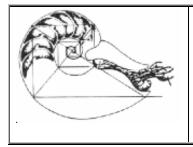# Mathematical Biology Newsletter

Volume 17 #2 – May 2004

The Society for Mathematical Biology

Edited by: Elizabeth H. Scholl

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Interdisciplinarity and Our Society - Remarks from the SMB President

Lou Gross
Departments of Ecology and Evolutionary Biology and Mathematics,
University of Tennessee, Knoxville

At a meeting of the research deans and directors of US schools of medicine I attended recently, an entire symposium session focused on issues of interdisciplinarity. A variety of institutions were illustrated as having model programs that encourage Ph.D. candidates and post-doctoral researchers to pursue learning at the interstices of different fields. In these cases the emphases were on biomedical projects, including biological engineering, medical imaging, and biochemistry of genomics. Considerable discussion ensued on the nature of interdisciplinary research, impediments to training and research across disciplines, and challenges such as limited routes for academic advancement for those who cross disciplines. Throughout the discussion was the acknowledgement that much of the scientific advancement we expect to occur over the next several decades will specifically require interdisciplinarity.

Much of this will have a very familiar ring to members of our Society who have for many years dealt with these issues. Should I accept a position in a Math or in a Biology Department? Should I encourage my students to take more biology or more math courses? How can I foster interactions with my colleagues in other departments? As these medical deans pointed out, the higher administrations at our various institutions, and in granting agencies, pronounce their willingness to foster interdisciplinary efforts, but very few institutions have much success in effectively doing so. The successful efforts in math biology have typically occurred because one or a few faculty members or researchers at an institution work very hard to overcome the barriers there and stake their careers on making the programs work.

In his address to this meeting, Dr. Jeremy Berg (the new Director of the US National Institute for General Medical Sciences, one of the largest government funding agencies for science) described the difference between "interdisciplinary research" and "multidisciplinary research". He provided a simple graphic that defined multidisciplinary research as bringing about collaboration on a common problem between two or more disciplines, but with no lasting change to either discipline. He contrasted this to interdisciplinary research in which the interaction between these fields forges an entirely new discipline. In this sense, mathematical biology is truly interdisciplinary.

As I pointed out at the meeting, at the individual level there is an entire spectrum of interdisciplinarity. Some of us wish to develop the language and concepts to communicate and collaborate effectively with individuals from other disciplinary backgrounds, but keep our main emphasis in one discipline. Others wish to become experts in multiple fields. My definition of an interdisciplinary individual is someone who has developed the intuition in multiple fields that allows him or her to decide whether a problem is really worth doing and what some appropriate approaches might be to address it. Many of the most important conceptual leaps in mathematical biology have arisen due to individuals such as Art Winfree, who had developed outstanding biological as well as mathematical intuition. This in no way diminishes the importance of efforts by individuals whose interests focus more on one side, one outstanding example being Ovide Arino whose careful mathematical analyses provided a firm basis for a wide variety of biologically significant problems. While we lament the passing of these two individuals, we also celebrate the diversity within our Society that fosters individuality while encouraging collaborative efforts to advance both biology and mathematics.

International Conference on Mathematics in Biology & Medicine:
Annual Meeting of the Society for Mathematical Biology
SMB-2004
July 25th – 28th, 2004, University of Michigan, Ann Arbor

The University of Michigan is currently in the midst of an exciting period of progress and growth. At the heart of Michigan's success are dedicated researchers in our top-rated Medical School, Mathematics Department, Center for the Study of Complex Systems, School of Public Health, Biology, Bioinformatics, and Biomedical Engineering departments. These scientists actively conduct research in mathematical biology or bioinformatics and will make up the organizing committee. The chairs of the meeting are Patrick Nelson and Trachette Jackson - Mathematics, Carl Simon - Complex Systems, and David States - Bioinformatics. The goals for this meeting are:

- To promote, encourage, and influence more cooperation, understanding, and collaboration in the scientific community of mathematical biologists
- To bring together various disciplines that attempt to understand the complicated issues of the medical and biological sciences through the use of modeling, computation, and analysis
- To foster the education of the next generation of math biologists
- To provide a forum for the presentation of cutting edge research

Scientific Program

The meeting will consist of lectures presented by:
- Bard Ermentrout, Pittsburgh
- Rakesh Jain, Harvard
- Simon Levin, Princeton
- Alan Perelson, Los Alamos
- Charles Peskin, Courant
- Tamar Schlick, NYU
- James Sneyd, Auckland
- Michael Waterman, USC

and numerous organized sessions and minisymposia that will cover topics on, but not restricted to:
- Computational Biology
- Medical Applications
- Immunology and Infectious Diseases
- Developmental Biology
- Ecology
- Complex Systems
- Mathematical Analysis
- Education

Contact Information
Contact Patrick Nelson or Trachette Jackson via SMB2004@umich.edu
or by regular mail at

       SMB-2004
       University of Michigan
       Department of Mathematics
       525 East University
       Ann Arbor, MI 48109-1109

Information will be updated when available at
http://www.math.lsa.umich.edu/~pwn/SMBindex.html

SMB 2004 Registration is Open

SMB 2004 is now on-line with a tentative schedule of events.
Please see http://www.math.lsa.umich.edu/SMB2004/SMBindex.html

We began accepting contributed abstracts and poster information on April 14th. Anyone interested in participating via lecture format or poster format can submit information through the web site to the conference management team.

We have scheduled a reception for Sunday evening (the first day of the conference) at a local park and have scheduled the conference dinner to be on Tuesday evening. Both of these events are included in your registration fees. You also will receive a lunch on Monday and Wednesday.

We also have a list of hotels with rooms available at a reduced rate so please make your reservations as soon as possible. July is a busy time in Ann Arbor with the Ann Arbor Art Fair that ends on the Saturday before the conference begins. This is considered one of the best art fairs in the country so come a day early to check it out. The web site is http://www.artfair.org

One final announcement is that foreign travelers need to secure their visa information as soon as possible. Students interested in applying for travel funds can visit http://smb.org/landahl.shtml to get information on the Landahl travel awards.

Mentoring Program for Junior Scientists:
2004 Annual Meeting of The Society for Mathematical Biology
July 25th – 28th, 2004, University of Michigan, Ann Arbor

Objective :

The Society for Mathematical Biology recognizes the importance of mentoring in the development of a successful career in mathematical biology. Following the successful mentoring program at previous annual meetings, we are again offering a mentoring program for the benefit of junior scientists attending the 2004 Annual Meeting of the Society for Mathematical Biology, to be held at the University of Michigan, Ann Arbor, MI, USA, July 25th - 28th, 2004. The goal of this program is two-fold:

- to optimize the educational and professional experience of mentees attending the conference;

- to assist the mentees' socialization into the field of mathematical biology.

How does it work?

Anyone attending the annual meeting can sign up, either as a mentee, a mentor, or both. Junior scientists can request to be matched with a senior scientist. Junior scientists include students (both undergraduate and graduate), postdoctoral fellows, research assistants, newly appointed faculty members, etc. Senior scientists include postdoctoral fellows, research assistants, faculty members, etc. Because of the overlap in our definitions of junior and senior scientists, some individuals may sign up both as a mentee and a mentor.

If you would like to participate, contact the coordinator of the mentoring program (see below). The coordinator will find suitable matches, based on research interests and/or special requests.

It is expected that the bulk of the interaction between the mentor and mentee will occur during the conference, although initial contact may be made before the conference. Of course we hope that the relationship is mutually satisfying to the mentor and mentee, and will continue after the conference!

At the conference, we envision the following types of interactions, as the mentor and mentee see fit:

- mentors introduce mentees to their colleagues to help the mentee establish a professional network;
- mentors and mentees spend a lunch or dinner together discussing the mentees' educational and/or career objectives;
- mentors share their career experience with their mentees;
- mentors attend the (poster or lecture) presentation of the mentee and provide constructive feedback;
- mentors spend some time explaining how conference presentations relate to each other, or how they fit into 'the bigger picture'.

We ask that mentors and mentees keep their discussions confidential to protect the privacy of everyone involved.

How do I sign up?

Please contact the coordinator of the mentoring program by June 1, 2004:

Gerda de Vries
Department of Mathematical & Statistical Sciences
University of Alberta
Edmonton, Alberta
T6G 2G1
CANADA
email: devries@math.ualberta.ca
fax: (780) 492 – 6826

In your message, please include the following information:

- Your mailing address, email address, and fax number;
- A brief (one paragraph) description of your research interests;
- Your career stage;
- *For mentees:* Do you have any special requests? For example, perhaps you would like a mentor who speaks a certain language, lives in a certain geographical region, has a dual-career family, etc. Or perhaps you know of a senior scientist coming to the conference that you would like to have as a mentor (if that person were available).
- *For mentors:* Do you have any special expertise that may be of benefit to mentees? Please include with your information whether you are willing to interact with mentees in a language other than English, whether you can advise on dual-career issues, etc.

We cannot guarantee perfect matches, but we will try our best!

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SMB Financial Support for Travel to Meetings

SMB's Landahl Fund has limited funds available to support travel to the Annual Meeting. See http://www.smb.org/landahl.shtml for guidelines.

In addition, SMB has limited funds to support travel to meetings other than the SMB Annual Meeting. Applicants and/or their referees must have been members of the SMB for at least one year prior to application. Preference is given to individuals at an early stage of their career (especially graduate students and post-docs) who have not received prior support from the SMB. The next deadline for applications is July 15. For more information and specific guidelines, consult http://www.smb.org/travel_other.shtml

Gordon Research Conference on Theoretical Biology & Biomathematics
June 6th – 11th, 2004, Tilton School, Tilton, NH

Chairs: Tim C. Elston & Raymond Mejia
Vice Chair: Paul C. Bressloff

http://www.grc.uri.edu/programs/2004/theobio.htm

Apply and submit an abstract for a poster using the icon at the bottom of the webpage. Some support may be available. Complete and updated schedule and information can be found on the webpage.

Daily schedule includes morning (9:00 am – 12:30 pm) and evening (7:30 pm – 9:30 pm) discussion sessions as well as an evening poster session (9:30 pm).

Sunday: arrival 2:00 pm – 9:00 pm
> *Evening Session:* Motors and Biological Motion

Monday:
> *Morning Session:* Spatial Components in the Modeling of Ecological Processes
>
> *Evening Session:* Innovations in Theoretical Immunology

Tuesday:
> *Morning Session:* Neurobiology of Breathing, Whiskering and Electrolocation
>
> *Evening Session:* Emergent Species/Diseases and Invasion

Wednesday:
> *Morning Session:* Systems Biology
>
> *Evening Session:* Modeling transcriptional control in gene regulatory networks

Thursday:
> *Morning Session:* Biofluids and Biological Gels
>
> *Evening Session:* The Future of Biomathematics and Theoretical Biology

Please see the GRC website at http://www.grc.uri.edu/programs/2004/theobio.htm for more details

Report on a workshop:
Models and Methods for Analysis of Lymphocyte and Pathogen Repertoire Generation, Development, Selection and Evolution
Ramit Mehr

The workshop "Models and methods for analysis of lymphocyte and pathogen repertoire generation, development, selection and evolution" was a Research Workshop of the Israel Science Foundation (ISF) organized by Dr. Ramit Mehr from Bar-Ilan University, Israel. The workshop took place in the Princess Hotel, Eilat, Israel, on February 29th – March 4th, 2004.

The goal of this workshop was to showcase and find new ways of elucidating the complex dynamics of lymphocyte and pathogen repertoires. Towards this goal, invited speakers included clinicians, experimentalists, mathematicians and bioinformaticians, who have experience and/or interest in studying lymphocyte and pathogen repertoire co-evolution.

These invited speakers included: Sonia Berrih-Aknin, INSERM/Weizmann Institute; Irun Cohen, Weizmann Institute; Rob de Boer, Utrecht University; Michael Cancro, University of Pennsylvania; Deborah Dunn-Walters, Kings' College London*;* Zelig Eshhar, Weizmann Institute; Klas Kärre, Karolinska Institute; Thomas Kepler, Duke University; Yoram Louzoun, Bar-Ilan University; Rose Mage, NIH; Ramit Mehr, Bar-Ilan University; Benoit Morel, Carnegie Mellon University; Penelope Morel, University of Pittsburgh; Lee Segel, Weizmann Institute*;* Shlomo Ta'asan, Carnegie Mellon University; Ron Unger, Bar-Ilan University.

A second goal was to include in the workshop as many students and post-docs as possible, because travel from Israel to Europe or North-America is expensive, so students and post-docs – and even young faculty members – do not have many opportunities to participate in international conferences and workshops, let alone workshops on specialized subjects such as theoretical immunology. The generous funding obtained from several organizations enabled the participation of a total of 20 graduate students, 3 post-doctoral students, and 3 junior faculty members in the workshop. Students and post-docs have presented 5 of the talks, and about 10 posters. Workshop participants came from the United States, the United Kingdom, Sweden and the Netherlands, in addition to Israel – a distribution that reflects the locations of most of the strong research centers in theoretical immunology today. Gender balance was as follows: among the speakers, 7 were female and 15 male, which seems to be better than the overall status in the field; and among all 44 participants, 20 were female and 24 male – without resorting to any type of "affirmative action".

The workshop was funded by the following organizations: ISF; the C.R.I. - Caesarea Rothschild Institute for interdisciplinary applications of Computer Science at the University of Haifa, which funded a tutorial in immunology for students of mathematics and computer science, and the participation of these students in the workshop; the Society for Mathematical Biology, which funded the participation of several additional students, post-docs and young faculty; Bar-Ilan University (through the office of the Vice-President of Research, and through the Faculty of Life Sciences), and Silicon Graphics Israel.

The scientific contents of the work presented in the workshop were varied, novel and challenging, which resulted in much lively discussion after each talk and during the breaks. Several collaborations and many promising contacts have been formed. All participants have expressed their enjoyment of the workshop, its social program (which included a field trip to Timna Park, a geological and archeological treasure) and the venue – sunny Eilat! All in all, it was a pleasure to organize, and participate in, this workshop. The final program, abstracts, and some pictures will soon be posted on the workshop website, http://repertoire.os.biu.ac.il/workshop.htm .

A Meeting Report:
International Symposium on Dynamical Systems Theory and Its Applications to Biology and Environmental Sciences: A Brief Sketch!

Samit Bhattacharyya

A giant Mathematical gathering in a string of islands! Mathematicians, Biologists, Environmentalists, research fellows and students, from various part of the globe assembled in the department of Systems Engineering, Shizuoka University, Japan. It is difficult to mention who was not present there from the field of Mathematical Biology! Stalwarts like, Professors Clark, Freedman, Glass, Gyllenberg, Smith, Thieme, Beretta, Sigmund, Ma, Diekmann, Sacker, Wang, Cushing, Neubert, and so many eminent professors were present at the meeting.

From March 14th -17th, 2004 participants convened for the "International Symposium on Dynamical Systems Theory and Its Applications to Biology and Environmental Sciences" held in Shizuoka University, Hamamatsu, Japan. Hamamatsu is a nice and charming city in Japan, just 250-300 km. from Tokyo. There were about 150 participants in the conference out of which 23 were invited speakers.

The famous opening lecture "How many species today? How many species tomorrow?" was delivered by Professor Rosenzweig, University of Arizona. He talked about the relationship between number and density of species with area (SPARs). Next talk was by Professor Glass, McGill University, on Dynamics of Paroxysmal Tachycardia. Twenty further invited plenary lectures were given throughout the conference over several days, discussing various topics including: Optimal Harvesting, Population Dynamics, Permanence -Persistence, Glucose/Insulin Models, Epidemic Models, Gene Transfer in Bio-films, Indirect Reciprocity, Cancer Models, Control Strategy on SARs in China, and Overcapacity Problems in World Fisheries. A few of them I personally enjoyed very much, like those given by Neubert, Clark, Gyllenberg, Freedman, and Smith. I regret that I cannot write about other topics due to lack of space.

Fifteen general sessions took place in the first and last days, with three sessions held concurrently. Session topics included Permanent-Persistence, Delay Models, Neural Network Models, Stage-Structured Predator-Prey Models, Meta -Population, Structure Population Models for HIV Information, Game Dynamics, Delayed Feedback Control of Chemostat Models, Integrated Pest Management Models, Spatio-Temporal Model Patterns of Invasion Species, Chaotic Dynamics of Cardiac Activities, and other different branches of Mathematical Biology and Environmental Systems.

Two days were scheduled for afternoon poster sessions, breaking up the invited talks. Such a timetable allotted a generous 40 minutes for each invited talk and 15-20 minutes for paper presentation s. This, and the specialized nature of audience, allowed speakers to give both biological and ecological background and extensive mathematical details of their work. Posters were prominently exhibited around a big hall providing ample viewing opportunity.

In the evening of the second day, a special dinner (not banquet!) in a genuine Japanese restaurant was arranged for the invited speakers. By mistake, I was present at the dinner! The main dish was full of Sashimi (raw fish), served with wasabi (Japanese horseradish root), vegetables or seaweed garnish, and shoyu (soy sauce), with a special Japanese drink Sake. I am fortunate that I was present there, of course, by mistake; otherwise I could miss this nice experience to write this report.

The size of the meeting, generous timetable, participants taste and social events created a congenial atmosphere. These gave ample opportunity, especially for research fellows and students, to discuss and exchange of their thoughts. Further, these helped to make more new contacts. I personally benefited a lot from the conference with valuable suggestions, comments, and future goals of my work, by face-to-face meetings with several eminent professors whom I used to connect with through e-mail only.

Regarding the organization of this ice-smooth gathering, it was really excellent! The names of Prof. Takeuchi and Prof. Sato of Department of Systems Engineering deserve special mention in this regard. From the daily updating of conference web site, making of such a nice timetable, arrangement of presentation media, etc. in every aspect, they proved their efficiency. The work of the organizers continues—papers based on presentation are to appear as special issues in some famous refereed journals.

At the end of this sketch, the organizers should be thanked for their hard work and efficient management as a whole. Participants must now wait for the second Dynamical Systems Theory conference at Shizuoka University!

Simon Levin Awarded 2004 Heineken Prize

Dr A. H. Heineken Prize for Environmental Sciences 2004 awarded to SimonLevin

The Royal Netherlands Academy of Arts and Sciences has awarded the Dr A. H. Heineken Prize for Environmental Sciences 2004 (USD 150,000) to Professor Simon A. Levin, Department of Ecology and Evolutionary Biology, Princeton University, Princeton, New Jersey, United States, for 'his insights into the effects of scale on ecosystems'.

For further information regarding the prestigious award please see following site:
http://www.knaw.nl/heinekenprizes/index.html

John Tyson: Among Virginia's Outstanding Scientists of 2004

John J. Tyson of Blacksburg, Va., University Distinguished Professor of Biology in the College of Science at Virginia Tech, has been named one of Virginia's three Outstanding Scientists of the Year 2004, according to an announcement by Governor Mark R. Warner and Science Museum of Virginia Director Walter R. T. Witschey.

See http://www.governor.virginia.gov/Press_Policy/Releases/2004/Feb04/0220.htm for more details.

NSF Mathematics Infrastructure Program

The Infrastructure Program provides support for activities that differ from the research projects supported by the disciplinary programs of the Division of Mathematical Sciences. These include working research sessions, such as conferences, symposia, colloquia, and special years, as well as training programs, such as grants for broadening education in the mathematical sciences or increasing the number of individuals in disciplines that are based in the mathematical sciences.

http://www.nsf.gov/pubs/progdesc/2004/mps/1260.html

NSF Training and Research Opportunities

Several NSF training and research funding opportunities are now available, including:

1. Postdoctoral Research Fellowships in Biological Informatics:
   http://www.nsf.gov/pubs/2004/nsf04539/nsf04539.html

2. Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences: http://www.nsf.gov/pubs/2004/nsf04546/nsf04546.htm

   Total award sizes should not exceed an average of $250,000 per year. For example, an award for a project of five years duration is limited to a maximum of $1.25 million.

3. Integrative Graduate Education and Research Traineeship Program (IGERT)
   http://www.nsf.gov/pubs/2004/nsf04550/nsf04550.htm

   U.S. academic institutions in the United States, its territories or possessions that grant the Ph.D. degree in the sciences and engineering may submit proposals. Non-Ph.D. granting, nonacademic, and international organizations may serve as collaborating organizations.

4. The Interagency Education Research Initiative (IERI)
   http://www.nsf.gov/pubs/2004/nsf04553/nsf04553.htm

   The Interagency Education Research Initiative (IERI) is a collaborative effort jointly sponsored by the National Science Foundation, the Institute of Education Sciences (see http://www.ed.gov/programs/edresearch/applicant.html), and the National Institute of Child Health and Human Development in the National Institutes of Health (see http://www.nichd.nih.gov/funding/funding-opps.htm). In FY 2004 the IERI grant competition will be managed separately by each agency. The National Science Foundation invites proposals for research projects that will investigate the effectiveness of interventions designed to improve student learning and achievement in pre-K-12 science and/or pre-K-12 mathematics with an emphasis on middle and high school. Technology should be a part of the intervention or used in an essential manner in the analysis of the intervention.

Bulletin of Mathematical Biology Available On-Line

The online version of the Bulletin of Mathematical Biology is now available to all members of the Society. For details on how to access the online version, please refer to http://www.smb.org/bmb_online.shtml

If you fail to receive your copy of the *Bulletin,* please let us know, at torcom@smb.org, so that we may notify the publisher.

SMB Member Home Page Information

We are incorporating member home page information and keyword information along with email addresses in the membership list on the SMB web site. If you would like to have this included with your listing, please send your URL and (up to 5) keywords to torcom@smb.org

Introduction to Infectious Disease Modelling and Its Applications:
A Two-Week Course

July 19th – 30th, 2004, The London School of Hygiene & Tropical Medicine

Organized jointly between the London School of Hygiene & Tropical Medicine and the Communicable Disease Surveillance Centre (Health Protection Agency, UK)

Summary:
Mathematical modelling is increasingly being applied to interpret and predict the dynamics and control of infectious diseases. Applications include predicting the impact of vaccination strategies against infections and determining optimal control strategies against HIV and vector-borne diseases.

This two week intensive course, now running for the fourth year, is intended to introduce professionals working on infectious diseases to this exciting and expanding area. The emphasis will be on developing a conceptual understanding of the basic methods and on their practical application, rather than the manipulation of mathematical equations.

Who should attend:
The course is designed for individuals interested in expanding their knowledge of the techniques for analysing and interpreting epidemiological data on infectious diseases and for predicting the impact of control programmes, including medical and health professionals, policy makers, veterinary scientists, medical statisticians and infectious disease researchers.

Specialist mathematical training is not a prerequisite. However, individuals with degrees in mathematical disciplines working on some aspect of infectious disease dynamics and/ or control, who wish to learn about the potential of infectious disease modelling will also benefit.

For copies of the leaflet and application form, please contact:
    Registry
    London School of Hygiene & Tropical Medicine
    50 Bedford Square
    London,
    WC1B 3DP
    UK
    email: shortcourses@lshtm.ac.uk

Further details about the course content are available at
    http://www.lshtm.ac.uk/ideu/courses/ModellingShortCourse.htm or
    http://www.lshtm.ac.uk

or contact one of the course organizers:
    Richard White   Emilia Vynnycky
    richard.white@lshtm.ac.uk   emilia.vynnycky@lshtm.ac.uk

EPSRC Summer School:
Cell Adhesion and Migration: The Interface with Tissue Engineering
September 6th – 10th, 2004, University of Nottingham, UK

This Summer School is aimed at graduate students and post-doctoral researchers who wish to learn more about cell adhesion and migration and the role of these fundamental processes in tissue engineering. Because tissue engineering is inherently multi-disciplinary, the School welcomes students from a broad range of backgrounds: biologists, physical scientists, engineers and mathematicians.

Lectures and laboratory tours will provide students with an overview of the relevant biological background, experimental and imaging techniques, theoretical models and applications.

The first of this series of two Summer Schools was held in 2002 and focused on cell-scale phenomena. The 2004 Summer School will address the behaviour of whole cell populations in tissue-engineering scaffolds.

Financial support for suitably qualified graduate students is available from EPSRC.
For further details see
http://www.maths.nottingham.ac.uk/Cmm/SUMMER_SCHOOL2004

SIAM Conference on Discrete Mathematics
June 13th -16th, 2004, Loews Vanderbilt Plaza Hotel, Nashville, TN

Invited Plenary Speakers:
Jennifer Chayes, Microsoft Research; Martin Grötschel, Konrad-Zuse-Zentrum für Informationstechnik Berlin (ZIB), DFG-Forschungszentrum "Mathematik für Schlüsseltechnologien", and Technische Universität Berlin, Germany; Jon Kleinberg, Cornell University; Tom Leighton, Massachusetts Institute of Technology and Akamai Technologies, Inc.; Paul Seymour, Princeton University; Bernd Sturmfels, University of California, Berkeley; Alexander Vardy, University of California, San Diego; Michael Waterman, University of Southern California

Registration and the preliminary program for this conference are available
at: http://www.siam.org/meetings/dm04/

ACM-SIAM Symposium on Discrete Algorithms
January 23rd -25th, 2005, Sheraton Vancouver Wall Center Hotel, British Columbia

The Call for Presentations for this conference is available at:
http://www.siam.org/meetings/DA05/

Submission Deadline: July 5, 2004

For additional information, contact the SIAM Conference Department at
meetings@siam.org .

Models and Metaphors from Biology to Bioinformatics Tools
September 5ᵗʰ - 7ᵗʰ, 2004, Universita' di Camerino, Camerino, Italy
http://www.nettab.org/2004/

Motivation and Scope:
The post-genomic era can be seen as characterized by two different scenarios: on the one hand, the huge amount of available biological data sets all over the world requires suitable tools and methods both for modeling biological processes and analyzing biological sequences; on the other, many new computational models and paradigms inspired and developed as metaphors of biological systems are ready to be applied in the context of computer science.

It may now be a good time to:
  (i)   report on the results achieved in these two areas,
  (ii)   present some open problems in computational biology,
  (iii)   advertise novel computational tools successfully applied to biological issues,
  (iv)   spread the knowledge on computational models inspired by biological processes, and
  (v)   foster the application of computational models to govern real biological systems.

The workshop intends to bring together bioscientists and computer scientists and to compare their approaches and their ideas for solving computational biology open problems. In particular, we expect the participation of those who are developing novel bioinformatics tools and those who are working towards the vision of biological systems as a model for designing new tools.

The workshop will also aim to inspire future collaboration between the different communities, to strengthen the relationships within the bioinformatics community, to activate cooperation between bioscientists and computer scientists, to collect the latest ideas, achievements and proposals in computational models and metaphors from biology.

Dates and deadlines can be found at our website.

Howard Hughes Medical Institute Guide to Scientific Management

The Howard Hughes Medical Institute has published a collection of advice, experiences and opinions from seasoned biomedical investigators and other professionals as a practical guide for postdocs and new faculty. The publication, Making the Right Moves: A Practical Guide to Scientific Management for Postdocs and New Faculty, may be read on-line or down loaded at http://www.hhmi.org/labmanagement.

The document is 250 pages, therefore you may want to scroll through it first or pick and choose as you like. Chapter titles are: obtaining and negotiating a faculty position and planning for tenure; the scientific investigator within the university structure; defining and implementing your mission; staffing your laboratory; mentoring and being mentored; time management; project management; data management and laboratory notebooks; getting funded; getting published and increasing your visibility; understanding technology transfer; setting up collaborations; and course in scientific management.

Nonlinear Dynamics and Chaos: Lab Demonstrations
Steven Strogatz

A video, Nonlinear Dynamics and Chaos: Lab Demonstrations, is now online and publicly accessible at: http://dspace.library.cornell.edu/handle/1813/97

It's a video I made some years ago with the help of several colleagues. It's intended for use as a supplement in courses on nonlinear dynamics, to show students some real phenomena in the lab, and to save teachers the bother of having to set up these demos for themselves.

Postdoctoral Position in:
Mathematical Modeling of Infectious Diseases
University of Maryland, Baltimore

The Department of Epidemiology and Preventive Medicine at the University of Maryland, Baltimore, seeks applicants for a postdoctoral scientist position to conduct research on mathematical modeling of infectious diseases. Applicants should have a Ph.D. or equivalent with experience in mathematical epidemiology, theoretical ecology, and dynamical systems theory. Experience in working with clinical databases and knowledge of nosocomial infections a plus. Interested candidates should submit a letter of application, CV and three letters of recommendation to:

> Dr. David M. Hartley, c/o Diane Lindt,
> Business Services Specialist
> 660 W. Redwood St.
> HH 109
> Baltimore, MD 21201

or email at:
> dlindt@epi.umaryland.edu

The University of Maryland, Baltimore is an AA/EEO/ADA employer. Women and minorities are encouraged to apply.

Postdoctoral Position in:
Modeling and Numerical Simulations of Specific Heart Diseases
INRIA-Rocquencourt, France

INRIA-Rocquencourt has an opening for a postdoctoral fellow to work on the modeling and numerical simulations of specific heart diseases (such as ischaemia), using a computational mechanics model of cardiac behavior. The ultimate objective is to provide cardiologists with a decisional tool to investigate the impact of certain treatments (surgical procedure, pacemaker implantation...) on an impaired organ. Hence the work will be carried out in a collaborative environment including medical doctors.

Duration: 9-12 months
Location: INRIA-Rocquencourt (Paris area)

Applicants should have a Ph.D. in numerical analysis or computational mechanics (non-linear solid mechanics more particularly relevant), and a strong motivation for biomedical applications. Non-French candidates from the European Union (and associated states), no more than 30 years old, are particularly encouraged, although all top-level applications will definitely be considered.

Applications to be submitted by email to Dominique.Chapelle@inria.fr

Postdoctoral Position in:
Computational Neuroscience: Neuronal Network Modeling
Netherlands Institute for Brain Research, Amsterdam, The Netherlands
http://www.neurodynamics.nl

Research in the workgroup Neurons & Networks of the Netherlands Institute for Brain Research (NIBR) is focused on plasticity and information processing in cortical neuronal networks. Experimental and computational approaches are integrated.

The workgroup participates in the research project Computational Analysis of Spatiotemporal Patterns of Activity in Neuronal Networks (CASPAN), a project supported by the NWO Program Computational Life Sciences. Within the CASPAN research team there is a vacancy for a 3-year Postdoc position.

Project description:
The project aims at describing and understanding the patterns of activity of nerve cells synaptically connected in neuronal networks. The project builds on recent developments in experimental techniques within the participating research groups for simultaneously recording neuronal activity from a large number of neurons in the network (e.g. in cortical brain slices and cultured neuronal networks). To be able to analyze and interpret the flood of data these new techniques produce, we intend to develop:
- (i) mathematical and statistical methods for analyzing spatiotemporal patterns of neuronal activity, and
- (ii) computational models of neuronal networks to simulate these patterns and understand them in relation to structural and functional connectivity within the network.

The methods and models will be validated with the extensive data we have on spatiotemporal patterns in cortical brain slices and cultured neuronal networks.

The CASPAN project builds on a close collaboration between the Neurons & Networks research group at the NIBR, the Experimental Neurophysiology Research Group at the Vrije Universiteit Amsterdam, and the Statistics Research Group of the Institute for Mathematics at the Vrije Universiteit. The three subprojects carried out by these groups concentrate on:
- a) macroscopic neural network models,
- b) detailed cortical microcircuit models, and
- c) statistical methods for analyzing spatiotemporal activity patterns, respectively.

Postdoc job description for subproject (a):
Development of a large-scale neuronal network model with realistic functional and structural connectivity to simulate neuronal activity in cortical brain slices and cultured neuronal networks. The research includes
1. the development of a stochastic model for generating network structure, replicating the neuronal composition and connectivity in cortical brain slices and in cultured neuronal networks;
2. modeling studies of the neuronal activity and spatiotemporal patterns of activity within these model networks, and
3. validation and comparison with the experimental data from cortical brain slices and cultured neuronal networks.

Requirements, job conditions and other details can be found in the SMB Digest, volume 04 issue 11 (ftp://ftp.ncifcrf.gov/smb/digest/v04i11).

Additional information can be obtained from the project website:
> http://www.neurodynamics.nl

Post-Doctoral Training Fellowships from
The Human Frontier Science Program

New Cross-Disciplinary Fellowships for scientists from outside the life sciences.

The Human Frontier Science Program has published the latest guidelines for their postdoctoral fellowship programs. The Long-Term Fellowships and the new Cross-Disciplinary Fellowships are aimed at young scientists who wish to obtain advanced research training abroad. Long-Term Fellowships are for scientists with a PhD or equivalent in the life sciences who aim to broaden their training by gaining experience in another field of research. The new Cross-Disciplinary Fellowships are for young scientists trained in a field outside biology, particularly in physics, chemistry, mathematics, computer science or engineering, who seek training in the life sciences.

These three year postdoctoral packages for training abroad are particularly attractive due to their flexibility and the chances they offer young scientists in the critical period during their move to independence. Fellows can either remain in their host laboratories for the three years of the fellowship, or they can take the third year in a laboratory back in their home countries. The return home may be deferred for up to two years if the host is prepared to support the Fellow from other sources. Those who return home are eligible to apply for a Career Development Award to help them startup their own independent laboratories.
More details are available on the HFSP web site at www.hfsp.org .

New Cross-Disciplinary Fellowships from
The Human Frontier Science Program

Over the last few years, the HFSP has been increasingly emphasizing the collaboration between scientists in different disciplines in its grant and postdoctoral fellowship programs. Involvement in the grant program of scientists working in disciplines outside the life sciences has increased seven-fold since 2001. More applications have also been received for postdoctoral fellowships from young scientists trained in the physical sciences, who are seeking training in the life sciences in laboratories abroad, but the change has not been as dramatic as in the grants. HFSP is especially committed to bringing new conceptual and methodological approaches from other disciplines into biology and young scientists will play an important role in this transformation. A special fellowship program for such scientists is therefore being introduced. The new Cross-Disciplinary Fellowships will be introduced starting with the application deadline in September 2004. The first awards will be announced in March 2005. The conditions for these fellowships will be the same as those of the current Long-term Fellowships. This three year postdoctoral package for training abroad is particularly attractive due to its flexibility and the chances it offers young scientists in the critical period during their move to independence. Fellows can either remain in their host laboratories for the three years of the fellowship, or they can take the third year in a laboratory back in their home countries. The return home may be deferred for up to two years if the host is prepared to support the Fellow from other sources. Those who return home are eligible to apply for a Career Development Award to help them start up their own independent laboratories.
More details are available on the HFSP web site at www.hfsp.org .

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