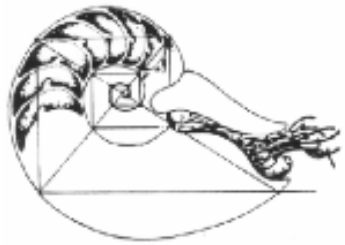

Mathematical Biology Newsletter

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

Edited by: Holly Gaff

2005 Annual Meeting of The Society for Mathematical Biology

We are glad to announce the forthcoming ECMTB05: European Conference for Mathematical and Theoretical Biology, Dresden, Germany, July 18-22, 2005, http://www.ecmtb05.org

ECMTB brings together scientists from all over the world and will be THE event in 2005 to communicate the recent advances in mathematical and theoretical biology with a focus on ten selected key topics: Cellular biophysics, Regulatory networks, Development, Neural systems and the brain, Evolution and ecology, Immune system, Biomedical applications, Biotechnology, Innovative mathematical methods, and Inter-disciplinary education. Applications are now invited for contributed talks and poster presentations. Submission deadline: February 1, 2005.

ECMB05 is the sixth tri-annual conference of ESMTB and the annual meeting of SMB.

Letter from the President

Dear SMB members,

The interplay between mathematics and biology continues to enjoy a great increase in general interest both in terms of the new opportunities for research and the challenges of interdisciplinary education. Just published by the Mathematics Association of America is a new compendium of articles "Math & Bio2010: Linking Undergraduate Disciplines", edited by Lynn Arthur Steen, which grew out of "Meeting the Challenges: Education across the Biological, Mathematical and Computer Sciences", details of which are posted at www.maa.org/mtc. This report contains articles by several SMB members (including John Jungck, Chair of the SMB Education Committee and Past-President Leah Edelstein-Keshet) and serves as a very useful guide to many of the available resources that can assist SMB members in their undergraduate educational endeavors. (See review on page 5.) Along with Symposia such as the recent one on "Quantitative Science in the Biology Curriculum" at the University of Maryland, Baltimore County (details at www.umbc.edu/biosci/symposium2004.html), this continues a trend towards rethinking the way we provide quantitative learning experiences for undergraduate biology students.

In addition to efforts at the undergraduate level, two forthcoming reports from the US National Academy of Sciences will be emphasizing new research opportunities from the more "mathematical" and the more "computational" side of quantitative science in biology. I expect that these two reports will serve in part to provide an update to the 1992 report "Mathematics & Biology: The Interface" edited by Past-President Simon Levin. The 1992 report provided hosts of examples of open and important challenges in our field, and in a similar manner, I expect that the two new reports will provide guidance to graduate students in selecting dissertation problems. While the separation of this into separate "math" and "computing" reports mimics the ongoing complementary development of mathematical and computational biology, many SMB members have feet in both of these disciplines. I don't particularly believe that such a splitting of quantitative science is the most fruitful way to encourage advances in biological science, so I encourage all our members to foster a broad view of quantitative life sciences as we train new graduate students. No doubt there are similar reports being developed elsewhere, and I encourage Society members to inform both myself and our Web Guru (Holly Gaff – webmaster@smb.org) about these so that they may be included on the resources pages of the Society Website.

The above highlights only a couple of examples of the ongoing growth of our field. It seems that every week I receive a notice of another course, workshop, meeting, training program, article or text that I "should" attend or read. Of course none of us can hope to keep up with the entire vast array of activities within quantitative biology, but I do encourage members to not limit themselves to a focus on their particular disciplinary area(s) of emphasis, but to attempt at least a bit to explore other areas of math biology. An excellent means to this end would be to plan to attend the next Annual Meeting of the Society, in Dresden in July. (See details on front page.) The broad coverage at this gathering, being hosted in collaboration with the European Society for Mathematical and Theoretical Biology, will provide a rapid introduction to many of the exciting current trends in our field.

Lou Gross, President
gross@tiem.utk.edu

Akira Okubo Prize

Lou Gross

Nominations are requested for the Akira Okubo Prize, which, for 2005, will be awarded to a living senior scientist whose lifetime achievements have been exemplary in developing innovative theory, establishing superb conceptual ideas, solving difficult theoretical problems, and/or for uniting theory and data to advance a biological subject. The areas of research are mathematical biology, biomathematics, theoretical biology, and biological oceanography. The prize is jointly awarded by the Japanese Society for Mathematical Biology (JSMB) and the Society for Mathematical Biology (SMB). The SMB will invite the prizewinner to deliver a lecture at the next annual SMB meeting, which will be held in Dresden (Germany) from July 18-22, 2005. The JSMB will invite the winner to deliver a lecture at the next annual JSMB meeting, which will be held in Yokohama (Japan) at September 17-19, 2005. The prize was initiated in 1999 and the previous senior winner was Simon Levin (2001).

Rules for the prize can be found at http://www.smb.org/prizes/index.shtml and at http://www.smb.org/prizes/okubo.shtml. To nominate a person for the Akira Okubo Prize, the following information should be submitted to Tsuyoshi Kajiwara VIA EMAIL (email kajiwara@ems.okayama-u.ac.jp) (1) Name, address, phone number, affiliation, and email address and/or fax number of the nominator. (2) Name, address, phone number, affiliation, and email address and/or fax number of the nominee. (3) A detailed statement describing why the nominee should be considered for the award. (4) A CV for the nominee in some form. (5) Name and contact information, including email address, for four potential referees who are not current or recent collaborators of the nominee. In addition, the nomination package may include up to two additional letters of support. Closing date for nominations is February 28, 2005.

Nomination Committee: Tsuyoshi Kajiwara (Chair, Okayama University), Jim Keener (University of Utah), Simon Levin (Princeton University), Hiroyuki Matsuda (Yokohama National University), Akira Sasaki (Kyushu University), and Jonathan Sherratt (Heriot-Watt University).

Institute for Advanced Study/ Park City Mathematics Institute

Carleen Inderieden

The IAS/PCMI will be held June 26 - July 16, 2005 with the Research Topic of Mathematical Biology. The Research Organizers are Mark Chaplain, University of Dundee; James Keener, University of Utah; Mark Lewis, University of Alberta; Philip Maini, Oxford University. The Clay Senior Scholars in Residence are Simon A. Levin, Princeton University and Charles S. Peskin, Courant Institute.

The annual Summer Session is organized into six groups: Graduate Summer School, Research Program in Mathematics, Undergraduate Summer School, Undergraduate Faculty Program, Secondary School Teacher Program and Mathematics Education Research Program. These groups meet simultaneously, pursuing both individual courses of study and a meaningful amount of interaction. The rich mathematical experience, combined with interaction among all participants, results in greatly increased understanding and awareness of the issues confronting mathematics and mathematics education today.

The Summer Session is a three-week residential program held in Park City, Utah, from June 26 - July 16, 2005. Financial support is available. Deadline for submission of applications is February 15, 2005. For more information about application guidelines, please visit our website at www.ias.edu/parkcity. The IAS/Park City Mathematics Institute is a program of the Institute for Advanced Study (IAS) in Princeton, New Jersey.

New SMB Board Members and Officers Elected

Lou Gross

The members of the Society have elected the following individuals as officers and new members of the Board of Directors of the Society: Mark Chaplain-President-Elect, Meghan Burke-Board of Directors, Yoh Iwasa-Board of Directors, and Rebecca Tyson-Board of Directors. Additionally, Rebecca Tyson has assumed the responsibilities of Secretary for the Society. Sharon Lubkin has been appointed Chair of the SMB Publications Committee, and we appreciate her willingness to serve the Society in this way.

The Society thanks very strong slate of candidates who agreed to run in the elections. The continued success of the SMB depends on the dedicated service of many members, and we were fortunate to have such a great group of candidates.

The new Board of Directors members replace current BOD members Rob de Boer, Suzanne Lenhart and Gerda de Vries. We thank each of them for their outstanding efforts to guide the Society. We also greatly appreciate the efforts of Ramit Mehr to guide the Publications Committee as its Chair over the past seven years.

Prize established in Memory of Art Winfree

Lou Gross

In the fall of 2002, theoretical biology lost one of its most creative luminaries when Arthur Winfree passed away from an aggressive brain tumor. Winfree was one the legendary figures in the field, one of the very few who combined brilliant theory with imaginative and masterful experiments. Many careers were built on his pioneering work in biological periodicity and pattern formation. Winfree's genius was frequently hidden by his modest, even self-effacing manner. Beyond his scientific contributions, he was an exemplary scientist and human being. His generosity and kindness to his colleagues and students is sorely missed.

In memory of Art, the Board of SMB approved the following motion at its annual meeting in July: The Board of Directors of the Society for Mathematical Biology, in memory of the contributions to mathematical biology by Arthur Winfree, hereby establishes a Prize in his honor. To be called the Winfree Prize, it will honor a theoretician whose research has inspired significant new experiments or observational efforts that have enhanced our understanding of biology. The prize will consist of a plaque, $500 and costs for the awardee to give a plenary address at the annual meeting of the Society. The prize will be offered every other year, starting with the 2006 Annual Meeting. Nominations of individuals to be considered for the prize may focus on a single paper or series of papers, which illustrate the close connection between theory and experiment, or may be based upon a larger body of theoretical work produced by the individual who has led to significant new biological understanding affecting observation/ experiments. The recipient will be decided by a Committee of the Society, consisting of three individuals appointed by the Board of Directors at the annual meeting the year before the Prize is to be awarded. Nominations will be solicited from Society members and the mathematical biology community at large.

This Prize has been established with generous support from the Winfree family, but to fully fund it in perpetuity, the SMB Board requests that those who wish to honor Art contribute to the SMB Winfree Prize Fund. Contributions should be sent to the SMB Treasurer, Torcom Chorbajian, by check in US dollars made payable to SMB, with a note stating that this is a contribution to the Winfree Fund. Contributions are tax-deductible, as limited by law, and contributors will receive a formal acknowledgement from the Society of their contribution. The address to send contributions is: Society for Mathematical Biology, P.O. Box 11283, Boulder, Colorado 80301 USA

Funding opportunities for interdisciplinary research in the life sciences

Martin Reddington

The Human Frontier Science Program is an international funding agency, supported by Australia*, Canada, France, Germany, Italy, Japan, Republic of Korea*, Switzerland, U.K., U.S.A. and the European Union (*new members in 2005). HFSP promotes international collaboration through a prestigious program of grants, which support interdisciplinary research in the life sciences. The program is intended to bring teams of scientists from various fields such as physics, mathematics, chemistry, computer science and engineering together with biologists to open up new approaches to understanding complex biological systems.

Teams applying for research grants must first submit a letter of intent online. The next deadline is March 31st 2005 and potential applicants must pre-register by March 21st 2005 (see the HFSP web site at www.hfsp.org for further details). In addition to team grants, individuals trained in non-biological sciences may apply for a Cross Discipline Fellowship to undertake postdoctoral research in biology (the next deadline for such Fellowships will be early in September 2005 - please see the website listed above).

Review of *Math & Bio 2010*, edited by Lynn Steen

Eric Marland and René Salinas

A new publication by the Mathematical Association of America (MAA) has recently been published as a follow-up practical guide to the *BIO2010* document that came from the National Research Council published by the National Academies Press. *Math & Bio 2010* is the result of a series of discussions that began at a meeting in Bethesda, MD in the spring of 2002. The goal of the project is to give a more practical guide on implementing the mathematical and computational components of *BIO2010*. The document also builds off of the ideas from the MAA's curriculum foundations project on interface between mathematics and its related disciplines. The full MAA Committee on the Undergraduate Program in Mathematics (CUPM) guide for mathematics curriculum reform is available from the MAA as well (www.maa.org/cupm/).

The book is divided into a series of chapters designed to address different aspect of the overall goal of improving the undergraduate preparation of biological researchers (not just majors in the biological sciences). One of the most important aspects of the book is the reference to many existing exemplary programs and resources. As an example, several hundred texts are listed in a categorized bibliography. While the list is not exhaustive, it is certainly close. The community of people developing materials for life sciences at the interface of mathematics and biology has been growing rapidly in the last five years and it is becoming increasingly important to maintain effective communication among the members of the community.

It also should be noted that while the SMB has not taken an official stance on educational issues in the manner of the National Research Council and the MAA, many of the published recommendations, including *Math & Bio 2010*, have been heavily influenced by members of the SMB.

Math & Bio 2010 can be purchased at enterprise.maa.org/ecomtpro/timssnet/common/tnt_frontpage.cfm. *BIO2010* can be purchased at www.nap.edu/books/0309085357/html.

LEE A. SEGEL
FEB 5, 1932 - JAN 31, 2005

Bulletin of Mathematical Biology, Editor
1986-2002
Obituary next issue

IV Brazilian Symposium on Mathematical and Computational Biology (BIOMAT 2004)

Raymond Mejía

BIOMAT IV, held Nov. 27 - Dec. 1, 2004 at Universidade Estadual de Santa Cruz (UESC http://www.uesc.br/), Ilhéus, Bahia, consisted of tutorials as well as invited, contributed and poster presentations on topics of current interest. The symposia are organized by the BIOMAT consortium (http://-www.biomat.org/). Tutorials included: Introduction to Mathematical Modeling Techniques in Biology (R. Bassanezi, UNICAMP), Pattern Recognition Techniques Applied to Genome Projects (D. Frias, UESC), Introductory Lectures on Quantum Information (R. Muradian, UESC) and Introduction to Protein Physics (R. Mondaini, UFRJ).

Over 150 students and researchers from South America, Europe, Australia, Asia and North America participated in lively and congenial discussions at an excellent venue. Invited lectures included: The Reaction-diffusion Approach to Morphogenesis (R. Dilão, IST); De Novo Protein Design: An Interplay of Global Optimization, Mixed Integer Optimization and Experiments (C. Floudas, Princeton); Dynamics of Leslie Predator-prey Model with Allee Effect on Prey (E. González-Olivares, PUC Valparaiso); Yellow Fever Vaccination: How Much is Enough? (E. Massad, USP); Mathematical Physiology Today: Examples of Synergies (R. Mejía, NIH); Ant Colony Optimization: Biological Motivation, Phase Structure and Modeling (M. Middendorf, Leipzig); Optical Tweezers and Applications (H. Nussenzveig, UFRJ); Rumors, Partitions and Mathematical Genealogy (C. Pearce, Adelaide); The Use of Proteomic Techniques in the Analysis of Snake Venoms (J. Perales, OCI); and The Optimal Strategy of the Natural Enemies' Introduction in Biological Pest Control (M. Rafikov, UNIJUI). Contributed and poster presentations included many areas of mathematical and computational biology (see http://www-.biomat.org/biomat4/pro-gramme.html). Proceedings of past symposia are available at: http://www.biomat.org/biomat/index.html. The proceedings of BIOMAT IV will be available early in 2005.

Human Frontier Science Program Organization expands membership in Asia-Oceania region

Martin Reddington

The Human Frontier Science Program Organization (HFSPO) is pleased to welcome Australia and the Republic of Korea as new contributing countries. HFSPO President, Professor Masao Ito comments, “The HFSPO has always been open to applications for membership and we are very pleased that Australia and the Republic of Korea have taken the initiative to join. Both countries have a strong capacity in scientific research and education and strong government support for research in the life sciences”. Professor Torsten Wiesel, Secretary General of HFSPO and Nobel Laureate adds, “This step should be seen as the beginning of stronger representation of countries in the Asia-Oceania region, which are emerging as strong contenders in scientific research at an international level. The interest of Australia and the Republic of Korea in joining HFSPO provides a clear sign of the need for such global funding mechanisms to promote frontier research”.

The Human Frontier Science Program Organization was founded in 1989 to support international research and training at the frontier of the life sciences. Until now it has been supported by contributions from the G7 nations, Switzerland and the European Union. With its collaborative research grants and postdoctoral fellowship programs it has supported more than 4000 scientists from 64 countries over the last 15 years. The HFSPO supports research at the interface between life sciences and the physical sciences and places special emphasis on creating opportunities for young scientists.

Open Positions

Burroughs Wellcome Fund 2006 Career Awards at the Scientific Interface

These awards are designed to encourage research at the interface between the physical/computational sciences and the biological sciences, recognizing the vital role cross-trained scientists play in furthering biomedical research. The awards provide bridging support for physical/computational scientists entering biology. These portable awards support up to two years of advanced postdoctoral training and the first three years of a faculty appointment. Candidates must hold a Ph.D. in mathematics, physics, biophysics chemistry (physical, theoretical, or computational), computer science, statistics, or engineering and must not have accepted, or be in serious negotiations for, a faculty appointment at the time of application. Candidates should propose innovative approaches to answer important biological questions. BWF encourages proposals that include experimental validation of theoretical models. Degree-granting institutions in the U.S. and Canada may nominate up to two candidates. Complete program information, eligibility guidelines, and application forms are available on BWF's website at http://www.bwfund.org. Deadline: May 2, 2005. The Burroughs Wellcome Fund is an independent private foundation dedicated to advancing the biomedical sciences by supporting research and other scientific and educational activities.

Postdoctoral Position in Computational Cell Biology

One postdoctoral position in Computational Cell Biology is available at IFOM-IEO campus in Milan, Italy, beginning summer 2005. Two of the main Cancer Research Institutions in Italy, IEO and IFOM are expanding and integrating their research activities. One newly established research team in Computational Cell Biology (contact: Dr. Andrea Ciliberto, http://www.ifom-ieo-campus.it) is recruiting a postdoctoral fellow. The candidate will be expected to investigate the cross talk between the p53 and Rb pathways developing models of ordinary differential equations. The postdoctoral position will be for one year with the possibility of extensions for up to three years. We encourage anyone with a strong background in computational biology, biophysics, and chemical engineering to apply. The salary ranges from 24,000 to 27,000 euros per year, depending on experience. Interested candidates should provide us with the following materials: (1) a cover letter stating your research interests and qualifications, (2) your CV, and (3) the names (emails or phone numbers) of three referees. These materials may be emailed to: Dr. Andrea Ciliberto, ancilibe@mail-.bme.hu

Postdoctoral Position University of Washington

The Applied Mathematics Department at the University of Washington is seeking a VIGRE Postdoctoral Fellow / Acting Assistant Professor beginning in the autumn of 2005. Strong applicants in all areas of applied mathematics are encouraged to apply, though please note that VIGRE Fellowships are available only to U.S. citizens, permanent residents, or U.S. nationals.

For further information please see http://www.amath.washington.edu/postad2004newvigre.html.

SMB 2004, Ann Arbor, Michigan, USA

Photos courtesy of Robert Miura