



SACEMA
DST/NRF Centre of Excellence in Epidemiological Modelling and Analysis

SACEMA NEWSLETTER

No 12: April 2009

The first few months of 2009 have been very busy for SACEMA staff and students. We were involved in several activities including successfully undergoing our first major review. We also celebrated the graduation of three SACEMA postgraduate students and launched a quarterly online magazine – see below for more details.

NEWS:

New magazine to focus on HIV and TB

SACEMA recently launched the first issue of *SACEMA Quarterly*, a bulletin which provides regular updates, articles and reviews of developments in the world of quantitative epidemiology – with particular reference to human health in South Africa and the advances in the fight against the twin scourges of HIV and TB.

Whereas a lot of the work of SACEMA is of a highly technical and mathematical nature the intention of this magazine is that the works presented there will be accessible to the lay-person and, most importantly, to the interested health professional and policy-maker. The first edition comes at an exciting time in the history of SACEMA and of the battle against HIV and AIDS. In the first issue, Professor Brian Williams, the founding father of SACEMA, provides a discussion on an article that he co-authored for the leading medical journal, *Lancet*, which suggested that “HIV testing and immediate antiretroviral therapy (ART) for everyone diagnosed with HIV in countries such as South Africa, could reduce new infections by 95% within ten years”.

The production of *SACEMA Quarterly* has been greatly facilitated by a grant from the Canadian International Development Agency (CIDA).

Visit www.sacemaquarterly.com to subscribe to the magazine.

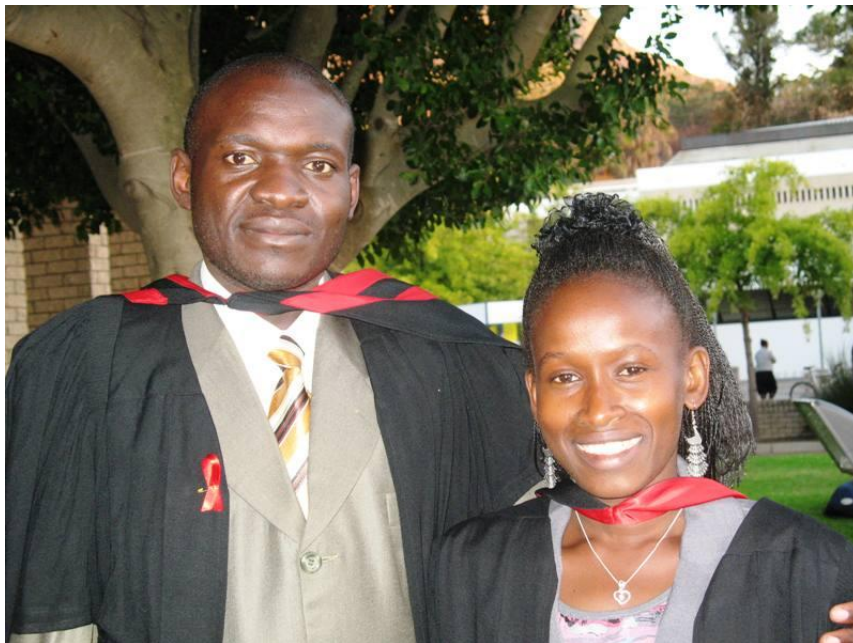
SACEMA graduations

SACEMA celebrated the graduation of three postgraduate students who received their degrees at Stellenbosch University's Faculty of Science graduation ceremony on 17 March 2009.

Mr Joseph Ssebuliba (Mathematics) was awarded his masters degree *cum laude*. The title of his MSc thesis is "Intracellular modelling and control of HIV-1 kinetics, T-lymphocyte decline and Immuno-senescence".

Ms Theresia Marijani (Mathematics) and Mr Damian Kajunguri (Mathematics) also graduated with a Master of Science degree. Theresia's thesis is titled "Modelling drug resistance in Malaria" and Damian's is titled "Modelling the impact of TB superinfection on the dynamics of HIV-TB coinfection".

All three students studied at the African Institute of Mathematical Sciences (AIMS) in Muizenberg before joining the Masters programme at SACEMA. They are the first resident MSc students to graduate from SACEMA. Both Joseph and Theresia will continue with their Doctoral studies at the University of Stellenbosch. Theresia is also the recipient of a Third World Organization for Women in Science (TWOWS) fellowship for her Doctoral study.



Pictured here are Joseph Ssebuliba and Theresia Marijani at the March graduation ceremony.

Visiting Researcher

In January SACEMA hosted Dr Stéphane Verguet, from the University of Washington. Stéphane completed his PhD at UC Berkeley and has been working with SACEMA on sexual partnering dynamics and the influence of age difference between sexual partners on sexually transmitted disease invasion. In the future, Stéphane will participate in SACEMA's long-term investigations on TB and HIV. Stéphane's interests lie in mathematical modelling to inform decision makers in public health.



NRF Review of SACEMA

The NRF review of SACEMA took place from 16-18 February 2009. The review covered the activities of the Centre from its inception in 2006 to 2008 and formed part of the broader review of the CoE programme and performance of individual CoEs. The outcome of the review was extremely positive. More details will follow once the report has been formalised by the relevant structures.



Pictured here are the reviewers with SACEMA staff and students

Conferences/workshops attended by staff and students

SACEMA staff and students attended the 4th South African Aids conference held in Durban from 31 March to 3 April 2009. Prof John Hargrove gave the plenary scientific talk at the opening of the conference - his presentation was titled "The HIV Epidemic in South Africa – Provenance and Prospects". At the opening ceremony on 31 March, Prof Hargrove shared the platform with Emeritus Archbishop Desmond Tutu and South Africa's Deputy President, Ms Baleka Mbete.

Prof Hargrove also gave an oral presentation titled "A case study of the application of the BED method for the estimation of HIV incidence", as well as a poster presentation titled "Estimating the window period for the BED method".

PhD students, Wim Delva and Carel Pretorius both delivered oral presentations - Wim's presentation was titled "Modelling the impact of combination HIV prevention" and Carel's "Intergenerational sex and the epidemic of HIV". Farai Nyabadza produced a poster presentation on the role of mathematical models in HIV/AIDS interventions. Visiting student, Guy Mahiane also produced a poster presentation titled "Statistical and Mathematical Analysis of the Dynamics of HIV and HSV-2 co-infection".

People on the move

Simon Childs visited the Onderstepoort Veterinary Institute at the beginning of February to brief the government on the potential outcome of aerial spraying as a strategy to control tsetse fly in K.Z.N. During the visit he also met with Prof Abdalla Latif and Chantel de Beer to discuss the use of the Fisher equation as a strategy to investigate the use of pour-ons and traps in the areas surrounding world heritage sites, and to plan experiments to obtain a missing data set which will complete Bursell's work on teneral H₂O loss. He also gave a talk on recently completed work modelling pupal water loss in *Glossina* (tsetse fly).

Rachid Ouifki visited the Theoretical Immunology Group at Utrecht University in the Netherlands from 1 February to 31 March. During this period he worked with Tendai Mugwagwa, Prof Dr Rob de Boer and Dr Jose Borghans on modelling the dynamics of telomere and T-cell receptor excision circles (TRECs) during HIV infection. They are currently working on the finalization of a paper that will be submitted for publication in the coming months.

EVENTS:

SACEMA Seminar Series

The following seminars were held in the SACEMA boardroom during the first quarter of 2009:

- Dr Simon Childs: *"Solving the Riddle Bursell Left Us (A Simple Model of Pupal Water Loss in Glossina)"*.
- Mr Guy Mahiane: *"Estimating the contribution of HSV-2 infection to increasing HIV incidence: the case of an adulthood Male Circumcising community"*.
- Dr Stéphane Verguet: *"The Basic Science of Microbicides"*.
- Dr Wim Delva: *"Keeping up to date with biomedical and biomathematical literature – The use of PubMed, Amedeo and e-mail alerts"*.



Dr Simon Childs explains a point during his seminar on pupal water loss.

Research Meeting

SACEMA hosted its annual research meeting on 16 and 17 April 2009. We invited all our students and their supervisors to this two-day meeting where SACEMA staff presented their own work and students reported on their progress, with new students presenting their research proposals.



SACEMA staff, students and supervisors at the Research Meeting

Graduate Students' Social Function

SACEMA staff and students joined the Department of Mathematical Sciences at their annual graduate students' social function. The function was held on 27 February in the StIAS courtyard. The festivities for the afternoon included a prize for the person sporting the best hat.



FORTHCOMING EVENTS:

US/Africa Clinic on Meaningful Modelling of Biological Data: 11 to 16 May 2009.

The US/Africa Clinic on Meaningful Modelling of Biological Data will be held at AIMS in Muizenberg from 11th to 16th May 2009. The workshop is sponsored by the Mathematical Biology Institute at Ohio State University, the Centre for Discrete Mathematics and Theoretical Computer Science at Rutgers University (DIMACS), the South African Centre for Epidemiological Modelling and Analysis (SACEMA), and the African Institute for Mathematical Sciences (AIMS), and is being supported by the US National Science Foundation (NSF) as well as SACEMA, and AIMS. The aim is to engage participants in epidemiological modelling methodologies using real biological data and grappling with practical questions in a meaningful way

SACEMA Introductory course on the Applications of Mathematics in Biology and Medicine: 6 to 10 July 2009.

SACEMA is sponsoring a one-week introductory course on the use of maths in biology and medicine for 3rd year and Honours students in the mathematical sciences. The purpose of this course is to interest them in the use of mathematics to address issues in biology or medicine. The course is run as a collaborative venture with AIMS, the Centre for Actuarial Research (CARE) at UCT and the Department of Mathematical Sciences at the University of Stellenbosch. South African students with a mathematical major are invited to contact Lynnemore Scheepers (scheepersl@sun.ac.za) for more information.