

Administration

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SACEMA **Newsletter 1**

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First meeting of the SACEMA Trust

Here, finally, is news many members on the SACEMA mailing list have been waiting for:

SACEMA will soon exist as a legal entity, able to negotiate its future funding in detail with the South African Government's Department of Science and Technology (DST), which largely conceived and has promoted this Excellence programme.

The formal proposal from the SACEMA Executive, submitted to the DST in early September 2004, gave rise to further detailed discussion between Ms Anati Canca of the DST and the two Principal Investigators (Professors Fritz Hahne and Ekkehard Kopp) of the initial DST grants totalling R2.5m received by SACEMA since March 2003. This led to invitations, approved by the Director-General of the DST, to nine prominent individuals to establish the **SACEMA Trust** and serve as its first Trustees.

The **Trustees**, who held their first meeting at STIAS on 17 August 2005, are:

Prof Salim Abdool Karim, Director, CAPRISA, University of KwaZulu Natal

Dr Ntuthuko Bhengu, Director, New Business & Medical Affairs, Biotech Labs (Pty) Ltd

Prof Chris Brink, Rector and Vice-Chancellor, University of Stellenbosch

Prof Darrell Comins, Director DST/NRF Centre of Excellence in Strong Materials, Witwatersrand University

Prof Wayne Getz, Department of Environmental Science Policy & Management, University of California at Berkeley, USA

Prof Ekkehard Kopp, Centre for Mathematics, University of Hull, UK,
Chairman

Dr Carl Lombard, Director, Biostatistics Research Unit, MRC

Prof Thandwa Mthembu, Vice-Principal, Witwatersrand University

Dr Brian Williams, TB Monitoring & Evaluation Unit, World Health Organisation, Geneva, Switzerland

Ms Anati Canca, Science Missions and Human Capital, DST, and *Dr Kamilla Oliver*, SACEMA Administrator, attended the meeting. The Trustees also welcomed two lunch guests, *Prof Walter Claassen*, Deputy Vice-Chancellor for Research, University of Stellenbosch, and *Prof Bernard Lategan*, Director, Stellenbosch Institute for Advanced Study (STIAS) for informal discussions.

DST Centre of Excellence: funding confirmed

Ms Canca confirmed that the DST will award grant funding to the Trust at the expected level of R5,000,000 p.a. for five years to SACEMA under its Centres of Excellence scheme, following the appointment of the SACEMA Director and approval of an initial business plan. A formal funding and management contract, similar to those established for existing Centres of Excellence, will be drawn up and managed through the National Research Foundation (NRF).

It is envisaged that the Centre of Excellence will be launched formally during the first half of 2006.

The Trust will complete a Memorandum of Understanding with SACEMA's host university, the University of Stellenbosch, which has supported us from the outset with administrative assistance and through the development of our premises at STIAS.

The Trust Board agreed to invite members of the former informal Programme Committee and Scientific Advisory Board to join a newly established Scientific Advisory Committee, whose proposed role, together with those of the Trustees and Director, is set out in a document outlining the governance of SACEMA as a project overseen by a legally independent Trust Board operating under a registered Trust Deed. Copies of this document are available upon request from the SACEMA Administrator.

Appointment of the SACEMA Director

The Trustees agreed to begin an international search process to fill the vacant post of Director, and nominated three Trustees to the selection committee to be established jointly with the University of Stellenbosch. It is expected that the successful candidate will be someone judged chair-worthy by the University through its normal processes, and thus be appointed to a chair within the University's Faculty of Science.

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.

Update on SACEMA's current activities

With a mailing list of over 250 scientists it is inevitable that a brief update of our activities over the past two years will contain much that some of you will already be familiar with. Nonetheless we hope that the account below, based on a paper presented to the Trust Board, will contain items that will be of interest to everyone. The SACEMA website (www.aims.ac.za/sacema), which is currently being updated and will undergo a major revamp shortly contains material on the December 2003 Workshop which launched the SACEMA project as well as details of several of the meetings sponsored by SACEMA.

1. Scientific Meetings, Research Projects and Publications

Following the success of the SACEMA Workshop in December 2003 and the formation of the first Executive Committee in February 2004, attention focused on developing the internal structure of SACEMA and assisting the research groups identified at the December Workshop in the development of viable research proposals. It was soon clear that four of these showed promise for rapid development:

Host-Viral Dynamics (convenor Gareth Witten)
TB/HIV Interaction Dynamics (convenor Brian Williams)
Population Modelling (convenor David Schneider)
Education (convenor Fritz Hahne).

The first three areas have led to further scientific meetings, arising directly from SACEMA-supported research, as follows:

Host-Viral Dynamics: a small research workshop was held at STIAS on 1-2 April 2004 to coincide with the annual meeting of SANUM at Stellenbosch. The Workshop included participants from the NICD and the University of Pretoria as well as from the University of Cape Town and students from AIMS. Research collaboration between **Dr Gareth Witten (UCT)** and his SACEMA-funded researchers (one post-doctoral and 3 MSc students) has continued; presentations on this research were given at an international meeting in Dresden in July 2005 and elsewhere.

A second workshop, held at STIAS on 19 April 2005, attracted about 15 researchers from France, Canada, and Belgium as well as UCT and Stellenbosch, for a lively meeting entitled *Mathematical Methods in Diseases, Metabolism and Ecosystems*. The group has established fruitful contacts with the French research agency IRD (Institute for Research and Development) and one of its senior members presented a paper at the Workshop.

Several research papers arising from the work of the group have been submitted to international journals.

TB/HIV Interaction Dynamics: an international Workshop, *Understanding the dynamics of HIV and TB in South Africa*, convened by **Dr Brian Williams (WHO)**, was attended at STIAS on 5-7 July 2004 by some 20 scientists from the Universities of Cape Town, Witwatersrand, Stellenbosch, KwaZulu Natal, Harare, California, Paris, London and Hull, from the Medical Research Council and the Department of Health. 14 presentations and intensive discussion led to the submission of proposals for further research accepted for 'pump-priming' funding by SACEMA. Several of these are currently underway.

In one case, support took the form of co-funding with the Wellcome Foundation of a major international research conference on *TB control strategies and factors affecting the risk of MTB infection in high HIV prevalence populations* held in Harare, 17-20 January 2005, led by Dr Liz Corbett, and this in turn has spawned substantial research proposals currently being considered by major funding agencies. This initiative is expected to lead to significant studies published in leading journals.

In addition, the following research projects have now received their initial funding allocation and will report in due course:

- (i) Prof Bertran Auvert (INSERM, Paris): Typology of Sexual Behaviour: Young Males
- (ii) Dr Henry Mwambi (UKZN): Determining R_0 for TB in South Africa
- (iii) Dr Chris Seebregts (MRC): Development of an Ethical Framework and Information Clearing House for Access to South African Tuberculosis and AIDS Research and Operational Data Sets.

Population Modelling: a highly successful international Workshop, led by **David Schneider (Chair of the ASSA AIDS Committee)**, was held at STIAS from 27 September to 1 October 2004 on the theme *Estimating the demographic and epidemiological impact of HIV/AIDS in South Africa, and projecting the need for antiretroviral therapy*. The meeting sought to examine the principal models used internationally (EPP, Spectrum, the UNPOP projection model and jwgAIDS) as well as the ASSA2002 AIDS model to estimate and predict the incidence and prevalence of HIV/AIDS and compare their projections on the basis of South African data, both with and without the roll-out of a national ARV programme. Researchers from UNAIDS and the WHO joined the modellers presenting the above strands of research in discussion of the results. An introduction to a micro-simulation model developed by Stats Canada was presented. Although some time has passed since the meeting, is hoped that presentations given at this meeting will appear in the international literature.

In addition, SACEMA has made funds available to South African modellers and students (including AIMS students) who have attended the annual short courses on population modelling given by the **UCT Centre for Actuarial Research (CARE)**, led by Professor Rob Dorrington in June 2004 and 2005.

Dr Alan Matthews (School of Physics, UKZN) hosted a small four-day SACEMA-supported workshop on the ASSA model in Durban in June 2005, attended by Professor Wayne Getz (Berkeley) and locally based scientists.

2. Student support and development

The development and support of students in epidemiological modelling has been a principal objective for SACEMA since its inception. Efforts have been led by **Professor Fritz Hahne, Director of the African Institute for Mathematical Sciences (AIMS)**, and began with a one-week intensive course for the first cohort of AIMS students in December 2003, in advance of the inaugural SACEMA Workshop. Some 20 delegates to the Workshop also attended, funded by SACEMA, with additional funding from US sources via the Getz Laboratory. Lectures were provided by Dr Kimber Gross, Jamie Lloyd-Smith and Wayne Getz.

This led to the establishment of epidemiological modelling as a full AIMS module for the second cohort of AIMS students, with a three-week course led by Kimber Gross (now at Cambridge), supported by Rob Dorrington and colleagues from CARE. It is intended that this will be repeated annually.

In each year 6 AIMS students (out of 30 in 2003/4 and 42 in 2004/5) opted to choose topics in epidemiological modelling for their final research essays. In 2004/5 two students were supported jointly by AIMS and SACEMA on MSc programmes at UCT and in 2005/6 two AIMS students are being supported by SACEMA on MSc programmes at Stellenbosch, one at UKZN and one at Witwatersrand University.

Early in 2005 AIMS received substantial funding from Vodacom specifically for the support of epidemiological modelling, and it is planned that this will support further students as well as visits by established researchers and a postdoctoral fellow.

Requests for funding of students were received from the University of Bulawayo following the Harare workshop, and the University of Venda and Rhodes University have expressed interest in visits from SACEMA researchers to help establish epidemiological modelling modules within their Honours programmes. These requests have yet to be acted upon.

3. Collaboration within Southern Africa

The SACEMA database lists contacts with a large number of active scientists in the field within South Africa, and contact has been made with many different groups.

SACEMA seeks neither to replace nor compete with any existing research efforts, but to complement and enhance them through active collaboration.

While members of many of these groups have attended SACEMA events and have links to individual researchers active on SACEMA-funded projects, our formal links with institutions and specific research groups are still somewhat limited. Now that SACEMA will exist as a legal entity, the informal contracts we have agreed with institutions, groups and individuals can be strengthened substantially and increased in number and scope.

To date SACEMA has agreed partial 'staff buy-out' and financial support arrangements with the following:

*(a) The University of the Witwatersrand: funding was provided at the end of 2004 for a research project undertaken by Dr Alex Welte (CAM) on *Virus dynamics modelling to understand emergence and persistence of drug resistant strains under interrupted therapy such as in the prevention of mother to child transmission.* SACEMA funding*

(which largely covered the costs of code development) for this project, undertaken jointly with Wayne Getz and others linked to his Berkeley laboratory, was supplemented from the latter's US-based research grants and other sources, including Witwatersrand University. Substantial progress has been made on developing a sophisticated computer code (DEBI) able to handle large systems of ODEs as well as Bayesian parameter fitting. Several research publications are being completed following three visits by Dr Welte to the Getz laboratory in Berkeley, and it is planned that the research programme will continue with the participation of SACEMA-funded research students.

(b) *AIMS*: Dr Gareth Witten, who was made a STIAS Fellow in 2004, has followed a detailed research plan submitted to SACEMA and STIAS. In addition to providing funds, jointly with STIAS, for him to concentrate full-time on these activities for the period April-August 2005, SACEMA is supporting his postdoctoral researcher, Dr Rachid Ouifki, and three MSc students (2 from AIMS). A report on the outcome of his research, which includes exacting targets for publication, dissemination and education, is due in late 2005. Collaboration with NICD staff also continues.

(c) *UKZN*: Dr Alan Matthews has collaborated with Professor Rob Dorrington on enhancing the computational aspects of the ASSA models for prediction of HIV/AIDS infection at the population level. The coding of these models in C++ has enabled him to conduct simulations, consider Bayesian parameter estimation and identify local extrema for different choices of parameters, enhancing model validation. Dr Matthews visited the Berkeley laboratory of Prof Getz in April 2004 and began collaborations with its researchers.

With the assistance of Professor Abdool Karim he has established a computer laboratory at UKZN, where a small team of researchers is pursuing this work with him. Upon receipt of a detailed research plan, SACEMA has 'bought out' his teaching load for part of 2005 to enable him to concentrate on this research. A final report is due early in 2006.

Other potential collaborations with teams within Southern Africa await development. The April meeting of the SACEMA Programme Committee was attended by Professor Sharon Fonn (Wits), who gave an impressive account of her large team's work with HIV datasets throughout Africa, as well as by Professors Hofmeyr, Chown and van Helden (Stellenbosch) all of whose presentations also identified areas of common interest and possible collaboration with SACEMA.

Other groups with whom various research contacts have been made include the universities of Pretoria, Bloemfontein, Bulawayo and Botswana.

4. International collaborations

A signal success has been the link established with the **Getz Laboratory** at Berkeley, USA, which has hosted fruitful research visits from Drs Welte, Matthews and Witten in addition to a one-month visit, funded by the McDonnell Foundation, by Professor Ekkehard Kopp in April 2004. The latter visit resulted in a joint theoretical paper, entitled *Superspreading and the impact of individual variation on disease emergence*, (Jamie Lloyd-Smith, Sebastian Schreiber, Ekkehard Kopp and Wayne Getz) which has recently been accepted for publication in *Nature* and is due to appear in September 2005.

At the WHO Brian Williams and Jeremy Lauer have held discussions with representatives of Stats Canada on possible joint work and funding applications to exploit microsimulation modelling techniques in the context of South African HIV data. The funding applications will require inter-governmental contacts for their success, which has become feasible with the establishment of the SACEMA Trust.

Other contacts established abroad include the Universities of Harvard and Yale as well as the London School of Hygiene and Tropical Medicine and Imperial College, London. Discussions have begun on possible joint work with SACEMA.

Dr Cathal Seioghe is a principal organiser of a joint Stanford-SA training programme in bioinformatics, whose workshop in September 2005 includes SACEMA-sponsored lectures on population modelling by Dr Matthews.

Together with public health researchers from the University of Ghent, as well as the WHO, the Prince Leopold Institute for Public Health (Antwerp), AIMS and the University of the Western Cape, SACEMA is planning an international conference in Cape Town in April 2006 under the title ***Modelling of HIV/AIDS, TB and Malaria: Addressing research gaps, capacity building and networking***. It is expected that significant numbers of researchers and students from Southern Africa will be able to attend – a request for substantial funding from EU sources has been submitted by the University of Ghent.

5. Visibility

In the last two years SACEMA has achieved substantial visibility within South Africa, assisted by articles in journals such as the *South African Journal of Science* (August 2003) and the first edition of *Quest* (early 2005). SACEMA continues to attract attention internationally: the website was visited frequently by active scientists seeking information, including access to the presentations at the inaugural workshop and the substantial literature list provided on the site. The acronym is widely recognised within the field.