation (F. Cummings, A. Goriely, J. Harte); dynamics (J. Velasco-Hernandez, E. González-Olivares, S. Coutinho, F. Córdova-Lepe, A.P.C. Rio Doce, J. Mena-Lorca, M. Kritz, R. Dilão, M. Rafikov, C.M. Dias, E. Coutinho, A. Rojas-Palma, A. Camacho, B. González-Yañez, J.D. Flores); systems biology, genomics and physiology (I. Roeder, R. Mejía, M. Rodriguez-Ricard, T. Carletti, A. Neves, P. Licinio, P. Sávio da Silva Costa); bioinformatics (P. Pardalos).
Details of the scientific program, including some abstracts, are at http://www.biomat.org/biomat6/program_2006.html. Proceedings will be available in March or April. Conference photos are at http://www.smb.org/publications/SMBnet/service/BIOMAT2006/.

Photos from BIOMAT 2006

Provided courtesy of Raymond Mejia

New Graduate Program in Neural Computation at Carnegie Mellon University and the University of Pittsburgh

In recognition of the increased demand for computationally-oriented researchers, Carnegie Mellon University, in collaboration with the University of Pittsburgh, has begun a Ph.D. program in computational neuroscience. As neuroscientists have applied new technologies to acquire and analyze large data sets, and have developed new models for understanding increasingly complicated neurobiological systems, quantitative methods have become centrally important to their effort. The new program takes advantage of the unusually large and highly collaborative group of faculty and students in neuroscience in the Pittsburgh community.

Details about program curriculum, training faculty and contact information are available at: http://www.cnbc.cmu.edu/GradTrain/pnc_index.shtml. The deadline for applications is February 1, 2007.

NJIT Conference on Frontiers in Applied and Computational Mathematics

FACM '07 will be held on May 14-16, 2007 at the New Jersey Institute of Technology (NJIT) in Newark, New Jersey. These conferences are organized by the Department of Mathematical Sciences (DMS) and are partially funded through an NJIT Strategic Initiative Plan. Roughly half of this conference will be dedicated to Mathematical Biology. Other research areas covered include fluid mechanics, nonlinear optics, computational wave propagation, and applied probability and statistics.

This conference will be similar to previous conferences (http://m.njit.edu/Events/FACM04/; http://m.njit.edu/Events/FACM05/). The first day (May 14) is an Undergraduate Research Day, and the second and third days (May 15-16) are Research Days with 4 plenary speakers, 2 poster sessions, 24 invited speakers in Mathematical Biology, and 8 invited speakers in each of the other research areas. Additional information on the conference, submitting a contributed paper, registration, accommodations, and travel support can be found at the conference URL: http://m.njit.edu/Events/FACM07/ or by contacting Ms. Susan Sutton at suttons@njit.edu

Part of the 2007 conference will be devoted to undergraduate research presentations. Participating universities in the Undergraduate Research Day include NJIT, SUNY Genesco, William and Mary University, Arizona State University, Georgia Tech, University of Louisiana, Brigham Young University, and University of Nebraska. These institutions have received grants from NSF for Undergraduate Biology and Math (UBM) Training, or Computational Science Training for Undergraduates in the Mathematical Sciences (CSUMS), or for hosting Research Experiences for Undergraduates (REU) NSF-funded centers. DMS is the recipient of a UBM Training Grant and a CSUMS Grant. These two grants have facilitated the immersion of many NJIT students into research. The Undergraduate Research Day will provide an opportunity for these students to present their work and interact with other recipients of such NSF funding.

The plenary speakers for the two Research Days are Jack D. Cowan, Professor of Mathematics and of Neurology, University of Chicago; Leslie Greengard, Director of the Courant Institute of Mathematical Sciences, New York University, who is a member of both the National Academy of Sciences and the National Academy of Engineering; Nancy Kopell, William Goodwin Aurelio Professor of Mathematics and Science, Department of Mathematics and Statistics, Boston University, who received a MacArthur Foundation Fellowship, and is in the National Academy of Sciences; and Sheldon Weinbaum, Distinguished Professor, Department of Mechanical Engineering, City University of New York, who is a member of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, and a recipient of a Guggenheim Fellowship.

A major theme in this conference is Mathematical Biology, which spans a large number of areas of mathematics and biology. The Mathematical Biology sessions at this year's conference will focus on the main research strengths within the group of mathematical biologists at NJIT. In particular, there will be four sessions focusing on mathematical and computational neuroscience, one session on mathematical ecology, and one session on modeling spatially extended biological processes.

Confirmed invited session speakers, their affiliations, and their areas of research, include: Christoph Borgers, Tufts University - Mathematical Neuroscience; Rob Butera, Georgia Tech - Computational Neuroscience; Carmen Canavier, University of New Orleans - Computational Neuroscience; Stephen Coombes, University of Nottingham - Mathematical Neuroscience; Steve Cox, Rice University - Mathematical Neuroscience; Gregor Fussman, McGill University - Dynamics of Ecological Population and Communities; Tasso Kaper, Boston University - Mathematical Biology, Nonlinear Dynamics; John King, University of Nottingham - Cancer Modeling; Yang Kuang, Arizona State University - Ecological Stoichiometry; Andre Longtin,

University of Ottawa - Computational Neuroscience; Victor Matveev, New Jersey Institute of Technology - Cell Biophysics; Alex Reyes, New York University - Experimental and Computational Neuroscience; Horacio Rotstein, New Jersey Institute of Technology - Dynamical Systems; Gareth Russell, New Jersey Institute of Technology - Mathematical Ecology; Frances Skinner, University of Toronto - Computational Neuroscience; David Terman, Ohio State University - Mathematical Neuroscience; Louis Tao, New Jersey Institute of Technology - Computational Neuroscience; X. J. Wang, Yale University - Computational Neuroscience; Glen Webb, Vanderbilt University – Epidemiology, Abdul-Aziz Yakubu, Howard University - Mathematical Ecology.

Alvin M. Weinberg, 1915-2006

Submitted by Eric Marland

Dr. Alvin M. Weinberg passed away on October 18, 2006 at his home in Oak Ridge, Tennessee. He is survived by a son and three grandchildren.

Dr. Weinberg was best known as a top nuclear scientist and a leading advocate for nuclear power, and yet he was deeply concerned with issues of nuclear safety and weapons proliferation. He was part of the team that created the first nuclear chain reactor in Chicago and wrote a classic text on the subject with Eugene Wigner.

Weinberg helped steer Oak Ridge National Laboratory (ORNL) from 1948 to 1973, first as research director and then as director of the laboratory. He coined such terms as “Faustian Bargain”, “Technological Fix” and “Big Science”. He served on presidential science advisory committees for Kennedy, Johnson and Nixon. In addition, he founded the Institute for Energy Analysis in 1973 and led this energy “think tank” until 1985.

Weinberg was a member of the National Academy of Sciences and the National Academy of Engineering. His expertise was so insightful that he was known, even into his 80’s, to be the only one who could hold a meaningful discussion with every person at ORNL (from distinguished scientist to groundskeeper). While directing ORNL, he was known to walk into the offices of newly hired scientists and say, “tell me what you are doing”. According to one colleague, within five minutes of talking with him, you would swear that he knew more about your field than you – and it was probably true!

What is less known about Weinberg is that he was the first student to receive his PhD in a new field called Mathematical Biophysics. He officially received his degree with Carl Eckart, by gives credit for his direction to Nicholas Rashevsky, the founder of the modern study of mathematical biology. Rashevsky began the first graduate program in a mathematical biology field, founded the first journal (now the official journal of the Society for Mathematical Biology) and his students (Landahl and Karreman) helped found the Society for Mathematical Biology itself.

Alvin Weinberg received his PhD in 1939 from the University of Chicago where his research focused on the propagation of nerve signals and the diffusion of ions. This work – with Gale Young, Herbert Landahl, Robert Williamson, Alston Householder, and Rashevsky – led to the famous discoveries of Hodgkin and Huxley that earned them the Nobel Prize.

It was 1941 when Carl Eckert and the Manhattan Project pulled Alvin away to study another type of diffusion.

In 2004, Weinberg spoke with Lou Gross, then president of SMB, about the history and progression of mathematical biology. A video of their conversation can be viewed at the 2007 SMB Annual Meeting in San Jose, California.

Tenure-Track Faculty Position at UCLA

The Department of Biomathematics at the David Geffen School of Medicine at UCLA invites applications for a tenure-track assistant professorship starting July 2007 in the areas of mathematical biology, theoretical biology and biomathematics. 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. Applicants with applied interests in biology or biomedicine and strong backgrounds in applied mathematics, theoretical condensed matter physics, theoretical physical chemistry, or the engineering sciences are especially encouraged to apply.

The Department has close physical and collaborative ties with mathematical and computational biology programs at UCLA in biology, medicine, mathematics, physics, chemistry, computer science and engineering, as well as the Institute for Pure and Applied Mathematics. The potential for innovative interdisciplinary research furthering this interaction will be a plus. A Ph.D. degree and evidence for good teaching are required. The formal teaching load is generally two graduate courses per year.

Applications will be screened beginning January 15, 2007, and accepted until the position is filled. Applicants should submit: curriculum vitae; a summary of research accomplishments, teaching, and future goals; and names and addresses of three to five individuals for letters of recommendation.

Submit applications by e-mail to facultysearch@biomath.ucla.edu, or through http://www.Mathjobs.org, or by mail to Chair, Mathematical Biology Search Committee, Department of Biomathematics, University of California, Los Angeles, 10833 Le Conte Avenue, Box 951766, Los Angeles, CA 90095-1766

The University of California is an Equal Opportunity/Affirmative Action Employer. The Department has a strong commitment to the achievement of excellence and diversity among its faculty, staff, and students.

Open Student and Postdoctoral Positions

PhD Position, Infectious Diseases, University of Edinburgh

A PhD position is available for an outstanding candidate interested in a career in infectious diseases. The candidate should be motivated to employ mathematical modeling and statistical inference to understand within-host dynamics of infectious diseases, in particular malaria and trypanosomiasis. Projects are co-supervised by experimental biologists so that model predictions feed immediately into experiments. Contact Nick Savill nick.savill@ed.ac.uk. See also: http://homepages.ed.ac.uk/nsavill.

Cultural Evolution and Adaptation Postdoc

Two three-year post-doc positions are expected to become available early in 2007 at the University of Bologna, Italy, for theoretical research on the dynamics of cultural evolution, with particular emphasis on the accumulation of cultural information and its adaptive value, and on the contact between cultures. These positions will be part of an EU-sponsored project including Bologna University, Stockholm University, Mälardalen University (Sweden) and the University of St. Andrews. Position recipients will work at the University of Bologna within a network of research groups at four European universities. For more information, please send a CV and a letter of interest to Stefano Ghirlanda stefano.ghirlanda@unibo.it., http://www.intercult.su.se/~stefano, Department of Psychology, University of Bologna.

Postdoctoral Position, Nucleotide Metabolism Modeler

The Virginia Bioinformatics Institute (VBI) at Virginia Tech invites applications for a Nucleotide Metabolism Modeler Postdoctoral Associate to work in the research group of Dr. David C. Samuels on a project to study the diseases caused by defects in this metabolism in mitochondria. This position will involve further development of the existing simulation, interaction with lab-based collaborators and supervision of one or two graduate students. Interested candidates should submit a letter of interest and CV upon applying through www.jobs.vt.edu searching by posting number 061331. Review of applications will begin for this position on January 15, 2007.

Postdoctoral Research Assistant, University of Oxford

The Centre for Mathematical Biology is looking to recruit a post- doctoral research assistant to work in the area of computational mathematical modeling of periodic pattern formation in developmental biology. More specifically, the PDRA will work alongside Dr Ruth Baker and Professor Philip Maini (CMB) and Professor David Gavaghan (Oxford University Computing Laboratory) to develop numerical schemes for solving models for segmentation of the vertebrate axis and feather bud formation. Further particulars may be obtained from vacancies@maths.ox.ac.uk and at http://www.maths.ox.ac.uk/notices/vacancies/. Deadline - 1st February 2007. Contact - Ruth Baker (ruth.baker@maths.ox.ac.uk)

Postdoctoral Opportunities, MBI, The Ohio State University

Postdoctoral Opportunities at the Mathematical Biosciences Institute (MBI) at The Ohio State University. MBI Postdoctoral fellows are hired for a 3-year term. They are engaged in an integrated program of tutorials, working seminars or journal clubs, participation in workshops, and interactions with local and visiting mentors. These activities are geared toward providing the tools to pursue an independent research program with an emphasis on collaborative research in the mathematical biosciences. MBI facilitated activities for postdoctoral fellows are tailored to the needs of each young scientist. For more information about applying for a Postdoctoral Fellowship please visit the MBI website at http://www.mbi.osu.edu/postdoctoral/postdoctoral.html.

Postdoctoral Researcher, Mathematical Institute, Oxford

An 18 month post to be based at the Mathematical Institute, University of Oxford to work on multi-scale modeling of solute movement in soil and solubilization and uptake of solutes by plant root branching structures is available. Candidates should have a background in modeling of physical phenomena using partial differential equations. The project on which the researcher will work is to develop models of nutrient uptake by plant root branching structures. For informal enquires please contact Prof. Guy Kirk, g.kirk@cranfield.ac.uk, or Dr Tiina Roose, roose@maths.ox.ac.uk.

Postdoctoral Position, IUPUI, Computational Neuroscience

We will have a one-year postdoctoral opening at the department of Mathematical Sciences at the Indiana University Purdue University at Indianapolis, starting as soon as possible. The project is devoted to the analysis and modeling of neural activity recorded intraoperatively from basal ganglia and thalamus in patients with Parkinson's disease. The project is aimed at the understanding of the dynamics of the basal ganglia-thalamocortical network (with the further focus on new strategies for therapeutic deep brain stimulation) and involves people from the Department of Mathematics and the Department of Neurosurgery of the Indiana University School of Medicine. Interested individuals may inquire at lrubchinsky@math.iupui.edu (Leonid Rubchinsky). Please feel free to send your CV and ask for two informal reference letters be e-mailed.

Photos from 2006 SMB Annual Meeting

Provided courtesy of Robert Miura