The Society for Mathematical Biology

SMB Newsletter

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Inside this Issue:

Letter from President....2

News from Mathematical Biology Institutes....3

Report from SMB 2010 Annual Meeting....4-5

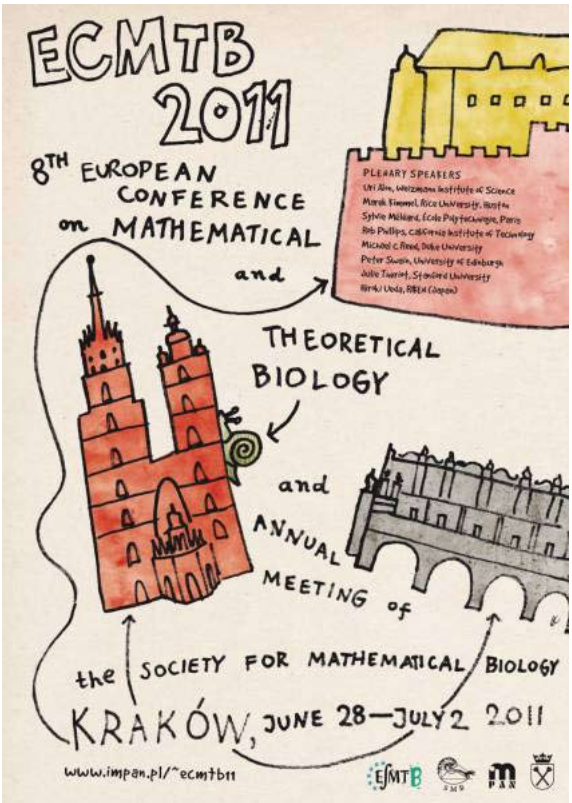
ASI and Workshop on Mathematical Modeling of Conservation Biology....6-7

My Career in Math Biology: Raymond Mejia....8-9

Buea International Conference on Mathematical Science....10-11

NIH Earl Stadtman Investigator Opportunity....12-13

Positions Available....13-16



Mark your calendars!

European Conference on Mathematical and Theoretical Biology 2011

http://www.impan.pl/~ecmtb11/

The joint triennial meeting of the European Society for Mathematical and Theoretical Biology and annual meeting of the Society for Mathematical Biology

will be held in

Kraków, Poland

June 28 - July 2, 2011

Dear SMB members,

The end of summer is close upon us, and I am still enjoying revisiting the things that I heard and saw at the Annual meeting in Rio de Janiero two weeks ago. There we were able to announce the results of our recent elections and the President-elect is Gerda de Vries, and three new members of the Board of Directors were introduced (Holly Gaff, Heiko Enderling, and Claudia Neuhauser). The slate of candidates standing for election was excellent and I thank all who allowed their names to be put forward.

Though our attendance was disappointingly small (about half normal, no doubt in large part because of the travel expense) we were treated to a delightful array of plenary lectures, contributed talks, talks in mini-symposia, and posters on so many aspects of mathematical biology that it fairly boggled the mind. The Scientific Advisory Committee did a wonderful job of identifying first-class speakers for the plenary lectures, and I was pleased to hear long time friends as well as make the acquaintance of several new colleagues who I had either heard of but never met, and some who were totally unknown to me. All in all, I thought that the meeting was a great success and if you are interested in the impressions of two students see the article by Lennart Hilbert and Romain Yvinec on pages 4-5.

The plenary lectures were held in wonderful facilities the School of Naval Warfare of the Brazilian Navy which gladdened my heart but also offered a bit of comic theatre as some attendees in shorts were turned away by the guards the first morning. Including some luminaries! The conference dinner on the Wednesday evening was held at the Officer's Club, and the attendance at the Thursday morning plenary lectures was noticeably thin due, no doubt, to the free and copious supply of glasses of Caipirinha--the Brazilian national drink.

Last week, one evening after dinner I was lying on my back outside gazing up at the sky which was brilliantly clear with the Milky Way spread from horizon to horizon, and watching the meteors falling as it was the first evening of the Perseids showers. According to a recent poll, 40% of the people living in one of the most powerful and influential countries of the world are of the opinion that the universe was created 6,000 years ago which is quite astonishing. However, whenever the Universe came into existence, simply spending an hour or so gazing at the splendor of it all in total silence is enough to place anyone in awe of the wonder of it all.

Our flagship journal, the Bulletin of Mathematical Biology, is undergoing some changes that will only enhance its prestige. Under the able direction of Editor Philip Maini, the Editorial Board is being revamped which will aid him in his work and streamline the refereeing process. Additionally we are moving from 8 to 12 issues yearly, which will help in the timely appearance of accepted papers. The publisher, Springer, will keep the price the same for the BMB if you have an electronic subscription, but if you opt for the print version there will be an increased cost. I strongly urge you to consider the online version as your option unless there is some compelling reason to do otherwise.

Membership in the SMB has been somewhat stagnant for the past few years, and Board members Heiko Enderling and Holly Gaff have taken on the task of finding innovative ways to induce likely members to join. Also, apparently many members have been remiss in paying their membership dues and if you are in arrears I urge you to rectify the situation immediately. It is easy to do.

For many of us, the next two weeks will be a hectic mixture of the last of holidays combined with preparation for the commencement of Fall classes, and I can feel that it is going to be soon as the evenings are much cooler that last couple of weeks. I have always enjoyed the start of term, ever since my undergraduate days, as I find the excitement of a new school year never seems to wear thin. Whatever awaits you in the next month, I wish you success in your endeavors and good rest of 2010.

Warm regards,
Michael Mackey

News from NIMBioS

Recent events:
Research Experience for Undergraduates (REU) and Research Experience for Veterinary Students (REV), June 7 - July 30. Thirteen undergraduates, 3 veterinary students and 2 high school teachers from 16 different institutions across the United States recently completed the 2010 NIMBioS REU and REV program at the interface of mathematics and biology.

Computational Biology Curriculum Development Tutorial, July 6-9. Co-hosted with BioQUEST Curriculum Consortium, SCALE-IT, the University of Tennessee, and Oak Ridge National Laboratory, this tutorial focused on helping graduate students and faculty develop curriculum resources and teaching approaches that reflect modern biological problem solving as well as engage students with the use of emerging computational tools and data.

Investigative Workshop: Modeling Reef Ecosystems, July 21-23. This workshop would examined the potential for development of a comprehensive coral reef systems model that links multiple interacting environmental stressors to the state and dynamics of reef ecosystems from coastal bays to coral reefs.

Graph Theory and Biological Networks Tutorial, Aug. 16-18. This tutorial led by two mathematicians and two biologists invited biologists, mathematicians and computer scientists to learn more about graph theory.

Upcoming events:
Undergraduate Research at the Interface of Mathematics and Biology, Nov. 19-20. This second annual conference, to be held at the Univ. of Tennessee Conference Center, provides opportunities for undergraduates to present their research at the interface of biology and mathematics. Student talks and posters will be featured as well as a plenary speaker. Application deadline to request funding for the conference is Oct. 1, 2010. For more information about the conference and details about the funding request, go to http://www.nimbios.org/education/undergrad_conf2010.html

Investigative Workshop: Solid Tumor Modeling, Jan. 19-21, 2011. Current achievements and challenges in modeling solid tumors in the human body will be discussed, and areas that could improve our understanding of tumor development and treatment will be identified. Application deadline: October 15. For more information about the workshop and how to apply, go to http://www.nimbios.org/workshops/WS_tumor_modeling.html

Investigative Workshop: Mathematical Models of Metabolism and Body Weight Regulation, July 12-15, 2011. With more than two-thirds of US adults considered overweight and more than one-third categorized as obese, understanding the mechanisms behind weight gain, loss and maintenance is a major national goal. Mathematical modeling of the metabolism and body weight regulation is an important and growing subfield of obesity research. Application deadline: March 14, 2011. For more information about the workshop and how to apply, http://www.nimbios.org/workshops/WS_metabolism

News from MBI

Current Topic Workshop: Bootcamp in Cancer Modeling, September 7-10, 2010, http://www.mbi.osu.edu/2010/btcmpdescription.html

Workshop 1: Mathematical Modeling of Plant Development, September 27-October 1, 2010, http://www.mbi.osu.edu/2010/ws1description.html

Workshop 2: Circadian Clocks in Plants and Fungi, October 25-29, 2010, http://www.mbi.osu.edu/2010/ws2description.html

Current Topic Workshop: Blackwell-Tapia Conference, November 5-6, 2010, http://www.mbi.osu.edu/2010/ctwdescription.html

SMB Annual Meeting 2010

Lennart Hilbert and Romain Yvinec

Before, during and after the SMB/BIOMAT joint meeting (24-29 July, 2010) in Rio de Janeiro, Brazil, we experienced a whole number of exciting first times: the SMB meeting in South America, the SMB and the BIOMAT coming together as a joint meeting – and for the two authors, the first time to attend a scientific conference. How do first times feel? New. Adventurous. We lack a standard method. Maybe because all this excites our neural networks tremendously, we learn most in these moments. It is in the nature of first times, that some little details do not work perfectly, yes. But what will stay as a memory is the magic of having done what had not been tried before, and that everything actually did work out really, really well.

The SMB/BIOMAT 2010 took place in Brazil. This was (also) a first time at a South American location, and this for sure is good news. Many people came from all over the world, including many Brazilian people of course. This was a very nice melting-pot; the sciences thrive on that. "Diversity helps cooperation," as Francisco Santos concluded nicely in a mini-symposium.

Also, it was for the first time a joint meeting of both BIOMAT and SMB. The SMB program included contributed talks, mini-symposia, plenary talks and a poster session. It was paralleled by plenary talks from BIOMAT, which took place at the same time as the SMB contributed talks and mini-symposia. On the one hand, this seriously beefed up the conference profile. On the other hand, the dilemma of not being able to attend all the interesting sessions got even worse from it. After all – what's better than being at a conference with more interesting talks than you can attend?

Additionally, BIOMAT provided two days of tutorials, aimed at fostering and promoting interdisciplinary research, which preceded the main conference. During these two days the conference and organization was not going at full pace yet – which effectively allowed for making connections amongst the "new arrivals", and for colloquial discussion with the presenters. Personally, we both learned especially from the personal discussion with the presenters.

Not a first time, but the first thing every morning, were the SMB plenary sessions. Their high level, the diversity of subjects, and the accessible and exciting delivery were delightful. While the talks were updates on the forefront of Mathematical Biology, they were also engaging examples for students just entering the field.

Further, some special sessions and social events went perfectly well, giving excitement to all those attending. Among these events, the Lee Segel prize session, the Torcom Chorbajian reception or the Conference Dinner in front of the sea was specially appreciated. For us (who came into the biological sciences through the back door from Mathematics and Physics), the Lee Segel prize talk, explaining vividly how to introduce mathematics into actual biological undergraduate curricula, was a rare and refreshing additional perspective.

Top Left : Scenic Rio de Janeiro
Above: Michael Mackey (SMB President), Meghan Burke (SMB Education Committee Chair) and others enjoy the meeting.

Left: Conference Venue in Urca
Above: Charles Pearce, Torcom Chorbajian (SMB Treasurer) and John Bush (Torcom Chorbajian Lecturer)

So, how was our personal first time at an international conference?

The coffee breaks, lunch times and receptions definitely set up a nice "background" to meet many other scientists. We found it amazing, that from students to professors, across the manifold of most diverse research interests, all contact was characterized by an extreme approachability. Sometimes "random collisions and human noise" in the reception hall made a clear conversation difficult business, so some dedicated discussion areas and time slots with seating could have helped. However, equipped with exquisite wine and snacks, we found that the front stairs were happily occupied for discussions (of which both of us had plenty!), and we even noticed a stand-up lecture there.

The afternoon sessions were a rich bundle of talks, rich in both quality and quantity. The topics covered many thrilling areas, from population dynamics, epidemics, to biochemistry, going through evolutionary of systems biology, and the mixture of speakers was truly multidisciplinary. At this density of interesting material, many participants tried hopping between sessions, which often did not work out because of some (small) troubles in paralleling the sessions and sticking to the program. However, first, this is a very hard job to do, which we totally acknowledge, and second, there was space for a lot of discussion, which, in our opinion, more than made up for any possible trouble.

What have we not mentioned so far? The many "off" events, which came up between participants. We enjoyed, for example, climbing the sugar loaf, strolling along Ipanema beach, and the bustling and spinning night life in Lapa.

The bottom line: The conference definitely had a special air to it – finding the golden mean between the organizer's Brazilian spontaneity and the participants' expectations of a minutely planned (and executed) protocol left both sides richer in experience and insights, and we think that after some initial confusion, everybody enjoyed it and learnt a lot. Clearly, this is the personal opinion of two young students, based on our (naturally) limited experience of the SMB/BIOMAT joint meeting. Still, from this limited perspective, we want to say: Thank you, for magnificent science, the joyful moments at the conference, and great times in Rio!

John Jungck, Michael Mackey, Brynja Kohler (Lee Segel Prize winner), Philip Maini (BMB Editor)

Advanced Study Institute and Workshop on Mathematical Modeling in Conservation Biology at the Southern African Wildlife College

Nina Fefferman, Sadie Ryan and Fred Roberts

To support and expand the collaborative network and interdisciplinary knowledge base in the field of mathematical modeling of questions in conservation biology among Africans and Americans, graduate students and researchers from the United States and eight countries throughout Africa met in South Africa from July 28th to August 13th. The venue was changed at the last minute from Kenya to South Africa due to safety concerns. The first week and a half (hosted at the WITS Rural Facility and then at the Southern African Wildlife College) were dedicated to a research-based, multidisciplinary, collaborative learning experience for graduate students from Botswana, Cameroon, Morocco, Nigeria, Rwanda, South Africa, Tanzania, Tunisia, and the United States. This Advanced Study Institute (ASI) welcomed students from the fields of mathematics, ecology, conservation biology, and wildlife and natural resource management.

Guest researchers working in the field of mathematical modeling for conservation biology (see list below) provided an initial series of introductory lectures in harvesting, plant and animal disease modeling, population viability analysis, global climate change, conservation genetics, remote sensing, reserve design, network models, and practical concerns in real-world conservation and management. Each of these lectures was meant to establish a common background among the students, and to cover the full breadth of the various fields pertinent to research into questions in mathematical modeling in conservation biology. These lectures were augmented with computational exercises, in multiple software platforms, giving students hands-on experience and coded examples to build on. After only a few days, the students formed small groups in which they defined, and then pursued research into open problems relevant to conservation and management efforts in Africa. Selection of projects and the course of the research were guided carefully by the Institute Organizer (Holly Gaff, Old Dominion University) and the staff of participating researchers (again, see list below) to encourage a diversity of concepts and ability of the outcome to inform real-world policy decisions once the research was accomplished. The student research projects included modeling of the spread of canine distemper among wild dogs, the movement of buffalo between grassland and water, the combined population impacts of climate change and spread of bovine tuberculosis in buffalo, fire and herbivory impacts on woodland vegetation, viability of red howler monkeys, and the trade-off between logging and maintaining habitat for endangered chimpanzees.

Above: ASI Participants included students and faculty from the US and Africa.

As a capstone event to the ASI, the

students were then able to participate in a Workshop, involving a broader diversity of researchers from North America and Africa. Workshop speakers included the Institute lecturers and additional experts (see list below), in a program organized by Wayne Getz (University of California, Berkeley). The ASI student research groups made two presentations: once to introduce their chosen research topics, modeling/research strategies, and plans for continuation of the work for the future to obtain feedback from their colleagues and the ASI organizers and guest researchers, and then a second time to present their initial results as part of the Workshop. All participants committed to continuing their research after the formal close of the ASI, working towards the production of a manuscript to be submitted for publication. In this way, the structure of the research experience not only expanded the students' understanding and capability within the field of mathematical conservation biology, but also continues to foster ongoing intercontinental collaborations with fellow students in hopes of generating a truly global cohort of life-long colleagues.

The organizers are very grateful to the Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), the Mathematical Biosciences Institute at Ohio State University (MBI), the Society for Mathematical Biology (SMB), the London Mathematical Society (LMS), and the US National Science Foundation (NSF) for their generosity in supporting these efforts.

Further details about both the ASI and Workshop in Conservation Biology are available at the website: http://dimacs.rutgers.edu/Workshops/ASIConsBio/. List of Advanced Study Institute Guest Researchers: Steve Bellan, UC Berkeley; Nina H. Fefferman, DIMACS, Rutgers University; Avner Friedman, MBI, Ohio State Univ.; Edward Lungu, Univ. of Botswana, James Osundwa, UN Environment Programme, Kenya; Fred Roberts, DIMACS, Rutgers Univ; Gareth Russell, NJIT; Sadie Ryan, UC Santa Barbara; Michael Washington, CDC; Aziz Yakubu, Howard University.
List of Workshop Speakers in addition to Advanced Study Institute Guest Researchers: Rauri Bowie, UC Berkeley; Justin Brashares, UC Berkeley; Joel Hartter, U. of New Hampshire; Ned Horning, American Museum of Natural History; Emile Chimusa Rugamika, University of Cape Town.

The Editors and Publisher are pleased to award the inaugural

Lord Robert May Prize

for the best paper published in the 2007 and 2008 volumes of **Journal of Biological Dynamics** jointly to

Stanley H. Faeth, Karl P. Hadeler and Horst R. Thieme for their paper "An apparent paradox of horizontal and vertical disease transmission" published in volume 1, number 1, 2007, 45-62 Available online at http://dx.doi.org/10.1080/17513750601040367

and

H.T. Banks, M. Davidian, Shuhua Hu, Grace M. Kepler and E.S. Rosenberg for their paper "Modelling HIV immune response and validation with clinical data" published in volume 2, number 4, 2008, 357-385 Available online at http://dx.doi.org/10.1080/17513750701813184

Both papers will be freely available until the end of 2010. For more information on the Lord Robert May Prize, please visit www.tandf.co.uk/journals/pdf/competitions/tjbd.pdf.

My Career in Mathematical Biology
A Personal Journey

Ray Mejia

My Path to Mathematical Biology: A Random Walk?

I was born in Puerto Rico and spent my early years in a busy small town, Humacao, named after Taino Chief Jumacao. My parents were both medical doctors who visited Puerto Rico on vacation, saw a need, and decided to stay on the island. I learned early to seek challenge as my parents did, retraining from internal medicine and ob-gyn to general surgery and anesthesiology, respectively, and operating a small farm during W.W.II, when there was a dire shortage of beef, milk and eggs. Beginning in elementary school I learned to question convention from Marina L. Molina, a school teacher and poet with an enthusiasm for learning, who sat reading on her front porch with a 38 caliber revolver under a light shawl on her lap "to show to any unruly passerby that might approach without permission".

My first interest in mathematics was probably stimulated while tracking hurricanes as they formed west of Africa and headed over the South Atlantic Ocean toward the Caribbean. This not only taught me to plot position on a map, but also prediction of a storm track and introduced me to English, since most of the radio stations that provided detailed weather information broadcast in English. My first investigation in physiology may have been with a pet rabbit, although I have been told that it did not end well for the rabbit. As a teenager I had an interest in billiards (applying geometry to hit two balls with a third with a force and direction that would leave the balls well-positioned for the next shot). Thirty-one, a variant of blackjack, made it profitable to card count and estimate probabilities. Sports such as basketball taught me discipline and the importance of angles, both in use of the backboard and in running plays, and helped me develop lasting friendships at school, work and conferences.

After several years of high school study on the U.S. mainland, my interests led to work as a laboratory technician during summers in Puerto Rico. The head technician would train students in the lab's work at the beginning of the summer, before s/he took a vacation. Doing chemical analyses taught lab technique, how to follow a recipe, as well as development of rapport with patients, whom one stuck with needles, and hospital staff, who wanted the results "pronto". It also allowed students to advance in skill and responsibility and taught instruction of others.

At a small arts/science/engineering school, Manhattan College, in New York City I majored in mathematics and minored in biology and chemistry. Fortuitously, during my third year IBM offered a computer course at a nearby women's college in a recruitment effort. It led me to become interested in numerical analysis, and resulted in several years of work at a Navy research laboratory, the David Taylor Model Basin (now the Naval Ship Warfare Center in Carderock, MD). At the same time I began graduate work at the University of Maryland under the direction of Ron Strauss until his untimely death at the age of 38. (Ron produced two mathematics progeny and over 115 grandchildren!)

The years at the Model Basin were great fun, working with many dedicated mathematicians and scientists in several disciplines, including

Betty Cuthill, Joanna Schot, Harry Polachek, Charlie Dawson, Feodor Theilheimer, Kent Meals, Joe Johnson and Lenny Mockapetris. We also collaborated with several laboratories including the Oak Ridge National Lab, which was an early proponent of mathematical biology. This introduced me to multidisciplinary research.

When Marvin Shapiro, a mathematician at the National Institutes of Health, suggested that I might join a fledgling group of mathematical and computational scientists at the Division of Computer Research and Technology (now the Center for Information Technology), I jumped at the opportunity to apply mathematics in biology.

The laboratory directed by Gene Harris was composed of statisticians, mathematicians and computer scientists who collaborated with NIH bench scientists. This lead to completion of work initiated at the Model Basin on techniques to analyze time series (with Chia Chang), which resulted in a text and suite of computer programs that was used to instruct investigators in the analysis of biological data. It also allowed me to work with a dedicated neurosurgeon, Maitland Baldwin, who would describe in detail the surgical procedure underway to all within earshot.

Work with John Stephenson (SMB President 1983-5; see http://www.smb.org/governance/presidents.shtml) led to research at the National Heart, Lung and Blood Institute on kidney physiology and membrane transport and thirty years as "guest worker" at the Mathematical Research Branch (now the Laboratory of Biological Modeling) of the National Institute of Diabetes, Digestive and Kidney Diseases. John was an engaging, insightful biophysicist who helped his fellows to develop their scientific insight, and was the first to postulate mathematical models of the mammalian urine concentration mechanism. MRB was founded by John "Zim" Hearon - since lead by John Rinzel and now Artie Sherman - all well-known to many SMB members. To date, LBM continues to focus on research that includes computational neuroscience, integrative physiology, and computational chemistry. See http://lbm.niddk.nih.gov/sherman/tmp/A brief history of LBM (MRB) [6 final].pps for a brief history of LBM and mathematical biology at NIH. Collaboration at NHLBI, in particular with Mark Knepper and Bob Balaban, as well as with fellows and former fellows, has resulted in work in mathematical and integrative physiology that has advanced the field.

I have learned along the way that internships are valuable in learning about one's likes and dislikes prior to making a larger investment in time and energy, and that being an integral part of a work/research group is a key to success in interdisciplinary research. We must encourage students to broaden their exposure to the sciences, so that they are better prepared for interdisciplinary work. Co-op programs broaden the experience of students when they include rotation among disciplines. Post-Bac programs prepare students for graduate work after their undergraduate years. However, both lengthen the time to complete a degree program. On the other hand, thoughtful mentoring can direct students to a goal earlier in their professional development, and I have seen the most success when mentoring is an integral part of a training program. Thus, I am especially pleased to see SMB lead in outreach, education and mentoring programs that we should all support.

See http://mrb.niddk.nih.gov/ray/Pubs.Ray.html for a brief list of publications.

Ray Mejia with Lou Gross, John Jungck and Torcom Chorbajian at the SMB Annual Meeting 2010

A Report on the First Buea International Conference on Mathematical Science

Miranda Teboh-Ewungkem

The First Buea International Conference on Mathematical Science (BICMS09) (May 12-15, 2009), dovetailed by a workshop on Mathematical Biology (May 15-17, 2009), took place at the University of Buea, located in the town of Buea situated in the South West Region of Cameroon in the continent of Africa. The conference brought together about 120 participants from 12 different countries around the world (Cameroon, USA, Canada, UK, Belgium, Germany, Sweden, France, Portugal, Guadalupe, Nigeria and Kenya), of which 50 stayed on for the workshop on Mathematical Biology.

The conference began with an opening word from the Dean of the faculty of science of the University of Buea, Prof. Therese Nkou-Akenji. After her opening remarks, the first two plenary talks were respectively delivered by Dan Burns (University of Michigan, USA) and Abba Gumel (University of Manitoba, Canada). Following their presentations, all the participants moved to the official opening of the conference and workshop. During this opening ceremony, in which many dignitaries and the Vice Chancellor of the University of Buea were present, another plenary talk was delivered by the Pro-Chancellor of the University of Buea, Prof. Maurice Tchuente. His talk highlighted some assets as keys to the success of mathematics and research in mathematics in Africa, for example, dynamism of researchers, good cooperation with other world universities including US universities and prestigious mentorship. Following his presentation was a short break, and the last plenary session of the day, delivered by Monica Neagoy (Monica Neagoy Mathematics Consulting Services). These four plenary sessions served as the entry point into the various contributed sessions which took place for the remainder of the day. One of the sessions was focused on talks on different mathematical biology subjects, with talks by Emmanuel Abatih (one of the participants sponsored by SMB World Outreach Committee (WOC), Institute of Tropical Medicine, Belgium) and Sarah Olson (Tulane University, USA).

On May 13th, the conference began with a plenary talk from Prof. Philip Maini (Oxford University, UK) who is also the current editor of the BMB. His talk was followed by a second plenary talk delivered by Werner Varnhorn (Kassel University, Germany). The afternoon contributed sessions included talks presented by Angela Gallegos (Tulane University/Occidental College, USA), Omayra Ortega (Arizona State University, USA), Asamoah Nkwanta (Morgan State University, USA) and Edith Umeh (Nnamdi Azikwe University, Nigeria, a WOC funded participant). After these sessions and a lunch break, there were 2 more plenary talks, one given by Gaston N'Guerekata (Morgan State University, USA) and the other by Abdul-Aziz Yakubu (Howard University, USA). The day ended with an excursion with visits to see the old German buildings in Buea, the vast Tole Tea estate plantation and the beautiful Bakingili volcanic eruption site. Dinner was served at the Limbe Botanical Garden over looking the Atlantic Ocean.

The last day of the conference had four plenary sessions and three concurrent contributed sessions. The four plenary talks were presented by Nicolas Gabriel Anjiga (Ecole Normal Superieure, Cameroon), Ralf Wunderlich (Zwickau University of Applied Mathematics, Germany), Francis Fai Mbutum (University of Buea, Cameroon) with Muluh Sama (Chief Examiner of A-Level mathematics for Cameroon GCE) and Anders Wandahl (e-math for Africa). Anders Wandahl provided the African participants with information to a good number of free online mathematics research tools and sites geared towards connecting the African mathematics population to the vast resources available to mathematicians in the world at large. The day ended with three

events: A panel/closing session which included a prize ceremony, dinner and a cultural evening. The panel discussion focused on the challenges and prospects of mathematical sciences in Africa, specifically in Cameroon. During this panel session, ideas were discussed on how to enhance the mathematical program and what is needed to hopefully create an institute to serve West Africa, as AIMS does for South Africa. At the prize award ceremony, organized by the University of Buea Mathematics Alumni, five prizes were awarded to deserving faculty members, undergraduate and graduate students. Two additional prizes (The Dr. Miranda Teboh-Ewungkem Awards) were awarded to the top undergraduate and graduate female students. All the awards were designed to encourage the enrollment and excellence of students into the mathematical sciences. Following the panel discussion/prize award ceremony was a short coffee break and the much awaited poster session in which eight students presented their posters. The presenters were Carl Ballard (Arizona State University, USA), Valerie Nelson (Morgan State University, USA), Calistus Ngonghala (West Virginia University, USA, WOC funded participant), Mechie Nkengla (University of Illinois in Chicago, USA), Devroy McFarlane (Howard University, USA), Helene Nguewou (Morgan State University, USA), Doriano-Boris Pougaza (Universite Paris-Sud 11, France) and Siewe Nouridine (University of Buea, Cameroon). After the poster sessions the participants all retired for a much deserved dinner filled with many delicacies from Cameroon and an enriching cultural story telling dance called the Elephant Dance. The University of Buea Choir sang traditional songs wearing traditional wear from different cultural regions of Cameroon.

Left: All workshop participants.
Above: Dancing on stage during cultural evening

At the end of the evening, the participants all found themselves on stage during the closing dance.

The workshop on mathematical biology started on May 15 with 50 participants. After short opening remarks from Gideon Ngwa, Abba Gumel and Philip Maini, the workshop problems were presented. There were numerous possible areas and topics from which participants were to identify problems of interest. Four main topics of interest were selected from the group: mathematical modeling of malaria, HIV/AIDS, the dynamics of malaria mosquito vectors, and tumor growth. From these four main topics, six groups were formed with the three malaria groups.

Mentors and facilitators were assigned to each of the six groups as follows: Philip Maini (tumor group), Abdul-Aziz Yakubu (the malaria groups and the mosquito dynamics group), Abba Gumel (the mosquito dynamics group and the HIV/AIDS group), Gideon Ngwa (the mosquito dynamics group) and Miranda I. Teboh-Ewungkem (the malaria groups). With groups formed and facilitators and mentors assigned, group members within each group moved into various classrooms for breakout sessions to discuss about their respective problems.

The groups spent the next day in various classrooms and/or the computer room for further discussions on their problems. Late that afternoon, the groups convened into the main hall for presentations. There were brief presentations from each of the six groups on their progress and plans for future collaboration. Presentations were given mostly by students within each group, almost all of whom were presenting for their very first time. The last day of the workshop, some of the participants hiked up Mount Cameroon, one of Africa's largest volcanoes and the highest mountain in West Africa, rising to 4,095m.

We are thankful to the SMB and the WOC for supporting the participation of three participants (Ngonghala Calistus, USA, Emmanuel Abatih, Germany and Edith Umeh, Nigeria); to Philip Maini, Aziz Yakubu and Abba Gumel for their mentorship and dedication to ensuring the success of the workshop; and to Dan Burns and Asamoah Nkwanta for their time at both the conference and workshop. In all, there were 50 participants for the workshop, 17 from the US, one from Canada, five from Europe and the rest from Africa. Please check the conference website at http://www.bueaconference.com for beautiful photos uploaded by Nkem Amin Khumbah as well as more information.

NIH Intramural Research Program is Recruiting "Earl Stadtman Investigators"

The National Institutes of Health, the nation's premier agency for biomedical and behavioral research, is pleased to announce a new call for top-tier tenure-track candidates to become "NIH Earl Stadtman Investigators." We have multiple positions to offer.

We are looking for creative and independent thinkers eager to take on high-risk, high-impact research. Regardless of your expertise — in the field or in the lab (wet or dry), within a discipline well established or on the frontiers of science — please consider the NIH for your career development. Areas of active recruitment include sensory biology and the neurosciences, symptoms research, systems biology, stem cells, infectious diseases and bioinformatics.

Who we are: Among our approximately 1,200 principal investigators and 4,000 trainees actively engaged in research are world-renowned experts in immunology, cancer, rare diseases, genetics, translational research, imaging, vaccine development, health disparities, systems biology, sensory biology, structural biology, computational biology, neurosciences, and development, to name but a few scientific areas. Our strength is our diversity in pursuit of a common goal, to alleviate human suffering.

The intramural program includes the NIH Clinical Center, the world's largest hospital entirely devoted to biomedical research, as well as the National Library of Medicine and PubMed, the Vaccine Research Center, and the International Centers for Excellence in Research working in the field in sub-Sahara Africa, South America and Asia. We constitute the world's largest training facility for the biomedical and behavioral sciences. Our researchers include numerous members of the National Academy of Sciences and the Institute of Medicine, Searle Scholars, winners of the Lasker Award, Nobel Prize, the National Medal of Science and the Presidential Early Career Awards, and recipients of many other high honors. Among us are the editors of top journals, the writers of some of the most highly cited papers in the biomedical sciences, and generators of licenses and patents yielding nearly $100 million in annual royalties. We are on the cutting edge of new discoveries and their application to the clinic. We perform work in labs, in clinics, out in the field, and on nearly every continent; and every day we advance the state of science to improve the quality of life.

What we seek: To maintain our position at the cutting edge, we seek the continued infusion of a diverse and creative staff. The Earl Stadtman Investigator recruitment is an opportunity to explore the limits of your productivity and your independence from preconceived research objectives. Please share with us your ideas for a novel research program and career aspirations and how they contribute to the NIH mission.

Qualifications/eligibility: Candidates must have an M.D., Ph.D., D.D.S./D.M.D., D.V.M, D.O., R.N./Ph.D., or equivalent doctoral degree and have an outstanding record of research accomplishments as evidenced by publications in major peer-reviewed journals. Preference will be given to applicants who are in the early stages of their research careers; only non-tenured applicants will be considered. Candidates in any area of biomedical, translational and behavioral research are invited to apply. Appointees may be U.S. citizens, resident aliens or non-resident aliens with, or eligible to obtain, a valid employment-authorization visa.

Salary: Successful candidates are offered competitive salaries commensurate with experience and qualifications, and they are assigned ample research space, supported positions and an operating budget. Our scientists focus entirely on their research with ample opportunities to mentor and train outstanding fellows at all levels.

How to apply: Complete applications must

be received by October 1, 2010. Interested applicants must submit a curriculum vitae, a three-page research plan, a one-page description of their vision for their future research and its potential impact, and contact information for three professional references through our online application system at http://tenure- track.nih.gov/apply. Letters of recommendation will be requested automatically when you submit your application. No paper applications will be accepted.

What to expect: Search committees of subject-matter experts will review and evaluate applicants based on the following criteria: publication record, potential scientific impact of current and proposed research, scientific vision, demonstrated independence, and awards. The committees will identify the most highly qualified candidates to invite to the NIH for a lecture open to the NIH scientific staff in December 2010 and for interviews with the search committees. Top candidates then will be nominated as finalists for Earl Stadtman tenure-track positions.

The Scientific Directors, who lead our 23 intramural programs, and the search committee chairs will work together to identify the finalists to be recruited as Earl Stadtman Investigators. Candidates not selected as Stadtman finalists can be considered for other open NIH research positions. The entire process from application review to job offer may take several months, depending on the volume of applications.

The inspiring story of Earl and Thressa Stadtman's research is at http://history.nih.gov/exhibits/stadtman. More information about the NIH Intramural Research Program is at http://intramural.nih.gov/search and http://sourcebook.od.nih.gov/ sci-prgms/sci-prgms-toc.htm. Specific questions regarding this recruitment effort may be directed to Dr. Roland Owens, Assistant Director, NIH Office of Intramural Research at owensrol@mail.nih.gov.

The NIH Intramural Research Program, with its extensive infrastructure and critical mass of expertise well established, has a crucial role in both maintaining America's research excellence and advancing treatments and cures. Come join the team whose hallmarks are stable funding, intellectual freedom, shared resources and broad expertise.

DHHS and NIH are Equal Opportunity Employers

Positions Available

Kozato Graduate Fellowship

The Kozato Graduate Fellowship in Quantitative Biology at the University of California Santa Barbara will offer competitive multi-year support comparable to the NSF Graduate Fellowship. The position is to begin in the Fall of 2011. The fellowship will support a student who has an interest in working on an interdisciplinary thesis project investigating a biological system using a combination of mathematical analysis and computational methods. It is envisioned the supported graduate student would have a primary adviser in mathematics, but would also interact closely with theoreticians and experimental biologists on campus at UCSB. The fellowship is funded by a generous donation from Hiro Kozato, a distinguished alumnus of the Department of Mathematics. Please fill out the form at the link below to be considered for this fellowship. Please be sure to include the names and e-mails for two references. Advisory Panel: Paul Atzberger, Department of Mathematics, Frank Brown, Department of Chemistry and Biochemistry, Hector Ceniceros, Department of Mathematics, Mustafa Kummash, Department of Mechanical Engineering, Everett Lipman, Department of Physics, Phil Pincus, Department of Materials, Omar Saleh, Department of Materials, Megan Valentine, Department of Mechanical Engineering. http://www.math.ucsb.edu/~atzberg/KozatoFellowship/

PhD Positions: Complex Systems in Biology Group

The Complex Systems in Biology Group at the University of New South Wales is looking for talented students to join their team in Sydney, Australia investigating immunity and vaccination for chronic infectious disease. The group is an interdisciplinary team including immunologists, applied mathematicians, physicists, chemists, engineers and computer scientists. The team collaborates with a number of experimental groups to study and model immune responses in humans and animals. The group has a strong history in successful interdisciplinary training, and is an ideal venue for scientists

considering a career change to work in quantitative biology. For more details of research interests see: http://www.med.unsw.edu.au/CVRWeb.nsf/page/CSB. PhD student scholarships (APA / IPRS): A number of post-graduate scholarships are available to support tuition and living expenses for domestic and overseas PhD students to study in Australia. A variety of projects are available studying the dynamics of HIV and malaria infection, as well as the genetic recombination mechanisms involved in immune recognition and viral evolution. These projects are suited to students with a strong background in a quantitative discipline like mathematics, physics, computer science, or bioinformatics. Acceptance is competitive, with a first class honors degree (or equivalent) and a GPA of >87% required. No previous experience in biology is required. Interested students should forward a CV and outline of interests to Prof Miles Davenport (m.davenport@unsw.edu.au) or Dr. Vanessa Venturi (v.venturi@unsw.edu.au).

PhD Position: Theoretical Biology & Bioinformatics Group

The Theoretical Biology and Bioinformatics Group of Prof. Rob de Boer (http://bioinformatics.bio.uu.nl/) of the Department of Biology of Utrecht University, Utrecht, the Netherlands invites qualified candidates to apply for a PhD position. The subject of the PhD project is modeling of asymmetric cell division in C. elegans. Asymmetric cell division is crucial for generating cell type diversity during development, and for enabling stem cells to combine self-renewal with the production of differentiating daughter cells. During asymmetric cell division the cleavage plane is positioned such that an unequal distribution of cellular components over daughter cells is achieved, allowing them to adopt different fates. In this project the PhD student will collaborate intensively with the experimental developmental biology group of Prof. S. van den Heuvel studying asymmetric cell division in C. elegans. The PhD student will integrate their experimental data into a computational modeling framework in which cell shape, membrane properties, gene regulation, protein phosphorylation, protein localization and spindle positioning are taken into account. The model will be used to obtain more insight in the mechanisms controlling cleavage plane positioning. One important research question the PhD will study concerns the mechanisms and forces that control the sequence of rotation, centration and posterior displacement of the centrosomes and spindle observed during the autonomous asymmetric division of the single cell zygote (1). Another research question concerns how the asymmetric division of epithelial seam cells depends on cell shape and polarity and how these in turn depend on cell-cell and cell-extracellular matrix adhesion and signalling. Additional information about this vacancy can be obtained from: Dr. Kirsten ten Tusscher, K.H.W.J.TenTusscher@uu.nl. (1) Galli M, van den Heuvel S. Determination of the Cleavage Plane in Early C. elegans embryos. Annu Rev Genet. 2008;42:389-411. We are looking for highly motivated individuals with experience, or an interest in developmental biology and a training in mathematical modeling and computer simulation. He/she communicates easily in English, both verbally and in writing.

Postdoc: Computational Immunology

Yale University School of Medicine, Department of Pathology is seeking a highly motivated postdoctoral associate to work on collaborative projects. The successful candidate will develop and apply computational methods/models and bioinformatics approaches to disease processes and the immune response in close collaborations with experimentalists. The ideal candidate will have strong quantitative and programming abilities, along with a demonstrated interest in applying these skills to problems in biology. Interested candidates should forward a CV and short description of research interests together with the names and addresses of three references to: steven.kleinstein@yale.edu -or- Steven Kleinstein, Ph.D., Department of Pathology, Yale University School of Medicine, 300 George Street, Suite 505, New Haven, CT 06511-6663. Yale University is an equal opportunity affirmative action employer. Minority and female applicants are encouraged to apply.

Postdoc: Molecular Epi & Evolutionary Diversity

Opportunities are available for postdoctoral research associates to study the molecular epidemiology and

evolutionary diversity of HIV, Influenza and other viruses. The research will be focused on HIV co-infection patterns and transmission networks; and human RNAs related to virus infections. The ideal applicants should have Ph.D. in molecular biology, bioinformatics, molecular/genetic epidemiology or applied mathematics with less than five years of postdoctoral experience. Extensive experience with sequence analysis, Perl/CGI, R, and MySQL is desirable. Individuals with expertise in high-throughput computational genomics and modeling, graph theory, and biological database development are particularly encouraged to apply. The position will be funded for 2 years with possible extension. To assure consideration, complete applications should be received by September 15, 2010. Applications will be entertained until the two positions are filled. The tentative start date is anytime after November 1, 2010. Please send the curriculum vitae, brief statement of research interests and names of three references to: Dr. Ming Zhang, Department of Epidemiology and Biostatistics, Faculty of Infectious Diseases, University of Georgia, Athens, GA 30602, c/o Dustin Baker jambaker@uga.edu.

PhD Position: Computational Systems Biology

Applications are invited for a PhD position, within the Computational Biology Group at the Department of Biosystems Science and Engineering of ETH Zurich. The group focuses on the development of detailed, predictive models for the behavior of cellular signaling networks in time and space with a view to develop a comprehensive understanding of the dynamics and evolution of cellular signaling. All projects are carried out in close collaboration with experimental groups so that quantitative data is available and model predictions can be tested in experiments. Applicants should hold or expect to obtain a degree in a numerate discipline (e.g. mathematics, physics, statistics, computational biology, or related areas). The Department of Biosystems Science and Engineering of ETH Zurich is an integral part of SystemX.ch, the Swiss initiative in Systems Biology. It is located in Basel, a European hotspot for biomedical research, in close proximity of the Biozentrum of the University of Basel, the Friedrich Miescher Institute for Biomedical Research, and the pharmaceutical and biotech industry. ETH Zurich is a major research university, offering an excellent environment for innovative and collaborative research across disciplines. Please send the usual application material, including at least two references, as a single PDF file to dagmar.iber@bsse.ethz.ch (preferred), or via surface mail to: Prof Dagmar Iber, ETH Zurich, D-BSSE, Mattenstrasse 26, 4058 Basel, Switzerland. For further information please visit our web page at http://www.bsse.ethz.ch/cobi

Three PhD Studentships & Postdoc: Theoretical Microbiology

A Post-doctoral position and three PhD studentships are available in bioinformatics and mathematical biology within the theoretical microbiology group of the School of Engineering at the University of Glasgow. In the theoretical microbiology group at the University of Glasgow we have pioneered the application of theoretical ecology to microbial communities in environmental engineering contexts. Prof. Sloan (head of group) was the first to apply neutral theory to model the assembly of these communities. In addition Dr Christopher Quince has developed novel algorithms and software for the analysis of next generation sequencing data from these communities. Consequently we have been very successful in obtaining funding from UK research councils (BBSRC, EPSRC) and industrial sponsors (Unilever). This has allowed us to embark on the ambitious project of integrating genomics data into mathematical community models. We have four positions available to work on aspects of this project (one EPSRC funded PDRA, and three PhD studentships). General enquiries can be addressed to Dr Christiopher Quince (quince@civil.gla.ac.uk). PhD Studentship in Metagenomics of the Human Microbiome available 1st October 2010 at the University of Glasgow, Supervisors: Dr Christopher Quince, Prof. William Sloan, and Dr David Taylor (Unilever), An exciting four-year PhD studentship is available under the BBSRC Industrial CASE scheme in the Department of Civil Engineering at the University of Glasgow. The objectives of this studentship are to develop improved statistical tools for the analysis of metagenomics data from human associated microbial communities. The

successful candidate will have a good (2:1 or above or equivalent) MSc or undergraduate degree in bioinformatics, engineering, mathematics, physics, statistics or other numerical subject. Biology students will be accepted if they can demonstrate sufficient quantitative skills. The PhD studentship will provide a tax free stipend at the rate of £16,590 per annum. The preferred start date is 1st October 2010 but other start dates may be possible. The studentship is open only to applicants from the UK and the European Union who fulfill residency requirements. Full details are available from: http://www.jobs.ac.uk/job/ABI075/phd-studentship/. Please contact Dr Christopher Quince with queries or applications (quince@civil.gla.ac.uk).

PhD Positions: Computational Biology

The following PhD positions are available in the Engineering Computational Biology Group at the University of Western Australia. (1) This position will be involved in a project on 'Multiscale modeling of fluid flow and solute transport through deformable porous materials'. This project's aim is to formulate multiscale models of bone incorporating the lacunae-canaliculi network and study solute transport, fluid flow and bone deformation behaviours. Outcomes of this project are expected to better understand the role and function of the osteocytic network in bone and they way osteocytes control bone remodelling. This project is supported by the Australian Research Council (ARC) discovery project grant scheme and coordinated by Drs Peter Pivonka and David Smith.

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 for 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

(2) This position will be involved in a project on 'Multiscale modelling of transport through deformable porous materials'. Aim of this project is to better understand transport behaviours of radionuclides through bentonites in order to be able to better design radioactive waste barriers. The PhD candidate will formulate models of ion transport through charged porous materials and compare the numerical results with experimental data provided by collaborators. This project is also supported by the Australian Research Council (ARC) discovery project grant scheme and coordinated by Drs Stefan Scheiner, Peter Pivonka and David Smith. (3) This position will be involved in a project on Engineering Computational Biology. The role of the PhD candidate will be development of computational/mathematical models of biological systems. Models will be developed to integrate a wide range of biological processes including: tissue deformation, fluid-tissue interactions, cell population dynamics models, inter and intra-cellular communication (systems biology). Projects will cover aspects of cancer biology (specifically colorectal and prostate cancer biology), regenerative medicine (specifically tendon and cartilage damage and repair), developmental biology (specifically drosophila development and bone growth), oxygen balance in the kidney, and implant design for the treatment of glaucoma. Typically models will involve a combination of partial differential equations, ordinary differential equations and discrete methods on a range of scales (e.g. molecular dynamics, cellular automata). These projects are coordinated by Drs Bruce Gardiner, Peter Pivonka and David Smith. For more information on our group, please see our webpage: http://biomed.csse.uwa.edu.au. Contacts: Dr Peter Pivonka - email: peter.pivonka@uwa.edu.au, Dr David Smith - email: david.smith@uwa.edu.au, Dr Bruce Gardiner - email: bruce.gardiner@uwa.edu.au. Required Skills: In order to register for a PhD, the applicant should have a Master degree or equivalent. The applicant should have a strong background in solid mechanics, fluid mechanics, physics, and / or computing; he/she should be familiar with FEM, Fortran, Linux (or Unix), Matlab, and multi-physics finite programs like COMSOL or equivalent. English is the working language at the lab, and good written and communication skills are essential. How to apply: please send a Curriculum Vitae and a motivation letter by email to one of the contacts listed above.