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## *SACEMA* Newsletter 2

December 2005

### **1. NEWS FROM THE SACEMA TRUST**

#### ***Appointment of the first Director of SACEMA***

Following an international search process and interviews held in Stellenbosch on 4 November 2005 by a selection panel made up of SACEMA Trustees and senior members of Stellenbosch University, **Dr John Hargrove** has been offered the post of inaugural Director of SACEMA for a period of five years, commencing in early 2006.

The post is accompanied by a chair appointment at the University of Stellenbosch, which was confirmed on 16 November by the University's Senate Appointments Committee. The chair will be based within the newly created Department of Mathematical Sciences and will be shared with the biological sciences. In addition to the SACEMA premises at STIAS, the Director is expected to have office facilities adjacent to these departments.

When the search process started in August, we reported the requirements for the post as follows in **Newsletter 1**:

*The post requires an exceptional person: someone able to converse effectively with mathematical scientists, biologists, medical and public health researchers, government and funding agencies. It also requires someone able to network convincingly and bring together scientists from disparate disciplines to develop ideas together and manage a large research portfolio. It is hoped to attract candidates with an international reputation in an area of biomathematics and sufficient standing in the subject to lead a major enhancement of research effort in quantitative epidemiological modelling within Southern Africa, while also being able to persuade government agencies of the relevance of research outcomes for policy decisions and funding agencies of the potential for successful research outcomes.*

The Trustees and the selection panel are pleased to report that in John Hargrove we have found just such a person. An internationally renowned modeller and biologist in the field of tsetse fly biology and control, with wide experience of managing a major research establishment and balancing the demands of international funding agencies and scientific researchers, he has over the past several years become centrally involved in seminal work on the impact of the HIV/AIDS epidemic on new mothers and babies in his native Zimbabwe. He thus combines a deep understanding of vector-borne disease with current work on the major epidemic afflicting the continent, and his wide

international research experience and contacts will enable him to establish SACEMA in the forefront of research international initiatives. We are confident that SACEMA will flourish under his leadership and are delighted to have him on board at the SACEMA premises, hopefully from January 2006.

### ***Appointment of Senior Research Fellow***

The Trustees have also agreed to appoint **Professor Edward Lungu**, of the Department of Mathematics at the University of Botswana, as a SACEMA Senior Research Fellow. This will be accompanied by an appointment as Professor Extraordinary in Mathematics at the University of Stellenbosch, and attracts an annual stipend to enable him to spend agreed periods each year at STIAS and elsewhere to conduct research and supervise training of young researchers, while retaining his full-time post at the University of Botswana.

Professor Lungu is chair of the Southern African Mathematical Sciences Association (SAMSA) and has played a leading role in the development of mathematics at university level in Southern Africa. He is an AIMS lecturer (see below) and has developed a highly successful prestigious MSC course on mathematical modelling (jointly with colleagues from Norway) in which epidemiological models play an increasingly central role. The course has trained a significant proportion of the academic staff in mathematics departments in several countries of Southern Africa, and several recent doctorates focusing on HIV models have been completed under his supervision.

We are very pleased to welcome him to SACEMA and look forward to much fruitful collaboration with South African scientists active in this field, as well as a continued major role in human resource development.

### ***Development of SACEMA as a DST Centre of Excellence***

As already reported in ***Newsletter 1***, the Department of Science and Technology (DST) have confirmed that SACEMA will be funded as a DST Centre of Excellence from January 2006. SACEMA is the seventh such Centre and the funding and reporting lines will be managed for the DST by the National Research Foundation (NRF), as is the case with the other six centres. A formal letter from the Director-General, Dr Rob Adam, has been received to confirm the position, and discussions between the SACEMA Trust, the University of Stellenbosch and the NRF on the detailed agreements to govern the process are now well under way.

The Trustees will be discussing the format and timing of a formal launch event for the new Centre of Excellence, when it is hoped to include comprehensive representation of the scientific community in this field and policy makers.

## **2 CURRENT AND PLANNED DEVELOPMENTS**

### ***(i) AIMS course of epidemiological modelling: SACEMA sponsors 12 participants***

As you may be aware, the African Institute for Mathematical Sciences (AIMS) has a three-week module on epidemiological modelling as part of its year-long Postgraduate Diploma programme. This originated with the one-week programme offered to the first AIMS student cohort by the team from the Getz Laboratory held just prior to the December 2003 Workshop from which SACEMA has grown. The module was very successful and led to a number of AIMS students taking up epidemiological modelling in their later research. It was expanded to a full three-week slot, held in November-December, for subsequent AIMS cohorts, and this year SACEMA is able to sponsor 12 additional participants from South Africa, Zimbabwe, Botswana, Belgium and Netherlands, who are attending AIMS solely for this module. The module, which is led by Dr Kimber Gross (Cambridge) and Professor Edward Lungu (Botswana), will extend the already close links between AIMS and SACEMA and assist our joint efforts to increase the number of scientists active in this field in Africa.

### ***(ii) Male Circumcision: planning meeting at UNAIDS in Geneva***

It is part of the folklore that male circumcision offers a degree of protection against female-to-male transmission of HIV, but until recently there has been a lack of scientific evidence to test this or quantify the effects, if any. The first three fully controlled clinical trials aiming to test this hypothesis began in Uganda, Kenya and at Orange Farm, South Africa less than two years ago. Because of the higher incidence of AIDS in South Africa, the Orange Farm trial was the first to report and was, indeed, stopped on ethical grounds as the effects were so clear and substantial. The trial found that circumcision offered 60-70% protection against HIV infection to the young males involved.

This trial was led by Professor Bertran Auvert, Professor of Epidemiology at the University of Versailles, who has been closely involved with SACEMA since inception, as a keynote speaker at our first workshop and currently as a member of our Scientific Advisory Committee. As reported in our first issue, his research on *'The development on a typology of sexual behaviour of young males'* is receiving limited pump-priming funding from SACEMA. Prof Auvert will use data gathered during the trial to provide more accurate mathematical models to assist our understanding of the spread of the disease more fully.

The trial results received wide attention and UNAIDS joined with SACEMA in organising a research planning meeting in Geneva on 17-18 November, attended by invited key experts from the USA, Europe and Africa, as well as policy advisers from the WHO. Presentations on all three trials were complemented by reports of comprehensive literature reviews and suggestions for implementing effective intervention based on these findings.

The meeting proved highly effective in introducing key international figures to the establishment and work of SACEMA. Sessions were chaired *inter alia* by John Hargrove and Brian Williams, and we hope soon to make the report of the meeting available on the SACEMA website. The meeting organiser, Dr Cate Hankins (UNAIDS), will present conclusions and recommendations of the meeting to the UNAIDS Reference Group in December.

### ***(iii) Modelling disease emergence: SACEMA-sponsored research published in 'Nature' attracts wide interest abroad***

The November 17 issue of the influential international science journal 'Nature' contains the article on '*Superspreading and the impact of individual variation on disease emergence*' (*Nature*, 438, 355-359) by JO Lloyd-Smith, SJ Schreiber, PE Kopp and WM Getz. The work leading to this paper was partially funded by SACEMA and three of the four authors are closely involved with SACEMA. The paper examines the impact on the modelling of and control strategies for diseases of casual contact of replacing the ubiquitous 'average reproduction rate'  $R_0$  by a more realistic continuous probability distribution. In doing so it provides a scalable definition of the concept of 'superspreader' which has recently exercised epidemiologists in the context of SARS and avian flu.

Since its acceptance by 'Nature' this paper has aroused much interest, both with specialists and the wider press. The 'News and Views' section of the same issue of 'Nature' leads with an article co-authored by Robert May (Lord May of Oxford) the retiring President of the Royal Society, highlighting the significance of handling the 'superspreader' phenomenon in the light of the paper's findings for eight common diseases. Especially in the USA, the authors were interviewed by a variety of radio and press reporters and Jamie Lloyd-Smith took part in a 'Nature' podcast to give a layman's interpretation.

### ***(iv) Further Meetings in preparation***

The research projects funded and planned by SACEMA have continued unabated during the past few months while the focus has been on the appointments announced above. Our new Director will have several ongoing planning tasks to attend to as soon as he takes office. Meetings currently being planned include a major international event to be held at Witwatersrand University in August 2006 (Wayne Getz, Alex Welte and Edward Lungu are on the organising group) and, as announced in the first issue, a joint meeting being planned with the University of Ghent to address research gaps in the modelling of major diseases. This meeting, originally scheduled for April 2006, will be postponed until later in the year, allowing the SACEMA Director to have a more active role in developing its content and focus. Details on further planned events will be posted on the SACEMA website ([www.aims.ac.za/sacema](http://www.aims.ac.za/sacema)).

***(v) Continued research funding***

In 2006 SACEMA will continue to support research projects featured in Newsletter 1, including the fellowship for Dr Rachid Ouifki (working with Gareth Witten) and research projects led by Alex Welte and Alan Matthews. The Director's comprehensive research and business plan is in preparation.