Conference attendees participate in the *powhiri*, a traditional Maori welcome

BioEd 2009
Anton Weisstein

The International Union of Biological Sciences' annual educational meeting, BioEd 2009, was held in Christchurch, New Zealand, from Feb. 12–15. These dates were chosen to coincide with the 200th anniversary of Darwin's birth, and 2009 also marks the 150th anniversary of the publication of The Origin of Species. The conference's theme, Evolution in Action, was thus highly appropriate.

The conference opened with a *powhiri*, a traditional Maori welcome featuring a ritual challenge, singing, and feats of agility. Several brave participants also volunteered to take part in a haka or posture dance, with greatly entertaining results. After cutting a birthday cake and pulling crackers for Darwin, participants had the opportunity to see the premiere of the play "Collapsing Creation," about the challenges Darwin faced in publishing his theory.

Conference participants represented a unique balance between evolution research and teaching: high school biology teachers comprised about 25% of the participants. Sessions on preparing teachers for evolution education and Darwinian medicine helped bridge this divide, interweaving insights from current research with new pedagogical strategies. For example, an overview of human settlement patterns

in the Pacific based on genetic and archeological data (Elizabeth Matisoo-Smith, Allan Wilson Centre, New Zealand) might be followed by a lesson plan for speciation in which students conduct experiments that directly challenge their own naïve views of unchanging species (Lee Traynor, Leibniz University, Germany). This mix of topics led to some fascinating teatime and dinner discussions on methods for bringing current research into the classroom and engaging students in active and collaborative learning.

The four plenary lectures were also well chosen to span a diversity of topics while representing the organization's international character. Presentations included Darwin's systematics work on barnacles (John Buckenridge, RMIT University, Australia), strategies for adapting primary literature for classroom use (Anat Yarden, Weizmann Institute, Israel), evolution education and the nature of science (Douglas Futuyma, SUNY, USA), and sexual selection in the evolution of human mating systems (Alan Dixson, Victoria University, New Zealand). The conference wrapped up with the play "Unnatural Selection," performed by four very talented New Zealand high school students, and a preview of October's IUBS meetings in Cape Town, South Africa.

Several high school teachers in attendance mentioned how much they enjoyed the opportunity for in-depth conversations with researchers, and many research-oriented participants equally appreciated the ideas for new teaching strategies. In response to this demand, the organizers established a blog to help maintain the collaborations begun at the conference. The conference also highlighted one other challenge common to many international societies, including SMB: the language barrier. The IUBS has taken an excellent first step by linking their website and associated materials to a web-based translator. Given the international nature of such conferences, any additional strategies for facilitating multilingual presentations could greatly enhance the experience for speakers and participants alike.

Dear SMB Members:

This winter brought significant changes: With the new President in the White House in the United States, new attitudes toward science have taken place. US federal money for research has increased dramatically for both the National Science Foundation (NSF) and the National Institutes of Health (NIH). This presents new opportunities for the mathematical biology community. Some of the US Economic Stimulus money has also been allocated to the NSF Division of Mathematical Sciences sponsored Mathematical Institutes to hire new postdoctoral fellows for the next two years, thus partially addressing the shortage or cancellation of many positions at universities across the United States. We live in a time where biological and medical discoveries are reported almost daily in the front pages of the international, national and regional newspapers. And as the biomedical sciences grow and expand, so does the need to model the biomedical processes with the aid of mathematical, statistical and computational methods.

The SMB annual meeting is a forum where members meet annually to present new results, exchange new ideas, and develop new connections. These gathering are particularly important to students and young researchers. For this reason the SMB allocates funds to support young career researchers to participate in these conferences. The next annual meeting will take place at the University of British Columbia, in Vancouver, during July 27-31. The SMB web site provides information on how to apply for support. The SMB also provides support to members who wish to participate in other mathematical biology conferences and workshops and sometimes support directly these conferences and workshops. For example, this year the SMB will support with modest funds one or two workshops in Africa. These workshops will deal with diseases such as HIV and malaria, and with data mining methodologies that can successfully identify future trends.

The SMB membership has been growing continuously over recent years. In order to facilitate the admission of new members and the renewal of the membership, a new online process has been developed; it takes just a few minutes. This apparently had an unintended consequence: A number of members did not receive the traditional request to renew their membership, and so they have not done it. At least this happened to me and a few people I know. So I hope that as you read these lines, you will go to your computer and renew your SMB membership (www.smb.org), if you have not already done so. (You can also download and print a paper copy if you don't want to renew on-line.)

The SMB Board of Directors will hold its annual meeting on July 26, one day before the annual meeting. If you have any suggestions on how the SMB can serve better its membership, I would appreciate it if you send them to me, and I shall add them to the Board's agenda.

I am looking forward to meeting many of you in Vancouver

Sincerely,

Avner Friedman

SMB President

Abdul-Aziz Yakubu and Avner Friedman

Society of Mathematical Biology President in South Africa
Abdul-Aziz Yakubu

The President of the Society of Mathematical Biology (SMB), Professor Avner Friedman, and the chair of the World Outreach Committee of SMB, Professor Abdul-Aziz Yakubu, visited Cape Town in South Africa from January 22, 2009 to January 27, 2009. During the six-day visit, Friedman and Yakubu participated in a number of activities.

Friedman gave a public lecture entitled "What is mathematical biology and how useful is it?" at the Iziko South Africa Museum in Cape Town. The public lecture, organized by Professor Henri Laurie of the University of Cape Town, had over 60 people in attendance.

Friedman and Yakubu also participated in a one-day workshop on Biomathematics at the African Institute of Mathematical Science (AIMS) in Muizenberg near Cape Town. The workshop focused on mathematical methods in biology, epidemiology and ecology. The AIMS workshop also featured leading experts in biomathematics in Africa. Friedman lectured on the interactions of a tumor and its microenvironment, and Yakubu lectured on disease-induced mortality in discrete-time epidemic models. Friedman and Yakubu also discussed educational and research opportunities in Mathematical Biology with workshop participants.

Friedman and Yakubu also visited the South African Center for Epidemiological Modeling and Analysis (SACEMA), a national research center in Stellenbosch. SACEMA focuses on research in quantitative modeling of the spatial and temporal patterns of disease. SACEMA Director, Dr. John Hargrove, and AIMS Director, Dr. Fritz Hahne, are part of the Africa-US initiative.

AIMS is a six-year old Institute that promotes mathematical sciences in Africa via its educational and research programs. Annually, AIMS hosts approximately 40 post-graduate students who have received their BA or BS degrees in mathematics with distinction. The students are drawn from all higher education institutions in Africa. AIMS students participate in intensive courses in all fields of pure and applied mathematics, which are offered by international and local researchers. Upon graduation from AIMS, the students typically apply to graduate schools in African universities and universities in North America and Europe. AIMS is also in its first year of a postdoctoral fellowship program in mathematics. Post-graduate students and postdocs are fully supported during their time at AIMS. Director Hahne is particularly interested in hosting leading experts in mathematical biology from the US as either long-term or short-term visitors at the AIMS facility in Muizenberg. Interested persons should contact the director for additional information (http://www.aims.ac.za/english/).

Participants of the Workshop on Biomathematics at the African Institute of Mathematical Sciences (AIMS) in Muizenberg-South Africa. Front and center is SMB President, Avner Friedman.

My Career in Mathematical Biology
A Personal Journey

Mark A. Lewis

Since I was a young boy I have been fascinated by nature and how it works. I grew up in the coastal town of Victoria, Canada, surrounded by nature and active in natural pursuits such as canoeing and backpacking. On a class trip, I visited a local natural historian, Francis King, and he taught us how a web of interactions shapes the natural world. I was amazed by the collection of butterflies and moths he had amassed: how could the world be so diverse and complex?

I was a mediocre high school student. My favorite subjects were biology and physics. My physics teacher had a poster of Einstein at the front of the class, under which he had written "forgive them for they know not what they do," particularly apt for our graduating class.

As a university student I was keen on studying ecology, but was curiously disappointed in the subject. Where were the ideas and principles? Was every study a special case? My lack of enthusiasm persisted until I took upper level courses on quantitative ecology and island biogeography. Ideas in these courses struck me powerfully: dynamics of populations and diversity of species could be understood from first principles, for those who could write down the equations and then analyze them--- heady stuff. Inspired, I took several math courses. These turned into many math courses and many computer science courses, until I graduated from the University of Victoria in 1987 with a double major in Biology and combined Math and Computer Science.

Late in my undergraduate career I wrote a term project on statistical sampling methods for estimating animal densities, and, for this paper, received an award in honour of the natural historian, Francis King, who had recently passed away. This award, from the Victoria Natural History Society, connected my studies back to my boyhood days, and it occurred to me that it might be possible to work in an area that I loved and felt connected to.

Subsequently I was able to get summer experience working with Pauline van den Driessche, studying the dynamics of diseases. When it came to graduate schools, she suggested that I apply to work with Jim Murray, a professor of Mathematical Biology at Oxford. I applied and was pleasantly relieved and excited to hear that I had a place there.

Three years later I received my D.Phil. Mathematical Biology on mathematical electrophysiology and the dynamics of cell structures. Besides developing an appreciation for room-temperature beer, and an aptitude for rowing, I had learned about the process of being a mathematical biologist, specifically, about the creation and analysis of mathematical models for biological phenomena, and about the development of new mathematical ideas. Even though mathematical biology could be frustrating and unpredictable, I found that I enjoyed it to the point where I wanted to continue with it.

Although I had learned an immense amount during my graduate years, I had strayed from my original love of ecology. This was remedied in my postdoc, joint with Peter Kareiva (Washington) and Jim Murray (who by then had moved to Washington). Immersed in a spatial ecology lab, I got daily updates on the role of modelling in resolving the legal dispute over forestry and the spotted owl, and in methods for applying mathematics to the spread of invasive

species.

My graduate and postdoc mentors really shaped the way I view science more than anyone else. I suspect that this is true for many people---influences during formative years remain for life. From Jim Murray I learned how to think as an applied mathematician, connecting science and dynamical systems in deep ways. From Peter Kareiva I learned how to communicate science effectively and how this can impact its application.

I took my first faculty position at the University of Utah, a hotbed for mathematical biology. I was blessed with senior colleagues who would not only happily dispense advice on scientific issues, but would help look out for my needs at a departmental level. I learned, by example, how research groups are built and how to fund science with competitive grants.

My wife Allison and I fell in love with the Salt Lake Valley, surrounded by the towering Wasatch Mountains. We made good friends, laid down roots, and started a family. However, we had long planned to move back to our home country, Canada. When I was offered a Canada Research Chair at the University of Alberta we said good-bye to colleagues and friends and moved to where we now live in Edmonton, Alberta.

In my current position, I am jointly appointed between two departments: Math/Stat Sciences and Biological Sciences. This has had an amazing impact on the science I can do. I collaborate closely with biological colleagues on subjects as diverse as wolf movement, diseases in wild and farmed salmon, mountain pine beetle spread, and the energy dynamics of polar bears. Collaborations with my biological colleagues are invigorating, because the work can have direct policy implications as well as mathematical and scientific implications. This new direction of policy-relevant research suits me well. It is a way of impacting the society that funds my research primarily through tax dollars. At the same time, I collaborate with mathematical colleagues on problems in partial differential equations, nonlinear waves, and pattern formation. Often the interactions involve shared graduate students or postdocs.

The Society for Mathematical Biology has been a constant presence during my career, and I have benefited greatly from attending annual meetings. I was privileged to serve a term as President of the Society for Mathematical Biology, and am pleased to see the Society is thriving. I recently took on the role of co-Chief Editor for the Journal of Mathematical Biology, am active on the boards of several mathematics institutes, and direct a Centre for Mathematical Biology at Alberta. These activities allow me to give back to the field that has nurtured my career.

I find I am constantly learning from colleagues, many of whom have also become good friends. When I explain my work to them, I am challenged to become a better scientist and to develop my thinking in new directions. I also learn from students in the same way. In fact, I have very much enjoyed building up a dynamic lab group of over a dozen researchers, ranging in level from undergrad to research associate. Keeping the lab running is a big job, but it is rewarding to see students and postdocs working together and learning from each other. This also gives me enough time to slip out of the lab to prepare for class, revise a paper, or even write a short biography!

Selected publications of Mark Lewis

Molnar, P.K, Derocher, A.E., Lewis, M.A. Taylor, M.A. 2008. Modeling the mating system of polar bears - a mechanistic approach to the Allee effect. Proceedings of the Royal Society of London B. 275: 217-226.

de Camino Beck, T., Lewis, M.A. 2007. A new method for calculating net reproductive value from graph reduction with applications to the control of invasive species. Bulletin of Mathematical Biology: 69: 1341-1354

Eftimie, R., de Vries, G., Lewis, M.A. 2007. Complex spatial group patterns result from different animal communication mechanisms. Proceedings of the National Academy of Sciences. 104: 6974-6979.

Krkošek, M., Ford, J.S., Morton, A., Lele, S., Myers, R.A., Lewis, M.A. 2007. Declining wild salmon populations in relation to parasites from farm salmon. Science 318: 1772-1775

Lewis, M.A., Renclawowicz, J., van den Driessche, P. 2006. Traveling waves and spread rates for a West Nile virus model. Bulletin of Mathematical Biology: 68, 3-23.

Lutscher, F., Pachepsky, E., Lewis, M.A. 2005. The effect of dispersal patterns on stream populations. SIAM Review: 47, 749-772

Lewis, M.A., Li, B., Weinberger, H.F. 2002 Spreading speed and the linear determinacy for two-species competition models. Journal of Mathematical Biology: 45, 219-233

Parameter Estimation in Physiological Models
Euro Summer School Lipari (Sicily-Italy) 13-26 September 2009

Lipari 2009 Summer School

The 2009 Euro Summer School is part of a series of 4 events from 2007 to 2010: each event consists of a summer school and associated workshop on modeling of human physiological systems with medical applications. The events are sponsored by the European Union under the program Marie Curie Conferences and Training Course. The Lipari 2009 summer school will be dedicated to the study of modeling from the side of parameter estimation (when the investigator presumes a functional form for the family of models representing the system, and is trying to identify the relevant parameter values) and from the side of qualitative study of the models, both deterministics and stochastic (with the goal of assessing congruency of behavior of the model with the known features of the experimental system under investigation). This school will address mathematical modeling and statistical estimation in a single framework, will tightly integrate methods and applications, and will provide understanding of the methodological problems in this field and a frame of reference for more individually focused study after school.

The summer school is intended for PhD students and postdocs interested in parameter estimation for physiological models. The number of participants will be limited to 60. Potential participants with backgrounds in applied mathematics, bioengineering, or biomedicine are welcome. Acceptance to the school is competitive, aiming also at regional and gender balance. Eligible candidates (both from the EU and from outside the EU) will have complete financial support for living accommodations and possibly partial support for traveling to the school. Non-EU supported individuals may also participate paying a School Fee of 2300 Euro. School participation includes tuition, social events and full board with accommodation in double room starting Sunday evening, September 13th, 2009, until Saturday morning, September 26th, 2009. Please visit: http://www.biomatematica.it/lipari2009/financial_support.html to apply.

7th Australia – New Zealand Mathematics Convention
Amina Eladdadi

This is a joint Australia-NZ meeting, incorporating the 2008 Australian and NZ Mathematics Colloquium. The meeting took place in a beautiful summer week of December 2008 (summer down there!), in the gorgeous "garden city" of Christchurch in the South Island of NZ, known as "the world's aerial gateway to the Antarctic".

There were sixteen special sessions in this conference. Of interest to me was the Biology Modeling session which was organized by Tim David from the Centre for Bioengineering at University of Canterbury and James Sneyd from the University Auckland. A total of eighteen contributed talks in the Biology Modeling mini-symposium were presented. They covered a wide range of topics in mathematical biology including cancer modeling, calcium oscillation, population dynamics, and signaling networks among others.

In addition to the contributed talks, two plenary talks in biology modeling were given: one by David NJ Wall from Biomathematics Research Centre at the University of Canterbury, and another by James Sneyd from the University of Auckland. David NJ Wall gave a talk on age distribution models of cancer cell growth-transfer from in vivo to in vitro, whereas James Sneyd talked about calcium, smooth muscle and asthma. Of course, Mr James Sneyd with his good and "contagious" sense of the "kiwi" humor didn't forget to mention (or advertise if I may say) the new editions of their famous Mathematical Physiology book with James Keener "which is now in two volumes which is as twice as good as one volume!" as he put it. These two talks drew a lot of questions and interests from the audience, even more so than from the non-biology modeling plenary talks.

As a young researcher in the field of mathematical biology, I appreciated this opportunity to present our research (joint work with David Isaacson) in cancer modeling to an international audience, and interact with members from one of the leading cancer research and biomathematics centers in NZ. I would like to acknowledge and gratefully thank the Society of Mathematical Biology and the Association for Women in Mathematics for their generous financial support to attend this conference.

Positions Available

Postdoc: Biomathematics

Department of Biostatistics and Computational Biology, University of Rochester School of Medicine and Dentistry has an immediate opening for one post-doctoral fellow position in biomathematical modeling. The potential candidates are expected to have a strong background in applied mathematics or engineering (Ph.D. required), especially in differential equations, agent-based models or stochastic models. The successful candidate is expected to collaborate with immunologists and virologists to develop mathematical models for immune response to viral infection based on immunological experiment data. Please send CV, three references and other supporting materials to Dr. Hulin Wu, C/O: Ms. Debra Perno (Job Code: Math) debra_perno@urmc.rochester.edu

Postdoc: Modeling infectious diseases

We are seeking candidates with skills and interests in mathematical modeling of biological systems to become involved in one or more ongoing infectious disease projects with Dr. Andrew Park at the Odum School of Ecology at the University of Georgia, including: short-term pathogen evolution, the emergence of immune escape pathogen strains, vaccination and herd immunity strategies, the role of host heterogeneity in maintaining pathogen diversity or characterizing disease evolution trajectories. Funding is available for 18 months, with the possibility of extension. Applicants should email a statement of interest, CV, and arrange to have 3 letters of recommendation sent to Dr. Park (awpark@uga.edu). Applications received before 28 May 2009 will be reviewed and the position can be taken up from July 2009, or later.

Postdoc: Computational Systems Biology

Postdoctoral Position in Computational Systems Biology and Bioengineering is available in the laboratory of Prof. Igoshin in the Dept of Bioengineering at Rice University. We are recruiting one postdoctoral researcher to work on statistical image analysis and quantification of the dynamic biofilms formed by Myxobacteria. The main project for this position would be to determine quantitative pattern descriptions (features) that describe biofilm phenotypes and distinguish mutant strains from wild-type strains. The position is open from July 1, 2009 until filled. The initial appointment is for 1 year with possible continuation for the second year upon satisfactory performance. Please visit http://igoshin.rice.edu/ or contact Prof. Igoshin for more information. Applicants should submit their resume and letter stating their research interests to igoshin@rice.edu.
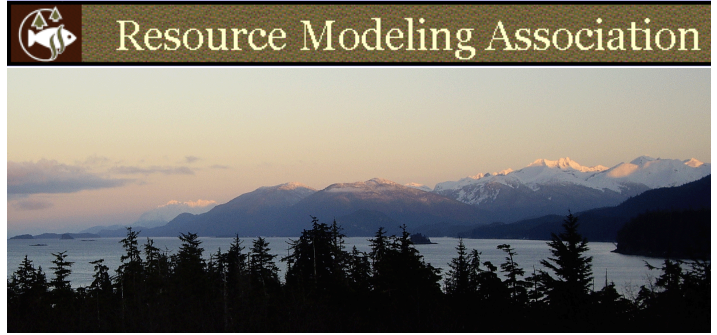
PhD Students & Postdocs: Basque Center

The BCAM - Basque Center for Applied Mathematics has opened an international call for Postdocs and PhD Students to join one of the Research Teams on: PDEs, Numerics and Control, Multiphysics, Inversion and Petroleum, Network Design, Analysis and Optimization. Calculus of Variations and Elasticity, Mathematical Biology. Applications MUST be submitted on-line at: www.bcamath.org/joboffers. More information on the research teams of BCAM can be found at: www.bcamath.org

Postdoc: PBPK Modeling

A postdoc is available in PBPK modeling at the Pacific Northwest National Laboratory (PNNL). Funding for this position is available through one of several research programs related to development and application of PBPK/PD models for research design, biomonitoring and risk assessment. The successful candidate will have a strong background in mathematics and statistics, including some exposure to Bayesian methods and have developed PBPK/PD models. Apply on-line at www.jobs.pnl.gov and reference job ID # 116965. Applicants should also send a cover letter, CV, and three references to: Justin Teeguarden, Ph.D., DABT, Pacific Northwest National Laboratory, Biological Monitoring and Modeling Group, P.O. Box 999, MSIN P7-59, Richland, WA 99352

Research Position: Neural Network Modeling

The Theoretical Neurobiology group (http://www.tnb.ua.ac.be) at the University of Antwerp, Belgium seeks a researcher specialized in neural network modeling to work at the Belgian National Neuroinformatics Node of the INCF (http://www.incf.org). Preference is given to postdocs but experienced PhD candidates will also be considered. The researcher will combine modeling of cerebellar networks (supervisor Prof. E. De Schutter) or cortical networks (supervisor Prof. M. Giugliano) with the development of an ontology of terms relevant for network models consisting of spiking neurons. Appointment can start anytime and preferentially by summer 2009. For further information or application (with full CV): contact Prof. E. De Schutter at erik@tnb.ua.ac.be

PhD studentship: Mathematical Aquaculture

A fully funded research studentship starting in October 2009 is available at the University of Stirling. The studentship will involve modelling the biology and control of salmon lice on farmed Atlantic salmon. The student will be co-supervised by Jozsef Farkas (Department of Computing Science and Mathematics) and Darren Green (Institute of Aquaculture). Complete applications, consisting of application form (available at http://www.cs.stir.ac.uk/~jzf) and curriculum vitae, with the name and contact details of two referees (at least one academic referee) should be submitted to Dr. Jozsef Farkas (jzf@maths.stir.ac.uk) by 16/05/2009. For further details please contact either Dr. Farkas or Dr. Darren Green darren.green@stir.ac.uk.

Postdoc: Evolutionary Biology

Two post-doc positions (2 years) in evolutionary biology are available at Umea University, Department of Ecology and Environmental Science, Sweden. Position 1 investigates the role of climate variability for the diversification of species. Position 2 tests how climatic variability affects the degree of genetic divergence among populations. For further information and guide on how to apply, see http://www8.umu.se/umu/aktuellt/arkiv/lediga_tjanster/315-301-09.html, or contact Roland Jansson (roland.jansson@emg.umu.se, www.emg.umu.se/roland). Last day for application is May 31, 2009.

Postdoc: Fields-Centre for Math Medicine

The Centre for Mathematical Medicine (CMM) hosted at the Fields Institute, Toronto, invites applications for candidates for a number of CMM-Fields postdoctoral fellowships to commence July 1, 2009 or a negotiable date thereafter. While positions are open to all areas of mathematical medicine and biology, preference will be given to those individuals with research interests in the current principal areas of CMM focus: mathematical oncology, computational neuroscience, and biomechanics of soft tissues or bioinformatics. In particular, we are looking for individuals interested in collaborative interaction with clinicians and experimentalists. To guarantee consideration postdoctoral applications should be received by June 1, 2009. (NOTE: late applications will be accepted until the positions are filled). Applicants must apply through https://www.mathjobs.org/jobs/Fields/1632

Resource Modeling Association

2009 World Conference on Natural Resource Modeling Juneau, Alaska June 17-19, 2009

This multidisciplinary conference is being sponsored by the Resource Modeling Association to provide a forum for new developments in modeling and analysis of natural resource systems, particularly ecological, economic and management aspects in forestry, fisheries, wildlife, ecosystem and biodiversity conservation, and management of multiple use resources. We are particularly interested in papers and posters that report on research that explores trade-offs between simple and complex models of complex natural systems.

Call for Papers: Abstracts of 100-200 words are welcome, submitted by e-mail if possible. Please note author's name and address, title of presentation, and whether oral or poster presentation is preferred. Deadline: May 1, 2009. Send abstracts to k.criddle@uaf.edu

More information at http://www.resourcemodeling.org/conferences.htm

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Editor's Notes:

We invite submissions including summaries of previous mathematical biology meetings, invitations to upcoming conferences, commentaries, book reviews or suggestions for other future columns. The deadline is the 15th of the month prior to publication.

The SMB Newsletter is published in January, May and September by the Society of Mathematical Biology for its members. The Society for Mathematical Biology is an international society which exists to promote and foster interactions between the mathematical and biological sciences communities through membership, journal publications, travel support and conferences. Please visit our website: http://www.smb.org for more information.

Holly Gaff, Editor, editor@smb.org